

SIXTH ANNUAL REPORT

OF THE

BOARDS OF TRUSTEES

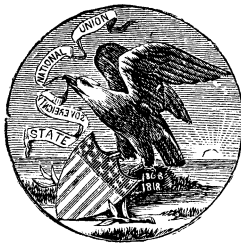
OF THE

ILLINOIS INDUSTRIAL UNIVERSITY,

FOR 1872-3.

WITH

MINUTES OF MEETINGS OF EXECUTIVE
COMMITTEE, LECTURES, Etc.



SPRINGFIELD :

STATE JOURNAL PRINTING OFFICE.

1874.

"Books, in this case, ought only to be accessories—not principles. The pupils must be brought in face of the facts through experiment and demonstration. He should pull the plant to pieces, and see how it is constructed. He must vex the electric cylinder till it yields him his sparks. He must apply with his own hand the magnet to the needle. He must see water broken up into its constituent parts, and witness the violence with which its elements unite. Unless he is brought into actual contact with the facts, and taught to observe and bring them into relation with the science evolved from them, it were better that instruction in science should be left alone; for one of the first lessons he must learn from science is not to trust in authority, but to demand proof for each asseveration. All this is true education, for it draws out faculties of observation, connects observed facts with the connections deduced from them in the course of ages, gives discipline and courage to thought, and teaches a knowledge of scientific method which will serve a life time. Nor can such education be begun too early. The whole yearnings of a child are for the natural phenomena around, until they are smothered by the ignorance of the parent. He is a young Linnaeus roaming over the fields in search of flowers. He is a young conchologist or mineralogist gathering shells or pebbles on the sea-shore. He is an ornithologist and goes bird-nesting. An ichthyologist and catches fish. Glorious education in nature, all this, if the teacher knew how to direct and utilize it."

LYON PLAYFAIR.

TO

GOVERNOR JOHN L. BEVERIDGE.

I have the honor to submit herewith the Sixth Annual Report of the Board of Trustees of the Illinois Industrial University, for the new fiscal year terminating with August 31st, 1873; as well as the statement of the condition of the endowment fund, and the receipts and expenditures of the year, called for by section four of the act of May 7, 1873, which statement will be found on pages 174 and 175.

Thanking you for the personal interest you have shown in our effort to fitly educate the great industrial classes of our State, I am

Very respectfully, yours,

W. C. FLAGG,

Cor. Sec. Board of Trustees.

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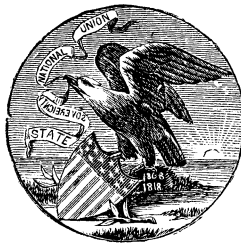
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NEW BOARD OF TRUSTEES,

UNDER LAW OF MAY 7, 1873.

Ex officio.

HIS EXCELLENCY, GOVERNOR JOHN L. BEVERIDGE.
JOHN P. REYNOLDS, PRESIDENT STATE AGRICULTURAL BOARD.

Term expires 1875.

A. M. BROWN, Villa Ridge, Farmer and Fruit-grower.
EMORY COBB, Kankakee, President, Farmer and Banker.
D. GARDNER, Champaign, Farmer and Banker.

Term expires 1877.

ALEXANDER BLACKBURN, Macomb, Farmer.
R. B. MASON, Chicago, Civil Engineer.
J. P. SLADE, Belleville, Teacher.

Term expires 1879.

J. J. BYRD, Cairo, Railroad Employee.
J. H. PICKRELL, Harriestown, Farmer.
D. D. SABIN, Belvidere, Merchant.

EXECUTIVE COMMITTEE.

EMORY COBB, Kankakee, President of the Board.
A. M. BROWN, Villa Ridge.
D. GARDNER, Champaign.

OFFICERS AND INSTRUCTORS.

Faculty.

JOHN M. GREGORY,
Regent, and Professor of Philosophy and History.
WILLIAM M. BAKER,
Professor of English Language and Literature.
A. P. S. STUART,
Professor of Chemistry.
STILLMAN W. ROBINSON,
Professor of Mechanical Engineering.
THOMAS J. BURRILL,
Professor of Botany and Horticulture.
COL. S. W. SHATTUCK,
Professor of Mathematics.
CAPT. EDWARD SNYDER,
Professor of Modern Languages and Military Tactics.
DON CARLOS TAFT,
Professor of Geology and Zoology.
JOSEPH F. CAREY,
Professor of Ancient Languages and History.
J. BURKITT WEBB,
Professor of Civil Engineering.
DR. MANLY MILES,
Non-resident Professor of Agriculture.
HON. WILLARD C. FLAGG,
Superintendent of the Experimental Farm.
DR. F. W. PRENTICE,
Non-resident Lecturer on Veterinary Science.

Instructors and Assistants.

N. CLIFFORD RICKER, Instructor in Architecture.	EDWARD S. STEELE, Assistant in English Language.
CHARLOTTE E. PATCHIN, Instructor in Free-hand Drawing.	CHARLES W. SILVER, Assistant in Chemical Laboratory.
CHARLES W. ROLFE, Assistant in Natural History.	WILLIAM L. CARD, Instructor in Book-keeping.

Assistants in Practice.

E. A. ROBINSON, Foreman of Machine Shop.	D. A. STEDMAN, Foreman of Carpenter Shop.
H. K. VICKROY, Orchardist and Gardener.	E. L. LAWRENCE, Head Farmer.
CHARLES I. HAYS, Florist.	WILLIAM L. CARD, Business Agent.

LIST OF STUDENTS.

EXPLANATIONS.

The first figures after the names indicate 1st, 2d, 3d and 4th year students. The succeeding figures designate the courses of study, as follows: 0, Elective; 1, Military; 2, Agricultural; 3, Horticultural; 4, Mechanical Engineering; 5, Civil Engineering; 6, Mining Engineering; 7, Architecture; 8, Natural History; 9, Chemistry; 10, Literature and Science; 12, Commercial.

MALE STUDENTS.

Names.	Post Office.	County.
Adams, George Clarence, 1.....	2 Urbana.....	Champaign.....
Adams, M. D., 1.....	0 Hainesville.....	Lake.....
Adams, W. W., 1.....	2 Urbana.....	Champaign.....
Allen, Charles W., 1.....	2 Harristown.....	Macon.....
Allen, Emory Adams, 2.....	5 Sheffield.....	Bureau.....
Allen, Henry C., 1.....	2 Harristown.....	Macon.....
Allen, Pulaski Kossuth, 1.....	10 Ringwood.....	McHenry.....
Allen, Ralph, 1.....	2 Delavan.....	Tazewell.....
Atkins, Thomas O, 1.....	4 Carbondale.....	Jackson.....
Bagby, John Scrips, 1.....	5 & 1 Rushville.....	Schuyler.....
Bailey, Ozias, 1.....	0 Champaign.....	Champaign.....
Bailey, Willis Joshua, 1.....	2 Argo.....	Carroll.....
Baker, Carroll, 1.....	2 Tuscola.....	Douglas.....
Baker, F. S., 2.....	10 Tarboro, N. C.....	.....
Baker, Horatio Fellows, 2.....	5 Mattoon.....	Coles.....
Baker, Julian Meredith, 2.....	2 Tarboro, N. C.....	.....
Baker, William Sherwood, 2.....	2 ".....	.....
Balcom, Stephen Francis, 2.....	5 Edgewood.....	Effingham.....
Ballou, Edward Lull, 2.....	2 Sherwood, Wis.....	.....
Barlow, William Lewis, 2.....	2 Tarboro, N. C.....	.....
Barnard, D. E., 3.....	2 Manteno.....	Kankakee.....
Barnes, Arthur Ellis, 2.....	9 Champaign.....	Champaign.....
Barnes, Arthur Marcus, 1.....	2 & 1 ".....	.....
Barrett, Benjamin, 1.....	0 ".....	.....
Barry, Charles Hart, 1.....	10 Alton.....	Madison.....
Benedict, Emerson, 1.....	12 Arlington.....	Bureau.....
Bentley, William N., 1.....	12 Rockton.....	Winnebago.....
Bird, Albert J., 1.....	0 Rochelle.....	Ogle.....
Birkett, John, 1.....	0 Todd's Point.....	Shelby.....
Blagden, Alonzo D., 2.....	12 Genoa.....	De Kalb.....
Blake, Arthur Eugene, 1.....	5 Mendota.....	La Salle.....
Bliss, Jr., Abel, 1.....	5 & 1 Joliet.....	Will.....
Bliss, Frank Wilbur, 1.....	0 St. Charles.....	Kane.....
Bond, Oswald, 1.....	0 Monticello.....	Piatt.....
Boothby, Almon H., 1.....	12 La Moille.....	Bureau.....
Bourland, Rodolphus Rouse, 2.....	5 Peoria.....	Peoria.....
Bowers, John Hewins, 2.....	0 & 1 Blue Grass.....	Vermilion.....
Bowman, Thomas Harrison, 1.....	2 Piasa.....	Macoupin.....
Boyer, Charles Summerfield, 2.....	6 Walla Walla, Wash. T.....	.....
Boyer, John, 1.....	0 Venice.....	Madison.....

Names of Students—Continued.

Names.		Post Office.	County.
Bracken, Henry Delos, 1	12	Elgin	Kane
Brennemann, Joseph, 1	0	Granville	Putnam
Brooks, Samuel P., 3	0	Lyndon	Whiteside
Brown, Dillon S., 2	2	Genoa	DeKalb
Brown, Frank Adelbert, 1	5	Marengo	McHenry
Brown, Ralph Lee, 2	10		
Brush, C. E., 1	7	Carbondale	Jackson
Bullard, Samuel A., 1	2	Mechanicsburg	Sangamon
Butler, Alban, 1	5	Decatur	Macon
Butterfield, Leroy Taylor, 1	5	Marengo	McHenry
Campbell, George Duncan, 1	0	Mt. Carroll	Carroll
Campbell, John, 1	4	Chicago	Cook
Campbell, John Patterson, 3	5	McLeansboro	Hamilton
Campbell, Robert H., 1	0	Mt. Carroll	Carroll
Carey, Charles Henry, 1	5 & 1	Champaign	Champaign
Carr, James Wellington, 1	10	Fenton	Whiteside
Cate, Horatio Wilson, 2	10	Hamilton	Hancock
Chandler, William B., 1	2	Bourbon	Douglas
Chapman, Henry H., 2	2	Elvaston	Hancock
Chapman, S. S., 3	2		
Chase, Willis Smith, 3	0 & 1	Chicago	Cook
Cheever, George Henry, 1	0	Champaign	Champaign
Cheney, Thomas H., 1	2	Springfield	Sangamon
Claridge, Rupert Roswell, 1	0	Otterville	
Clark, Charles Wright, 1	5	Champaign	Champaign
Clark, J. C., 1	10	Elvaston	Hancock
Clark, Judson J., 1	4	Xenia	Clay
Clay, Luther G., 2	3 & 1	South Pass	Union
Codington, Vantile William, 2	5	Menomunie, Wis.	
Cole, Henry C., 2	9	Chester	Randolph
Cole, Oliver Garrison, 1	0	Salem, Oregon	
Cole, Richard H., 3	5 & 1	Peru, Indiana	
Coler, William W., 1	0	Champaign	Champaign
Conner, Henry, 2	10 & 1	Burton	Adams
Connet, Dickey, 2	2	Champaign	Champaign
Cook, Francis, 2	10	Nokomis	Montgomery
Corson, Edward, 3	4 & 1	Richland	Sangamon
Cowen, R. H., 1	2	Champaign	Champaign
Cox, John Frank, 1	2	Mattoon	Coles
Craig, Augustus Lessure, 2	9	Aledo	Mercer
Crawford, John S., 1	10	Champaign	Champaign
Crawley, John Joseph, 2	0	Tuscola	Douglas
Culter, Bradford Marshall, 1	0	Florida	
Daily, Milton, 1	10 & 1	McLeansboro	Hamilton
Davenport, Joseph J., 2	10 & 1	Minonk	Woodford
Davis, Charles, 2	10 & 1	Marengo	McHenry
Davis, Taylor, 2	8	Bourbon	Douglas
Dimon, Jacob V., 1	10	Creston	Ogle
Dobson, Franklin Pierce, 2	5 & 1	Minonk	Woodford
Donaldson, Eli Altier, 1	0	Urbana	Champaign
Dore, Clarence Francis, 2	10	Forreston	Ogle
Dowell, Wilson L., 4	7	Lexington	McLean
Drake, James Frederic, 2	2 & 1	Belvidere	Boone
Draper, Edwin Frank, 2	0 & 1	Nokomis	Montgomery
Drewry, Ebenezer L., 2	0	Mason	Ethingham
Dunlap, Burleigh Arthur, 2	5	Savoy	Champaign
Dunlap, Clermont D., 3	5	Norwood Park	Cook
Dunlap, Henry, 3	0	Champaign	Champaign
Dunning, Albert, 1	5	Jefferson	Cook
Eager, John T., 1	0	Earlsville	LaSalle
Earle, Frank S., 1	0	South Pass	Union
Edsal, Croyden, 1	0	Grafton	Jersey
Ellithorpe, Frederick, 1	0	Chicago	Cook
Ells, William Cushing, 3	5	Champaign	Champaign
Estep, Harvey C., 3	5	Rantoul	
Evarts, Frank H., 1	12	Girard	Macoupin
Everhart, Winfield Scott, 2	10 & 1	Neoga	Cumberland
Everts, Frank Herbert, 1	12	Girard	Macoupin
Eyman, Walter, 2	5	Belleville	St. Clair
Farson, John W., 1	0	Champaign	Champaign
Faulkner, James, 3	3 & 1	Clement	Clinton
Ferguson, William Dugan, 1	4	St. Charles, Mo	
Fidler, William Allen, 1	10	Neoga	Cumberland
Filson, William F., 1	2	Xenia	Clay
Fisher, William Henry, 1	12	Rockford	Winnebago
Folks, Willis Kemper, 2	5	Champaign	Champaign
Foster, Charles F., 1	12	Springfield	Sangamon
Fowler, Charles H., 1	12	Chicago	Cook
Frost, Edward Disborough, 1	9	Jerseyville	Jersey

Names of Students—Continued.

Names.		Post Office.	County.
Gabriel, Gregory, 3	2	Armenia, Asia Minor	
Garniner, William Rodney, 1	9 & 10	Mahomet	Champaign
Gay, Eugene Volney, 1	2	Girard	Macoupin
Gennadius Panajiotis, 3	2	Athens, Greece	
Gilkerson, Hiram, 1	2	Ney	DeKalb
Gilkerson, John, 1	0		
Gill, Joseph A., 1	13	Springfield	Sangamon
Gill, John David, 2	10	Antwerp, N. Y.	
Gillen, Elijah Fisher, 1	0	Champaign	Champaign
Glass, Wilbur Smith, 1	10 & 1	Marengo	McHenry
Gmunder, Jr., Frederick, 1	9	Adrian	Hancock
Gore, Fred Harry, 1	5 & 1	Byron	Ogle
Gore, Simeon Thomas, 1	7	Ashley	Washington
Graham, Charles Payton, 4	0	Champaign	Champaign
Graham, Jonathan, 1	12	Mattoon	Coles
Grant, James B., 3	10 & 1	Davenport, Iowa	
Gregory, Charles Edwin, 3	10 & 1	Urbana	Champaign
Gregory, Samuel F., 3	0 & 1	Sand Lake, N. Y.	
Grey, Elmer W., 1	0	Champaign	Champaign
Gridley, George N., 4	2	Half Day	
Groves, Charles W., 1	12	Champaign	Champaign
Groves, John I., 1	12		
Gunder, Jasper M., 1	0	Fairmount	Vermilion
Hall, Rollin Hill, 1	12	Paxton	Ford
Hall, Walter Orlando, 2	2	Rankin	Randolph
Hannah, Richard H., 2	3	Rossville	Vermilion
Harland, William O., 1	9	Mahomet	Champaign
Hatch, Frederic Lewis, 4	2	Bliven's Mills	McHenry
Hathorn, John C., 1	0	Blair	Randolph
Hauser, Henry, 1	10	Mascoutah	St. Clair
Hawes, Joseph W., 1	9	Mahomet	Champaign
Hays, Charles L., 4	3	Bridgeport	Cook
Hennessey, Augustus L., 4	0	LaSalle	LaSalle
Hessey, Clarence Knight, 3	7	Champaign	Champaign
Hewins, Charles F., 1	0	Oakalla	Iroquois
Hill, Edgar L., 4	9 & 1	Eftingham	Eftingham
Hodges, George Irving, 1	12	Champaign	Champaign
Holmes, Fred. H., 1	0	Warsaw	Hancock
Hook, Samuel Houston, 3	10	Urbana	Champaign
Hoover, Henry C., 1	0	Urbana, Ind.	
Hoover, Joseph H., 1	4	Bridgeport	Cook
Howard, Edwin Monroe, 1	9	Champaign	Champaign
Howe, Charles, 2	0	Wenona	Marshall
Hull, Evelyn T., 2	3	Alton	Madison
Irwin, Ralph Judson, 1	10	Havana	Mason
Jeffers, Charles Perry, 3	9	Lyndon	Whiteside
Johnson, Frederick L., 1	5 & 1	Springfield	Sangamon
Johnson, Samuel E., 1	4	Oakalla	Iroquois
Jones, Thomas A., 1	2	Brighton	Macoupin
Joy, Edwin W., 1	12	Jacksonville	Morgan
Karr, William Alexander, 1	10 & 1	Fitts Hill	Franklin
Kasson, Myron, 1	0 & 1	Woodstock	McHenry
Kelley, John Campbell, 1	12	Paxton	Ford
Kenower, George Frederic, 2	10	Clement	Clinton
Kingsbury, Charles S., 2	5	Bowensburgh	Hancock
Kipp, Ellakim B., 1	12	Minonk	Woodford
Kitchell, William W., 1	1	Olney	Richland
Knapp, Albert J., 2	4	Joliet	Will
Knibloe, Walter Elliott, 1	4	Gilman	Iroquois
Kyle, James Henderson, 2	10 & 1	Urbana	Champaign
Ladd, James C., 2	0	Ringwood	McHenry
Lambert, Cyrus Wilbur, 3	0	Rantoul	Champaign
Lawhead, Charles W., 1	0	Champaign	
Lee, Charles Mylo, 1	2	Millersburg	Mercer
Leflar, John Emmerson, 2	10	Batavia	Kane
Lindley, Ira S., 2	0	Grove City	Christian
Linn, Edward W., 2	2	Montgomery, Ala.	
Lloyd, Joseph Julius, 1	10 & 1	Lansing, Iowa	
Loomer, Melvin Harry, 2	12 & 1	Marengo	McHenry
Loomis, George Duckels, 1	5 & 1	Carlinville	Macoupin
Love, Sharon, 2	2	Philo	Champaign
Low, James Eli, 1	0	Waukegan	Lake
Lupton, Thomas, 1	0	Todd's Point	Shelby
Lutzer, Louis, 1	2	Highland	Madison
Lyford, Charles C., 3	2	Roscoe	Winnebago
Lynch, Edward, 3	0	Monticello	Piatt
Lynch, Henry Edward, 1	5		
Mabin, George G., 2	0	Belvidere	Boone
Mackay, Daniel Grover, 1	10	Oakville	

Names of Students—Continued.

Names.	Post Office.	County.
Mackay, James Henry, 1.	10 Oakville	
Mackay, William Alexander, 1.	5 & 1	
Magill, Russell Milton, 1.	10 Naples	Scott
Mahan, Henry Weston, 1.	10 Champaign	Champaign
Makemson, Samuel Clinton, 1.	9 Wilmot, Ind.	
Mann, Frank Irving, 2.	10 & 1 Gilman	Iroquois
Mann, James Robert, 2.	0 & 1	
Mariott, Joseph, 1.	12 La Moille	Bureau
Mathews, Newman Hamline, 1.	4 Mackinaw	Tazewell
Maze, Edward Samuel, 1.	10 Peru	LaSalle
McCauley, John Charles, 2.	10 Lincoln	Logan
McCoy, Charles B., 1.	10 & 1 Aledo	Mercer
McDonald, Alexander, 1.	9 Champaign	Champaign
McFall, James Allison, 1.	9 Mattoon	Coles
McMillan, Charles Richardson, 1.	5 Champaign	Champaign
Miller, A. V., 1.	12	
Mitchell, Rufus Sterett, 1.	5	
Moore, Aaron Henry, 2.	10 Louisville	Clay
Morlock, John, 1.	0 Mascoutah	St. Clair
Morris, John Ca'vin Calhoun, 3.	0 Lincoln	Logan
Mueller, John, 1.	9 Wuerttemberg, Germany.	
Nebeker, Corie Aquilla, 2.	0 Mahomet	Champaign
Noble, Louis Reeder, 1.	4 & 1 Mattoon	Coles
Ockerson, John Augustus, 4.	5 Elmwood	Peoria
Oliver, William Francis, 1.	9 & 1 Ladoga, Ind.	
Page, Calvin Samuel Herbert, 2.	10 Champaign	Champaign
Paige, James Albert, 1.	5 Brush Valley, Pa.	
Palmer, Frank Mitchell, 2.	10 & 1 Clinton	DeWitt
Pancake, George H., 4.	0 Mahomet	Champaign
Parker, George W., 2.	4 Wenona	Marshall
Parks, James Harvey, 2.	5 & 1 Orion	Henry
Parsons, Fernando Alston, 2.	10 Waterloo, Iowa.	
Patch, Emory Edward, 3.	4 Janesville, Wis.	
Paton, John, 2.	4 Lincoln	Logan
Paul, William Todd Nicholls, 1.	0 Dwight	Livingston
Phillips, Parley Agrippa, 4.	0 Damascus	Stephenson
Pickrell, Watson, 2.	2 Mechanicsburg	Sangamon
Pickrell, William, 3.	2	
Pierce, Elon Albert, 1.	2 Belmond, Iowa	
Pierce, John Larke, 3.	10 Champaign	Champaign
Platt, Franklin C., 3.	0 Warren	Jo Daviess
Poage, James S., 2.	5 Aledo	Mercer
Pollock, William Clarence, 2.	9 Mt. Vernon	Jefferson
Poole, Franklin Rand, 2.	5 Cobden	Union
Porterfield, Newlon, 4.	4 Sidney	Champaign
Prickett, Charles Mortimer, 2.	0 Ringwood	McHenry
Priestley, Forrest M., 2.	4 Princeton	Bureau
Proudfit, Samuel Mitchell, 3.	10 McLeansboro	Hamilton
Puckett, Russell Trall, 2.	2 Nora.	Jo Daviess
Puckett, Ralph Waldo Emerson, 2.	2	
Pulliam, Benjamin, 1.	2 Tolono	Champaign
Pulliam, William Thomas, 1.	2	
Reinhardt, Adolf, 1.	2 Granville	Putnam
Reynolds, Henry Sheldon, 4.	2 Urbana	Champaign
Rhodes, James Frederick, 2.	10 Dwight	Livingston
Rhodes, Joseph William, 2.	5	
Robbins, Henry Edwin, 4.	4 Wenona	Marshall
Robbins, Simeon Volney, 2.	4	
Robertson, Henry Wright, 1.	0 Compromise.	Champaign
Robinson, Elna Alphonso, 3.	4 Champaign	
Rodgers, Robert Ranwick, 1.	10 McLeansboro	Hamilton
Ross, Henry H., 1.	2 Alvin	Vermilion
Russell, Sullivan J., 2.	5 Elmwood	Peoria
Rutan, Abram Rharson, 1.	12 Dwight	Livingston
Sampson, Charles C., 2.	5 Fair Play, Wis.	
Satterlee, Louis Andrick, 2.	0 Batavia	Kane
Savage, Manford, 1.	10 Girard	Macoupin
Schardon, Louis F., 1.	0 Hillsboro	Montgomery
Scott, Oliver Jackson, 1.	0 Champaign	Champaign
Scovell, Melville Amasa, 2.	9	
Scribner, Artemas Coffin, 1.	2 Bradford.	Stark
Scudder, Clarence O., 2.	9 Creston	Ogle
Searles, Frank Wesley, 1.	10 & 1 Hadley	Will
Shaw, Charles L., 2.	0 & 1 Pittsfield	Pike
Shaw, Franklin Davis, 1.	12 Paxton	Ford
Shawhan, George Robert, 2.	10 Sidney	Champaign
Sheldon, Clarence F., 1.	10 Urbana	
Short, Albert Roswell, 3.	9 Fairmount.	Vermilion

Names of Students—Continued.

Names.		Post-Office.	County.
Silver, Howard, 3.	2	Urbana	Champaign
Sim, Coler Lindley, 1	9 & 1	"	"
Simpson, George M., 1	12	Minonk	Woodford
Smith, Charles Augustus, 3	4	Mt. Vernon, Ind.	"
Spitler, Jonas Beaver, 1	10	Brunnersburg, O	"
Staley, C. C., 1	5	Champaign	Champaign
Stanton, Louis Chalmers, 2	5	London, England	"
Stanton, Samuel Cecil, 1	10	"	"
Starr, Frank Augustus Ellis, 2	10 & 1	Elsah	Jersey
Stayman, John Mather, 1	0	Champaign	Champaign
Steer, George S., 1	4	Stanton, Michigan	"
Stewart, Charles Evans, 1	0	Champaign	Champaign
Stone, Edwin B., 1	0	New Lebanon	De Kalb
Stookey, Daniel Wesley, 1	4	Harristown	Macon
Story, George, 3	5	Champaign	Champaign
Strawn, Wilder F., 2	10 & 1	Odell	Livingston
Sturman, Mathew D., 1	12	Dahlgren	Hamilton
Swartz, Alexander Culberson, 4	5	Fairview	Fulton
Tate, Charles Mitchell, 2	10	Champaign	Champaign
Tullock, Alonzo, 2	5	Rockford	Winnebago
Tunison, George C., 1	2	White Hall	Greene
Turner, Isaac M., 1	0	Todd's Point	Shelby
Tyndale, Hector Hilgard, 2	5 & 1	Springfield	Sangamon
Waite, Fred Tecumsah, 1	10	Paul's Valley, Ind. Ter.	"
Walker, Enoch, 1	4	Clinton	De Witt
Ward, Henry Austin, 1	5 & 1	Terre Haute, Ind.	"
Warner, Jr., Lyman Fenn, 2	5	Rockford	Winnebago
Watts, William, 3	5 & 1	Watts	Sangamon
Welch, Thomas Jefferson, 2	10	Sidney	Champaign
Weston, Charles, 3	0	Champaign	"
Wharry, Walter W., 3	0 & 1	Sycamore	De Kalb
Wharton, Jacob N., 4	6	Bement	Piatt
Wheeler, Herbert, 1	0	Yellowhead	Kankakee
White, William H., 1	9	Greenville	Bond
Whitham, Robert Farwell, 1	5 & 1	Paxton	Ford
Wilbur, George W., 1	0	Belvidere	Boone
Wild, George Alfred, 1	5 & 1	Marengo	McHenry
Wiley, James Edgar, 4	10	Mason, Michigan	"
Williams, George Aurelious, 1	2	Quincy	Adams
Williams, Louis Edward, 4	10	Montrose, Iowa	"
Williams, Thomas T., 1	2	Sterling	Whiteside
Wilson, Charles Milo, 1	4	Mackinaw	Tazewell
Wood, Frederick Lansing, 2	3 & 1	Chicago	Cook
Woodward, J. H., 1	12	Cairo	Alexander
Worrell, Robert Edwin, 2	10	Bowensburgh	Hancock
Yamaou, Tunetaro, 2	2	Yeddo, Japan	"
Yocum, Albert L., 1	10	Waynesville	De Witt
Young, Horace Dickinson, 2	10 & 1	Gilman	Iroquois
Young, William Wait, 1	0 & 1	"	"
Zook, Jacob Wesley, 2	2	Olney	Richland
Total number of male students	326		

FEMALE STUDENTS.

Adams, Nettie V., 1	0	Urbana	Champaign
Anderson, Ella Jane, 1	10	Champaign	"
Anderson, Lucy, 1	10	"	"
Anderson, Laura Morris, 2	10	"	"
Ayers, Lettie, 1	10	Urbana	"
Baker, Ella, 3	10	Champaign	"
Benson, Sylvia I., 1	0	Union	McHenry
Blasdel, Maria, 2	10	Champaign	Champaign
Booker, Lucy H., 1	10	Fairmount	Vermilion
Bowes, Kate, 1	0	Champaign	Champaign
Bowman, Ella, 1	0	Belleville	St. Clair
Boyer, Rachel A., 1	0	Venice	Madison
Broshar, Cornelia, 1	0	Champaign	Champaign
Burgess, Mary C., 1	0	Tonica	La Salle
Burns, Sara, 1	0	Arcola	Douglas
Eurt, Ida Kate	0	Urbana	Champaign
Eurt, Nora, 1	10	"	"
Eurwash, Harriet Lovina, 1	0	Champaign	"
Campbell, Amanda, 2	10	Philo	"
Cranby, Anna, 1	0	Champaign	"

Names of Students—Continued.

Names.	Post-Office.	County.
Carey, Elizabeth B., 1.....	0 Champaign	Champaign
Carley, Isotta, 1.....	0	
Chapman, Egenes, E., 1.....	0 Richmond, Indiana.	
Cheever, Alice, 2.....	10 Champaign	Champaign
Clark, Emma J., 1.....	0	
Columbia Frances Mae, 2.....	0	
Dunlap, Maggie E., 1.....	10	
Eaton, Edith, 1.....	0 Philo.	
Everhart, Ophelia, 1.....	10 Neoga.	Cumberland.
Foos, Florence Ida, 1.....	0 Champaign.	Champaign
Foot, Eva A., 1.....	0 Urbana	
Goodwin, Jessie, 1.....	0	
Gourley, Ada, 1.....	0 Springfield.	Sangamon.
Gregory, Carrie L., 1.....	0 Urbana.	Champaign
Gregory, Helen B., 1.....	10 Champaign.	
Gregory, Lucy M., 1.....	0 Urbana.	
Hall, Ellen Elizabeth, 1.....	0	
Harris, Maggie, 1.....	0 Champaign	
Harris, Nannie C., 1.....	0 Monticello	Piatt
Himes, Minnie, 1.....	0 Elgin	Kane.
Holton, Martha Gray, 1.....	0 Champaign.	Champaign
Hullenger, Kate, 1.....	0 Rock Falls.	Whiteside.
Huntington, Julia Alsera, 1.....	0 Marengo.	McHenry
Kariher, Israella Kate, 1.....	0 Champaign.	Champaign
Kellogg, Flora Lorania, 2.....	0 Woodville, Ohio.	
Kincaid, Mattie, 1.....	0 Champaign	Champaign
Larned, Mary S., 1.....	0	
Lee, Alice, 2.....	0	
Lemen, Anna, 1.....	0	
Longmate, Emma, 1.....	0 Farmer City	DeWitt.
Mahan, Jennie Curtis, 1.....	0 Champaign	Champaign
Mansfield, Maria Pope, 1.....	0 Mansfield	
McColluch, Mary, 1.....	0 Paris.	Edgar
Miltemore, Mary Frances, 1.....	0 Janesville, Wis	
Pierce, Fanny, 2.....	0 Champaign	Champaign
Potter, Frances Adelia, 3.....	10	
Raymond, Jennie, 3.....	10 Sidney	
Rea, Augusta M., 2.....	0 Urbana.	
Reynolds, Mary Anna, 2.....	0 Belvidere	Boone.
Romine, Mary F., 3.....	0 Urbana.	Champaign
Roots, Nellie Cornelia, 1.....	0 Champaign	
Rush, Mary, 1.....	0	
Rush, Sarah, 1.....	0	
Smith, Avice Elida, 1.....	0 Union.	McHenry
Stanton, Ellen Loise, 1.....	0 London, England.	
Steele, Mary C., 2.....	0 Urbana	Champaign
Stewart, Maggie Esther, 2.....	0 Champaign	
Stewart, Maggie L., 1.....	0	
Stewart, Una, 1.....	0 Urbana	
Thomas, Elizabeth R., 1.....	0 Champaign	
Van Horn, Emma, 1.....	0	
Victor, Caroline D., 1.....	0	
Whitcomb, Abbie, 2.....	0 Urbana	
Whitcomb, Mary, 2.....	10 Urbana	
Total number of female students.....	74	

RECAPITULATION.

By Sexes.

Male Students.....	326
Female Students.....	74—400

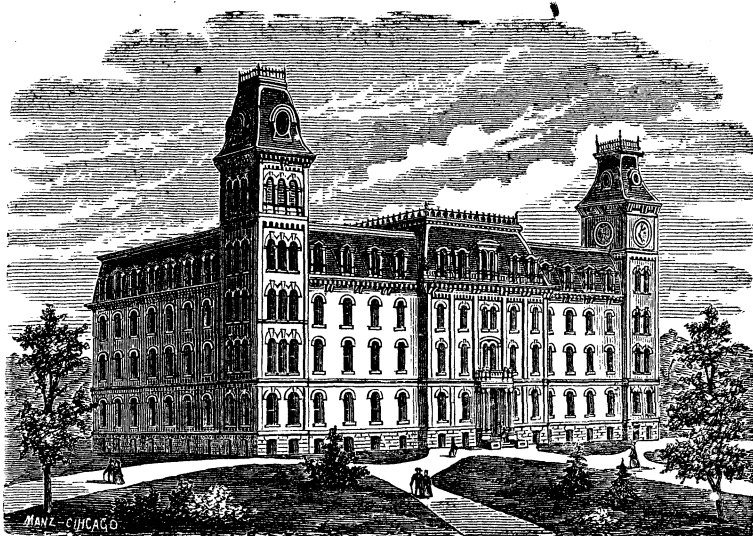
By Studies.

Agricultural.....	53	Horticultural.....	3
Agricultural and Military.....	2	Horticultural and Military.....	3
.....	— 55	.....	6
Architectural.....	4	Literature and Science.....	58
Chemical.....	18	Literature and Science and Military.....	17
Chemical and Military.....	3	.....	— 75
Chemical and Literary.....	1	Mechanical Engineering.....	22
.....	— 22	Mechanical Engineering and Military.....	2
Civil Engineering.....	36	.....	— 24
Civil Engineering and Military.....	15	Military.....	1
.....	— 51	Mining Engineering.....	2
Commercial.....	26	Natural History.....	1
Commercial and Military.....	1	.....	400
.....	— 27		
Elective.....	133		
Elective and Military.....	9		
.....	— 132		

By Residence.

Adams.....	2	Randolph.....	3
Alexander.....	1	Richland.....	2
Bond.....	1	Sangamon.....	11
Boone.....	4	Schuyler.....	1
Bureau.....	5	Scott.....	1
Carroll.....	3	Shelby.....	3
Champaign.....	119	Stark.....	1
Christian.....	1	St. Clair.....	4
Clay.....	3	Stephenson.....	1
Clinton.....	2	Tazewell.....	3
Coles.....	5	Union.....	3
Cook.....	9	Vermilion.....	6
Cumberland.....	3	Washington.....	1
De Kalb.....	6	Whiteside.....	5
DeWitt.....	4	Will.....	3
Douglas.....	5	Winnebago.....	5
Edgar.....	1	Woodford.....	4
Effingham.....	3	Not given.....	5
Ford.....	4		
Franklin.....	1	Total from Illinois, 69 Counties.....	360
Fulton.....	1		
Greene.....	1	From other States and Territories.	
Hamilton.....	5	Alabama.....	1
Hancock.....	8	Indiana.....	7
Henry.....	1	Indian Territory.....	1
Iroquois.....	7	Iowa.....	5
Jackson.....	2	Michigan.....	2
Jefferson.....	1	Missouri.....	1
Jersey.....	3	New York.....	2
Jo Daviess.....	3	North Carolina.....	4
Kane.....	5	Ohio.....	2
Kankakee.....	2	Oregon.....	1
Lake.....	3	Pennsylvania.....	1
La Salle.....	5	Washington.....	1
Livingston.....	5	Wisconsin.....	5
Logan.....	3		
Macon.....	4	Total from other States.....	33
Macoupin.....	7		
Madison.....	5	From Foreign Countries.	
Marshall.....	4	Asia Minor.....	1
Mason.....	1	England.....	3
McHenry.....	15	Germany.....	1
McLean.....	1	Greece.....	1
Mercer.....	4	Japan.....	1
Montgomery.....	3		
Morgan.....	1	Total from abroad.....	7
Ogle.....	5		
Peoria.....	3	Total.....	400
Piatt.....	5		
Pike.....	1		
Putnam.....	2		

The counties of Brown, Calhoun, Cass, Clark, Crawford, Du Page, Edwards, Fayette, Gallatin, Grundy, Hardin, Henderson, Jasper, Johnson, Kendall, Knox, Lawrence, Lee, Marion, Massac, McDonough, Menard, Monroe, Moultrie, Perry, Pope, Pulaski, Rock Island, Saline, Wabash, Warren, Wayne, White and Williamson, 34 in number, are not represented in the Institution.



New University Building.

HISTORY.

The University is both State and National in its origin and character. The public movement which gave rise to this University, began a quarter of a century ago. Public meetings of the friends of industrial education were held in all parts of the State, and numerous petitions, signed by thousands of the agriculturists and other industrial classes, flooded the State Legislature. At length, in 1856, the General Assembly adopted joint resolutions, asking Congress to make grants of public lands to establish colleges for industrial education. After long discussions, Congress passed the necessary law in July, 1862, making the magnificent grant of public lands out of which has arisen that long list of Agricultural Colleges and Industrial Universities now scattered over the Continent.

Illinois, the first to ask, was among the first to accept the grant, and great public interest was excited in the question of the organization and location. Princely donations, in some cases of half a million of dollars, were tendered by several counties to secure the locating of the institution in their midst. In February, 1867, a law was passed fixing the locality, and defining the plan of the University, and in May the board of trustees met at the University Building donated by Champaign county, and finally determined the location. During the year much of

the scrip was sold or located, necessary alterations were made in the buildings, apparatus and library were purchased, a faculty partly selected, and preparations made for active work. On March 2d, 1868, the University was opened for students, and on the 11th formal inauguration exercises were held. In the Autumn of 1871 the University was opened for the instruction of female students, and now it offers its advantages to all classes of society, without regard to sex, sect or condition.

LOCATION.

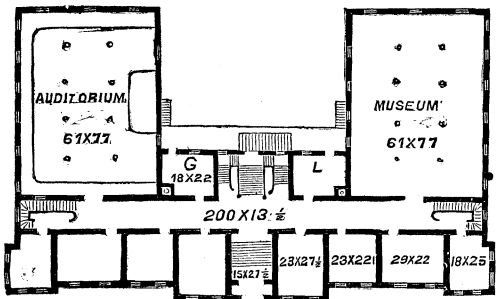
The University is situated in the city of Urbana, adjoining the limits of the city of Champaign, in Champaign county, Illinois. It is 128 miles from Chicago, on the Illinois Central Railroad. The Indianapolis, Bloomington and Western Railway passes near the grounds. The county is one of the most beautiful prairie regions in the West. The two contiguous cities, constituting really only one community, have together a population of nearly 10,000, well supplied with churches and schools, and affording boarding facilities for a large body of students.

BUILDINGS AND GROUNDS.

The domain occupied by the University, (see map of the grounds on opposite page), embraces about 623 acres, including stock farm, experimental farm, orchards, gardens, nurseries, forest plantations, arboretum, botanic garden, ornamental grounds and military parade ground.

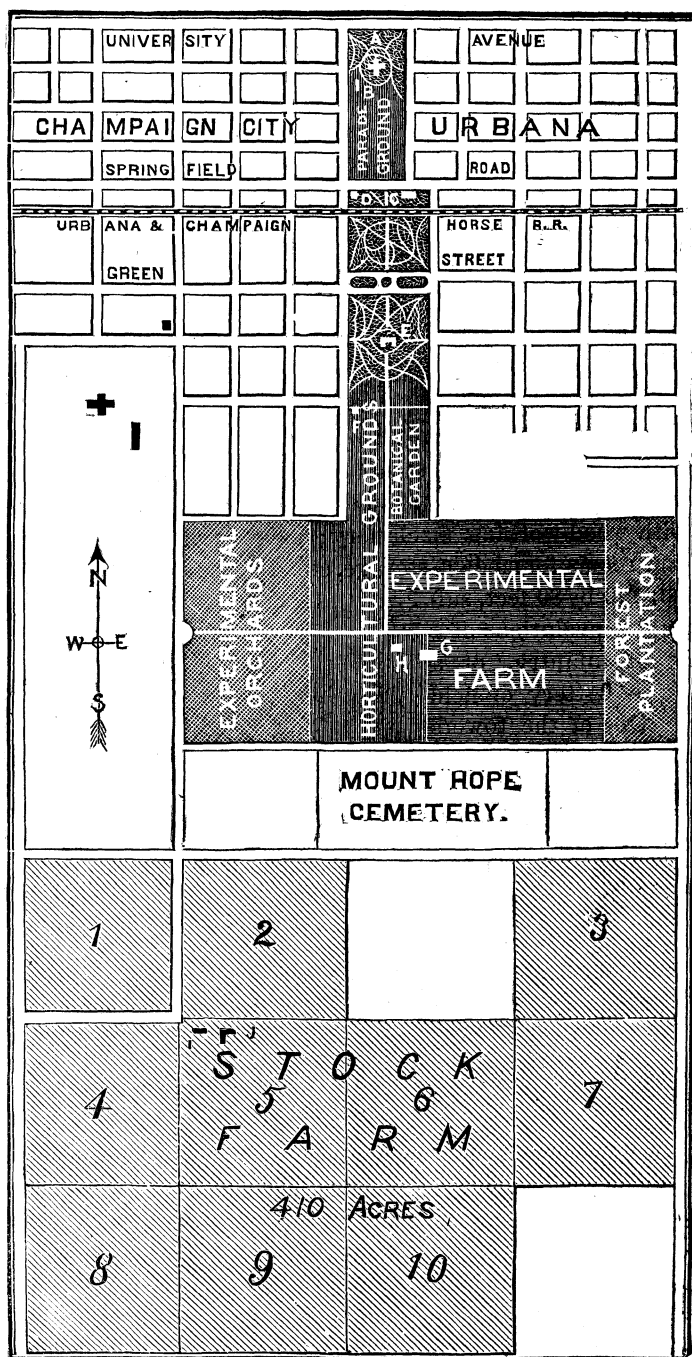
The old University Building, (A,) now occupied partly by class rooms, library and laboratory, contains some seventy dormitories for students. It is 125 feet in length and five stories in height, with a wing of 40 by 80 feet, four stories in height. This building was donated by the county.

The New University Building, (see E,) is one of the most spacious and convenient to be found on this continent. It is 214 feet in length, with a depth on the wings of 122 feet. It is designed wholly for public use. The library wing is fire-proof and contains five large halls, devoted to the



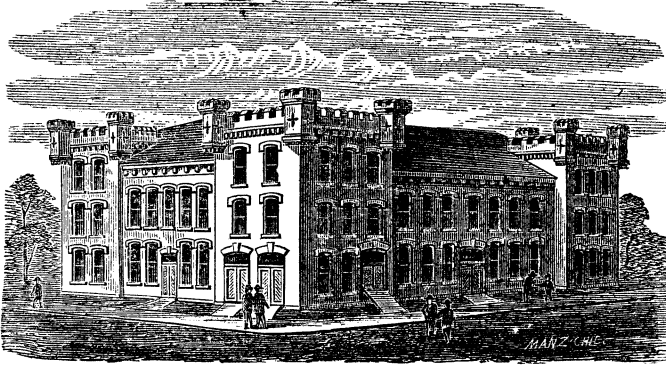
Plan of New Building.

library and various cabinets and museums. The chapel wing affords a large physical laboratory and lecture room, and spacious draughting rooms. In the main part are thirty class rooms of good size, and also cloak and wash rooms for both sexes, store rooms, and several large



Map of Farms, Buildings, Grounds, Etc.

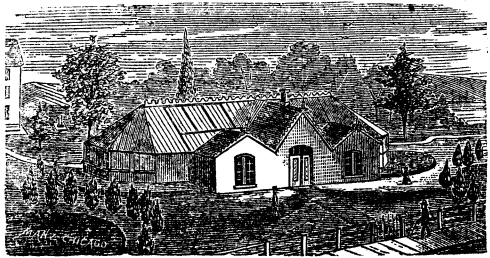
halls for students' literary societies. This building will be occupied in September next.



Mechanical Building and Drill Hall.

The Mechanical Building and Drill Hall (see map C,) is of brick, 128 feet in length by 88 feet in width. It contains a boiler, forge and tank room; a machine shop, fur-

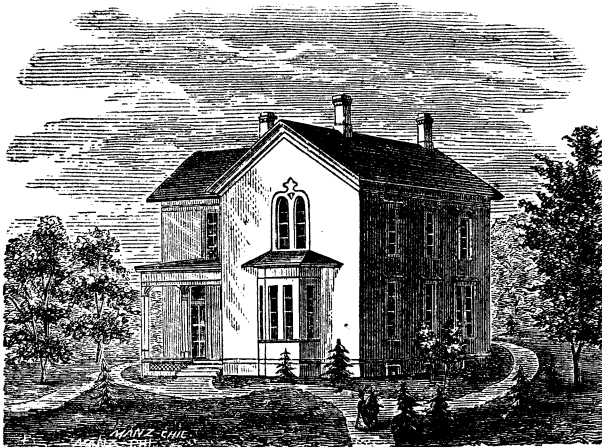
nished for practical use with a steam engine, lathes and other machinery; a pattern and finishing shop; shops for carpentry and cabinet work furnished with wood-working machinery; paint, printing and draughting rooms, and rooms for models, storage, etc. In the second story is the large Drill Hall, 120 by 80 feet, sufficient for the evolutions of a company of infantry, or a section of a battery of field artillery. One of the towers contains an armorer's shop and military model room, an artillery room and a band room. The green house, (see map B,) is 70 feet by 36, and contains potting, seed and furnace rooms. There are two other green houses; one 12 feet by 35, the other 22 by 40.



Green House.

The University has two large and valuable barns, (see maps J and G,) belonging to the Stock and the Experimental Farms, and 4 dwelling houses for the Superintendents.

The Farm House recently built on the Horticultural Grounds was de-

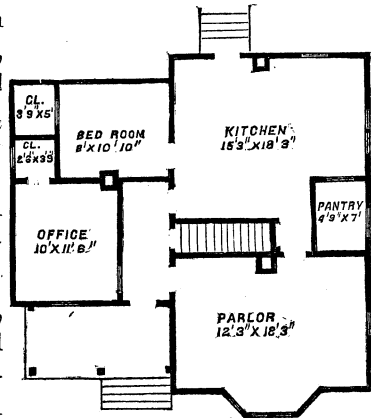


Farm House.

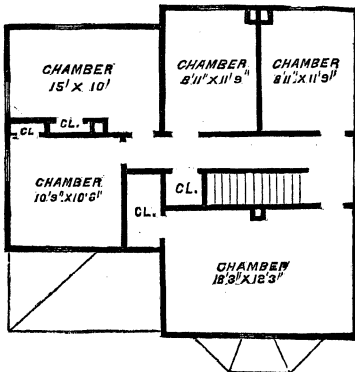
signed to afford a model for a farmer's house. It is tasteful in appearance, economical in cost, and compact and convenient in arrangement and detail. (See map H).

A cellar under the whole, walled with hard brick and having a cement floor, affords a laundry, a large cistern, and an ample cellar in two compartments, one for dairy uses, and the other for vegetables.

The front door is sheltered by a pleasant verandah and the front hall or entry affords direct admission to office, parlor and kitchen. The office, a small room, which the intelligent farmer will find abundantly useful for his business affairs, will also serve as a library and



First Floor of Farm House.

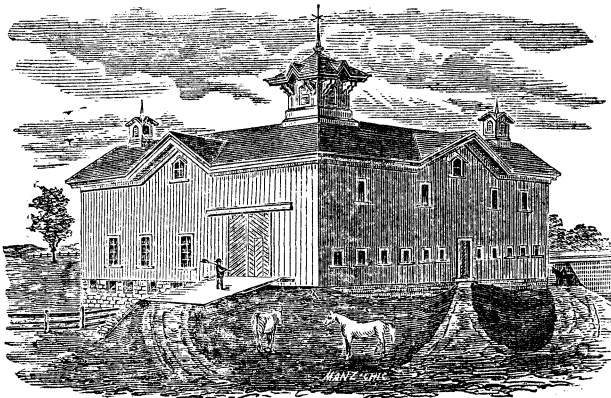


Second Floor.

reading room on wet days, and the evenings. The parlor is a commodious apartment, which is rendered doubly pleasant by the bay window. The kitchen is also of good size, as many farmers' families make this the "living room," as they call it, where the cooking and eating are both done, and the family work goes on. A lean-to, serving as a summer kitchen and well-room, has been added since the building was first erected. The second floor has a goodly num-

ber of sleeping rooms, all but two supplied with closets.

The barn recently erected on the Stock Farm of the Industrial Uni-



Stock Farm Barn.

versity has north and west front of eighty feet each. Each limb, or ell, is 40 feet wide. It is of the kind known as a side-hill barn.

In the basement R is the root-cellar. C a cook-room, furnished with a steam

boiler to steam food, and a small engine to furnish power for grinding, threshing and cutting. D is a set of hog pens, and E another set of pens or yard under the shed, which extends along both sides of the barn in an angle. S represents a set of bull stalls for the several breeds. F a series of stalls for fine breeding cows, with calf pens in the rear. O O shows the places of the two large cisterns taking the water from the roofs. U is a drive way. H is the wind-mill. The steam engine is situated in the cook room.

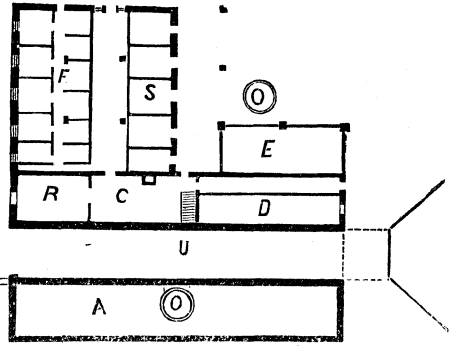
In the plan of the first floor, B B are bridges. T T T show trap doors in the rear of horse stalls to allow droppings to be thrown into manure pit. L shows a series of box stalls for breeding mares. G G grain bins. M a harness room. P, a large ventilating tube or flue, leading from cattle room below to the cap above the roof; there are doors in the sides of this flue, through which hay can be thrown down for feeding the cattle. Above the main floor are ample hay lofts.

The barn on the Experimental Farm, which cost about \$3,000, has a cellar suitable for the storing of roots, vegetables, etc., in quantities; and upon the first floor there is a large room for a museum of tools and implements, together with stalls for teams and experimental cattle. Above there is ample room for the storage of crops and hay. Its external appearance is quite similar to that of the barn upon the Stock Farm. See G on the map of the University grounds.

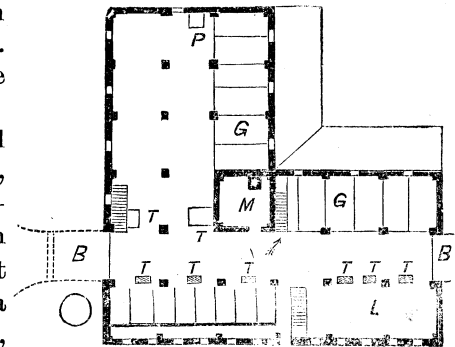
For descriptions of the Mechanical Shops and Drill Hall, see Schools of Mechanical Engineering and Military Science.

PROPERTY AND FUNDS.

Besides the lands and buildings already described, which are, with furniture, library, etc., valued at \$300,000, the University owns 25,000



Basement of Stock Farm Barn.



Main Floor.

acres of well selected lands in Minnesota and Nebraska. It has also endowment funds invested in State and county bonds, amounting to \$364,000, besides other property and avails, valued at \$33,000. The State has appropriated \$25,000 to the Agricultural Department for barns, tools, stock, etc.; \$20,000 to the Horticultural Department for green house, barns, drainage, tools, trees, etc.; \$25,000 for Mechanical and Military building, machinery, etc.; \$75,000 to begin the erection of the main building, which is to cost \$150,000; \$10,500 to furnish the Chemical Laboratory; and \$20,000 for library and apparatus. Further appropriations have just been made, for which see page 27.

LIBRARY.

The Library, which has been carefully selected with reference to the scientific studies required in the several practical courses, includes now about 8,600 volumes. The large Library Hall is fitted up as a reading-room, and is open every day and evening for study, reading and consultation of authorities. It is well provided with American, English, French and German papers and periodicals, embracing some of the most important scientific and art publications. A list of the periodicals regularly received, will be given in another place in this report.

AIMS OF THE UNIVERSITY.

"Its leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."—*Act of Congress*, 1862, *Sec. 4*.

"The trustees shall have power to provide the requisite buildings, apparatus and conveniences; to fix the rates of tuition; to appoint such professors and instructors, and establish and provide for the management of such model farms, model art and other departments and professorships, as may be required to teach, in the most thorough manner, such branches of learning as are related to agriculture and the mechanic arts, and military tactics, without excluding other scientific and classical studies."—*Act of General Assembly*, 1867, *Sec. 7*.

In accordance with the two acts above quoted, and under which the University is organized, it holds as its principal aim to offer freely the most thorough instruction which its means will provide, in all the branches of learning useful in the industrial arts, or necessary to "the liberal and practical education of the industrial classes, in the several pursuits and professions in life." It includes in this all useful learning,

scientific and classical—all that belongs to sound and thorough scholarship.

Its practical aims will be best understood by a survey of the following departments of instruction, for which it offers the best facilities :

Scientific Agriculture.—Soil culture of all varieties, and for all crops, Animal Husbandry, Stock-breeding, Feeding, Veterinary Science, Agricultural Chemistry, Rural Engineering and Drainage.

Horticulture.—Market Gardening, Fruit Growing, Management of Nurseries, Forests, Green Houses, Propagating Houses and Ornamental Grounds.

Mechanical Engineering.—Theory and Practice in Construction of Machinery, Pattern Making, and Working in iron and brass. Study of the Motors, Strength of Materials, and Mechanical Drawing.

Civil Engineering.—Land and Government Surveys, Railroads, Canals, Bridge Building, Topographical Surveys and Leveling.

Mining Engineering.—Mine Surveys, Sinking and Tubing of Shafts, Driving of Adits and Methods of Working, Assaying, Treatment of Ores, and Metallurgy.

English Language and Literature.—A thorough and extended course in higher Grammar, Rhetoric, Criticism and Essay Writing, to fit students for editorial or other literary work, or teaching.

Analytical Chemistry.—Chemistry applied to the Arts ; Laboratory Practice with Re-agents, Blow-pipe and Spectroscope. A full course to fit students to become Chemists, Druggists and Pharmacentists.

Architecture.—Architectural Drawing, Styles of Building, Plans, Materials, Estimates, Ornamentation.

Military Tactics.—Manual of Arms, Squad, Company and Battalion Drill, Brigade and Division Evolutions, Bayonet and Sword Fencing, Military Arms, Roads and Fortifications.

History and Social Science.—General and Special History, Political Economy, Rural and Constitutional Law.

Mental and Moral Philosophy and Logic.

Modern and Ancient Languages.—French, German, Latin, etc.

Commercial Science.—Book-keeping, Commercial Law, etc.

Mathematical Science.—Pure and Applied, Physics, Astronomy.

Natural History.—Botany, Zoology, Geology, Physical Geography.

Drawing.—Mathematical and Free-hand.

FREEDOM IN CHOICE OF STUDIES.

The University being designed not for children, but for young men and women, who may claim to know something of their own wants, powers and tastes, *entire freedom in choice of studies* is allowed to each student, subject only to such necessary conditions as the progress of the classes or the convenience in teaching requires. It is not thought useful

or right to use every student, without regard to his capacity, taste or practical wants, to take entire some lengthened curriculum, or "course of studies." Liberty everywhere has its risks and responsibilities as well as its benefits, in schools as well as in society; but it is yet to be proved that compulsory scholarship is necessarily better, riper and more certain than that which is free and self-inspired. Each student is exhorted to weigh carefully his own powers and needs, to counsel freely with his teachers, to choose with serious and independent consideration the branches he may need to fit him for his chosen career, and then to pursue them with earnestness and perseverance, without faltering or fickleness.

It is necessarily required: 1st, that students shall be thoroughly prepared to enter and keep pace with the classes in the studies chosen; and 2d, that they shall take these studies when they are being taught.

It is expected that each student shall have three distinct studies, affording three class exercises each day. But on special request to the Faculty, he may be allowed less or more, to meet the exigencies of his course.

No changes in studies can be made after the beginning of a term without permission of the Faculty.

It is recognized that students will often need advice in the selection of studies and in the arrangement of a proper course. To meet this need, the Faculty have carefully arranged several courses of studies which are expected to be followed by those who have no special reasons for diverging from them. See Courses on pages 60 to 64.

Due care will be taken to prevent, as far as possible, all abuse of the liberty of choice. Students failing to pass satisfactory examinations in their chosen studies will not be permitted to remain and take other studies, without a vote of the Faculty.

ADMISSION.

Candidates for admission to the University must be at least fifteen years of age, of good moral character, and able to sustain a satisfactory examination in the following branches:

English Grammar.—Formation of words, parts of speech, properties of nouns and pronouns, declensions, conjugations, etc., analysis and syntax of sentences, and use of modifying words and connectives.

Geography.—Form, size, motions, and circular divisions of the earth; latitude, longitude and zones; the continents and their grand divisions; countries and capitals of Europe and America; mountain systems and

chief rivers and lakes of Europe and America; boundaries, capitals, chief towns, great railroad and canals of the States of the Union.

Arithmetic.—Decimal system of notation and numeration, the four grand rules or operations, with clear explanation of processes, reasons and proofs, classifications of numbers, reduction, denominate numbers, fractions, reduction of fractions, addition, subtraction, multiplication and division of fractions, decimal fractions, operations in decimals, per centage, interest, ratio, proportions, involution and evolution.

Algebra.—Definitions, notations by letters and signs, simple operations, changes of signs and reasons, algebraic fractions, equations, transformations of equations, solutions of problems, methods of elimination, calculus of radicals.

History of the United States.—Discovery and settlement of the several States, Indian and other wars, struggle between France and England for possession, the early history of Illinois and the West, the Revolutionary War.

Natural Science.—As the law requires that no student shall be admitted who shall not pass a satisfactory examination in the studies of the common schools, and as the new school law prescribes that the “elements of Natural Science” shall hereafter be taught in the common schools, candidates for admission to the Industrial University, in the Fall of 1873, and thereafter, must be prepared in the elements of Human Physiology, in Botany and in Natural Philosophy, in addition to the studies heretofore required.

Students entering after the beginning of the first term, must also pass examinations in the studies already pursued by their classes.

HOW TO ENTER THE UNIVERSITY.

In answer to the questions often received, the following *explicit directions* are given to those wishing to enter the University :

1. You must be over fifteen years of age, of good moral habits. If unknown to the faculty, you should bring a certificate of character.
2. You must possess a thorough knowledge of the common school branches, as given above, and of such other studies as you may find under the heading “Admission,” in the College you wish to enter.
3. You should enter at the beginning of the year; but you *may* enter at any other time if prepared to pass the additional examinations.

For the dates of Examinations, beginning of the year, Matriculation Fee, etc., etc., see “Calendar” and “Expenses;” or, read the miscellaneous matter following page 58.

COLLEGES AND SCHOOLS.

The University embraced the following Colleges and Schools. A School, it will be observed, is designed to provide a combined course of instruction made up of the branches of learning needful for some one profession. Schools naturally allied are grouped into a College.

I. THE COLLEGE OF AGRICULTURE.

School of Agriculture ; School of Horticulture.

II. THE COLLEGE OF ENGINEERING.

School of Mechanical Engineering ; School of Mining Engineering ; School of Civil Engineering ; School of Architecture.

III. THE COLLEGE OF NATURAL SCIENCE.

School of Chemistry ; School of Natural History.

IV. THE COLLEGE OF LITERATURE AND SCIENCE.

School of English and Modern Languages ; School of Ancient Languages and Literature.

V. OTHER SCHOOLS.

School of Military Science ; School of Commerce ; School of Domestic Science and Art.

Schools of *Wood Engraving, Printing, Telegraphing, Photography, and Designing*, it is hoped, will be added at an early day.

Upon pages 61 to 64, the student will find marked out the course of studies selected to fit him for his chosen pursuit. A completion of one of these courses will be necessary to entitle him thus to graduate. A student desiring to pursue any branch of study farther than is provided for in the courses of the Schools, will find a statement of the extent of the course of instruction given in such branch, under the heading "Departments."

STATE APPROPRIATIONS.

The State Legislature, at its recent session, passed an act making various appropriations, amounting in the aggregate to over \$50,000, for the completion, heating, lighting, furnishing, etc., of the New University Building. This large structure was inclosed, floored and plastered, and the grounds partly laid out, before the cold weather of last year set in. The work will be continued vigorously this year. During the sum-

mer vacation, the library, cabinets, etc., will be moved to their new and spacious quarters, the chapel, lecture and numerous class rooms, offices, and society rooms will be furnished, the heating and lighting arrangements completed, and the whole building and its surroundings put in order for occupation by the September classes.

For some time past the insufficient accommodations for the numerous lectures and classes constantly going on in the different departments of the University, have been the cause of great inconvenience to professor and student, and much detriment to the subjects taught. The completion and occupation of the new accommodations will therefore be a great relief, and perhaps no appropriation will be of more real economy to the State than that just made, or of more direct importance and value to all the counties, few of which have not students in the University.

COLLEGE OF AGRICULTURE.

FACULTY.

The REGENT, Professor BURRILL, Professor SHATTUCK, Doctor PRENTICE, Professor MILES, Professor STUART, Professor TAFT, Superintendent FLAGG.

SCHOOLS.

School of Agriculture; School of Horticulture.

CONTRIBUTIONS.

Many manufacturers have favored us with donations of implements, and it is hoped this will continue until the large room devoted to the tools shall become a rich museum of all that is most important.

Appeal is made to friends everywhere for assistance in furnishing the fruit and tree plantations with the fullest possible stock, in the building and furnishing of the green-houses and conservatories, and in the enlargement of the scientific collections in the arboretum and botanical garden. The plants now in the houses and upon the grounds have been catalogued, and will be forwarded to parties wishing to exchange or contribute.

It requires a vast amount of money, time and skilled labor to make a large collection of useful agricultural and horticultural plants, yet the importance of such a collection at the University is recognized by all who are interested in these pursuits. New varieties of grain, vegetables, root crops, seeds, and live plants may easily be sent, and will always be thankfully received.

SCHOOL OF AGRICULTURE.

OBJECTS OF THE SCHOOL.

The aim of this school is to educate scientific agriculturists. The frequency with which this aim is misunderstood by the community at large, demands that it shall be carefully explained. Many, looking upon agriculture as consisting merely in the manual work of plowing, planting, cultivating and harvesting, and in the care of stock, justly ridicule the idea of teaching these arts in a college. The practical farmer, who has spent his life in farm labors, laughs at the notion of sending his son to learn them from a set of scientific professors. But all of this implies a gross misunderstanding of the real object of agricultural science. It is not to teach *how* to plow, but the reason for plowing at all—to teach the composition and nature of soils, the philosophy of plowing, of manures, and the adaptations of the different soils to different crops and cultures. It is not simply to teach how to feed, but to show the composition, action and value of the several kinds of food, and the laws of feeding, fattening, and healthful growth. In short, it is the aim of the true Agricultural College to enable the farmer to understand thoroughly and profoundly all that men can know about soil and seed, plants and animals, and the influences of light, heat and moisture on his fields, his crops and his stock, so that he may both understand the reason of the processes he uses, and may intelligently work for the improvement of those processes. Not “book farming,” but a knowledge of the real nature of all true farming—of the great natural laws of the farm and of all its phenomena; this is the true aim of agricultural education. And when it is recollected that agriculture involves the principles of a larger number of sciences than any other human employment or profession, it will not be regarded as an unfit end of a sound collegiate training.

INSTRUCTION.

The instruction unites, as far as possible, theory and practice—theory explaining practice, and practice illustrating theory.

The subjects are so arranged that those not requiring illustration upon the farm are taught in the winter, and sufficient educational labor is required in favorable weather to impress and illustrate the principles developed in the other lectures and recitations. In Veterinary Science the lectures are given by an English practitioner, a graduate of the Schools of Veterinary Science in both Edinburgh and London. Sick animals are brought in from the surrounding neighborhood, and are treated free of charge for the instruction of the classes.

APPARATUS.

The College has, for the illustration of practical agriculture, a large stock farm of 410 acres, provided with a large stock barn, fitted up with stables, pens, yards, cooking room, etc. See map, page 19, and description, page 20. It has also a fine stock of several breeds of neat cattle, embracing Short Horns, Herefords, Devons, Ayrshires, and Jersey cattle. Also several breeds of swine and sheep, to illustrate the problems of breeding and feeding.

An Experimental Department, aided by a special appropriation, has also been organized. It includes field experiments in the testing of the different varieties and modes of culture of field crops, and in the comparison and treatment of soils, carried on at the University farm, where about sixty acres are devoted to this purpose, and at other points representing the different soils and climates of the State. It includes, also, experiments in horticulture and agriculture, under the direction of the Professor of Horticulture and of the Farm Superintendent, and of experiments in feeding animals of different ages and development upon the various kinds of food. In common with similar departments in the several State agricultural colleges of the country, it attempts to create positive knowledge towards the development of an agricultural science. At a meeting held at Chicago, in August, 1871, the representatives of these institutions agreed to co-operate in this work, and make experiments in common, as well as others peculiar to their several States.

A Veterinary Hall and stable is provided, and a Clinic is held in the Fall or Winter Term, to illustrate the lectures on Veterinary Science.

Surveying and drainage are illustrated by practice in the field. Chemistry is pursued by work in the laboratory. Collections of seeds, soils, plants, implements, skeletons of animals, models and apparatus are provided to illustrate the several branches of Agricultural Science.

SCHOOL OF HORTICULTURE.

OBJECT OF THE SCHOOL.

The aim of this school is to afford a scientific and practical education specially adapted to the wants of those who cultivate garden and orchard plants. In the fertile soils and favorable climate of our State, with our rapidly increasing population and easy transportation, this department of human industry, always of prime importance, is becoming

more and more prominent, more lucrative to the successful grower, and more essential to the comforts and enjoyments of home. The enhanced price of land, the competition of numbers, the increasing depredations of insects, and the ravages of vegetable diseases, render imperative increased knowledge and skill on the part of the cultivator, while the demand of the age calls loudly for general intellectual and moral culture fully equal to that given to the other pursuits and professions of life.

INSTRUCTION.

The instruction is both theoretical and practical. The class room recitations and lectures are supplemented by instructive practice in the fields and plant-houses. In connection with the lectures upon methods of obtaining and perpetuating new varieties of plants, students have practical exercises in cross-fertilizing, seeding, grafting, budding, etc., as a part of their regular education. So, in connection with the studies of ornamental plants and grounds, the care of the green-houses constitutes an essential feature of the student's work. Ladies can engage not only in the studies, but also in the practical exercises. The course which is recommended for those intending to prepare for the duties of the practical horticulturist, is given with the other courses, pages 61 to 64.

APPARATUS.

The apparatus for the practical portions of the course of instruction, is well provided, and the means of illustration are fast accumulating.

Of 130 acres of land devoted to the use of schools, 20 are planted with forest timber trees, including nearly all the valuable kinds, both native and introduced. An apple orchard of 1,200 varieties is beginning to bear; nearly 400 different kinds of pears are growing; also many varieties of cherries, grapes, blackberries, strawberries, currants, gooseberries, etc. The nurseries are well filled with young ornamental and useful plants, and in the vegetable gardens a large collection has been made. An arboretum and a botanical garden has been commenced, in which it is proposed to gather all the native and hardy exotic plants. Twenty acres are devoted to the building and ornamental grounds, where much pains is taken to make both summer and winter ornamentation attractive and pleasing. A fine green-house, 36 by 70 feet, is filled with a rich collection of valuable plants. Two other structures afford ample room for the propagation of a large stock of plants, and also illustrate the different modes of heating. The cabinets include many illustrative specimens, and the library contains the best horticultural literature known to the world. See map of the grounds on page 19, and descriptions on pages 20 and 21.

COLLEGE OF ENGINEERING.

FACULTY.

The REGENT, Professor ROBINSON, Professor WEBB, Professor STUART, Professor SHATTUCK, Professor TAFT, Instructor RICKER, Instructor PATCHIN.

SCHOOLS.

School of Mechanical Engineering; School of Mining Engineering; School of Civil Engineering; School of Architecture.

ADMISSION.

Applicants should be at least eighteen years of age, and none will be admitted under fifteen. Besides the requirements for admission into the University, given on page 25, they will be expected to pass their examination in Algebra, through Powers and Roots of any degree, Quadratic Equations and all of Plane Geometry. The examinations in Mathematics will be most thorough.

Admission Next Year.—The examinations for entering this College in September, 1874, will be extended to include all of Geometry, both plane and spherical, but not Trigonometry.

PREPARATION.

Thorough preparation is essential to success in the Professions of the Engineer and Architect, and applicants will do well to make sure of passing their examinations in Mathematics.

The studies are arranged so that those who will make further preparation than is required before entering, can make their courses more extensive and profitable, and the following suggestions will be of use to such as wish to make thorough work. One recitation a day is devoted to English and modern languages; by coming well prepared in English grammar and composition, with some knowledge of English literature, the whole of this time can be devoted to French and German, each of which should have at least one year. Some preparation in Latin will be of great assistance in these languages. The Engineer or Architect should be an adept in the various departments of Drawing, and some previous study and practice of this branch will be of great advantage; "Warren's Draughting Instruments" may be used as a text-book, and the drawings made on smooth drawing paper, each plate 8 inches by 10 inches. Cleanliness, neatness, and exactness of execution should be acquired as a habit. Sufficient preparation in Free-hand and Geometrical

Drawing will also make room for an additional term in Botany or Chemical Analysis. It will be of great advantage to obtain a knowledge of the simple trigonometrical functions, and of logarithms, and to gain practice in the use of the tables. The French or metric system of weights and measures should be familiarized.

REGULATION PAPER.

The following sizes and qualities of paper will be required in all the College exercises. Two scales are used, agreeing very nearly in the actual sizes, but adapted, the one to American inches, and the other to French centimetres. One or the other must be adhered to for the same class of exercises.

Qualities.—For manuscript and unimportant drawings, a heavy flat-cap paper, but slightly sized. For ordinary drawings, not colored, a heavy first quality smooth drawing paper. For drawings finished in colors, the best Whatman's cold-pressed paper. For topographical and right-line drawings and lettering, the best three sheet Bristol board.

For Problems and Exercises, and First and Second Vacation Journals---

American size—Size of page, 5 inches by 8 inches; width of margin, half an inch.

French size—Size of page, 12.5 cm. by 20 cm.; width of margin, 1.25 centimetres.

For Memoirs, Lectures and other manuscripts, and for Geometrical, Projection, Topographical, Railroad and Typographical Drawings:

American size—Size of page or plate, 8 inches by 10 inches; width of margin, .75 inches.

French size—Size of page or plate, 20 cm. by 25 cm.; width of margin, 2 centimetres.

For Advanced Drawings and Theses, the Patent Office size, or the corresponding size in French measure, is selected. Larger sizes will be allowed only when deemed necessary by the Professor in charge.

American size—Size of page or plate, 10 inches by 16; width of margin, 1 inch.

French size—Size of page or plate, 25 cm. by 40 cm.; width of margin, 2.5 centimetres.

CONTRIBUTIONS.

Our friends and students are earnestly desired to send us specimens of material and manufactures, and drawings, models or photographs of machinery, bridges and other engineering and architectural works. Finished and detailed working drawings, perhaps otherwise useless, would be of great value for purposes of instruction. Illustrated circulars and

price lists of manufacturing firms are desired. Contributions will be labeled with the donors' names and placed in the cabinets of the College for the inspection of students, and the illustration of lectures.

THESIS.

In all the Schools of this College a Thesis is required of those who graduate. It must be an original composition of suitable length, upon a subject appropriate to the School, and approved by the Professor in charge. The student must be prepared to read, explain and defend it before his class. It must be illustrated with such photographs, drawings and sketches as may be needed, and embellished with a title page neatly designed and printed with India ink, or colors. It must be upon Regulation Paper and securely bound. It will be prepared during the latter part of the fourth year and presented at the close of the course, after which it will be deposited in the Library of the College.

SCHOOL OF MECHANICAL ENGINEERING.

OBJECT OF THE SCHOOL.

This school is intended to prepare students for the profession of Mechanical Engineering. It is designed to supply a class of men long needed, not simply practical nor wholly theoretical, who, guided by correct principles, shall be fully competent to invent, design, construct or manage machinery, in the various industrial pursuits. The instruction, while severely scientific, is thoroughly practical, aiming at a clear understanding and mastery of all mechanical principles and devices. Practice in the Mechanical Laboratory is combined with the theoretical training, and is counted as one of the studies of the course.

INSTRUCTION.

Instruction in this school is given in both Principles and Practice.

In Principles the knowledge is imparted by lectures, combined with the use of plates and illustrative models, and recitations are made from text-books. Numerous examples are also given, showing the application of the theories and principles taught. Experiments in the testing of machines and motors are undertaken by the student.

In Practice the instruction consists mainly in the execution of Projects, in which the student is required to construct machines, or parts thereof, of his own designing, and from his own working drawings.

The students, in class exercises under competent teachers, use the machinery and tools of the Machine and Pattern Shops and Foundry, according to the most approved methods of modern practice. See "Projects."

The practical instruction is not intended merely to teach the trade, but is added as a necessary supplement to the theoretical training.

TECHNICAL STUDIES.

The Course is given by the year and term in the tabular view, page 62, course 4. The order of studies there indicated should be closely followed, that the student may avoid interference of his hours of recitation. The following is a detailed view of the Technical Studies.

MATHEMATICS.—For a list of the subjects included under Pure Mathematics, see the Department of Pure Mathematics, page 54, as far as Calculus of Variations. The following are those included in Applied Mathematics:

Cinematics and Principles of Mechanism.—Relative Motion of points in a system of connected pieces; Motion independent of Force; Velocity-ratio; Investigation of the Motion of elementary parts of machines, as Friction and Curve Wheels in rolling contact, Cams and Curves in sliding contact; Correct-working Gear Teeth; Gearing Chains; Escapement Link-work. *Analytical Mechanics*—Equations of Equilibrium; Moments; Virtual Velocities; Centers of Gravity; Mechanical Powers; Friction; Dynamics. *Hydraulics*—Amount and Center of Pressure upon submerged surfaces; Flow of Liquids through Orifices, Weirs, Pipes and Channels; Distribution of water in cities. *Thermodynamics*—Thermal and Thermometric Units; Sensible, Specific and Latent heat; Expansion by heat; Absolute Temperature; Laws of Thermodynamics; Thermal Lines; Changes of Temperature and Pressure attending Expansion of Gases; Laws of Work. *Pneumatics*—Flow of Gases through Orifices and Pipes; Density and Inertia of Gases; Distribution of Illuminating Gas.

NATURAL SCIENCE.—*Physics and Descriptive Astronomy*—See Department of Physics and Astronomy. *Chemistry*—Inorganic Chemistry and Qualitative Analysis. *Geology*—Elements of Physiographic, Lithological, Historical and Dynamical Geology.

DRAWING.—*Projection D.*—Use of Instruments in applying the Elements of Descriptive Geometry; Use of Water Colors; Isometrical Drawing; Shades and Shadows; Perspective. *Free-hand D.*—Sketches of Machinery; Ornamentation; Lettering. *Machine D.*—Working Drawings of original Designs; Finishing in Water Colors, and in Line-shading; Details for shop use according to the practice of leading manufacturers.

ENGINEERING.—*Projects*—Proportions, dimensions and customary forms of Machinery; Designing and Detailing; Construction of Machines from Working Drawings in the Mechanical Laboratory. *Resistance of Materials*—See School of Civil Engineering. *Prime Movers*—Work developed by water-wheels, wind-wheels, and by steam; Hot-air and Electric Engines; Economy of different Engines. *Mil-work and Machinery*—Principles of Mechanism; Correct forms for parts of Machines; Machinery of Transmission; Manufacturers' and Engineers' Machinery; Elastic and ultimate strengths of heavy machinery.

SPECIAL EXERCISES.

PROJECTS.—The Designing, Drawing and Shop Practice, has always a definite practical purpose. The students under the immediate direction of teachers, carefully determine the dimensions and shapes best suited for the parts of some machine, reduce them to neat and accurate working drawings, and make tracings for shop use. In the fourth year, the drawings are completely finished with line-shading or colors, and detailed according to the best methods. The drawings are left for the

further use of the school. No student will commence his shop practice without working drawings. The designs are such as require execution in iron, brass and wood, for the purpose of giving breadth of practice. The student is required to make the patterns and castings, finish the parts, and put them together in accordance with the working drawings and the required standard of workmanship. This acquaints the student with the manner in which the Mechanical Engineer carries his designs into execution, and teaches him to so shape, proportion and dispose the parts of a machine as to secure the greatest economy in construction, and durability in use.

Experiments in the testing of Prime Movers and other machines, are undertaken by the classes. They will take Indicator Diagrams from the engine of the Mechanical Laboratory and determine from them the power developed with different degrees of expansion.

VACATION JOURNALS AND MEMOIRS.

Journals of Travel are required to be kept during the summer vacations. Entries should be made as often as once a week, and consist of notices of manufactories, especially of their peculiar mechanical methods and machines. Dimensions of large or important machinery, such as stationery engines of water works, blowing or hoisting engines, and machinery in use in mining or other operations, may form a part of the record. The Journals of the first Vacation are to be read and discussed in connection with the class in Designing and Shop Practice, and those of the second in connection with the class in Cinematics and Principles of Mechanism. They should be illustrated by sketches reproduced upon the blackboard.

Reports or memoirs upon visits and observations of the third vacation will be required instead of journals, to be read in the class in Machine Drawing, during the middle term of the fourth year. These reports should be made upon rare and interesting mechanical operations or machinery, such as making gas pipe, spinning zinc, copper and brass ware, manufacturing saws, etc. They will be placed in the Library of the School, and should be illustrated by ample sketches and drawings.

APPARATUS.

This School is provided with plates and a cabinet of models for illustrating mechanical movements and elementary combinations of mechanism. This collection is rapidly increasing by our own manufacture, and by purchase from abroad. A supply of Riggs' models has lately been added, and more are ordered from the celebrated model manufactory of J. Schroeder, of Darmstadt, Germany. About two hundred valuable models have lately been received from the U. S. Patent Office.

This plan* of the Mechanical Laboratory shows the arrangement of the same. The bottom and left-hand side of the plan correspond to the two faces of the Mechanical Building, shown in perspective on page 20.

In the Boiler and Furnace Room, T is a Root's Sectional Safety Boiler of 33 horse-power, which supplies steam for the engine and for warming the building. The Forge and Furnace, UU, are in this room, and also a moulder's bench with sand and the appliances for making brass, iron and other castings. At Z are the Pumps, and Stilwell Heater and Lime Extractor, for supplying the boiler with water. *

In the Machine Shop, A is the Engine, of 16 nominal horse-power, but capable of working to 30. It is regulated by a variable cut-off of new design and simple construction, by Professor Robinson. It was made by the students of the University. A Richard's Indicator of the most approved construction is fitted to the cylinder. The main line of shafting is cold-rolled iron, 72 feet long, and furnished with the best iron pulleys and hangers. At B is a Putnam Engine Lathe of 20 inches swing by 10 feet bed. At D is an Ames Lathe of 15 inches swing by 6 feet bed. At C is a Putnam Planer for iron, planing 5 feet long. At EE are two Hand Lathes swinging about 10 inches by four feet. These were made by students. At FFF is a stretch of about 100 feet of heavy hard-wood benches, fitted up with vises, drawers, tool cases, etc. The Steam-heating Coils of this room are under the benches. At G is the Grindstone, also a No. 1 Sturtevant Pressure Blower for furnishing blast to the furnace and forge.

In the Pattern Shop are four complete sets of tools, benches and vises, each sufficient for a pattern maker; also a small Buz-saw.

In the Carpenter Shop are the following: A Whitney Planer, a Moulding Machine, a Tenoning Machine, a Jig Saw, a Cutting-off Saw, a Slitting Saw, a Morticing Machine, a Yankee Whittler, a Turning Lathe, and three Power Grindstones; also ten work-benches, and a corresponding number of sets of bench-tools. There is also at the back of the building a brick Drying House, 25 feet by 14 feet, for drying lumber, containing 1,000 feet of three-quarter inch heating pipe.

SCHOOL OF MINING ENGINEERING.

OBJECT AND INSTRUCTION.

This School is intended to qualify the student for undertaking mining operations of all kinds. Its instruction consists of a thorough training

* The cut illustrating this plan was not furnished the printer.

in the principles of theoretical and applied chemistry, of chemical and blow-pipe analysis, of assaying and metallurgy, and of the engineering operations of mining.

STUDIES AND APPARATUS.

The course of studies will be found on page 61. For two years it agrees nearly with that for Civil Engineering, after which the following specialties are introduced: *Analysis*—Qualitative and Quantitative, Chemical and Blow-pipe. *Assaying and Metallurgy*—Lectures on the processes in use in this and other countries; Laboratory Practice with the ores of various metal. *Geology*—Mining Districts; Theory of mineral veins and seams; Deposits of gold, silver, copper, iron and other metals, and of coal, peat, petroleum, salt, cements, etc. *Drawing*—Sections of strata; Galleries, winzes, workings and machinery of mines; Shafts lined with stone, wood, and metal tubing. *Engineering*—Determination of the dip and position of veins and seams, by trenches and borings; Boring and drilling tools; Blasting with powder and nitroglycerine; Use of compressed air in subterranean workings; Methods of exploitation or of working out mineral deposits of all kinds; Sinking of shafts and winzes; Running of levels and adits.

Journals of travel, projects and theses upon mining topics, will be required of those who complete the course, similar to those in the other Schools of this College.

Models, apparatus and plates are used in the lectures, for illustrating to the eye the principles and methods taught. Engineering instruments are used for ideal mine surveys, and results calculated from observed data.

The Cabinet already contains a quantity of mining models, and about \$2,000 worth in addition are arriving from Europe.

SCHOOL OF CIVIL ENGINEERING.

OBJECT OF THE SCHOOL.

The school is designed to furnish a course of theoretical instruction, accompanied and illustrated by a large amount of practice, which will enable students to enter intelligently upon the various and important duties of the engineer. Those who desire a preparation, at once broad and thorough, and who are willing to make persevering effort to obtain it, are cordially invited to connect themselves with this School.

INSTRUCTION.

It is desired that the student lay a broad foundation in general and disciplinary culture, which will enable him to pursue his professional studies with greater ease and advantage. With this view the subjects peculiar to civil engineering are not introduced until the second year.

The instruction is, as usual, given by lectures, text-books and reading, to which are added numerous problems and practical exercises, as serving best to completely explain subjects and fix them in the mind. Models and instruments are continually used, both in lectures and by the students themselves.

COURSE OF STUDIES.

The complete course occupies four years. Upon page 61 will be found the tabular view, showing the arrangement of the subjects. The studies of the first three years will prepare students for undertaking many engineering operations, such as the building of railroads, canals, embankments, etc. The fourth year is intended to fit them for the higher Engineering constructions, as the building of arches, trussed bridges, and supporting frames of all kinds.

Each year consists of thirty-six working weeks, divided into Fall, Winter and Spring terms. The 4 years is divided among the different branches nearly as follows: Languages, 360 recitations. Pure Mathematics, 360 recitations. Drawing of all kinds, 840 hours. Lectures with Mathematical Analysis, 100 hours. Surveying, recitations, drawing and field-practice, 200 hours. Physics, Mechanics, Hydraulics, Astronomy, Geology, Chemistry, Mental Philosophy, Logic, Political Economy, History, altogether 680 lectures, recitations and exercises. Practice in the Chemical Laboratory, 110 hours. Engineering Projects, 240 hours. Besides the above there are various special exercises requiring time, the amount of which cannot be assigned. Each recitation requires one hour in the class room, and to its preparation should be given an average time of three hours.

TECHNICAL STUDIES.

MATHEMATICS.—For a list of the subjects included under Pure Mathematics, see that department, page 53, as far as “Calculus of Variations.” The following are those included in Applied Mathematics:

Descriptive Geometry.—Problems on the Point, Right Line and Plane; Curved Lines and Surfaces; Tangents; Intersections; Warped Surfaces; Perspectives; Shades and Shadows; Practical Problems. *Analytical Mechanics and Hydraulics.*—See School of Mechanical Engineering. *Astronomy.*—The Observatory; Instruments and their Adjustments; Determination of time, latitude and longitude; Practical Exercises. *Geodesy.*—Figure of the Earth; Surveys of the Earth's Surface; Base Lines;

Parallels and Meridians; Methods of the U. S. Surveys; Barometric Measurements. *Land Surveying*.—Areas; Distances; Omissions and Corrections; Standard Units; Metrical System; Refractional Curvature of the Earth; Theories of Surveying Instruments; Adjustment of Instruments. *R. R. Surveying*.—Curves; Turnouts; Crossings; Obstructions; Slope Stakes; Earth-work, Grades; Curvature of Rails; Coning of Wheels; Calculation and use of Tables.

DRAWING.—*Projection D.*—Use of Instruments in applying the Elements of Descriptive Geometry; Use of Water Colors; Isometrical Drawing; Shades, Shadows and Perspective; Drawings finished in colors and by right-line shading; Right and Oblique Arches. *Free Hand*.—Landscapes, Buildings, etc.; Lettering and Ornamental Work. *Topographical*.—Sketching; Ink Drawings; Conventional Signs, etc. *Mapping*.—Railroad, and City and County Maps. *Architectural*.—Designing and Drawing of Engineering Structures.

NATURAL SCIENCE.—*Physics and Descriptive Astronomy*.—See Department of Physics and Astronomy. *Chemistry*.—Inorganic Chemistry and Qualitative Analysis. *Geology*.—Elements of Physiographic, Lithological, Historical and Dynamical Geology.

ENGINEERING.—*Road Engineering*.—Location and Construction of Roads and Railroads; Grades; Gauges; Tunnels, etc. *Resistance of Materials*.—Elasticity; Safe Limits; Shearing Stress; Flexure and Strength of Beams and Columns; Practical Formulae. *Trusses*.—Analysis of a variety of Roofs and Frames, with methods for obtaining the strains. *Bridge Construction*.—Warren's, Howe's, and other Trusses; Tubular and Suspension Bridges; Arches, etc. *Stone Work*.—Stone; Limes and Mortars; Foundations, etc.

SPECIAL EXERCISES.

VACATION JOURNALS.—Journals are required to be kept by each student during his second and third vacations. They must be written as often as once a week, and will contain accounts of his travels and occupations, with special reference to matters pertaining to his chosen profession, and general attention to all scientific and industrial facts. They will be presented during the Fall terms, read before the class, interesting facts discussed, and marked and credited as studies of the course.

It is recommended that students employ their vacations in Engineering practice. To facilitate this important part of their preparation, students of creditable standing at the ends of the second and third years of their courses, can obtain certificates to this effect from the Professor in charge.

Projects and Vacation Memoirs.—During the Spring Term of the second year, an accurate topographical survey of a locality is made by the class, with reference to the execution of a project in railroad engineering, which is then given to the class for consideration and discussion, but which is executed in the Fall Term of the next year. The plane table is used as in the U. S. surveys.

The project consists of memoirs, location, drawings and estimates.

The memoir will propose a location for a railroad to fulfill certain exact requirements, and will state the reasons for the choice, with the necessary calculations and estimates. It will be presented at the opening of the Fall Term. Different memoirs will be compared, and one or two routes decided upon for the class to work up.

The location will consist in running the line over the routes decided upon, with all the necessary measurements and calculations for estab-

lishing the grade, setting slope stakes, determining the amount of earth-work, designing the buildings, bridges, culverts, etc.

The drawings will include alignment, profile, plans and sections.

The estimates will give the cost of ground, earth-work, structures, rolling stock, etc.; expenses of operating the line, and estimated income.

A memoir will also be required at the opening of the fourth year upon an allowed subject, and a project in engineering construction will be executed during the year. See also "Thesis," page 34.

APPARATUS.

The school is provided with both English and American instruments for the different branches of engineering practice, and for the astronomical work of higher surveying. It has numerous models for illustration of its specialties and access to the cabinets of the other schools. To facilitate the practice in trigonometrical and land surveying, it has a specially prepared area, in which the difficulties of plain surveying are presented to the beginner as he is able to meet them, and where he is taught practical methods of overcoming them. This area is subdivided by a large number of lines, the positions of which are accurately known, but not by the student. He is then required to determine the positions of the "corners" by various methods, and to calculate the enclosed areas. Other problems are given in determining inaccessible distances, passing obstacles, avoiding local attraction, etc., for which the ground is prepared. The number of divisions is so large that no two students need have the same problem, and so accurately laid out that the correctness of the student's work can at once be determined.

Some expensive and accurate instruments are being added to the cabinet, which are being made by the instrument maker of the U.S. surveys. These are the first of a complete set of geodetic and astronomical instruments, which, with a few stations, will make possible practical instruction in geodesy.

An astronomical observatory for meridian observations, and of suitable size for the practical exercises in astronomy, has been erected, and is in use. An equatorial telescope has also been mounted for the use of the students. A set of Smithsonian meteorological instruments has been procured and placed in positions for making observations. Since January 1, 1873, these have been regularly made and recorded by students J. A. Ockerson and S. J. Russel. A summary is published each month, and the whole series will be carefully preserved and continued for future publication.

SCHOOL OF ARCHITECTURE.

OBJECT AND INSTRUCTION.

This school is designed for those who desire to fit themselves for the profession of architect and builder. The specialties of the course are taught upon the same general plan as in the European art schools, by a gentleman of much practical experience, who is now studying in Berlin, but is expected to return this year. The history of architecture is taught by lectures during the second and third years, and it is arranged to give carpenters, builders and masons, not able to take a full architectural course, the opportunity of getting the whole history of architecture in one year, besides instruction in architectural drawing. The principles of the different styles of architecture are taught partly by lectures, but chiefly by drawing exercises.

STUDIES AND EXERCISES.

The course will be found tabulated on page 61. To some extent it agrees with that of the School of Civil Engineering in the technical studies. The following are those in which it differs :

DRAWING.—*Free-hand D.*—Landscapes ; Ornamentation ; the Human Figure in pencil and crayon ; Drawings from Casts and Models. *Perspective D.*—Drawing of Perspective from orthographic projections, and from objects ; Finished Drawings and Designs with the pen, and in colors. *Architectural D.*—Elements of the Greek, Roman and Gothic styles ; Drawing of Buildings in the principal styles, with plans, elevations, sections and details ; Exercises in Original Design, embracing problems in architecture, with details and ornamentation ; Working Drawings for Stone Cutters, Masons and Carpenters.

ARCHITECTURE.—*History of A.*—General and Detailed History of the Ancient, Renaissance and Modern Styles of Architecture. *Designing.*—Lectures and Exercises on original designing ; Heating and Ventilation. *Specifications, etc.*—Estimates ; Builders' Contracts and Specifications ; Liabilities and Rights of Builders.

Two Vacation Journals, and two Memoirs upon Architectural Subjects will be expected of each student, as in other Engineering Schools.

APPARATUS.

This school has a fine set of one hundred and fifty plaster casts, embracing copies from the antique, statuary, capitals and architectural ornaments, from the celebrated establishment of Christian Lehr, of Berlin, which are used as drawing models. It has also a numerous and costly collection of German and French plates as "studies" in all departments of architectural and landscape drawing and coloring. It is provided with a large number of the best books on architecture, and with the best American, English, French and German periodicals devoted to the subject. It has also for its "shop practice" the use of the carpenter shop, with its machinery and tools. For a description see "Mechanical Laboratory," page 37. See also "Periodicals."

COLLEGE OF NATURAL SCIENCE.

FACULTY.

The REGENT, Professor STUART, Professor BURRILL, Professor TAFT.

SCHOOLS.

School of Chemistry ; School of Natural History.

SCHOOL OF CHEMISTRY.

OBJECT OF THE SCHOOL.

The object of this school is to impart such theoretical and practical knowledge of Chemistry as will enable the student to apply successfully the principles of the science to any of the related arts, and to fit him for the more difficult but not less attractive field of original research.

INSTRUCTION.

A tabular view of the complete course is given on page 62, course 9. Each student who takes it is expected, in connection with other studies, to work two hours daily in the laboratory, five days in the week, during four years, beginning with the second term of the first year; and, in order to graduate, each is expected at the close of the course to make an original investigation, and to write a thesis. See also "Department of Chemistry."

Students who pursue Chemistry only as a part of other courses, will find it to their advantage to work at least two consecutive hours daily during such time as their specialty may require.

TEXT BOOKS—Roscoe's Chemistry; Will's Outlines of Chemical Analysis; Fresenius' Analysis, Miller's Chemistry; Rose's Analysis.

BOOKS OF REFERENCE—Gmelin's Handbook of Chemistry; Graham Otto's Ausführliches Lehrbuch der Chemie; Watt's Dictionary of Chemistry; Lehmann's Physiological Chemistry; Percy's Metallurgy; Mitchell's Practical Assaying.

APPARATUS.

The facilities here for obtaining a practical knowledge of Chemistry are confidently believed to be unsurpassed by those of any other institution in the West. In addition to the usual apparatus found in every laboratory, is an extensive series of instruments recently purchased in Europe, including a large platinum retort for the preparation of hydrofluoric acid; a Dove's polarizer, with a complete suite of accompanying

apparatus; a Geissler's mercurial air pump; a so-called Hoffman's apparatus for illustrating in the lecture room the composition of compound gases; a Soleil-Scheibler's saccharometer of the most recent and approved construction; an excellent set of areometers; a Hauy's goniometer; a camera with Ross' lenses; a Ruhmkorff's coil; galvanic batteries of Grove and Bunsen; also a potassium dichromate battery, a galvanometer and a thermoelectric pile; a spectroscope and a large binocular microscope; two additional chemical balances, peculiar in the shortness of their beams and remarkable for the accuracy and rapidity with which weighing can be executed with them. A Natterer's carbon dioxide condenser, and an extensive set of metallurgical apparatus, consisting of models of furnaces, etc., have been ordered, and are expected at an early date.

The library of the school has recently been enriched with complete sets of standard scientific works; the *Annalender Chemie und Pharmacie*; the *Jahresbericht ueber die Fortschritte der Chemie*; *Dingler's Polytechnic Journal*; the *Handuoerterbuch der Chemie*; *Percy's Metallurgy*; *Silliman's Journal*. See table of contents for the list of Periodicals taken.

SCHOOL OF NATURAL HISTORY.

OBJECT OF THE SCHOOL.

The aim of this school is to thoroughly educate and prepare Practical Geologists, Collectors and Curators of cabinets and museums of Natural History, and Superintendents of scientific explorations and surveys.

INSTRUCTION.

The instruction is given by lectures and text-books, and excursions are made under charge of the Professors. The Course of Studies will be found on page 63, course 8. Vacation Journals and Memoirs are required as in the College of Engineering.

APPARATUS.

Collections of Specimens and Illustrative Apparatus are being rapidly provided by purchase, manufacture and donation.

In BOTANY the school has an extensive and valuable Herbarium, collected by the Powell expeditions, which has been largely increased from other sources; also a Lignarium exhibiting woods in section. It has a fine collection of enlarged *papier-mache* models of flowers and fruits, made by Dr. Auzoux, of Paris, and dissected to exhibit perfectly the most minute organs and tissues; among these are a pink, a papilio

naceous flower, a cherry, a strawberry, a pea-pod with peas, a vetch legume, a grain of wheat, etc. The green-house, arboretum and botanical garden, are open to the students of this school.

In ZOOLOGY the cabinets contain: A human skeleton purchased in Paris, and a manikin made by Dr. Auzoux; skeletons of a cow and other mammals, and of birds; stuffed preparations of a large number of birds, mammals, fishes, reptiles, etc.; a dissected horse's leg and hoof, a dissected eye, trachea and vocal apparatus, in *papier-mache*, by Dr. Auzoux; collections of shells, fossils and insects.

In ENTOMOLOGY, Dr. Le Baron, State Entomologist, required by law to make collections for the University, is preparing a full suite of specimens.

In GEOLOGY, a complete collection of specimens from the State Geological Survey.

In MINERALOGY, PALÆONTOLOGY, etc., large collections, with preparations of ores.

There is also a large dissolving-view camera and slides, for illustrating Astronomy, Geology, Zoology and History.

COLLEGE OF LITERATURE AND SCIENCE.

FACULTY.

The REGENT, Professor SNYDER, Professor STUART, Professor SHATTUCK, Professor STEELE, Professor BAKER, Professor CAREY, Professor BURRILL, Professor TAFT, Instructor PATCHIN.

SCHOOLS.

School of English and Modern Languages; School of Ancient Languages and Literature.

ADMISSION.

Candidates for admission to either of these schools must have the qualifications prescribed on page 25, and for the school of Ancient Languages and Literature they will, in addition, be examined in Latin Grammar, Elementary Latin Prose Composition, (Harkness or Arnold) four books of Cæsar's Commentaries, six orations of Cicero, and six books of the Æneid, or other selections from the same or other authors of equal amount and like character; also in Greek Grammar, three

books of Xenophon's *Anabasis*, and twenty-four exercises in Arnold's *Greek Prose Composition*, and in *plane Geometry*.

The object of this College is to furnish a sound and liberal education to fit students for the general duties of life, and especially to prepare them for those business pursuits which require a large measure of literary and scientific knowledge and training. It is designed to meet the wants of those who wish to prepare themselves for the labors of the press as editors and publishers, for teachers in the higher institutions, or for the transaction of public business.

Students in the Agricultural or other technic schools desiring to educate themselves as teachers, writers, and professors in their special departments, require a knowledge of the Ancient, as well as the Modern Languages, to give them full command of all the instruments and facilities required for the highest proficiency in their studies and proposed work. The University seeks through these schools to provide for this important part of its mission—the furnishing of teachers to the industrial schools of the country, and investigators and writers for the arts. The large liberty allowed in the selection of the special studies of his course will permit the student to give such direction to his education as will fit him fully for any chosen sphere or pursuit.

INSTRUCTION.

The plan of instruction embraces, besides the ordinary text-book study, lectures and practical exercises in all the departments, including original researches, essays, criticism, proof reading, and other work intended to illustrate the studies pursued, and exercise the student's own powers. Voice culture, and a training in elocutionary practice are designed to be given to all students.

A prominent aim in this, as in all the departments of the University, will be to teach the right use of books and thus prepare the student for self-directed investigation and study which shall extend beyond the curriculum of his school and the period of his graduation. With this view, constant use of the already ample and continually enlarging stores of the library will be required and encouraged. As a farther aid in this direction the members of the advanced English classes are expected to act as assistant librarians. In this service they are able to obtain much valuable knowledge of the various departments of English literature, of prominent authors and the extent and scope of their writings. Of special value as an incentive to, and a means of practice in English composition, should be mentioned

THE STUDENT, a monthly paper edited and published by the students of the several colleges, each of which is appropriately represented in its columns. A printing office has been provided for in the new mechan-

cal building and a press with the requisite supply of type will be procured at an early day.

In the school of Ancient Languages and Literature, the methods of instruction, without swerving from their proper aim, to impart a sufficiently full and critical knowledge of the Latin and Greek languages and writings, will make the study of these tongues subservient in a more than usual degree to a critical and correct use of English. With this view written translations, carefully prepared with due attention to differences, equivalences and substitution of idioms, and the comparison and discrimination of synonyms, will form part of the entire course.

In the school of English and Modern Languages the instruction in Modern Languages will, for the present, be confined to German and French, and will extend through two years of the course. In the first the student passes over a complete grammar and a reader, acquiring a knowledge of the technicalities of the idiom, and a sufficient vocabulary for the use of the books of reference within his course. The second year is devoted to a critical study of the language and philological analysis, and a course of select classic reading, composition and conversation will enter largely into the year's work. A third year in either language, if called for, will consist of a course of Rhetoric, Composition and History of Literature, with recitations in the language studied.

The library is well supplied with works illustrating the several periods of English and American Literature. It contains at present some eight thousand well selected volumes, and it is constantly growing by purchase at home and abroad. A number of valuable American and foreign periodicals are regularly in the reading room, a list of which is given in the "Miscellany." During the summer vacation the books will be removed to the commodious library hall in the new building, which is to be occupied in September.

The courses of study recommended in this College are to be found on page 64.

SPECIAL EXERCISES.

Three Vacation Journals, with notices of readings, narratives of public events, and observations on the current literature and the progress of public affairs will be required; also a Thesis on some philological subject at the close of the student's course.

OTHER SCHOOLS.

SCHOOL OF MILITARY SCIENCE.

OBJECT AND INSTRUCTION.

The aim of this School is not to make professional soldiers, but to teach Military Tactics to all the students of the University, as required by the laws of Congress and the State. To such as desire it, the leading principles of Military Science will also be taught.

The instruction in this School will be given in two sub-divisions.

Military Tactics.—Practical instruction, for the present confined to the infantry arm, to all able-bodied male students of the University, comprising the following branches :

Manual of Arms; Squad and Company Drill; Bayonet Exercise; Skirmish Drill; Battalion Drill; Guard and Picket Duty; Evolutions of the Brigade; Target Practice.

The exercises are confined to three hours' drill and instruction per week. There is now formed a battalion of six companies, officered by the students of the class in Military Science, for battalion and skirmish drills. Bayonet exercises are also practiced.

Military Science.—There is taught a class in Military Science and Art, as far as is necessary for the duties of officers of the line. Students are admitted into this class after having participated at least two terms in the general military exercises, and shown the proficiency and ability necessary to a utilization of the instruction thus received. The members of this class officer the companies, and act as drill sergeants and instructors for the lower classes.

The instruction and exercises occupy but five hours each week, arranged so as not to interfere with any courses of study, making it possible for the members of other Schools to engage in it as an optional study. The course of study will be found on page 61. It will be confined to two years' instruction until further facilities and teaching force can be obtained. —

APPARATUS.

The Drill Hall* is 124 by 75 feet. 350 rifle muskets are ranged around it in racks, W. There are also cavalry swords, fencing swords and muskets, an armory with a growing collection of arms, and models of arms and projectiles for practical instruction. The platform is large enough to accommodate over 250 visitors, and the galleries, L M, will

*The cut illustrating the Drill Hall was not furnished the printer.

hold 100 more, besides the University Band. Below the Armorer's Room is the Artillery Room, and above it the Band Room.

The Parade Ground is shown on page 19. The University Library contains books on Military Science, Military History and Engineering.

A Gymnasium, at present in the Drill Hall, has been furnished with apparatus, and a club has been organized under a skilled leader.

LEGISLATIVE ENACTMENT.

The recent act of the Legislature requires that all male students shall take part in the Military Drill, unless exempted by physical disability, and wear the University Uniform as prescribed on page 59.

SCHOOL OF COMMERCE.

The course in this School is given on page 62. The first term will be occupied in teaching the principles of book-keeping in general; the second, their application to special lines of business, general business forms and papers; and the third, to the higher operations of a counting house, commercial law and political economy. Students who wish to prepare for a commercial career, and also acquire a general education, may extend this course through two or more years, by taking such collateral studies as their contemplated vocation may render desirable. The studies recommended for this purpose are, English and German, Mathematics, one or two terms of Chemistry (for druggists, etc.,) and History, Political Economy and Commercial Law.

SCHOOL OF DOMESTIC SCIENCE AND ART.

The purpose of this School is to provide a full course of instruction in the arts of the household and the sciences relating thereto. No industry is more important to human happiness and well-being than that which makes the home. And this industry involves principles of science as many and as profound as those which control any other human employment. It includes the architecture of the dwelling house, with the laws of heating and ventilation; the principles of physiology, and hygiene, as applied to the sick and the well; the nature, uses, preservation and preparation of animal and vegetable food, for the healthful,

and for invalids; the chemistry of cooking; the uses, construction, material and hygiene of dress; the principles of taste as applied to ornamentation, furniture, clothing and landscapes; horticulture and culture of both house and garden plants; the laws of markets; and the usages of society and laws of etiquette and social life. It is intended eventually to develop the course to cover the topics named, and whatever else may pertain to domestic economy.

The instruction in this School will be developed as fast as practicable. The full course will very nearly correspond with the course in English and Modern Languages, page 63, except that in the second and third years lectures on the foregoing topics will take the place of the mathematical studies. Drawing is taught by a skilled instructor, music can be had as an "extra," and painting will be provided for.

Other schools, especially adapted to the wants of women, will be opened as fast as the means in the possession of the University will permit. Young ladies have free access to all the Schools in the University, and several are already pursuing studies in the Schools of Chemistry, Horticulture, Architecture and Commerce.

DEPARTMENTS.

EXPLANATIONS.

A department of study embraces a single branch of learning. The following statements are intended to show more fully than is done under the schools of the University, the extent of the instruction given in the different branches. It will be seen that some of the branches can be pursued farther than is required in any of the Schools. The numerals indicate years corresponding to those of some of the courses.

AGRICULTURE.

This department embraces a thorough course of instruction in the theory and practice of land culture and cropping in its several varieties; animal husbandry, including stock and dairy farming; sheep and swine husbandry; and the principles of stock breeding. It includes also the principles of the amelioration of soil, veterinary science, and the general management of farming estates.

2. *The Farm*.—It measurements, and mapping; Subdivisions—meadows, pastures, orchards, woodlands, gardens, etc., fences, hedges. *Soil*—Chemical elements and chemical treatment, classification and mechanical treatment, plowing, etc. *Fertilizers*.—Composition, manufacture, preservation and application. Drainage. *Plant Culture*.—Structure and physiology of plants; classes of useful plants, their characteristics, varieties and values. Wheat, culture; maize, grass, and root culture. Insects injurious to vegetation.

3. *The Farm*.—Farm implements—principles of structure and use. Road making. *Animal Husbandry*.—Breeds and varieties of neat cattle, horses, sheep and swine; principles of breeding, rearing, training, fattening, etc.; chemical composition of food, and preparation of the several varieties; poultry; bees; veterinary surgery and medicine. *Fruit Growing*. *Book-keeping*.—Farm book, herd book, etc. *Rural Law*.—Tenures and conveyances of land, highways, cattle, fences, noxious weeds, etc., laying out estates.

4. *Agricultural Economy*.—The relation of agriculture to the other industries and to commerce; the several branches of agriculture; farm buildings; climate; influence of light, heat and electricity on soils and vegetable growth; foreign and ancient farming; dairy farming, and general farm manufactures—cheese, butter, cider, vinegar, etc.; history and literature of agriculture.

The instruction is aided by, and illustrated with practical exercises on the Experimental and Stock Farms, and in the management of fine and graded stock of several varieties. But it must be fully understood that it is no part of the business of the department to teach the mere manual processes of plowing, hoeing, harvesting, etc.; these can be learned in the employ of some good practical farmer, such as may be found in every township.

HORTICULTURE.

The studies in this department will include the formation, management and care of gardens, hot-beds, propagating houses, green-houses, nurseries, orchards, tree plantations and ornamental grounds. The instruction will be from text-books and by lectures in the class room, together with illustrations and applications in the propagating and green-houses, botanical gardens and arboretum, and upon the vegetable and fruit grounds.

2. Composition and classes of soils, with reference to their uses; fertilizers; vegetable physiology, and laws of growth of plants; chemical treatment of soils; manufacture and application of manure; laying out and mapping of grounds; mechanical treatment of soils; drainage; insects injurious to vegetation.

3. Fruit growing; planting and treating of orchards; forest culture; management of nurseries propagating, grafting, etc.; plans of orchards, gardens, etc.; records, management of market and vegetable gardens; small fruit culture.

4. Care of hot and green-houses; propagating houses; conservatories; floriculture; garden architecture; ornamentation; green-house work; landscape gardening; ancient and foreign horticulture.

ENGINEERING AND ARCHITECTURE.

See the Schools of Engineering and the School of Architecture, pages 32 and 38; also the courses of study on page 63.

CHEMISTRY.

To accommodate those who have a particular object in view, this department has three special courses of Laboratory work arranged. See also pages 39 and 63, and list of Periodicals, page 58.

Agricultural.

1. Inorganic, Organic and Agricultural Chemistry; Qualitative and Quantitative Analyses of Salts; Chemical Physics.

2. Analysis of Clays, Marls, Mineral Waters, Manures, Soils and Vegetable Products.

3. Isolation of Organic Acids and Bases; Estimation of Hydrogen, Carbon, Sulphur, Sugar, Tannin etc.

4. Analysis of Air, Illuminating Gas, etc.; Study of Poisons.

Technical and Pharmaceutical.

1. The same as Agricultural, except Agricultural Chemistry.
2. Quantitative Analysis of Dolomite, Marl, Silicates and Ores; Preparation of Acids, Alkalies and Salts.
3. The same as in Agricultural, with Electroplating, Bleaching, Dyeing, Tanning and Assaying.
4. Same as in Agricultural, with Photography.

Metallurgical.

1. Inorganic Chemistry; Chemical Physics; Qualitative and Blow-pipe Analyses of Alloys, etc.
2. Analysis of Gold, Silver, Copper and other Ores, also Slags of furnaces; Assays of Bullion, and Ores of Zinc, Antimony, Tin, etc.
3. Analysis of Iron, Steel, Nickel, Cobalt, etc.; Fuel; Electro-Metallurgy; Preservation of Wood, Lime, Mortar and Cements.
4. Same as in Agricultural.

NATURAL HISTORY.

The studies in this department begin with the second term in the Colleges of Natural Science and Agriculture. The increased prominence given to this class of studies by the new school laws of the State will be met by increased efforts to make the instruction as thorough and practical as possible.

1. *Botany*—Essential parts of plants; Modifications of the root, stem, leaves, flowers, fruits, etc.; Laws of morphology and terminology; Structural, Physiologic and Systematic Botany; Microscopic Vegetable Anatomy; Life-work of plants; Classification and distribution of the flowering plants.

2. *Botany*—Flowerless plants; Anatomy and physiology of injurious plants; Lectures upon vegetable physiology; Practical work with microscopes. *Lectures* introductory to the study of Natural History; Illustrated lectures on Human Anatomy and Physiology. *Systematic Zoology*—Principles of Classification; Characteristics of Departments, Classes, Orders, etc. *Entomology* of injurious and beneficial insects.

3. *Comparative Anatomy*—Modification of plan by which animals are adapted to the various conditions of existence, in respect to respiration, circulation, embryology, peculiar modes of reproduction and development, geological and geographical distribution, etc. *Geology*—Forces known to produce observed phenomena in the crust of the earth; Characteristics of the rocks, stratified and unstratified, constituent elements, crystalline structure, etc. Historic Development of the Earth, as revealed by Palaeontology, or the entombed Fossils of the primeval inhabitants.

4. *Geology*—History of the origin and progressive phases of the Science. *Physical Geography and Meteorology*—Principles of the phenomena manifest in the Life of the Earth, or of the Earth's Physiology; Topography and Geology of Illinois, with excursions for observation and practical work.

ENGLISH LANGUAGE AND LITERATURE.

In the arrangement of the studies in this department the endeavor is to present a thorough and extended drill in grammatical and philological study, and in the authors and history of the English Language, affording a training equivalent to the ordinary studies of the classical languages. The course extends through three years, but may be shortened according to the ability and preparation of the student. Weekly essays, forensics, plans and criticism are required. Instruction in Anglo-Saxon will be given to those who desire it. See the College of Literature and Science, and the courses of study in Languages; also, "Library" and "Periodicals."

1. Sources and History of the English Language; Punctuation; Use of Capitals; Principles of Composition; Primary Rhetoric; Advanced Grammar; Philological and Grammatical Analysis of Authors, History of their times and contemporaries.

2. Reading and Analysis of Shakspeare and the early Dramatists, Spencer, Chaucer, Gower, etc.; History of their times and Contemporaries; Chronological History of English Literature begun.
3. History of English and American Literature; Rhetoric; Elements of Criticism; Principles of Taste; Methods of Philological Study, etc.

GERMAN.

This language, being of practical value to the farmer and artisan, is taught thoroughly. The first year should enable the student to read German scientific works; the second year completes the course, and should make him thoroughly acquainted with the language. Books of reference: Becker's *Deutsche Grammatik*; Grimm's *Deutsche Sprache*; Grimm's and Sander's Dictionaries. See Periodicals, page 58

1. Comfort's Complete German Course. Etymology completed; Conversational Reader commenced. Syntax; Reader completed.
2. Review of Etymology; Classic Reader; Review of Syntax; Schiller's "*Jungfrau von Orleans*;" Goethe's "*Iphigenia*;" Heyse's *Leitfaden der Deutschen Sprache*; German Composition and Conversation; Lectures on the German Language and Literature; Reading of German Papers. A third year of German Rhetoric and Composition, Literature and History, will be added to this course.

FRENCH.

The studies of the first year should enable the student to read French Scientific Works, and in the second he should become well acquainted with the language. See list of Periodicals, page 58.

Instruction in Italian and Spanish will be provided.

2. Etymology; Exercises in pronunciation. Written translations, English into French; Select readings. Syntax; Translations; French composition.
1. Review of Grammar; Classic French Literature. Modern French Literature, novels, comedies, etc. Composition; History of French Literature; Written criticisms of French authors weekly.

LATIN.

See page 46 for preparatory, and page 64 for collateral studies. Other authors may be substituted for those given below:

1. Cicero de *Amicitia*; Livy; Odes of Horace; Roman History; Archæology; Prose Composition; Prosody; Written Translations and Comparison of parallel and equivalent idioms.
2. Horace—*Satires* and *Ars Poet*; Juvenal; Quintilian; Roman History and Archæology, continued.
3. Cicero de *Officiis*; Tacitus; Origin and structure of the Language; Relation of the Latin and English Languages.

GREEK.

See page 46 for preparatory, and page 64 for collateral studies. Other authors may be substituted for those given below.

1. Xenophon's *Anabasis*—4th book; Herodotus; Thucydides.
2. *Iliad* and Demosthenes de *Corona*.
3. Selections from Greek Tragedy; Xenophon's *Memorabilia*; Plato; Greek Philosophy.

HISTORY AND SOCIAL SCIENCE.

The studies afford a general view of the history, social organization and progress of the race. They embrace also the history of the Arts

and Sciences, and of Civilization, the principles of civil polity and law, the philosophy of history, and the principles of political economy and constitutional law. The instruction is given chiefly by lectures, with readings of specified authors, and the study of historical geography and chronology. The course occupies two terms in the first, and three each in the third and fourth years of the University Courses.

1.—Discovery, settlement and colonial history of the United States, with notices of other American States; American Geography; History of the United States from the time of the Revolution—two lectures, or lessons, a week.

3.—Ancient history of Greece and Rome, with notices of other ancient nations; Ancient Geography; Medieval History; Modern History; general European History; European Geography.

4.—Constitutional History of England, and of the United States—four lectures a week. History of Civilization; analysis of historical forces and phenomena; notices of the arts and of the inductive sciences. Constitutional and international law. Political economy.

PHILOSOPHY AND LOGIC.

The studies of this department are taught chiefly by lectures, with readings of specified authors and written essays.

4.—*First Term*—Mental Philosophy. Analysis and classification of mental phenomena; theories of perception, imagination, memory, judgment, reason, intuition. The æsthetic. Phenomena of dreaming, clairvoyance, and insanity. Doctrines of the absolute and the unconditioned. Philosophy of education. *Second Term*—Moral Philosophy—three lectures a week. Theory of conscience; Nature of moral obligation; Moral Feeling; The Right; The Good. Practical ethics; Duties. Formation of character. Logic, formal and inductive—two lectures a week. *Third Term*—History of Philosophy. Ancient schools of philosophy; Scholasticism; Modern schools of philosophy; Influence of philosophy on the progress of civilization, and on modern sciences and arts. Inductive logic.

PURE MATHEMATICS.

1.—*Geometry*—Facts and principles, demonstrated, illustrated, and applied, with reference to right lines, circles, angles, triangles, polygons, planes, solid angles, prisms, pyramids, cylinders, cones and spherical surfaces, and the measurement of their lengths, areas or volumes. *Algebra*—Powers, roots and radicals of any degree; binomial Theorem; Properties and summation of series; Exponential quantities; Logarithms; General theory and methods of solving equations. *Trigonometry*—Analytical, Plane and Spherical. Relations between the functions of an arc; Formation and use of tables; Solution of plane and spherical triangles.

2.—*Analytical Geometry*—Construction of equations by means of co-ordinates; Discussion in a plane of the point, right line, circle, ellipses, parabola, and hyperbolas; Higher plane curves; cycloid, cissoid of Diocles, etc. *Differential Calculus*—Differentials of algebraic and transcendental functions; Mac-laurin's Theorem; Maxima and minima of functions; Equations of tangents, normals, sub-tangents, sub-normals, etc.; Differentials of lines, surfaces, and volumes. *Integral Calculus*—Integration of known forms, and of rational fractions; Rectification of curves, quadrature of plane areas and surfaces of revolution, and cubature of solids of revolution.

3.—*Analytical Geometry*—Loci in space; Surfaces of the second order. *Differential Calculus*—Differentials, and maxima and minima of functions of two or more variables; Taylor's Theorem; Osculatory curves, radius of curvature; Evolutes, involutes, envelopes; Discussion of algebraic and transcendental curves and surfaces. Tangent plane and normal; Partial differentials of surfaces and volumes. *Integral Calculus*—Integration of transcendental and irrational differentials; Differentials of higher orders; Differential equations; Rectification, quadrature and cubature in general; Calculus of Variations.

PHYSICS.

This subject has been amply provided for in the new building by the appointment of a Physical Laboratory and a Lecture Room, to which the apparatus will be removed this summer, and where the expected

additional instruments, necessary to fully illustrate the subject, can be accommodated. In connection with the lectures, Silliman's Physics is used as a text-book; as many of the topics are more thoroughly discussed in other classes, special attention is paid to the portions remaining. The following are the main heads: Matter, Force, Motion. Properties and Laws of Solids, Fluids and Liquids. Acoustics and Optics, with mathematical discussions of the undulations and instruments, solar and stellar spectra, etc. Heat. Magnetism. Electricity. Chemical Physics is given in a special course of lectures.

ASTRONOMY AND GEODESY.

Temporary arrangements have been made for Observatory Practice by the erection of a small observatory, and the mounting of instruments of convenient size for students' use. Descriptive Astronomy is given by lectures, with Lockyer's Astronomy for a text-book. The Equatorial Telescope is in constant use during favorable weather. Practical Astronomy is given by lectures, practical work with the Meridian Circle, Sextant, Theodolite, etc., and Astronomical Calculations. Geodesy is given by lectures, practice and calculations. Some first class instruments have been ordered and trigonometrical stations will be erected.

DRAWING.

Complete Courses in Geometrical and Projection, Architectural, Engineering, Mechanical and Free-hand Drawing are given. Free-hand Drawing is given by personal instruction in the execution, with pencil and crayon, of "studies" by celebrated French and German artists, and in drawing from plaster models and other objects. The selections are made from a large and valuable stock purchased in Europe. Painting in Oil and Water-colors will be provided for.

MUSIC.

Instruction is provided for on the Piano and Organ. This is charged for at the rate of \$10 per term of twenty lessons, and if a University instrument is used for practicing, the charge per term for such use is \$2 for each hour daily of practice. The class meets weekly for public practice, and at the end of the term they are examined in public and marked, as in the other classes.

MISCELLANY.

EXAMINATIONS.

Frequent examinations will be held to test progress in study, and to determine each student's fitness to remain in his classes. The University insists on thoroughness in its own proper studies.

Regular examinations of all the classes are made at the close of each term. A record is kept of the standing of each student at all his examinations, and from this his final certificate of graduation is made up.

CERTIFICATES AND DIPLOMAS.

Under the law, any one who remains a year at the University, and maintains a satisfactory standing in his studies and in character, is entitled on leaving the University, to a certificate of studies and standing.

The full Diploma of the University will be given to those only who have satisfactorily completed a *four years* course in some one of the Colleges. Each diploma will state the College and course pursued, the actual studies taken, and the number of terms, with standing in each marked on a scale of 100. Hence, each diploma will have just so much value as the student shall have given it by a more or less thorough mastery of his studies.

SUPERINTENDENTS' CERTIFICATE.

By authority of the State Superintendent of Instruction, to prevent pecuniary loss to those living at a distance not prepared to enter the University, but who might come hoping to pass the Examinations for admission, the following arrangement has been made.

County Superintendents of Schools will be furnished with questions and instructions for the examination of candidates, and those who pass creditably, will, when they present the Superintendent's Certificate to that effect, be admitted to the University Classes. They will pay their fees, but their Matriculation Papers will be withheld until they shall have passed the regular examinations of the first term of their attendance.

Applicants not personally known to a Superintendent must present to him introductory letters, and satisfy him as to their moral character and social standing.

DORMITORIES AND BOARD.

There are in the several University buildings about one hundred private rooms, which are rented to the students who first apply. Each

room is of ample size for two students, and is without furniture, as it is thought best that the students shall provide their own.

There are many boarding houses near the University, where either table board, or board and rooms can be obtained, with the advantages of the family circle. Boarding clubs are also formed by the students, by which the cost of meals may be reduced to \$2 per week. Many students prefer to prepare their own meals, and thus reduce expenses still farther. Coal is purchased at wholesale, and furnished to the students at cost. For estimated expenses see page 60.

LADIES' BOARDING HALL.

Until the old University building can be thoroughly refitted and devoted to the use of lady students, and to the School of Domestic Science and Art, and other schools for women, young ladies may find suitable accommodations and care at the Hall, which has been opened near the University. This affords good rooms for about 40 students, with parlor, dining room, kitchen, laundry and music room. The whole is under the charge of a competent Steward and experienced Matron. As the number who can be accommodated is limited, all who desire rooms should apply early to the Regent; no room will be reserved after the opening of the term. The private rooms, for two Students each, are furnished with bedstead, wardrobe, washstand, table and stove. All other furniture must be provided by the occupant. It can be procured at reasonable rates on arrival. The boarders share the expense of the provisions, as in the young men's boarding clubs, and, under the Matron, perform the labors of the house, thus receiving valuable lessons in Domestic Art, and diminishing their expenses. The estimates are given on page 60, and *payment must be made monthly in advance.*

LABOR.

Labor is not compulsory, but is furnished as far as possible to all who desire it. It is classified into Educational and Remunerative labor.

Educational labor is designed as practical instruction and constitutes a part of the course in several schools, and students are credited with their proficiency in it as in other studies. Nothing is paid for it.

Remunerative labor is prosecuted for its products, and students are paid what their work is worth. Those desiring employment must join the *Labor Classes*, which go out four hours each alternate day. The maximum rate paid for Farm Garden and Shop Labor is *ten cents*, and for that about the Buildings and Ornamental Grounds, *eight cents per hour*. Efficient students, who desire to earn more money, can often obtain work for extra hours, or they may be allowed to work by the piece or job, and thus by diligence or skill secure more.

Some students who have the requisite skill, industry and economy, pay their entire expenses by their labor; but, in general, young men cannot count upon doing this at first without a capital to begin with, either of skill, or of money to serve them till a degree of skill is acquired. With this, however, and with a judicious use of time during vacations, many students have been able to meet their entire expenses.

STUDENTS' ORGANIZATIONS.

University Battalion.—Commander, Professor Edward Snyder; Captains, E. L. Hill, J. J. Davenport, W. Strawn, W. W. Wharry, C. E. Gregory, W. Watts. *University Cornet Band*.—12 Instruments; H. E. Robins, Leader. *Literary Societies*.—Adelphic—C. I. Hays, Pres.; J. S. Romine, Sec. Philomathean—P. A. Philips, Pres.; L. F. Warner, Sec. Alethenai.—Ladies—A. Campbell, Pres.; M. E. Stewart, Sec. *Gymnastic Club*.—W. W. Wharry, Pres.; A. L. Craig, Sec. *Agricultural and Horticultural Society*.—W. W. Wharry, Pres.; C. O. Scudder, Sec. *Musical Societies*.—University Choir—L. C. Stanton, Chorister; A. Cheever, Organist. Apollothemesians—C. P. Jeffers, Pres.; C. S. Boyer, Sec. *Christian Associations*.—Young Men's Christian Association—E. S. Steele, Pres.; C. P. Graham, Rec. Sec.; J. S. Romine, Cor. Sec. Young Women's Christian Association—E. L. Stanton, Pres.; F. Pierce, Rec. Sec.; M. F. Miltimore, Cor. Sec. Ample accommodations for these Societies are provided in the New Building.

UNIVERSITY UNIFORMS.

Under the authority of the act of incorporation, the trustees have prescribed that all male students, after the first term, shall wear the University uniform. The University cap is to be worn from the first. This uniform consists of a set of cadet grey mixed cloth, of the same color and quality as that worn at West Point, and manufactured by the same establishment. Students can procure them ready-made on their arrival here. The University cap is of dark blue cloth, and is ornamented in front with the initials I. I. U., surrounded by a silver wreath. Students will always wear their uniforms on parade, but in their rooms and at recitations may wear other clothing.

PERIODICALS IN THE LIBRARY.

Agricultural and Horticultural—American Agriculturist, Annalen der Landwirthschaft, Chemische Ackersmann, Cultivator and Country Gentleman, California Journal, Journal d'Agriculture, Michigan Farmer, Massachusetts Ploughman, New England Farmer, Northwestern Farmer, National Live Stock Journal, Prairie Farmer, Rural New Yorker, Rock River Farmer, Southern Cultivator, Viehsucht, Western

Agriculturist, Western Rural, Willamette Farmer, Gardener's Monthly, Horticulturist, Revue Horticole. *Engineering*—American Builder, Le Moniteur des Architectes, Manufacturer and Builder, Mining Journal—London, Publication Industriels, Railroad Gazette, Railway Review, Scientific American, The Builder—London, The Workshop, Van Nostrand's Eclectic Engineering Magazine. *Scientific*—American Chemist, American Journal of Science, American Naturalist, Annalen der Physic, Berichte der Chemischen Gesellschaft, British Microscopic Journal, British Journal of Science, Comtes Rendus, Geological Magazine—London, Journal of the Franklin Institute, Philosophical Magazine—London. *Literary*—Athæneum—London, Atlantic Monthly, Blackwood's Magazine, Edinburgh Review, London Quarterly, The Nation, North American Review, North British Review, Revue des Deux Mondes, Scribner's Magazine, Westminster Review. *Philological*—Archiv fuer Studium der Neueren Sprachen und Literatur. *News*—Champaign County Gazette, Chicago Post, Centralia Sentinel, Galesburg Republican, Henry County Chronicle, Illinois State Journal, Illinois Staats Zeitung.

CALENDAR FOR 1873.

Examination for admission to Advanced Classes.....	January	1
Opening of the Second Winter Term.....	January	2
Anniversary Day ; recess of one day.....	March	11
Annual Meeting of the Board of Trustees.....	March	14
Second Term Examinations begin.....	March	18
Closing of the Second or Winter Term.....	March	19
Opening of the Third or Spring Term.....	March	20
Baccalaureate Sermon in University Chapel.....	June	1
Third Term Examinations commence.....	June	2
Examinations for admission, and Closing of the Third Term.....	June	3
Competitive Speaking and Society Addresses.....	June	4
Commencement Day, and beginning of Summer Vacation of Fifteen Weeks.....	June	5
Examination of Candidates for admission.....	Sept.	16
Examination of Candidates for admission.....	Sept.	17
Opening of the First or Fall Term.....	Sept.	18
Solid Geometry completed and Algebra commenced.....	Nov	6
First Term Examinations begin.....	Dec.	22
Closing of the First or Fall Term.....	Dec.	24
Christmas, and beginning of Vacation of Two Weeks.....	Dec.	25

For 1874.

Examinations for admission to Advanced Classes.....	January	7
Opening of the Second or Winter Term.....	January	8
Anniversary Day ; Recess of one day.....	March	11
Second Term Examinations begin.....	March	24
Closing of the Second or Winter Term.....	March	25
Opening of the Third or Spring Term.....	March	26
Baccalaureate Sermon in University Chapel.....	June	7
Third Term Examinations commence.....	June	8
Examinations for admission, and Closing of Third Term.....	June	9
Competitive Speaking ; Thesis Reading ; Society Addresses.....	June	10
Commencement Day.....	June	11

EXPENSES.

The Tuition fee is free to all the University Classes.

The Matriculation Fee entitles the Student to membership in the University until he completes his studies, and must be paid before he enters—amount.....	\$10 00
The Term Fee for Incidental Expenses is, per Student.....	5 00
Room rent in a University Dormitory, each student per term.....	4 00

All bills due the University *must be paid, and the receipt* of the Treasurer *shown* to the Regent, *before the student can enter* the Classes.

The following are the estimated maximum and minimum annual expenses, exclusive of books and clothing, of a residence for 36 weeks at the University:

For Gentlemen.

	Max.	Min.
Term Fees and Room Rent for each Student.....	\$27 00	\$27 00
Total board in boarding houses and clubs.....	144 00	72 00
Fuel and light.....	15 00	10 00
Washing at 75 cents per dozen.....	27 00	13 50
Total annual amount.....	\$213 00	\$122 50

For Ladies at the Boarding Hall.

Term fees.....	\$15 00	\$15 00
Room rent for each Student.....	30 60	23 40
Table expenses, share for each.....	54 00	45 00
Fuel and light.....	15 00	10 00
Services of Steward and Matron.....	18 00	18 00
Total annual amount.....	\$132 60	\$111 40
Board and room in private houses, per week.....	6 00	4 50

COURSES OF STUDY RECOMMENDED BY THE FACULTY OF THE UNIVERSITY.

EXPLANATIONS.

The following are the Courses arranged for the schools of the University. Students who are to graduate in a school must follow closely and in proper order the studies assigned to them. The courses are numbered for the purposes explained on page 9. Those studies of a course, which are collateral, are separated from each other by semi-colons, which are reserved for that purpose. Where two or more studies are taken up consecutively, the time devoted to each is indicated by the proper number, followed by w. for weeks. For each study not otherwise marked the student is expected to be in prompt and regular attendance, in the proper University Class Room, during one assigned hour each school day. Variations from this are indicated by placing after the study simply a numeral, stating the number of hours per week required. For

“special exercises” the time cannot be given. For admission to courses 4, 5, 6, 7 and 10, plane geometry is also required. This statement has been omitted under the corresponding schools.

COURSE 0 ; THE ELECTIVE COURSE.

(Refer to ‘Freedom in choice of Studies.’)

COURSE 1 ; SCHOOL OF MILITARY SCIENCE.

First Year.

1. School of the company. Bayonet fencing. 2. Battalion and skirmish drill. Bayonet fencing.
3. Brigade and division evolutions. Target practice and theoretical instruction on fire arms.

Second Year.

1. Military administration. Reports and returns. Army regulations and military laws. Sword fencing. 2. Mahan's outpost and picket duty. Sword fencing. 3. Art of war. Strategy and grand tactics. Organization of armies.

Third Year.

1. Artillery practice. Field artillery. Drill at the cannon. 2. Military engineering. Cavalry tactics, theoretical. 3. Military fortifications. Field and permanent bridges and roads. Military history and statistics.

COURSE 12 ; SCHOOL OF COMMERCE.

First Year.

1. Book-keeping by single and double entry. Theory of mercantile accounts, and the several principal and auxiliary books. Penmanship. Commercial calculations (English or German), Mathematics, Chemistry or History. 2. Partnership accounts. Commission and shipping. Farm books. Business forms and papers. Notes, drafts, exchange, endorsements. Bills of lading. Accounts current. Account sales. Inventories, invoices, etc. Commercial correspondence; English or German; Mathematics or chemistry. 3. Banking. Brokerage. Railroad accounts; Political Economy or Commercial Law; English, German, or Mathematics.

COURSE 2 ; SCHOOL OF AGRICULTURE.

First Year.

1. Plane Geometry; Chemistry; English or Latin; History, 2. 2. Botany; Chemistry; English or Latin; History, 2. 3. Botany; Chemical Laboratory Practice, 10; English or Latin.

Second Year.

1. Farm Surveying, 10, 7 w. Soils, 7 w.; Cryptogamic Botany; French, or Analytical Chemistry, 10.
2. Chemistry of Soils and Manures, 2; Farm Mapping, 6; Zoology; French, or Analytical Chemistry, 10. 3. Drainage, 6w. Mechanical Treatment of soils, 5w.; Entomology; French, or Analytical Chemistry, 10.

Third Year.

1. Orchard Fruits; Anatomy and Physiology; German or History. 2. Animal Husbandry; Geology; German or History. 3. Agricultural Book-keeping; Rural Law and Economy; German or History.

Fourth Year.

1. Dairy Farming and Farm Manufacturers; Mental Philosophy or Constitutional History; History of English and American Literature. 2. Veterinary Surgery; Physical Geography and Meteorology; Rural Architecture. 3. Landscape Gardening; Geology of Illinois or Political Economy; History of Philosophy or Logic.

COURSE 3 ; SCHOOL OF HORTICULTURE.

First Year.

1. Plane Geometry; Chemistry; English or Latin; History, 2. 2. Botany; Chemistry; English or Latin; History, 2. 3. Botany; Chemical Laboratory Practice, 10; English or Latin.

Second Year.

1. Farm Surveying, 10, 7w. Soils, 7w.; Cryptogamic Botany; French, or Analytical Chemistry, 10.
2. Chemistry of Soils and Manures, 2; Farm Mapping, 6; Zoology; French or Analytical Chemistry, 10. 3. Drainage, 6w. Mechanical Treatment of Soils, 5w.; Entomology; French, or Analytical Chemistry, 10.

Third Year.

1. Orchard Fruits; Anatomy and Physiology; German or History. 2. Propagation of Plants; Geology; German or History. 3. Small Fruits and Vegetables; Rural Law and Economy; German or History.

Fourth Year.

1. Green Houses; Mental Philosophy or Constitutional History; History of English and American Literature. 2. Garden Architecture; Physical Geography and Meteorology; History of Civilization. 3. Landscape Gardening; Geology of Illinois, or Political Economy; History of Philosophy or Logic.

COURSE 4; MECHANICAL ENGINEERING.**First Year.*

1. Solid Geometry, 7w.; Algebra, 7w.; Descriptive Geometry and Drawing, 10; English or French; History, 2. 2. Advanced Algebra; Free-hand Drawing, 10; English or French; History, 2. 3. Plane and Spherical Trigonometry, 10; Free-hand Drawing, 10; English or French; History.

Second Year.

1. Designing and Drawing, 10; Advanced Descriptive Geometry; German. 2. Shop Practice and Drawing, 10; Analytical Geometry; German. 3. Shop Practice, 10; Calculus; German.

Third Year.

1. Principles of Mechanism; Calculus; Principles of Chemistry; Vacation Journal and Memoir. 2. Analytical Mechanics; Physics; Shades, Shadow and Perspective, 10. 3. Analytical Mechanics, 3; Descriptive Astronomy, 4; Physics; Chemical Laboratory Practice, 10.

Fourth Year.

1. Hydraulics, 1; Thermodynamics and Pneumatics, 4; Resistance of Materials, Trusses; Geology or Mental Philosophy; Vacation Journal and Memoir. 2. Prime Movers; Millwork; Finished Machine Drawings, 10; History of Civilization. 3. Millwork and Machines; Designs and Estimates, 10; Political Economy; Thesis.

COURSE 5; SCHOOL OF CIVIL ENGINEERING.**First Year.*

1. Solid Geometry, 7w.; Algebra, 7w.; Descriptive Geometry and Drawing, 10; English or French; History, 2. 2. Advanced Algebra; Free-hand Drawing, 10; English or French; History, 2. 3. Plane and Spherical Trigonometry; Free-hand Drawing, 10; English or French; History, 2.

Second Year.

1. Land Surveying and Drawing, 10; Advanced Descriptive Geometry; German. 2. Typographical and Right-line Drawing, 10; Analytical Geometry; German. 3. Topographical Surveying and Drawing, 10; Calculus; German.

Third Year.

1. Railroad Surveying and Drawing, 10; Calculus; Principles of Chemistry; Vacation Journal and Memoir. 2. Analytical Mechanics; Physics; Shades, Shadows and Perspective, 10. 3. Analytical Mechanics, 3; Descriptive Astronomy, 4; Physics; Chemical Laboratory Practice, 10.

Fourth Year.

1. Hydraulics, 1; Practical Astronomy and Geodesy, 8; Resistance of Material; Trusses; Geology or Mental Philosophy; Vacation Journal and Memoir. 2. Bridge Construction; Finished Engineering Drawings, 10; History of Civilization. 3. Stone Work, 8; Architectural Drawing, 8; Political Economy; Thesis.

COURSE 6; SCHOOL OF MINING ENGINEERING.**First Year.*

1. Solid Geometry, 7w.; Algebra, 7w.; Descriptive Geometry and Drawing, 10; English or French; History, 2. 2. Advanced Algebra; Free-hand Drawing, 10; English or French; History, 2. 3. Plane and Spherical Trigonometry; Free-hand Drawing, 10; English or French; History, 2.

Second Year.

1. Surveying and Drawing, 10; Advanced Descriptive Geometry; German. 2. Typographical and Right-line Drawing, 10; Analytical Geometry; German. 3. Topographical Surveying and Drawing, 10; Calculus; German.

* The Requirements for Admission this year, page 35, should include Plane Geometry.

Third Year.

1. Railroad Surveying and Drawing, 10; Calculus; Principles of Chemistry; Vacation Journal and Memoir. 2. Analytical Mechanics; Physics; Chemical Laboratory Practice, 10. 3. Mineralogy and Crystallography; Physics; Descriptive Astronomy, 4; Chemical Laboratory Practice, 10,

Fourth Year.

1. Hydraulics, 1; Practical Astronomy and Geodesy, 8; Chemical Laboratory Practice, 10; Geology or Mental Philosophy; Vacation Journal and Memoir. 2. Assaying; Mining Engineering; Metallurgy. 3. Mining Drawings, 10; Metallurgy; Geology of Mining Districts; Thesis.

COURSE 7; SCHOOL OF ARCHITECTURE.**First Year.*

1. Solid Geometry, 7w.; Algebra, 7w.; Descriptive Geometry and Drawing, 10; English or French; History, 2. 2. Advanced Algebra; Free-hand Drawing, 10; English or French; History, 2. 3. Plane and Spherical Trigonometry; Free-hand Drawing, 10; English or French; History, 2.

Second Year.

1. Joinery and Detail Drawing, 10; Advanced Descriptive Geometry; German. 2. History of Architecture; Drawing, 10; Analytical Geometry; German. 3. Methods of Architecture; Drawing, 10; Calculus; German.

Third Year.

1. History of Architecture, Drawing, 10; Calculus or Surveying; Principles of Chemistry. 2. History of Architecture, Drawing, 8; Analytical Mechanics; Shades, Shadows and Perspective, 8. 3. History of Architecture; Drawing, 8; Crayon Drawing from Plates, 8; Mechanics and Astronomy, or Mineralogy.

Fourth Year.

1. History of Architecture; Drawing; Crayon Drawing from Casts, 10; Resistance of Materials; Trusses; Geology or Mental Philosophy; Vacation Journal and Memoir. 2. Architectural Designing, 8; Complete Drawings, 8; Physics. 3. Specifications, Estimates, 8; Stone Work, 8; Physics; Thesis.

COURSE 8; SCHOOL OF NATURAL HISTORY.*First Year.*

1. Inorganic Chemistry; Geometry; English or Latin; Chemical Physics, 2. 2. Botany; Algebra; English or Latin. 3. Advanced Botany; Trigonometry; English or Latin.

Second Year.

1. Cryptogamic Botany; Anatomy and Physiology; French. 2. Zoology; French; Drawing, 10, or Laboratory Practice, 10. 3. Special Entomology; French; Drawing, 10, or Laboratory Practice, 10.

Third Year.

1. Mineralogy; Ancient History, German. 2. Geology; Medieval History; German. 3. Lithological Geology; Modern History, or Drawing, 6, and Descriptive Astronomy, 4; German.

Fourth Year.

1. History of Geology; Comparative Anatomy; Mental Philosophy. 2. Meteorology and Physical Geography; Physics; History of Civilization. 3. Geology of Illinois, Excursions; Political Economy; Physics; Logic.

COURSE 9; SCHOOL OF CHEMISTRY.*First Year.*

1. Inorganic Chemistry; Geometry; English; Chemical Physics, 2. 2. Organic Chemistry; Laboratory Practice, 10; Algebra; English. 3. Crystallography and Mineralogy; Laboratory Practice, 10; Trigonometry; English.

Second Year.

1. Determinative Mineralogy; Analytical Chemistry, 10; Anatomy and Physiology; German. 2. Analytical Chemistry, 10; Botany; Analytical Geometry; German. 3. Analytical Chemistry, 10; Advanced Botany; Entomology or Calculus; German.

Third Year.

1. Practical Chemistry, 10; Comparative Anatomy; Vegetable Physiology; French. 2. Practical Chemistry, 10; Physics; Medieval History; French. 3. Practical Chemistry, 10; Physics; Modern History; French.

* The Requirements for Admission this year, page 35, should include Plane Geometry.

Fourth Year.

1. Chemical Researches, 10; Geology; Mental Philosophy. 2. Chemical Researches, 10; Geology; History of Civilization. 3. Thesis, 10; Geology of Illinois; Political Economy.

COURSE 10; SCHOOL OF ENGLISH AND MODERN LANGUAGES.*First Year.*

1. History of English Language, Composition; Solid Geometry, 7w; Algebra, 7; Chemistry; History, 2. 2. Advanced Grammar, Philological Analysis; Algebra; Free-hand Drawing, 10, or Chemistry; History, 2. 3. Advanced Grammar, Authors; Trigonometry or Chemistry; Botany or Book-keeping.

Second Year.

1. English Literature, Authors; French; Descriptive Geometry, or Anatomy and Physiology. 2. English Literature, Authors; French; Analytical Geometry or Zoology. 3. History of English Literature; French; Calculus, or Mineralogy and Entomology.

Third Year.

1. History of English Literature; German; Ancient History and Drawing, or Anatomy and Physiology. 2. Rhetoric; German; Medieval History or Geology. 3. Criticism, Principles of Taste; German; Modern History or Geology.

Fourth Year.

1. Mental Science; Constitutional History or Geology; Practical Astronomy. 2. Moral Philosophy, 3; Logic, 2; History of Civilization and the Arts; Physical Geography or Physics. 3. History of Philosophy, Logic; Political Economy; Constitutional Law or Physics.

COURSE 10; SCHOOL OF ANCIENT LANGUAGES AND LITERATURE.*First Year.*

1. Cicero de Amicitia and Prose Composition; Solid Geometry, 7w; Algebra, 7w; Anabasis—4th Book, and Prose Composition. 2. Livy and Roman History, Prose Composition; Advanced Algebra; Herodotus and Prose Composition, or Chemistry. 3. Horace—Odes, Prosody, Roman History; Trigonometry or Chemistry; Thucydides or Botany.

Second Year.

1. Horace—Satires and Ars Poetica; Descriptive Geometry or Anatomy and Physiology; Iliad and Greek Prosody. 2. Juvenal; Analytical Geometry or Zoology; Iliad. 3. Quintilian; Calculus or Mineralogy and Entomology; Demosthenes de Corona.

Third Year.

1. Cicero de Officiis; Ancient History or Comparative Anatomy and Physiology; Selections from Greek Tragedy. 2. Tacitus; Medieval History or Geology; Xenophon's Memorabilia. 3. Tacitus; Modern History or Geology; Plato and Grecian Philosophy.

Fourth Year.

1. Mental Science; Constitutional History or Geology; Practical Astronomy. 2. Moral Philosophy, Logic, 2; History of Civilization and the Arts; Physical Geography or Physics. 3. History of Philosophy, Logic; Political Economy; Constitutional Law or Physics.

EXERCISES OF COMMENCEMENT WEEK, 1873.

SUNDAY, JUNE 1—3:30 P. M.

BACCALAUREATE SERMON in University Chapel, by the Rev. W. G. Pierce.

MONDAY, JUNE 2.

EXAMINATIONS, from 8 A. M. to 5 P. M.

TUESDAY, JUNE 3.

EXAMINATIONS, from 8 A. M. to 5 P. M.

WEDNESDAY, JUNE 4—10 A. M.

PRIZE SPEAKING in Drill Hall.

THURSDAY, JUNE 5—10 A. M.

COMMENCEMENT.

MUSIC—*University Band.*

PRAYER.

MUSIC—"Our Country's Flag."

ORATION—"The Outlook."..... Frederick L. Hatch.

ORATION—"Education of Laboring Classes."..... J. Wiley.

ORATION—"Virtue Essential to Liberty."..... Parley A. Phillips.

MUSIC—*University Band.*

ORATION—"The Educated Farmer."..... Louis E. Williams.

ORATION—"Man's True Greatness."..... Charles P. Graham.

MUSIC—SOLO..... Miss Maggie E. Stewart.

ORATION—"Mathematics."..... Augustus L. Hennessey.

ORATION—"Horticulture."..... Chas. L. Hays.

MUSIC—*University Band.*

PRESENTATION OF CERTIFICATES..... By the Regent.

MUSIC—"Glee."

BENEDICTION.

2 O'CLOCK P. M.

MUSIC—*University Band.*

ADDRESS before the University by Hon. Andrew D. White, LL. D., President Cornell University—
"The Battle Fields of Science."

MUSIC—*University Band.*

DRILL..... By the Students.

FOUR YEAR STUDENTS,

And others receiving Certificates, with their average Scholarship. 1873.

Names.	Residence.	Course.	Per cent.
C. P. Graham	Champaign, Illinois.	Elective	89
F. S. Hatch	Blacins Mills, "	Agricultural	88
C. J. Hays	Bridgeport, "	Elective	91
A. S. Hennessey, (partial course)	LaSalle, "	Civil Engineering	82
E. S. Hill	Watson, "	Military and Chemical	84
Samuel H. Hook, (partial course)	Urbana, "	Civil Engineering	87
J. A. Ockerson	Elmwood, "	"	81
P. A. Philips	Damascus, "	Chemical	84
M. E. Porterfield, (partial course)	Sidney, "	Mechanical Engineering	80
H. E. Robbins	Wenona, "	"	82
A. C. Swartz	Fairview, "	Civil Engineering	95
Howard Silver	Urbana, "	Elective	90
C. W. Silver	"	Agricultural	91
J. H. Day, (partial course)	Nokomis, "	Elective	86
C. M. Tate, (partial course)	Champaign, "	Literature and Science	84
T. Yamaon, (partial course)	Yeddo, Japan	Agricultural	93
David Meade, (partial course)	Fairmount, Indiana	Elective	78
E. J. Wiley, (partial course)	Mason, Michigan	Literature and Science	86
S. E. Williams	Montrose, Iowa	Agricultural	86
F. C. Platt	Rockford, Illinois	Military	86
Four year students			12
Partial course			8
Total			20

SEVENTH ANNUAL MEETING

OF THE

BOARD OF TRUSTEES OF INDUSTRIAL UNIVERSITY.

MARCH 11, 1873.

SEVENTH ANNUAL MEETING OF THE BOARD OF TRUSTEES.

The Board assembled in the Regent's office at 5:30 P. M., having previously met in the Drill Hall, and taken a recess to witness the drill of the University Battalion. The Regent, Dr. J. M. Gregory, having called the Board to order, Judge E. L. Lawrence read the Scriptures and led in prayer.

The following members responded to their names:

Messrs. Blackburn, Brayman, Brown, Buck, Byrd, Cobb, Cunningham, Edwards, Galusha, Goltra, Haller, Hartwell, Huse, Johnson, Lawrence, Mansfield, Mason, McMurray, Pearson, Proctor, Pullen, Scott, Slade, Smith, Wright, Reynold and the Regent—27.

Absent: Messrs. Anderson, Brown, Douglas, Eull, Lindsay, Pickrell, Pickard, Van Osdel, Wagner, Bateman and Governor Palmer—11.

The newly appointed members of the Board present took the oath of office.

The Secretary read letters from Gov. Palmer, Dr. Bateman, Mr. Pickard, and General Wagner, expressing their regrets for being unable to attend this meeting of the Board.

The Regent then proceeded to read his annual report, as follows:

ANNUAL REPORT OF THE REGENT.

To the Board of Trustees of the Illinois Industrial University:

The present annual meeting closes the fifth year of the actual work of the University and the sixth year since its incorporation.

The history of these five years is such as to fill us with gratitude to the Divine disposer of events for the favor with which He has crowned our efforts to build here for the State, and especially for its great industrial interest, a University of Scientific and Practical learning.

The proceedings of the Executive Committee, which I herewith report, and the papers submitted by the several departments of the Institution, will not only explain to you the work of the year, but will show in nearly every department a measure of success and prosperity which must be gratifying to you as the sworn guardians of this institution.

ORGANIZATION.

In order to secure a clearer classification and to guide students in their courses of study, some slight modifications were made in the last Catalogue, in the presentation of the several departments and subdivisions of the University. As now organized, the University is subdivided into four Colleges: The College of Agriculture, The College of Engineering, The College of Natural Science and The

College of Literature and Science. These Colleges are each subdivided into subordinate departments or schools, as follows:

The *College of Agriculture* embraces the School of Agriculture, proper, and the School of Horticulture.

The *College of Engineering* includes the four Schools of Mechanical, Civil and Mining Engineering and Architecture.

The *College of Natural Science* embraces the School of Chemistry and the School of Natural History.

The *College of Literature and Science* embraces the School of Modern Language and Literature, and the School of Ancient Language and Literature.

Besides these there are the School of Commercial Science, the School of Military Science and a School of Domestic Economy.

The work in the last named of these Schools is but just begun. Each school has its own appropriate course of studies, and in most cases its own apparatus of instruction.

ATTENDANCE.

The number of students during the year is considerably greater than that shown by any former report. The entire attendance since your last annual meeting thus far is 418. Males, 355, females, 63. The number of counties represented is 80, and it is a gratifying fact that counties heretofore represented have largely increased their representation this year.

The numbers who have been engaged in some of the leading studies during the year are as follows:

Botany and Veg. Phys.	99
Entomology	15
Horticulture and Fruit Growing	26
Drainage	6
Zoology	83
Geology	21
Anatomy and Physiology	74
Chemistry	70
Mineralogy	22
Chemical Physics	55
Agricultural Chemistry	34
Technical Organic Chemistry	8
Laboratory	71
Natural Philosophy and Physics	73
Practical and Theoretical Agriculture	30
Veterinary Science	36
Mathematics	264
English Language and Literature	231
German Language and Literature	101
French Language and Literature	50
Ancient Language	63
Civil Engineering	55
Mechanical Engineering	38
Architecture	12
Draining	132
Book-keeping	83
Military Tactics	34

All able-bodied male students are instructed in the University Battalion. The roll contains 352 names.

THE FACULTY AND INSTRUCTORS.

The Faculty at present includes the following persons:

J. M. Gregory, Regent.

Professors W. M. Baker, S. W. Robinson, S. W. Shattuck, D. C. Taft, J. B. Webb, A. P. S. Stuart T. J. Burrill, E. Snyder, J. F. Carey.

Dr. F. W. Prentice, Veterinary Surgeon.

Instructors and Assistants—E. S. Steele, C. W. Silver, N. C. Ricker, C. W. Rolfe, E. G. Walker, P. Gennadiers, G. R. Shawhan, J. P. Campbell, Miss L. E. Patchen.

There is an urgent demand for some increase of the number of instructors at the earliest day. The health of Prof. Miles did not permit him to give this winter his usual course of Lectures in Agriculture, but the deficiency has been made up to some extent by the valuable lectures of our Corresponding Secretary, Hon. W. C. Flagg, and by the Veterinary Lectures of Dr. F. W. Prentice.

It has been the steady intention of the Trustees to put on continued service a Professor of Agriculture as soon as a suitable man for the place can be obtained. The interest of the Agricultural Department demands also the employment of a Professor of Agricultural Chemistry as soon as a person of the requisite qualifications can be found, and a suitable laboratory provided.

This chemist would not only give the special instruction in the chemistry of soils and fertilizers, feeding, &c., but also conduct the chemical experiments in agriculture. There is also needed at an early day a Professor of Physics. The instruction thus far has been given by other Professors, whose work in their own departments is constantly increasing. Provisions are made in one of the large basement rooms of the new building for a physical laboratory, in which practical instruction can be given in demonstration and application of those great laws of nature which underlie all our mechanic arts, and even our agriculture.

Our former instructor in Architecture, having failed in health, his place has been very acceptably filled by Mr. N. C. Kicker, an advanced student in that department, whose practical knowledge of the subject, and whose mechanical experience has enabled him to give very valuable instruction. He anticipates spending this spring and summer in Europe prosecuting his studies, and extending his observations; and I cordially recommend that on his return he be appointed permanently to fill the place of Instruction in Architecture.

DEPARTMENT WORK.

The work of instruction in the several Colleges has been prosecuted with increasing efficiency in most cases, and need not be particularly detailed here. Reports from some of these departments will accompany this report. We have all sought to keep steadily in view the great fundamental principle of the Institution: the *union of practice with theory*. In all studies in which it is feasible, field labor, literary work or other practical work, have been used to add force and clearness to the instruction of the lecture room.

THE FARM.

The Stock Farm, under the care of E. W. Lawrence, Head Farmer, makes a fair exhibit of successful and thrifty management.

The report of Mr. Lawrence, which is appended, will exhibit in detail the various crops cultivated, with the expense and product of each. In sustaining the entire loss of the oat crops by the ravages of the army worm, damaging us, as was estimated, nearly \$500, the books show a balance of \$1,827 06 of net income.

Mr. Lawrence has conducted some very interesting experiments in feeding with several varieties of feed, cooked and raw, the results of which will be reported to you by the proper officer. Of course the experiments of a single year do not positively determine any great principle, but they form a valuable contribution to the body of evidence, by which such principles are to be ultimately established. It is designed that the experiments shall continue through successive years, and with the purpose of arriving at some trustworthy results in this department of agricultural science. We cannot much longer delay the erection of a proper farm house upon the stock farm. The present building, besides being very defective and inconvenient, and much dilapidated from age, and supposed to be unhealthful. Our finances may not allow the erection of a building this year; but plans and estimates should be prepared, that due preparations may be made for building at the earliest date practicable.

Experimental Farm.—The experimental farm has been cultivated under the direction of Hon. W. C. Flagg, under whose direction also the experiments in feeding were made. His experimental plats have been arranged with reference to a series of experimentation, to extend through a series of years. They are designed to investigate or illustrate the truth in four or five great departments of agricultural science. Thus, one set of plats is devoted to experiments with fertilizers; another to experiments in methods of cultivation; a third to a rotation of crops; a fourth to test the different varieties of the same grain. To these he has added the experiments in food, already mentioned, as conducted by Mr. Lawrence. Mr. Flagg's reports will prove suggestive and valuable to the farmers of the State, though several years must elapse before there can be drawn from them any settled conclusions. It is to be hoped that Mr. Flagg may be permitted to continue this work through this, and coming years.

AGRICULTURAL DEPARTMENT.

The report of Prof. Burrill and Mr. Vickroy will furnish you a fully detailed statement of work in this department. Although the receipts from horticultural products have not been as large as was expected, chiefly for lack of suitable market, yet if the value of the nursery stock on hand be taken into account, the year has not been an unprofitable one. The nurseries, orchards, small fruit and the forest plantation, have all thrived to a more than usual extent. Some modifications have been proposed in the general management of a portion of the land, chiefly in the seeding down of a sufficient

breadth, to allow the keeping of a few head of cattle, for the sake of consuming on the place the coarser grains raised. It has been suggested, that if the fine stocks can be removed to the experimental farm, they would be much more accessible to the classes for study, and to visitors, who desire to see them.

MECHANICAL DEPARTMENT.

We have now occupied the Mechanical Building for a little over a year; and it is already quite well supplied with machinery, both in the iron working and wood working departments. The machine shop has proved itself a very valuable addition to the practiced teaching force of the University, and a large amount of valuable work has been performed. It is believed that with the experience already gained, its future management can be made still more effective and economical. The mechanical engineers trained here can scarcely fail to be men of practical character, and we have been glad to find that young men who have served their apprenticeship elsewhere, are in increasing numbers induced to come here, that they may add the knowledge of scientific principles to the skill that they have gained elsewhere. Instead of remaining simply common mechanics, they become masters of mechanical science and skillful engineers, competent to the care of great manufacturing enterprises. If the wood working department can be put in similar relation to the school of architecture that the machine shop holds to the mechanical engineers, I shall hope for equal benefits to be derived from its instruction. The field work of the classes in civil engineering has been increased, and perhaps no engineering school in the country now affords a larger amount of field practice to its students than our own. I am gratified to add, that students from all of these schools have found practical employment during their vacations in their professions, and have in many cases received the highest commendation of their employers.

CHEMICAL LABORATORY.

It grows more and more evident that the Institution must at an early day be provided with a laboratory, dedicated to the great and growing classes in this department of science. Our present laboratory has been crowded, and is wholly inadequate for such an institution as this.

LIBRARY AND CABINET.

There has been added to the library 1,120 bound volumes, besides a large number of pamphlets. It now contains about 8,427 volumes, or 8,760 volumes including duplicates. In proportion to its size it is rich in works of natural science, and in agriculture and the arts. It is also well supplied with works of American and English history and literature. The scientific character of the Institution will, however, imperatively demand constant additions of fresh books in all the branches of science and the arts.

There are now received at the library 84 periodicals, of which 21 are agricultural, 3 horticultural, 33 scientific, 27 are literary and miscellaneous. They embrace some of the best journals of Chemistry, Natural History, Engineering, Architecture and other arts, published in England, France and Germany.

The library is largely used by the students, and has proved a most valuable aid in their education. The cabinets have received some valuable additions during the year, both by purchase and donation. But as we are soon to enter upon the occupancy of more ample and convenient cabinet rooms, it seems desirable that large additions shall be made as early as the funds of the Institution will allow, or the generosity of its friends may afford. Natural History cannot be successfully taught without abundant means for illustration. Geology, Mineralogy, (and all the branches of) Zoology and Botany ought to be so represented by natural specimens and artificial preparations, that the students in these branches might have the clearer knowledge which comes from sight, and, by a personal observation, gain definite and truthful ideas of the objects and materials of their studies.

THE NEW BUILDING.

At the date of the last annual meeting there had been expended upon the erection of the new University the sum of \$75,000, provided by the State. And it was expected that the Legislature then in session would grant the remaining \$75,000 virtually promised in the law. They finally adjourned without such appropriation, and the executive committee, in accordance with the opinions freely expressed by the board of trustees, and with the advice of the architect, deemed it wise and prudent to provide temporarily the means for the continuance of the work, by the sale of the Champaign county bonds, the contractor having expressed the right to go on with the work under the contract, thus waving any right he might be supposed to have under the new circumstances of the case, to close said contract. Operations were resumed in May, and continued until December. The building is now fully inclosed and a large part of the plastering is done, and much of the flooring is down.

The architect estimates that the work can be completed for \$12,000 or \$13,000. In the month of

August it became known to the Executive Committee that the contractor was seriously embarrassed, and was not paying fully the sub-contractors who were furnishing him with material and labor. Steps were immediately taken, in accordance with the wish of his bondsmen and with the contractor's own consent, to secure the strict application of all moneys allowed him on the contract to the parties to whom such moneys were due. Early in November, his embarrassments increasing, and several of his creditors having served notices of their intention to apply for a mechanic's lien, referees were appointed, as provided for in the contract, to determine the amounts due for extras and alterations made in the building. The award of the referees was rendered in the latter part of November, and it was then found that the contractor had been paid all that was due him under the contract, and that nothing was left to meet the outstanding claims of his creditors.

A few days later he reported to the committee his inability to complete the contract, and a formal notice was served upon his sureties of the said failure. These circumstances, and the speedy approach of cold weather, led to a suspension of the work which has not yet been resumed. It ought to be said, to the honor of the contractor, that his work seems to have been done with great fidelity, and that he claims to have lost largely upon the contract, chiefly on account of the enhanced prices of labor and material, occasioned by the Chicago fire. At the opening of the present session of the Legislature an application was made, and is now pending, for further appropriation to complete the building, to provide for the heating apparatus, and the furniture needed to fit the building for its use. I cannot too strongly urge the great importance of securing the early completion and fitting up of this building for our occupancy. The class-rooms of the old University building are wholly inadequate for the large and growing classes in all the chief departments. I trust that the Executive Committee will be instructed to resume the work as soon as legislative appropriation is determined, and that proposals may be received for warming, seating and otherwise furnishing the building.

FINANCES.

The report of the Book-keeper will show you the number of warrants drawn, and the object and amount of each, as also a classified statement of the expenditures for the year. From this it appears that the entire expenditure for all purposes is \$124,994 85, of which \$55,873 03 was for the new University building, paid out of the proceeds of the sale of the Champaign county bonds. The whole amount paid for salaries was \$25,433 87. The next largest amounts were paid out for the several shops, farms and horticultural grounds. These expenditures were chiefly for labor and material, and were of course balanced by the products of these several departments. The entire expenses of the University proper for the year, excluding the expense of shops, farms, horticultural department, experiments and lecture sessions, and taxes on lands, and including the \$4,709 13 spent for library and cabinets, was \$41,336 81.

The income, as shown by the Treasurer's report, is as follows :

From endowment fund.....	\$28,680 00
From fees and room rents.....	6,653 50
From sale of bonds.....	60,000 00
From other sources.....	35,354 22
Total.....	\$130,687 72
The assets of the University, as reported in December last to the State Board of Charities, are as follows:	
Lands.....	\$86,000 00
Building and improvements.....	175,000 00
Total.....	\$261,000 00
Furniture, library cabinets and apparatus.....	\$75,000 00
Funds and investments.....	424,000 00
Total personal property.....	\$499,000 00
Total assets.....	\$760,000 00

WILD LANDS.

During the past year the Executive Committee sent to Nebraska and Minnesota an experienced agent, to make a careful inspection and estimate of the value of the wild lands held by the University in those States. His report gives a full statement of the character and probable value of each piece, and of the roads, railroads or settlements which may affect this value. The lands in Nebraska were found, on a fair estimate, to be worth from \$4 to \$7 per acre, while those in Minnesota vary from \$2 to \$5. A circular has been issued offering them for sale, and inquiries begin to be made by those desiring to purchase.

A NEW CONGRESSIONAL GRANT.

In accordance with the resolutions of a large National Convention of the representatives of State and other Agricultural Societies, held in Washington in February, 1872, and of the Agricultural Colleges, a bill was introduced into Congress providing for an additional grant, not of lands, but of the proceeds of the sales of public lands, for the further endowment of the Industrial Universities and Colleges established under the act of 1862. This bill passed the Senate by a large majority, and a substitute for it, agreed on by its friends, which made provisions also for the public schools, passed the House of Representatives by an equally decided vote, but was finally sent by the Senate to a committee of conference from the two houses.

It was generally claimed and conceded, in the Agricultural Convention above mentioned, that in most, if not in all of the States, the proceeds of the grant of 1862 was wholly inadequate for the support of such a College as was required to be maintained under the act of Congress making that grant. Everywhere in this country and in Europe, it has been found that scientific education is vastly more expensive than simple classical and literary training. The expensive and always advancing literature of science, the large and costly laboratories required, the extensive cabinets of specimens and illustrative collections demanded in all successful study of nature, and the much larger teaching force required to adequately represent and teach the great family of sciences, all these serve to multiply beyond ordinary conception the cost of scientific education. And when the applications of these sciences to the arts is added to the undertaking, the expense is carried to an amount which can only be justified by the vital importance and high pecuniary value to the country of such expenditure. The great sums being expended by the leading European governments on this class of schools and education, prove not only the correctness of the estimates here given of the cost, but also their appreciation of the great public and commercial necessity and value of these adjuncts of the industrial forces of the country.

SCHOOLS FOR WOMEN.

In my last annual report I took occasion to argue at some length the duty of making some adequate provision for special instruction of female students in such branches of practical arts as fall within their sphere, and I laid before the Trustees some needs of a School of Domestic Science. The general views of my report were warmly approved by the committee to which they were referred.

The failure of the legislature to make the appropriation for the completion of the new building, and the necessity of retaining the old building for common University purposes, prevented the attempt to carry out the plan for converting it into a boarding hall for ladies, to be connected with the school of Domestic Economy. Anxious to see some experiment tried in that direction before we should enter upon the work on so large a scale as the use of this building would imply, I provided at my own expense, during the year, a boarding hall, or home for young ladies, fitted up with suitable private and public rooms, including dining-room, kitchen and laundry, and procured the services of a matron who had had considerable experience in ladies' boarding schools.

The number of young ladies in the home has not been large, but in other respects the experiment has been satisfactory so far as it has gone. We have not had the means to provide a special instructor in Domestic Science, and but little progress has been made in developing a regular course of instruction for this school. I can only reiterate the views I formerly expressed as to its value and importance, and add my increased conviction of its feasibility and usefulness.

I hope that the Executive Committee may be instructed to procure a teacher for that department as soon as the funds will permit.

MILITARY DEPARTMENT.

The work in the Military Department has been carried on with much more regularity and success since we have entered upon the occupancy of the new Drill Hall.

The University Battalion now consists of six companies, and 352 members. The special class has been continued, and its members have served as officers of the several companies, while affording to the young men some measure of healthful exercises, without interfering at all with the progress of their studies in the several departments.

The general influence upon the character and spirit of the Institution has been decidedly beneficial; and an application is now pending to the War Department for the detail of an officer, under the law of Congress, providing for such detail, to come as military commandant and instructor, and the prospect seems favorable, if the Trustees still deem it desirable to obtain the services of an officer whose recommendations are of the most satisfactory character.

Some complaint has been made from time to time in regard to the uniform prescribed for the students, but it is believed that the views of the students generally favor its continuance. The uniform seems absolutely essential to the maintenance of a proper spirit and discipline in the Military Department, and if this requisition of the law of Congress and the State is to be obeyed, it seems indispensable that some uniform should be prescribed and enforced.

RECORDING SECRETARY'S REPORT.

DR. J. M. GREGORY,

Regent of the Illinois Industrial University :

CHAMPAIGN, ILL., March 10, 1873.

DEAR SIR: Enclosed I have the honor to submit to you the following statements :

- I. Financial statement for the current year.
- II. Abstract of warrants.
- III. Summary of same by departments.
- IV. Abstract of student labor pay roll.

Very respectfully,

E. SNYDER, *Recording Secretary.**Financial Statement of the Classified Expenditures for the Fiscal Year ending March 10, 1873.*

Departments and Accounts.	Appropriations.		Cash earnings.	Cr. by work fr. other dep'ts	Total credits.	Total expense	Balances.	
	State.	Current					Over-drawn.	Unexpended
Board expense.....		\$1100 00			\$1100 00	\$1111 23	\$11 23	
Salaries.....		27100 00			27100 00	25433 87		\$1666 13
Buildings and grounds.....		3000 00			3000 00	3410 03	410 03	
Fuel and lights.....		1000 00	\$1028 66	\$323 86	2352 52	2437 05	84 53	
Stationery and printing.....		1000 00			1000 00	835 89		164 11
Incidental expense.....		1500 00			1500 00	1511 72	11 72	
Insurance.....		500 00			500 00			500 00
Lands and taxes.....		2500 00			2500 00	2510 20	10 20	
Unpaid account of last year.....		2600 00			2600 00	2594 17		5 83
*Farm account.....			3465 26	353 96	3819 32	5265 32	1445 99	
*Mechanical shop.....		1000 00	2472 41	2237 56	5709 97	8558 22	2848 25	
*Carpenter Shop.....		2000 00	1803 27	2821 59	6124 86	7560 71	1435 85	
*Horticultural department.....	\$1750 00	200 00	982 85	238 00	3170 85	3998 11	827 26	
Military department.....		335 00			335 00	182 68		152 32
Chemical department.....		2750 00			2750 00	894 84		1855 16
Library and apparatus.....		5000 00	200 00	328 90	5528 90	4973 23		555 67
Experiments and lectures.....		3000 00			3000 00	3371 38	371 38	
New University building (spec'l).....		56326 00			56326 18	56326 18		

*For the account of improvements, stock, material, etc., on hand, reference is made to the reports from these departments.

Abstract of Warrants drawn from March 13, 1873 to March 6, 1873, No. 1 to 693 Inclusive.

No.	Date.	To whom.	For what.	Amount.
1	March 13..	J. M. Pearson.....	Expense to meetings.....	\$74 50
2	" 13..	J. P. Slade.....	" ".....	23 50
3	" 13..	B. Pullen.....	" ".....	17 00
4	" 13..	M. C. Goltra.....	" ".....	28 70
5	" 13..	R. R. Harrington.....	" ".....	21 50
6	" 13..	Newton Bateman.....	" ".....	10 00
7	" 13..	A. Blackburn.....	" ".....	24 60
8	" 13..	I. S. Mahan.....	" ".....	20 75
9	" 13..	S. B. McMurray.....	" ".....	12 00
10	" 13..	J. W. Bunn.....	Salary 1871 and 1872, and unpaid bills.....	1,000 00
11	" 13..	L. W. Lawrence.....	Expense to meeting.....	24 05
12	" 13..	P. R. Wright.....	" ".....	27 75
13	" 13..	D. A. Brown.....	" ".....	10 00
14	" 13..	J. R. Scott.....	" ".....	7 00
15	" 13..	A. M. Brown.....	" ".....	27 50
16	" 13..	Hon. J. L. Pickard.....	" ".....	16 30
17	" 13..	W. C. Flagg.....	Salary superintendent experiments.....	476 50
18	" 13..	E. L. Lawrence.....	" for 1871 and 1872.....	480 00
19	" 13..	I. D. Foulou.....	" to March 12.....	75 00
20	" 13..	J. M. Gregory.....	Balance for periodicals purchased.....	2 95
21	" 13..	Miller & Toll.....	Towels and cloths.....	4 25
22	" 13..	Enterprise Coal Company.....	Four cars coal.....	74 00
23	" 13..	Hostford & Spear.....	Oil and lamp furnishings.....	2 30
24	" 13..	J. B. Tibbets.....	Sinking well.....	178 75
25	" 13..	Flynn & Scroggs.....	Printing.....	9 00
26	" 13..	J. W. Keys.....	Hanging paper.....	5 00
27	" 13..	Adams, Blackmer & Lyon.....	Blank books.....	61 50
28	" 13..	B. D. Whitney.....	Planer for carpenter shop.....	250 00
29	" 13..	J. L. Wayne & Sons.....	Bill of tools.....	507 55
30	" 13..	J. M. McKee.....	Lumber.....	43 35
31	" 13..	E. Snyder.....	Petty expense.....	2 67
32	" 13..	N. W. Manufacturing Co.....	Material for shop.....	58 92
33	" 13..	G. H. Burt.....	Hot-bed sash.....	13 50
34	" 13..	Nicholel & Schoff.....	Printing.....	4 00

List of Warrants—Continued.

No.	Date.	To whom.	For what.	Amount.
35	March	13. Hesse & Co.	Castings	\$31 53
36	"	13. A. P. S. Stuart.	Petty expense chemical department.	25 25
37	"	13. Jas. Vick.	Seeds	16 50
38	"	13. P. Henderson & Co.	"	14 95
39	"	13. Graham & Stephenson.	Carpenter work.	26 00
40	"	13. Hovey & Co.	Seeds	3 40
41	"	13. Fuller & Fuller.	Linseed oil and paint.	72 62
42	"	13. John Fisher.	Flower pots.	7 00
43	"	13. Jas. H. Mills.	Pear cions.	5 00
44	"	13. H. Pedicord.	Coal and plaster.	43 25
45	"	13. E. V. Peterson.	Stationery.	32 18
46	"	13. Dodson & Hodges.	Hardware.	87 69
47	"	13. H. K. Vickroy.	Petty expense horticultural department.	3 05
48	"	13. T. J. Burrill.	"	1 95
49	"	13. Larrabee & North.	Tools.	162 25
50	"	13. Walker Bros.	Material, labor, oil, etc.	41 45
51	"	13. J. W. Bunn.	Paid printing.	5 50
52	"	13. N. O. Albert.	Work for February, 1872.	14 51
53	"	13. Shaffer & Harwood.	Seventeen tons coal.	71 50
54	"	13. Oldham & Webster.	One box stove.	9 00
55	"	13. D. C. Kennedy.	Work in shop.	22 30
56	"	13. Reade, Brewster & Co.	Printing envelopes.	8 50
57	"	13. Chalmers, Spencer & Co.	Labor, etc.	40 00
58	"	13. M. Miles.	Salary, March, 1872.	333 34
59	"	13. J. Teeple.	one month.	50 00
60	"	13. C. W. Silver.	March, 1872.	40 00
61	"	30. J. M. Gregory.	"	333 33
62	"	30. W. M. Baker.	"	166 66
63	"	30. A. P. S. Stuart.	"	166 66
64	"	30. S. W. Robinson.	"	166 66
65	"	30. J. T. Carey.	"	166 66
66	"	30. T. J. Burrill.	"	150 00
67	"	30. S. W. Shattuck.	"	150 00
68	"	30. E. Snyder.	"	150 00
69	"	30. J. B. Webb.	"	150 00
70	"	30. D. C. Taft.	"	150 00
71	"	30. H. Hansen.	"	125 00
72	"	30. Franks.	"	75 00
73	"	30. H. K. Vickroy.	"	83 33
74	"	30. D. A. Steadman.	"	83 33
75	"	30. H. K. Vickroy.	Expense horticultural dep't mnt Mar., 1873	90 04
76	"	30. H. S. Reynolds.	Service in laboratory.	50 00
77	April	1. E. L. Lawrence.	Farm expense March, 1872.	581 69
78	"	1. A. S. Barnes & Co.	Shipping charges.	82 56
79	"	1. E. Snyder.	Students labor March, 1872.	477 03
80	"	4. M. C. Goltra.	Expense to meeting.	14 15
81	"	4. J. M. Pearson.	"	18 80
82	"	4. E. Cobb.	"	10 25
83	"	4. Flynn & Scroggs.	Binding for library.	76 50
84	"	4. E. Snyder.	Petty expense.	29 10
85	"	4. Robeck & Goebler.	Chemicals.	39 00
86	"	4. Dodson & Hodges.	Hardware.	42 20
87	"	4. T. J. Burrill.	Plants, etc.	32 23
88	"	4. J. W. Dowell.	Copying plans.	15 00
89	"	4. Illinois Journal Company.	Printing.	4 50
90	"	4. N. W. Manufacturing Co.	Fittings and materials.	7 68
91	"	4. Shaffer & Harwood.	Coal.	28 00
92	"	4. W. H. McAllister.	"	5 50
93	"	4. C. J. Tay.	Felting.	900
94	"	4. E., C. & C. Co.	One car coal.	1500
95	"	4. H. Swannell.	Paint, oil, glass.	4568
96	"	23. E. L. Lawrence.	Cattle.	1,01000
97	"	23. I. D. Foulon.	Salary.	7500
98	"	23. J. M. Gregory.	Thirty-six lectures, common law.	50000
99	"	23. J. M. Pearson.	Expense to meeting.	1950
100	"	23. E. Cobb.	"	2055
101	"	23. M. C. Goltra.	"	1450
102	"	23. S. Shick.	Periodicals.	1775
103	"	23. Geo. Ely.	Blacksmithing.	860
104	"	23. J. Manz.	Engraving.	5535
105	"	23. J. E. Hessel.	Harness repairs.	3545
106	"	23. J. M. Gregory.	Petty expenses.	3535
107	"	23. J. E. Hutchinson.	Feed cutter.	1710
108	"	23. Student Company.	One column advertising and 33 copies.	7300
109	"	23. Trevett & Green.	Hardware.	23449
110	"	23. Enterprise Coal Company.	One car coal.	1500
111	"	23. M. Adams.	One and one-half cord wood.	675
112	"	23. U. S. Patent Office.	Binding reports.	2000
113	"	23. J. Teeple.	Salary, one month.	5000
114	"	30. J. M. Gregory.	April.	333 33
115	"	30. W. M. Baker.	"	166 66

List of Warrants—Continued.

No.	Date.	To whom.	For what.	Amount.
116	April 30.	A. P. S. Stuart	Salary, April	\$166 66
117	" 30.	S. W. Robinson	" "	166 66
118	" 30.	J. F. Carey	" "	166 66
119	" 30.	T. J. Burrell	" "	150 00
120	" 30.	S. W. Shattuck	" "	150 00
121	" 30.	E. Snyder	" "	150 00
122	" 30.	D. C. Taft	" "	150 00
123	" 30.	H. Hansen	" "	125 00
124	" 30.	W. C. Flagg	" "	250 00
125	" 30.	C. W. Silver	" "	40 00
126	May 1.	A. M. Brown	Expense to meeting	23 10
127	" 1.	M. C. Goltra	" "	14 00
128	" 1.	J. H. Pickrell	" "	7 27
129	" 2.	E. L. Lawrence	Farm expense, April 1, 1872	402 51
130	" 2.	S. W. Lawrence	Expense to meeting	24 00
131	" 2.	J. B. Webb	Salary, April, 1872	150 00
132	" 2.	N. W. Manufacturing Co.	Fittings and pulleys	19 51
133	" 2.	J. E. Hessel	One saddle	12 75
134	" 2.	J. M. Gregory	Petty expense	48 99
135	" 2.	Hesse & Co.	Castings	10 65
136	" 2.	W. F. Huks	Strawberry plants	39 50
137	" 2.	Fuller & Fuller	Two carboys acid	16 93
138	" 2.	T. J. Burrell	Petty expenses	7 56
139	" 2.	Murray & Parks	One burdock cutter	38 00
140	" 2.	E. Snyder	Petty expense	7 75
141	" 2.	Enterprise Coal Co	One car coal	15 00
142	" 2.	H. K. Vickroy	Expense horticultural dep't	206 96
143	" 2.	J. A. Noyes	Sweet potatoes	4 75
144	" 2.	H. Swannell	Paint, glass, etc	25 91
145	" 2.	Walker Brothers	Lumber, oil	15 52
146	" 2.	Ayers & McCanley	Castings	53 44
147	" 2.	Trevett & Green	Hardware	75 57
148	" 2.	E. V. Peterson	Stationery	28 65
149	" 2.	Journal Printing Co.	Printing for exp. farm	6 00
150	" 2.	D. Van Nostrand	Book	5 00
151	" 2.	A. S. Davis	Grass seed	1 80
152	" 2.	F. F. Holbrook	Cultivator	10 00
153	" 2.	Shaffer & Harwood	Coal	26 15
154	" 2.	Geo. Ely	Blacksmithing	11 15
155	" 2.	A. G. Paro	Oil cans	25 50
156	" 2.	A. Bennett	Trees	36 90
157	" 2.	C. Green	Brooms	1 75
158	" 2.	E. F. Gehlman	Building	5,000 00
159	" 2.	E. Snyder	Students labor, April	471 68
160	" 2.	D. A. Steadman	Expense for carpentry	94 57
161	" 2.	I. B. & W. R. R. Co	Freight boxes	27 95
162	" 2.	Oehlrich & Co.	Shipping charges	23 79
163	" 2.	I. D. Foulon	Salary, May 12	75 00
164	" 9.	A. S. Barnes & Co	Shipping charges	59 70
165	" 13.	W. A. Chase	Work in horticultural dep't	25 50
166	" 13.	S. Shick	Books	9 65
167	" 13.	W. J. McCanley	Brass and iron	23 05
168	" 13.	J. W. Bunn	Taxes on lands	2,238 60
169	" 17.	J. M. Gregory	Salary, May	333 33
170	" 17.	F. L. Hatch	One month work	45 80
171	" 17.	H. S. Reynolds	" "	51 45
172	" 17.	T. G. Lansden	Pump and fittings	78 96
173	" 17.	W. M. Baker	Salary for May	166 66
174	" 31.	A. P. S. Stuart	" "	166 66
175	" 31.	S. W. Robinson	" "	166 66
176	" 31.	J. F. Carey	" "	166 66
177	" 31.	T. J. Burrill	" "	150 00
178	" 31.	S. W. Shattuck	" "	150 00
179	" 31.	E. Snyder	" "	150 00
180	" 31.	D. C. Taft	" "	150 00
181	" 31.	J. B. Webb	" "	150 00
182	" 31.	H. Hansen	" "	125 00
183	" 31.	J. Teeple	" "	50 00
184	" 31.	J. Colberg	" "	32 00
185	" 31.	C. W. Silver	" "	40 00
186	" 31.	E. L. Lawrence	Farm expense, May	320 03
187	June 6.	W. M. Beatty	Surveying and appraising lands	111 60
188	" 6.	I. D. Foulon	Salary, to balance	75 00
189	" 6.	J. M. Pearson	Expense to meeting	18 80
190	" 6.	M. C. Goltra	" "	14 85
191	" 6.	F. L. Hatch	Work on exp. farm	77 10
192	" 6.	A. M. Brown	Expense to meeting	24 25
193	" 6.	A. L. Lawrence	" "	24 10
194	" 6.	J. H. Pickrell	Books for library	77 25

List of Warrants—Continued.

No.	Date.	To whom.	For what.	Amount.
274	July 31.	D. A. Steadman	Expense Carpenter dep't, July	\$351 17
275	31.	S. W. Robinson	Expense Mechanical dep't, July	493 20
276	Aug. 1.	E. L. Lawrence	Farm expense, July	305 31
277	1.	H. K. Vickroy	Expense Horticultural dep't, July	297 08
278	1.	W. C. Flagg	Experimental farm,	58 32
279	1.	C. I. Hays	Work in greenhouse	50 00
280	1.	Flynn & Scrogg	Printing	21 40
281	1.	J. M. Gregory	Library purchase	200 00
282	1.	E. F. Gehlman	Work on new building	5,400 00
283	1.	H. H. Holden	Wood and iron	34 80
284	1.	Hall, Kimbark & Co.	Material	145 20
285	1.	N. W. Manf. Co.	Pipes, valves and castings	112 69
286	1.	Fuller & Fuller	Oil	26 38
287	1.	T. B. Brown & Co	Hardware	58 79
288	1.	J. A. Fay & Co	Tenoning machine	249 43
289	1.	Larrabee & North	Materials	67 35
290	1.	Post & Goddard	"	25 07
291	1.	W. C. Rolf	Janitor services, July	22 00
292	1.	S. R. Wilber	Hauling four cars coal	20 00
293	14.	F. W. Christern	Books	84 89
294	14.	Enterprise Coal Co	Seven cars coal at \$15	105 00
295	14.	J. Schroader	Models Mechanical dep't	224 27
296	14.	W. S. Gurley	Mathem. instruments	58 50
297	14.	U. S. Pat. Office	Bound reports	32 50
298	16.	H. E. Robbins	Work in Mechanical dep't	12 60
299	16.	Carl Shuman	Mining models	253 13
300	24.	S. W. Shattuck	Whitewashing and cleaning building	162 11
301	31.	E. Snyder	Salary, August	150 00
302	31.	W. H. Piper & Co	Books	522 00
303	31.	S. W. Shattuck	Cleaning building	60 70
304	31.	H. K. Vickroy	Salary, August	75 00
305	31.	S. W. Robinson	"	166 66
306	31.	H. Hansen	"	125 00
307	Sept. 4.	E. L. Lawrence	Farm expense	304 73
308	5.	A. M. Brown	Expense to meeting	24 00
309	5.	L. W. Lawrence	"	24 00
310	5.	J. M. Pearson	"	20 80
311	5.	D. A. Steadman	" carpenter dep't	581 33
312	6.	C. Hesse & Co	Castings	691 58
313	7.	Enterprise Coal Co	Seven cars coal	105 00
314	7.	Geo. W. Call	Implement repairs	15 20
315	7.	S. W. Robinson	Pay roll, Mechanical dep't	486 33
316	7.	A. Snidecker	Castings	50 69
317	7.	Trevett & Green	Hardware	262 58
318	7.	H. Swannell	Paint, glass and putty	10 61
319	7.	Dodson & Hodges	Hardware	47 31
320	7.	Walker Bros.	Oil, material	9 70
321	7.	S. W. Robinson	Petty expense	32 63
322	7.	H. K. Vickroy	Expense Horticultural dep't	216 62
323	7.	Nicholet & Schaff	Printing	31 00
324	7.	M. E. Lapham Co.	Lumber	9 46
325	7.	W. H. McAllister	Implements and seeds	6 68
326	7.	A. G. Paro	Gas fixtures	4 35
327	7.	Webster, Davis & Co.	Lumber	26 00
328	7.	J. Rigg & Sons	Brooms	1 50
329	7.	J. H. Smith	"	1 50
330	7.	C. Green	Jars	2 90
331	7.	Beach & Condit	Blosberg coal	12 50
332	7.	J. M. Parsons	Two band instruments	24 00
333	8.	F. L. Hatch	Pay roll hands, August	141 97
334	8.	E. Hunt & Sons	Hardware	29 74
335	8.	C. F. Sprague	Books	107 90
336	8.	J. M. Gregory	Petty expense	82 11
337	8.	Crane Bros	Material	99 66
338	8.	Champlin Rogers	Tape	1 69
339	8.	Hussey, Wills & Co	Cast steel	28 55
340	8.	Journal Printing Co	Advertising and printing	23 00
341	8.	Advance Co	"	16 00
342	8.	Interior Company	Advertising	8 64
343	8.	Church & Goodman	"	12 60
344	8.	Fuller & Fuller	Paint, glass and putty	70 76
345	9.	B. Blum	Sand bath	5 50
346	9.	Coltor & Proctor	Stove castings	1 40
347	9.	Eastman & Bartlett	Stationery	14 00
348	9.	M. Miles	Books	34 50
349	9.	E. F. Gehlman	New building	2,800 00
350	12.	Thos. Waddell	Superintendent new building	398 80
351	13.	Chas. W. Rolf	Work in library	35 00
352	13.	C. W. Dorr	Moving guard house	60 00

List of Warrants—Continued.

No.	Date.	To whom.	For what.	Amount.
353	Sept. 16.	Oehlrichs & Co.	Freight from Europe.	\$12 15
354	" 18.	Vredenberg & Eilsson	Iron stove-case	800 00
355	" 21.	E. F. Gehlman	Plastering rooms.	175 00
356	" 27.	J. M. Gregory	Salary for September	333 33
357	" 30.	A. P. S. Stuart	" " "	166 66
358	" 30.	W. M. Baker	" " "	166 66
359	" 30.	S. W. Robinson	" " "	166 66
360	" 30.	J. Mary Gregory	" " "	30 00
361	" 30.	J. S. Carey	" " "	166 66
362	" 30.	E. J. Burrill	" " "	150 00
363	" 30.	S. W. Shattuck	" " "	150 00
364	" 30.	E. Snyder	" " "	150 00
365	" 30.	D. C. Taft	" " "	150 00
366	" 30.	J. B. Webb	" " "	150 00
367	" 30.	W. C. Flagg	" " "	125 00
368	" 30.	C. I. Hays	" " "	50 00
369	Oct. 2.	W. M. Beaty	Surveying University lands.	35 00
370	" 2.	M. C. Goltra	Expense to meeting.	14 50
371	" 2.	A. M. Brown	" " "	22 60
372	" 2.	E. Cobb	" " "	18 00
373	" 3.	D. A. Steadman	Expense in carp., Sept., 1872.	563 19
374	" 3.	E. F. Gehlman	New building.	9, 679 37
375	" 3.	J. M. Gregory	Balance purchase library	22 74
376	" 3.	J. M. Gregory	Petty expense, September.	19 39
377	" 3.	T. Pearce & Bros.	Glass and putty.	11 15
378	" 3.	Enterprise Coal Company.	Two cars coal.	30 00
379	" 3.	Fuller & Fuller.	Glass and paint.	30 08
380	" 3.	L. C. Garwood & Co.	Clock repairs	10 00
381	" 3.	Roebeck & Goebler	Chemical apparatus.	120 34
382	" 3.	E. L. Lawrence.	Farm expense.	250 26
383	" 3.	T. R. Leal	Cabinet collections.	150 00
384	" 3.	E. F. Gehlman	Work on building and plastering.	97 90
385	" 3.	Dodson & Hodges.	Hardware.	26 83
386	" 3.	Root & Cady	One piano, compl.	265 00
387	" 3.	E. W. McAllister	Postage.	2 00
388	" 3.	E. F. Hollister & Co.	Mattng, carpeting.	54 31
389	" 3.	H. K. Vickroy	Expense Horticultural Department.	184 27
390	" 3.	S. W. Robinson	Petty expense.	12 33
391	" 3.	Geo. Ely	Blacksmithing.	5 45
392	" 3.	Trevett & Green.	Hardware.	75 02
393	" 3.	H. Swannell	Chem. and glass	12 07
394	" 3.	Adams, Blackburn & Lyon	Advertising	9 00
395	" 3.	Crane Bros. Manufactur'g Co.	Brass castings.	1 50
396	" 3.	Larabee & North	Materials	11 00
397	" 3.	H. M. Sherwood	Settees	108 00
398	" 3.	James McLaughlin	Materials	92 20
399	" 3.	I. B. and W. R. R. Co.	Freight on specimens	41 61
400	" 3.	Hitchcock & Waldon	Books.	10 80
401	" 3.	Reynolds & Co.	Screws	1 25
402	" 3.	C. W. Silver	Salary for September, 1872.	70 00
403	" 3.	P. Genadios	" " "	30 00
404	" 3.	E. S. Steele.	" " "	60 00
405	" 7.	Charlotte E. Patchen.	" " "	40 00
406	" 7.	Flynn & Scroggs	Binding for library	143 80
407	" 7.	Walter & Pancake.	Lumber	62 18
408	" 7.	C. W. Silver	Balance salary 1871-2	13 40
409	" 7.	C. I. Hays	Half month's wages.	25 00
410	" 7.	C. W. Rolf	Salary September, 1872	40 00
411	" 7.	Students' Labor Pay-roll	September, 1872.	434 62
412	" 7.	I. C. R. R. Co.	Books for library	13 10
413	" 16.	F. Cook	Painting and glazing.	9 45
414	" 22.	S. W. Shattuck	Cleaning and repairing.	28 49
415	" 22.	A. Johnson.	Corner stone and spauls.	56 00
416	" 24.	F. W. Christem	Drawing copies	93 48
417	" 31.	J. M. Gregory	Salary, Oct.	333 33
418	" 31.	W. M. Baker	" " "	166 66
419	" 31.	A. P. S. Stuart	" " "	166 66
420	" 31.	S. W. Robinson	" " "	166 66
421	" 31.	T. J. Burrill	" " "	150 00
422	" 31.	S. W. Shattuck	" " "	150 00
423	" 31.	E. Snyder	" " "	150 00
424	" 31.	D. C. Taft	" " "	150 00
425	" 31.	J. F. Carey	" " "	166 66
426	" 31.	J. B. Webb	" " "	150 00
427	" 31.	C. W. Silver	" " "	70 00
428	" 31.	P. Genadios	" " "	30 00
429	" 31.	E. Steele.	" " "	60 00
430	" 31.	Mary M. Gregory	" " "	30 00
431	" 31.	C. W. Rolf	" " "	40 00

List of Warrants—Continued.

No.	Date.	To whom.	For what.	Amount.
432	Oct. 31.	W. S. Smith	Seven days' mason work	\$31 50
433	" 31.	H. K. Vickroy	Salary Oct.	75 00
434	" 31.	E. L. Lawrence	Farm expense, Oct.	258 37
435	" 31.	D. A. Steadman	Pay-roll, October	434 10
436	" 31.	C. A. Patchin	Salary to Oct. 30	40 00
437	" 31.	E. V. Peterson	Stationery, etc.	58 95
438	Nov. 6.	M. C. Goltra	Expense to meeting.	14 60
439	" 6.	J. M. Pearson	" "	19 30
440	" 6.	S. W. Lawrence	" "	24 00
441	" 6.	Judge A. M. Brown	" "	22 25
442	" 6.	E. Cobb	" "	8 00
443	" 6.	W. C. Flagg	Salary to Oct. 11.	125 00
444	" 6.	W. C. Flagg	Nov. 12.	125 00
445	" 9.	H. K. Vickroy	Expense for Oct., 1872.	94 82
446	" 9.	J. M. Gregory	Sundry expenses	34 40
447	" 9.	Root Steam Engine	Machinery	3 75
448	" 9.	Students' Labor Pay-roll.	For October, 1872	540 36
449	" 9.	Enterprise Coal Co.	Three cars coal	54 00
450	" 9.	C. D. Webster	Eng. Transit	100 00
451	" 9.	Gazette office.	Printing	11 50
452	" 9.	T. J. Lansden	Gas fixtures.	19 77
453	" 9.	J. M. Kennedy	Gate closers.	3 00
454	" 6.	C. S. Moorehouse	Material for decorating hall.	7 77
455	" 6.	Rochester Machine M'f'g Co.	One cutter-head.	18 00
456	" 6.	Trevitt & Green.	Sundries, hardware.	18 88
457	" 6.	W. S. Maxwell	" whitewashing building.	22 60
458	" 6.	Dodson & Hodges.	Hardware	14 37
459	" 6.	Trevitt & Green.	" "	27 18
460	" 6.	H. Swannell	Glass	3 30
461	" 6.	Champaign Gas Co.	Gas from March to Oct. 1.	63 20
462	" 6.	Adams, Blackmer & Lyon.	Books	6 38
463	" 6.	Fuller & Fuller	Glass and frames	34 96
464	" 6.	Crane & Bros.	Machinery	54 25
465	" 6.	W. H. Piper	Books	73 24
466	" 6.	W. S. Shattuck	Superintending repairs of building	50 00
467	" 6.	E. F. Gehlman.	New University building	10,433 92
468	" 6.	George Ely	Blacksmithing	11 00
469	" 6.	J. M. Gregory	Cabinet specimens	42 00
470	" 14.	A. Snidecker	Castings	58 48
471	" 15.	E. Moore	Lettering new University building	2 50
472	" 16.	E. F. Gehlman.	New University building	2,626 05
473	" 18.	J. M. Vosdell.	Picture of new University building, and expense to 11 Board meetings.	181 50
474	" 19.	J. M. Pearson	Expense to November meeting	22 50
475	" 19.	A. M. Brown	" "	26 50
476	" 20.	S. W. Shattuck	Surveying and mapping Exp. Farm	100 00
477	" 20.	I. B. and W. R. R. Co.	Freight on flower pots	4 00
478	" 21.	E. F. Gehlman.	Work and material on Gard. house.	106 48
479	" 21.	E. F. Gehlman.	Work on new University building	1,466 17
480	" 2.	E. Rummel	Boxes on Reports 1871.	16 75
481	" 30.	J. M. Gregory	Salary, November.	333 33
482	" 30.	W. M. Baker.	" "	166 66
483	" 30.	A. P. S. Stuart.	" "	166 66
484	" 30.	S. W. Robinson.	" "	166 66
485	" 30.	T. J. Burrill	" "	150 00
486	" 30.	S. W. Shattuck	" "	150 00
487	" 30.	E. Snyder	" "	150 00
488	" 30.	D. C. Taft	" "	150 00
489	" 30.	J. F. Carey	" "	166 66
490	" 30.	J. B. Webb.	" "	150 00
491	" 30.	C. W. Silver	" "	70 00
492	" 30.	P. Gennadios.	" "	30 00
493	" 30.	E. L. Steele	" "	60 00
494	" 30.	C. W. Rolf.	" "	40 00
495	" 30.	C. E. Patchin	" "	40 00
496	" 30.	D. A. Steadman	" "	83 33
497	" 30.	H. K. Vickroy	" "	75 00
498	" 30.	H. K. Vickroy.	Expense, November, 1872	88 02
499	" 30.	D. A. Steadman	" "	339 50
500	" 30.	E. L. Lawrence.	" "	341 09
501	Dec. 4.	C. Shephard.	Straw	2 50
502	" 4.	J. M. Gregory	Salary, December	333 33
503	" 4.	Students' Pay Roll.	For November, 1872.	557 16
504	" 4.	W. C. Flagg	Salary to December 11, 1872	125 00
505	" 7.	Fuller & Fuller	Freight duties on apparatus.	111 15
506	" 10.	J. H. Pickrell.	Expenses to five meetings.	23 63
507	" 10.	A. M. Brown.	" "	19 10
508	" 10.	J. M. Pearson	" "	17 50
509	" 10.	M. C. Goltra	" "	14 65

List of Warrants—Continued.

No.	Date.	To whom.	For what.	Amount.
510	Dec.	4.. Flynn & Cunningham.....	Binding books.....	\$103 27
511	"	4.. J. F. Tenney.....	Making marking die.....	14 35
512	"	4.. Webster, Davis & Co.....	Lumber.....	313 26
513	"	4.. Thomas Waddell.....	Superintendent's services.....	104 70
514	"	4.. D. E. Barnard.....	Apparatus for gymnasium.....	67 85
515	"	4.. Crane Bros Manuf'g Co.....	Iron pipes and pump.....	123 05
516	"	10.. Trevett & Green.....	Hardware.....	17 33
517	"	10.. Henry H. Holden.....	Mahogany wood.....	29 38
518	"	10.. Lurabee & North.....	Steel wire.....	5 75
519	"	10.. B. F. Sturtevant.....	One pressure blower.....	44 10
520	"	10.. E. Snyder.....	Petty expenses from Oct. 10 to date.....	27 12
521	"	10.. U. S. Patent Office.....	Reports.....	65 00
522	"	10.. Walker Bros.....	Moldings.....	2 66
523	"	10.. John Fisher.....	Flower pots.....	14 33
524	"	10.. W. C. Runyan.....	Repairing furnace.....	2 00
525	"	10.. James A. Root.....	Apple seeds.....	4 50
526	"	10.. Elisha Eldred.....	Lumber.....	100 25
527	"	10.. Enterprise Coal Company.....	Three cars coal.....	60 00
528	"	10.. Hollister & Parker.....	Mouldings.....	6 17
529	"	10.. George Chambers.....	Arbitrator's services.....	50 00
530	"	10.. J. H. Rice.....	" ".....	50 00
531	"	10.. C. Price.....	" ".....	50 00
532	"	10.. Trevett & Green.....	Hardware.....	39 92
533	"	10.. Thomas Lindsey.....	Lumber.....	123 46
534	"	17.. Kankakee Planing Mills.....	Glass.....	650 00
535	"	17.. J. P. Campbell.....	Salary, Tutor 1st class.....	28 00
536	"	17.. Geo. R. Shawhan.....	" ".....	28 00
537	"	17.. N. C. Ricker.....	" ".....	158 33
538	"	17.. James Green.....	Repairing meteorological instrument.....	12 00
539	"	17.. M. Scovall.....	Assistant in laboratory.....	21 40
540	"	17.. A. M. Barnes.....	" ".....	20 69
541	"	17.. George McCarthy.....	Boring well.....	110 00
542	"	18.. E. G. Walker.....	Salary, December.....	25 00
543	"	30.. W. M. Baker.....	" ".....	166 66
544	"	30.. A. P. S. Stuart.....	" ".....	166 66
545	"	30.. S. M. Robinson.....	" ".....	166 66
546	"	30.. T. J. Burrill.....	" ".....	150 00
547	"	30.. S. W. Shattuck.....	" ".....	150 00
548	"	30.. E. Snyder.....	" ".....	150 00
549	"	30.. D. C. Taft.....	" ".....	150 00
550	"	30.. J. B. Webb.....	" ".....	150 00
551	"	30.. C. W. Silver.....	" ".....	70 00
552	"	30.. P. Gennadois.....	" ".....	30 00
553	"	30.. S. E. Steele.....	" ".....	60 00
554	"	30.. C. E. Patchen.....	" ".....	20 00
555	"	30.. J. F. Carey.....	" ".....	166 66
556	"	30.. Fuller & Fuller.....	Freight and duties.....	41 55
557	"	30.. D. E. Owens.....	Mason work on boiler.....	4 00
558	"	30.. Fire-proof Building Co.....	Iron lathe.....	550 00
559	"	24.. James M. Rolph.....	Mason work, boiler.....	17 50
560	"	31.. I. B. and W. R. R. Co.....	Freight and cartage of whale skeleton.....	7 55
561	"	31.. I. I. McAllister.....	1½ tons coal.....	8 75
562	Jan.	1.. E. L. Lawrence.....	Farm expenses, December, 1872.....	259 36
563	"	1.. H. K. Vickroy.....	Expense on orchards.....	45 37
564	"	1.. H. K. Vickroy.....	Salary, December, 1872.....	75 00
565	"	3.. A. M. Pennell & Co.....	Perforated iron base.....	193 90
566	"	3.. D. A. Steadman.....	Expense, carp. department.....	244 57
567	"	4.. Students' Labor Pay Roll.....	December, 1872.....	576 38
568	"	7.. D. A. Steadman.....	Salary, December 1872.....	83 33
569	"	7.. S. H. Hook.....	Tending boiler and repairs.....	30 41
570	"	7.. F. W. Christern.....	Periodicals.....	56 20
571	"	7.. Geo. W. Rust.....	American Stock Journal.....	2 00
572	"	7.. W. C. Flagg.....	Salary to January 12, 1873.....	125 00
573	"	7.. Emory Cobb.....	Expenses to meetings.....	21 25
574	"	8.. J. M. Gregory.....	Salary, January, 1873.....	333 33
575	"	8.. Nicolet & Schoff.....	Printing and old type.....	12 13
576	"	8.. Sabine & Bros.....	Two tons coal.....	11 00
577	"	8.. A. H. Vail & Co.....	Pear stocks.....	7 50
578	"	8.. Geo. Kumball.....	Paint.....	5 25
579	"	8.. H. Pedicord.....	Lime and hair.....	5 30
580	"	8.. Enterprise Coal Co.....	Three tons coal.....	67 50
581	"	8.. John Fisher.....	Flower pots.....	6 87
582	"	8.. Geo. Dearth.....	Cooks.....	592 25
583	"	8.. E. V. Peterson.....	Stationery.....	21 35
584	"	8.. Waters & Co.....	Walnut lumber, 3362 feet.....	100 86
585	"	8.. J. M. Gregory.....	Petty expenses.....	36 93
586	"	8.. W. C. Flagg.....	" ".....	5 30
587	"	8.. H. Jefferson.....	Two tons coal.....	11 00
588	"	8.. Joseph McCorkle.....	Hardware.....	17 33

List of Warrants—Continued.

No.	Date.	To whom.	For what.	Amount.
589	Dec. 8..	S. S. Vest & Co.	5½ tons coal.	\$22 50
590	" 8..	E. A. Robinson	Petty expenses.	21 07
591	" 8..	Trevett & Green	Hardware.	2 95
592	" 8..	Beach & Condit	Blossberg coal.	14 50
593	" 8..	T. J. Lansden	Pipe fittings	6 42
594	" 8..	S. W. Robinson	Traveling expense.	19 37
595	" 11..	I. C. R. R. Co.	Freight on coal.	132 75
596	" 11..	E. F. Gehlman	Building repairs	17 83
597	" 22..	G. Windeman	Engineering instruments.	192 25
598	" 22..	H. Pedicord	Lime and Cement.	107 63
599	" 22..	E. F. Gehlman	Work on building.	113 02
600	" 22..	C. W. Rolf	Salary December, 1872	26 66
601	" 25..	F. H. Wines	Drafting app. bills	10 00
602	" 25..	Boughton, Tillotson & Co.	Castings.	134 54
603	" 29..	I. I. McAllister	2½ tons coal	12 15
604	" 31..	Robert H. Miller	Eight cords wood.	32 00
605	" 31..	H. K. Vickroy	Labor pay-roll	33 90
606	" 31..	W. M. Baker	Salary, January, 1873.	166 66
607	" 31..	A. P. S. Stewart	" "	166 66
608	" 31..	S. W. Robinson	" "	166 66
609	" 31..	J. T. Burrill	" "	150 00
610	" 31..	S. W. Shattuck	" "	150 00
611	" 31..	E. Snyder	" "	150 00
612	" 31..	D. C. Taft	" "	150 00
613	" 31..	J. F. Carey	" "	166 66
614	" 31..	J. B. Webb	" "	150 00
615	" 31..	C. W. Silver	" "	70 00
616	" 31..	E. S. Steele	" "	60 00
617	" 31..	C. W. Rolf	" "	40 00
618	" 31..	C. E. Patchen	" "	40 00
619	" 31..	P. Gennadios	" "	30 00
620	" 31..	H. K. Vickroy	" "	75 00
621	" 31..	D. A. Steadman	" "	83 33
622	" 31..	H. D. Ward	Night watch at new University.	98 70
623	" 31..	D. A. Steadman	Pay of hands in shop.	202 80
624	Feb. 2..	W. F. Barrett	Serving notice to bondsmen	14 00
625	" 2..	E. L. Lawrence	Farm expense, January	177 94
626	" 5..	B. F. Johnson	Expense to lectures.	16 15
627	" 5..	Samuel Stanton	Purchase books, London	102 25
628	" 5..	Students labor	Pay-roll, January, 1873.	538 54
629	" 10..	H. K. Vickroy	Expense to lectures.	14 05
630	" 15..	W. C. Flagg	Salary to February 12.	125 00
631	" 15..	W. C. Flagg	Expense to lectures.	49 35
632	" 15..	J. B. Turner	" "	25 00
633	" 15..	J. M. Gregory	" "	8 70
634	" 15..	Editors "Student"	Advertising.	42 45
635	" 17..	B. F. Johnson	Expense to lecture.	5 50
636	" 17..	H. Jefferson	Coal	18 42
637	" 17..	E. L. Lawrence	Expense to lectures	20 35
638	" 17..	C. K. Gill	Work in hay press.	5 63
639	" 20..	I. I. McAllister	Two tons coal	11 00
640	" 25..	E. Cobb	Expense to meeting	15 60
641	" 25..	J. M. Pearson	" "	23 60
642	" 25..	J. H. Pickrell	" "	14 00
643	" 25..	M. C. Goltra	" "	15 00
644	" 25..	J. W. Lawrence	" "	24 60
645	" 28..	J. M. Gregory	Salary, February.	393 37
646	" 28..	A. P. S. Stuart	" "	166 74
647	" 28..	S. W. Robinson	" "	166 74
648	" 28..	J. F. Carey	" "	166 74
649	" 28..	J. T. Burrill	" "	150 00
650	" 28..	S. W. Shattuck	" "	150 00
651	" 28..	D. C. Taft	" "	150 00
652	" 28..	J. B. Webb	" "	150 00
653	" 28..	C. W. Silver	" "	70 00
654	" 28..	E. S. Steele	" "	60 00
655	" 28..	P. Gennadios	" "	40 00
656	" 28..	C. E. Patchen	" "	40 00
657	" 28..	H. K. Vickroy	" "	75 00
658	" 28..	D. A. Steadman	" "	83 37
659	" 28..	E. Snyder	Petty expenses, Dec., Jan., Feb.	56 30
660	" 28..	J. W. Booker	Lettering on building	8 00
661	" 28..	Boughton, Tillotson & Co.	Castings.	23 90
662	" 28..	S. M. Marble	Two tons coal.	11 00
663	" 28..	B. Westerman	Books.	10 49
664	" 28..	Root Steam Engine Co.	Gaskets.	4 00
665	" 28..	Sabine Bro's	Four tons coal	22 00
666	" 28..	Crane Bro's Manuf'g Co.	Materials	53 65
667	" 28..	George Wiswall	Painting.	2 00

List of Warrants—Continued.

No.	Date	To whom.	For what.	Amount.
668	Feb. 28.	J. S. Kaskeel.....	Seeds.....	\$6 50
669	" 28.	W. H. Rea.....	Books.....	2 50
670	" 28.	Doan House.....	Bill of committee.....	51 50
671	" 28.	James Vick.....	Seeds.....	8 50
672	" 28.	Warner Bros.....	Maps.....	15 00
673	" 28.	J. E. Thomas.....	Papering.....	6 00
674	" 28.	J. M. Gregory.....	Traveling expenses.....	105 45
675	" 28.	Jones & Laughlin.....	Iron.....	44 02
676	" 28.	W. F. Nelson.....	Apple seedlings.....	10 50
677	" 28.	Enterprise Coal Co.....	Eight cars coal.....	183 00
678	" 28.	Nat. Greene.....	Paper.....	8 08
679	" 28.	A. P. S. Stuart.....	Petty expense.....	25 83
680	" 28.	Strong Bros.....	Brooms.....	1 90
681	" 28.	H. K. Vickroy.....	Expense, Hort. Depart.....	31 68
682	" 28.	Prof. E. Snyder.....	Salary, February.....	150 00
683	" 28.	C. W. Rolf.....	.....	40 00
684	" 28.	R. F. Piper.....	Peech seeds.....	80
685	" 28.	D. A. Steadman.....	Pay-roll, Carp. Dept.....	68 66
686	" 28.	A. H. Bailey.....	Watching new building.....	38 75
687	March 1.	E. L. Lawrence.....	Farm expenses.....	282 58
688	" 1.	T. J. Burrill.....	Expenses to lectures.....	9 85
689	" 1.	D. C. Taft.....	Expense for cabinet.....	4 50
690	" 1.	D. C. Taft.....	Expense to lectures.....	19 30
691	" 4.	Students' labor.....	Pay-roll.....	453 37
692	" 6.	Ill. Central R. R.....	Two cars coal and back freight.....	100 07
693	" 6.	Ill. Central R. R.....	Freight for 1872-73.....	1,294 71
				\$124,999 85

One hundred and twenty-four thousand nine hundred and ninety-four dollars and eighty-five cents expended on warrants as above.

E. SNYDER, *Recording Secretary.*

URBANA, March 6, 1873.

Abstract of Students' Pay Rolls for the fiscal year ending March 10, 1873.

	Carpenter Shop.	Mechanical Shop.	Horticultural Dep't.	All other work	Total.
1872, March	\$52 73	\$211 55	\$49 82	\$162 93	\$477 03
1872, April.....	26 27	177 62	176 14	91 57	471 60
1872, May	40 68	184 85	125 21	88 03	438 77
1872, September.....	26 13	271 10	55 14	129 13	481 50
1872, October	73 11	191 14	60 50	239 90	564 65
1872, November	118 93	219 82	50 86	167 55	557 16
1872, December	64 26	360 55	43 50	108 07	576 38
1873, January	57 44	285 52	34 55	161 03	538 54
1873, February	35 18	223 45	31 41	163 33	453 37
Totals.....	\$494 73	\$2,125 60	\$627 13	\$1,311 54	\$4,559 00

E. SNYDER,
Rec. Secretary.

URBANA, ILL., March 10, 1873.

REPORT OF FARM SUPERINTENDENT.

To the Regent of the Illinois Industrial University:

I herewith present a statement of the operations of the Stock Farm, for the year ending March 1, 1873. The crops raised on the farm the past year have been as follows:

Corn	70 acres
Rye	10 "
Wheat	9 "
Oats	60 "
Potatoes	3 "
Meadow	120 "
Pasture	120 "
Total	392 "

Occupied by yards, orchard roads and waste ground, 18 acres. Total of farm, 410 acres.

There has been a balance of profits on all the operations of the farm, except the 60 acres of oats. These grew excessively large, were all lodged before time to harvest, and about the time the field was ready for the reaper, the army worm passed through, and saved us the trouble of harvesting, making a total loss, except as fuel, in the lot, for hogs.

Herewith please find a statement of receipts and expenditures for the year.

RECEIPTS AND EXPENDITURES.

Stock Farm to Illinois Industrial University, Dr.

1873. March 1..	To pay for labor and board of hands	\$1,848 69	
	“ purchase of tools and machinery, engine, etc.	776 21	
	“ purchase of trees for yard	26 12	
	“ repairs, shoeing, etc	111 32	
	“ grass seed, wheat and potatoes	54 74	
	“ taking up and setting well	31 00	
	“ lumber for various purposes	42 66	
	“ purchase of cattle	1,481 16	
	“ salary of Head Farmer	720 00	
	“ coal for engine	22 57	
	“ receipts for bull service	68 00	
	“ unenumerated expenses paid	96 00	
	“ freight on two cars cattle	50 00	
	“ invoice of March 1, 1872	1,611 34	
		\$6,939 81	
	Cr.		
	By sales of hay		\$1,146 90
	“ sales of oats		210 00
	“ sales of pasture		113 25
	“ sales of corn		210 73
	“ work, care of fine stock, experiments, etc.		921 56
	“ sale of cider and vinegar		108 67
	“ sale of apples		102 56
	“ sale of hogs		457 50
	“ sale of cattle		1,039 78
	“ sale of potatoes		31 25
	“ sale of cow		52 00
	“ colt		120 00
	“ bull service (paid to treasurer)		68 00
	“ sales and receipts unenumerated		211 67
	“ invoice of March 1, 1873		3,158 00
	Balance found	1,012 06	
		\$7,951 87	\$7,951 87

Of the first item of “labor and board of hands,” \$628 50 was for student labor. During vacation, students were hired, wages being from \$20 to \$25 per month, board furnished on the farm. Students were also hired Saturdays during the season, and 12½ cents per hour paid. The corn was (a considerable share of it) gathered by students working by the job, some making as high as \$3 per day by working early and late.

The second item is made up as follows:

Balance for steam engine	\$355 00
For corn sheller	117 00
“ threshing machine	90 00
“ circle saw	10 00

For feed cutter and freight	\$39 55
“ rope for check-rowing	5 00
“ cider mill	45 00
“ root or vegetable cutter	16 00
“ freight (express)	6 85
“ steam boxes, saw frame, etc., account of carpenter department	53 42
“ hardware, bill for fixture for engine, belting, etc.	38 39

Total \$776 21
 The hay and grain fed the fine stock is accounted for as “sold.”

STATEMENTS OF COST AND VALUE OF FARM CROPS.

1.—COST AND VALUE OF 70 ACRES CORN.		
To breaking stalks, 25 acres	\$3 00	
“ plowing 70 acres, \$1 50	105 00	
“ harrowing and leveling 7 days	21 00	
“ seed	4 00	
“ planting 9 days	27 00	
“ harrowing 25 acres	6 00	
“ replanting	8 00	
“ cultivating three times	105 00	
“ gathering 5,200 bus., 4 cts.	208 00	
“ wear of tools, etc.	25 00	
Balance found (net profit)	568 00	
By value of 5,200 bus. in crib, 20c		\$1,040 00
“ value of stalks, after fuel, etc		40 00
	\$1,080 00	\$1,080 00
2.—COST AND VALUE OF 10 ACRES RYE.		
Plowing 10 acres, \$1 50	\$15 00	
To harrowing 1 day	3 00	
“ drilling 1 day	3 00	
“ seed, 10 bus., 60c	6 00	
“ harvesting, \$2 50 per acre	22 50	
“ slacking	9 00	
“ threshing 210 bus., 10c	21 00	
“ marketing	4 50	
Balance found (net profit)	57 00	
By value 210 bus., 60c		\$126 00
“ value straw		15 00
	\$141 00	\$141 00
3.—COST AND VALUE OF 47 STEERS.		
To purchase money	\$1,481 16	
“ pasture	220 00	
“ value of food (corn and fodder)	592 00	
Net profit (balance)	444 62	
By 15 head sold		\$1,014 78
“ 32 head on hand		1,723 00
	\$2,737 78	\$2,737 78
4.—COST AND VALUE OF HOG CROP.		
To 52 stock hogs, 7,800 lbs., 3½c	\$273 00	
“ 1,165 bus. corn, 20c	233 00	
“ value of pasture	20 00	
Net profit (balance)	136 00	
By cash sales		\$467 00
“ 5,375 lbs. on hand, 3½c		195 00
	\$662 00	\$662 00
5.—COST AND VALUE OF 120 ACRES MEADOW.		
To mowing 120 acres, 50c	\$60 00	
“ raking, 20c	24 00	
“ cocking 150 tons, 25c	37 50	
“ hauling	150 00	
“ marketing at barn	37 50	
Net profit (balance)	811 00	
By value of 130 tons timothy, \$8		\$1,040 00
“ value of 20 tons mixed, \$4		80 00
	\$1,120 00	\$1,120 00

6.—COST AND VALUE OF 9 ACRES SPRING WHEAT.		
To total cost	\$78 00	
“ balance found (profit)	47 00	
By value of 100 bus., \$1 25		\$125 00
	\$125 00	\$125 00
7.—COST AND VALUE OF 3 ACRES POTATOES.		
To cost of crop (estimated)	\$69 00	
By value of 235 bus., 40c.		\$94 00
To profit	25 00	
	\$94 00	\$94 00
8.		
By value of 120 acres pasture	\$337 00	
9.—COST AND VALUE OF ORCHARD PRODUCT.		
To estimated cost of gathering apples, marketing and making cider	\$200 00	
“ balance found (profit)	160 00	
By sale of apples		\$102 00
“ sale of cider and vinegar		108 00
“ cider on hand (excess of 1872)		150 00
	\$360 00	\$360 00
10.		
Estimated profit on \$920, received for work from various sources, at 33 per cent	\$303 60	
11.		
Estimated loss on 60 acres of oats destroyed by army worms	\$180 00	

LOSS AND GAIN.

Profit on 70 acres corn	\$568 00	
“ 10 acres rye	57 00	
“ 47 steers	444 62	
“ hay crop	136 00	
“ 120 acres meadow	811 00	
“ 9 acres spring wheat	47 00	
“ 3 acres potatoes	25 00	
“ 120 acres pasture	337 00	
“ orchard crop	160 00	
“ work, 33 per cent	303 60	
Loss of 60 acres oats		\$180 00
Balance profits of the year (estimated)		2,709 22
	\$2,889 22	\$2,889 22
Compares with the actual accounts of the year as follows :		
Cash balance	\$1,012 06	
Value of improvements and machinery	995 00	
Salary of head farmer	720 00	
Estimated profits (too low)		\$17 84
“ as above		2,709 22
Actual profits	\$2,727 06	\$2,727 06
Gains of the year, being amount of profits, less salary of head farmer	2,007 06	
Available balance, as above	\$1,012 06	
Balance of State appropriation	686 41	
Available means	\$1,698 47	

It will be seen that in the following statements and estimates I have not deducted from the earnings of the farm the salary of the head farmer. When private farmers make estimates of this kind, their

labors are counted as profits. For this reason I have made these statements on that basis, that they might compare with similar statements on private farms:

It will also be seen that there is a difference of \$17 84 between the losses and gains on the various crops (as shown by the sheet of "Loss and Gain,") and the actual gains of the year. I have made up this sheet from my books and from the estimates of profits, and it has not been "doctored" to make them come out even.

The profits on the crop of hogs was materially diminished by the loss of twenty-six by cholera, and I should have had no balance to report, had I not been successful in selling at the right time. Most of the sales were made at four cents, whereas later in the season they brought but three cents per pound.

On account of the drouth for the two past seasons, we have made but little progress in seeding. There has been over one hundred acres seeded to timothy and clover, of which only about fifteen acres has made a stand. Ten acres of this was with rye, and the remainder was seeded last spring and pastured. This failure has interfered, materially, with following out the system of rotation of crops, laid down.

The manure made on the place has been hauled out as fast as made. Nine acres has been well manured since last August. That part that was manured last fall was plowed. Some two acres has been covered during the winter, to be plowed in this spring.

Of the \$1,500 by vote of the Board of Trustees loaned the farm for the purchase of cattle, \$1,481 was used; and although stock cattle have been very high, and fat cattle very low, the investment proved to be a good one, as we found a much better market for our corn crop than could have been found elsewhere. I would suggest the propriety of making purchase of a carload of young steers, to take the place of those recently sold.

The farm is now well stocked with tools and machinery, and but little will be required for the coming year. The teams on the farm are not as good as could be desired—there being but one team worthy of the name. The pair of mules are able to do good service. As the five horses we have are "advanced in years," we might look for an "early dissolution," were it not for the fact that, as a whole, they seem much better than they did two years ago. I think that an investment for a pair of Norman or Percheron mares (thoroughbred), to breed from, would be a good one, and would also add to the attractions of the farm, and would show that we mean to lead in farm enterprises, instead of following our more enterprising neighbors.

Our five noble sheep were all killed by dogs. I can't find words to express my feelings in the matter, and so will drop it. "You know how it is yourself." The thoroughbred cattle are doing well. The bulls have made good gains, and are fine animals, as also are the heifers. Two have been added to their number during the year.

Every cold or rainy day we are reminded of the fact that a new dwelling house is much needed on the farm. The present house sets in the ground; underneath is the best place in the world to generate bad air. Were it simply a matter of *inconvenience*, I would not say a word, but when I realize that the health and lives of my family are put in jeopardy, I deem it a matter of vast importance.

To successfully manage the farm, as now stocked and machined, the manager should be and *must* be a machinist, engineer and mechanic, as well as a financier and farmer, and should also be a scholar; and with the salary at present allowed, in order to make a good showing of "personal accounts," he should be a pensioner.

All of which is respectfully submitted.

E. L. LAWRENCE,

Head Farmer Stock Farm I. I. U.

CARE AND FEED OF FINE STOCK CATTLE.

ILLINOIS INDUSTRIAL UNIVERSITY,

In account with Stock Farm:

March 1, '73	To wages of herdsman, 12 months, at \$22 50.....	\$270 00
"	" 52 weeks board, at \$3 75.....	195 00
"	" 7 tons hay, fed to July 1st, at \$12.....	84 00
"	" 12 tons hay, fed to March 13, at \$9.....	108 00
"	" 80 bushel oats, at 25 cents.....	20 00
"	" 12,600 pounds meal fed to Sept. 1, at 60 cents.....	75 60
"	" 16,800 pounds meal fed to March 1, at 50 cents.....	84 00
"	" 5 months pasture, 5 heifers, at \$1 50.....	37 50
"	" 2 halters, at 80 cents.....	1 60
"	" 4 halters, at 75 cents.....	3 00
"	" 5 bull rings.....	4 20
"	" transportation of cattle in Canada.....	31 15
"	" record of "Baron Unus" in A. H. B.....	1 00
	Total.....	\$915 05

INVOICE.

March 1, '73	16 steers, 20,800 pounds, at \$4 75	\$988 00
	16 steers, 17,300 pounds, at \$4 25	735 00
	14½ tons hay in barn, at \$8	116 00
	2,006 bushel corn, at 20 cents	400 00
	90 bushel oats, at 20 cents	18 00
	1,280 gallons cider, at 15 cents	192 00
	32 barrels	32 00
	5,572 pounds stock hogs, at \$3 50	195 00
	1 three year old colt	125 00
	1 two year old colt	75 00
	200 bushels rye	100 00
	100 bushels wheat	50 00
	4 stacks loose oats	30 00
	180 bushels potatoes, at 40 cents	72 00
		<u>\$3,158 00</u>
	PERMANENT IMPROVEMENTS—MACHINERY, ETC.	
	Tools and machinery (see enumeration on 2d page of report)	\$776 21
	Labor and material setting up engine and machines in engine room	46 20
	Making 320 rods board fence	48 00
	1 keg fence nails	6 00
	Moving 120 rods rail fence	15 00
	Fence wire and staples	10 58
	Making wire fence	3 00
	Work on hedges and hedge plants purchased	17 00
	Paid for ornamental trees	26 12
	Setting, mulching, and care of same	8 50
	Making 100 rods open ditch	15 00
	Other improvements, burying and digging stone, etc.	23 39
		<u>\$995 00</u>

REPORT FROM DEPARTMENT OF HORTICULTURE.

Dr. J. M. GREGORY, *Regent Illinois Industrial University* :

SIR : I herewith hand you the report of the Horticultural Department for the year ending February 28th, 1873 :

In general the year has been a prosperous one ; the crops have been above the average, and fruits have scarcely ever been more abundant. The extreme drouth and cold of the preceding winter killed many evergreen trees, especially those recently transplanted, and the peculiarities of the season gave us an unprecedented growth of weeds, which, in spite of strenuous efforts to keep them down, made the fields and grounds present, through portions of the summer, an undesirable appearance. With these exceptions I am pleased to say the horticultural labors have been crowned with success, while the age of the plantations and the development of plans are rapidly increasing the interest and value of these labors.

Mr. H. K. Vickroy remains in charge of the fruit and tree plantations, and of the vegetable garden and nursery. I submit with approval and pleasure his detailed reports of experiments upon Grafting, Forest Trees, Planting, Early Cabbage and Tomatoes. Other experiments were attempted, but under such difficulties that no reliable information could be gathered from them. The report of experiments of last year have been very widely copied in newspapers and journals, attracting a good deal of attention. For the following averages and remarks I am indebted to W. C. Flagg, Superintendent of the Agricultural Experiments :

AVERAGES FROM GRAFTS OF 1872.

	Growth, inches.	Per ct. living.
First cut of cion	21.17	66.66
Second cut of cion	20.44	83.33
Third cut of cion	20.95	55.00
First cut of root	22.61	66.66
Second cut of root	21.00	73.33
Third cut of root	18.60	70.00
Six inch roots	27.75	85.00
Four inch roots	24.50	75.00
Two and a half inch roots	22.83	70.00
One and a half inch roots	20.93	60.00

The longest growth and largest per cent. of living grafts were on the six inch roots, not taking into account the roots three times larger than the cion, from which we get no averages, and the length of growth and percentage of living grafts diminish pretty regularly as the length of root diminishes.

Comparing different cuts of cions, we find that the first, or but cut, makes the longest growths; but the second cut the largest percentage of living grafts.

Comparing cuts of roots, the first, or collar cut, makes the longest growth, and the second shows the largest percentage of living grafts.

In 1871, similar experiments were made with the same variety of Apple. We have below a comparison of the growths, etc., of the two years:

	Growth, inches, 1871.	Growth, inches, 1872.	Per cent. living, 1871.	Per cent. living, 1872.
First cut of cion.....	12.51	21.17	52.00	66.66
Second cut of cion.....	11.50	20.44	63.00	83.33
Third cut of cion.....	9.63	20.95	55.00	55.00
First cut of root.....	12.81	22.61	72.00	66.66
Second cut of root.....	12.98	21.00	60.00	73.33
Third cut of root.....	8.96	18.60	45.00	70.00
Six inch roots.....	15.48	27.75	65.00	85.00
Four inch roots.....	17.63	24.50	75.00	75.00
Two and a half inch roots.....	11.58	22.83	40.00	70.00
One and a half inch roots.....	22.00	20.93	20.00	60.00

The length of growth and percentage of live grafts was much greater in 1872 than in 1871, which was a very dry and unfavorable year,

As in 1871, so in 1872, there appears to be very little difference between the first and second cuts, both of root and cion, and further experiments are necessary to determine which is practically the best.

The comparison of roots of different lengths shows that the experiments of 1872 give much more uniform and apparently reliable results. We are probably safe in saying that, planted under the conditions given, the longest rooted plant would give the best results; not so much in greater length of growth, however, as in the larger percentage of living plants. Mr. Vickroy observes that in 1872—and the same was probably true in 1871—that grafts planted at a shallow depth started sooner and made a better growth than when they were planted deeply. This observation, no doubt, explains the remarkable growth of cions on short roots.

AVERAGES FROM GRAFTS OF 1871 CONTINUED THROUGH 1872.

	Growth, inches, 1871.	Growth, inches, 1872.	Per cent. living, 1871.	Per cent. living, 1872.
But, or first cion.....	12.51	38.46	52.00	30.00
But, or second cion.....	11.59	36.00	63.00	30.00
But, or third cion.....	9.63	33.93	53.00	26.66
But, or fourth cion.....	11.35	34.62	40.00	25.00
Collar, or first root.....	12.81	40.98	72.00	50.00
Collar, or second root.....	12.98	41.50	60.00	15.00
Collar, or third root.....	8.96	36.66	45.00	26.66
Collar, or fourth root.....	8.21	25.33	30.00	10.00

These figures go to show, as the same grafts did in 1871, and as those of 1872, that the nearer the collar of the root and the but of the cion, the better the graft; but with hardly any difference between the first and second cuts of either.

The averages of the roots of different lengths of the grafts set in 1871, give the following report for their first and second year:

	Growth, inches, 1871.	Growth, inches, 1872.	Per cent. living, 1871.	Per cent. living, 1872.
Six inch roots.	15.34	42.37	65.00	60.00
Four inch roots.	17.63	39.61	75.00	65.00
Two and a half inch roots.	11.18	38.87	30.00	22.00
One and a half inch roots.	17.87	42.54	27.00	22.00
Two and a half inch roots inverted.	14.54	37.37	45.00	25.00
Root six times larger than cion.	21.75	41.25	80.00	80.00
Root four times larger than cion.	18.56	42.57	70.00	70.00

Comparing length of roots, we find, as in 1871, the largest per centage living among the four inch roots; but the superior growth from the shoot roots—*when they survived*—is maintained from last year; but the short roots die out considerably more, even in a favorable season. Perhaps deep planting and treading, however, would prevent this. Inverted roots seem to have succeeded better than roots of the same length properly set. This is probably accidental. With roots larger than the cion, the best results of all have occurred both in percentage of living grafts and in the length of growth; but this is not borne out by the grafts set in 1872. Probably the results of a wet and dry year would vary in this respect. The extra amount of root would be quite advantageous in drouth, but not specially so in a moist atmosphere.

FOREST PLANTATIONS.

Though too early to draw conclusions in regard to the results of these plantations, still Mr. Vickroy's record will be read by very many whose attention has been called to the immense importance of timber-tree planting in our State. Special attention is asked to the record of the Osage Orange. It is the cheapest tree among them, and considering the undoubted value of the wood is, so far as these figures go, the best for profitable planting.

For the present season's planting it is recommended that there be purchased 600 Scotch Pine, 1,000 Chesnut, and enough of European Larch to fill up the vacancies in the rows.

TOMATO AND CABBAGE EXPERIMENTS.

These were carefully made, but will need repetition several years to get the most accurate results. Great pains were taken to have plants treated alike from the time of germination, without which experiments are of no value. Even then there is a possible chance for error in the required conditions for the different varieties. All may not thrive equally well under the best treatment for any one.

APPLE ORCHARD.

Corn has been cultivated as heretofore between the rows of trees, and frequent and thorough cultivation given to the trees themselves.

The body of the trees were washed in June with a solution of salsoda—one and a fourth pounds of salsoda dissolved in a gallon of water.

There were eighty-nine varieties bore from one apple to one half peck each; but quite a number of them, where there were only one or two specimens on a tree, dropped off before maturity, and some were stolen, so we could not tell whether they were true to name or not. We found several instances where they were labeled with different names, proving to be the same thing. About two-thirds of what bore were summer fruit. We found nothing worthy of special mention, without it is a seedling of the Siberian Crab, which has borne fruit for the past three seasons. The fruit is as large as the Transcendent, and of fine quality, and an abundant bearer.

Almost all the trees have made a good growth. Several varieties have died.

We still find occasionally the Apple-root Plant-louse above and below the surface of the ground.

We have completed the shelter belts of soft maples on the north side of the orchard.

It will be remembered that the apple trees are planted upon ridges raised by the plow, to provide surface drainage. These ridges, together with the increasing size of the trees, render the profitable cultivation of crops almost impossible. It is therefore recommended to seed a portion, say twelve acres, with clover the present season, cutting the crop and using it for mulch to the trees, and for further preparation of other parts to plant potatoes with the idea of sowing clover the next year; some may still be planted with corn to test the influence of the different cultivations upon the trees. The road through the orchard from east to west should be bordered with trees, which, besides serving as wind breaks, would add greatly to the appearance of the drive. Since a large tree would shade the ground and apple trees too much, the European mountain ash is suggested.

PEAR ORCHARD.

Our pear trees are still in the nursery and may readily remain there another year, but the site having been selected the evergreen trees designed to be placed among the pears for shelter should be planted this spring. Suitable trees are now on hand. Mr. Vickroy donates to the University pear trees which are planted east of his house and north of the barn. Here, too, several ornamental and shelter trees should be planted—the most of which we have.

CHERRY ORCHARD.

The sweet cherries that were planted last spring are all living except two or three. The tops of some of them have been killed by the severe winter.

SMALL FRUITS.

We planted last spring one acre of Wilson's Albany strawberries. The weather for several weeks after planting was very dry and we lost a good many plants; but there was enough lived to make plants to fill the vacancies, which was done in August and September, so we have a good stand now. The plantations of grapes, blackberries and raspberries are in good condition.

NURSERY.

We planted last spring over 40,000 apple and 7000 pear grafts—grafting mostly done by students. The apple grafts have done very well and made a good growth; but the pear grafts have nearly all died. Those that lived made a fair growth. The pear grafts started nicely in the spring, but as soon as the hot weather came they died. All the nursery stock has made a good growth and is in healthy condition.

MARKET AND EXPERIMENTAL GARDEN.

The propagating house erected last spring, 20x40 feet, proved very serviceable and much more convenient and economical than ordinary hot beds. The heat is supplied by a wood fire in a common large sized box-stove setting in the middle of the house, the pipe (common sheet iron) running to one end, and wooden troughs, for the circulation of water from a tin boiler on top of the stove, conveys the heat to the other end of the house. Though not very permanently constructed, the house is cheap and satisfactory, giving opportunity for the propagation of plants at little cost and in the best manner.

A great many vegetables of good quality were grown, but the market was poor. Quite a number were shipped to Chicago, and were sold for the highest prices at the season, but after deducting expenses of freight, drayage and commission little was left. It is hoped that it may be possible to grow some few *paying* crops, still it can hardly be predicted what they are when all our circumstances are considered. At any rate the experimental part should be kept up, and a good collection retained for the purpose of comparison and study.

ARBORETUM AND GROUNDS ABOUT THE NEW BUILDING.

Forty-eight varieties of forest trees, two each, were planted last spring in the arboretum, of which several died, the early part of the year being very dry and the varieties naturally hard to transplant. This planting should go on. The aim is to combine ornamental effect with scientific classification, and in the planting thus far attention has been given to this combination. Hoed crops may be cultivated here for some years. Around the new building the necessary grading should be done, and the main north and west entrances prepared according to map. Some planting may also be done here this spring. South of the building to the nurseries, it seems to me, should be sown with meadow grass until wanted for other purposes. The appearance would be improved, less labor required, and full as much realized from the land. Near the building blue grass might be sown, and the planting as contemplated afterward done by cutting out beds from the sod, leaving the latter for walks. All roads and drives not to receive gravel should be sown with grass, which could be kept in neat appearance easier than our present bare surfaces.

The outlet from the drains is in bad condition, and being through the property of Mr. Nelson, we were unable to have it properly attended to. He is now living near and promises aid, but at all events the outlet should be made good.

GREEN HOUSE AND CAMPUS.

Here the entire work for the year has been done by students, Mr. C. I. Hays having principal charge, assisted through portions of the year by Mr. C. W. Rolfe, Mr. Hannah and other students. The work has been well done, and the plants are now in good condition, having been safely wintered in spite of the unprecedented severity of the weather. The beds and grounds were kept during the summer in good trim, and shown with great beauty during the latter part of the season. The expense was less than half that of former years. Unfortunately some trees were disfigured by cows breaking in at the gates and elsewhere, though the blame rests somewhere else than upon the students.

STUDENT LABOR.

The desire to labor for pay, in the Horticultural department, has gradually diminished among our students, partly owing to the increased employment in the shops, partly from the inability to provide

them with such regular, every day labor as should keep up the habit and fashion of working, and partly from the reduced pay which the Trustees were compelled to make. For several weeks last spring there was more labor needed than could be obtained from the students—a thing never known before. Still I know of no feeling against manual labor. It is counted honorable, and the man, or woman either, who does join the working classes suffers no disrespect thereby. One great trouble, and may be the principal one, is the impossibility of arranging the programme of exercises with our free choice of studies, so that a class can get a sufficient amount of consecutive time to make it pay for them to go the fields; and without class work little can be done for either student or University. With work near at hand, and such as could be done day after day without much interruption, student labor would still be, as it was, as popular as anything connected with our institution. The horticultural class of last year grafted—without pay—each 1,000 apple root grafts, and afterward planted them with their own hands; the class of this year is doing the same thing. Such labor—for instruction—is always cheerfully done, and it is thought wise to encourage it, and provide more and more as opportunity permits.

Very respectfully submitted.

T. J. BURRILL,
Prof. Botany and Horticulture.

EXPERIMENTS WITH ROOT GRAFTS.

T. J. BURRILL, *Professor of Botany and Horticulture:*

I submit the following records of experiments for 1872:

There were grafted February 1, 1872, ten each of the Ben Davis, using warm wax for dressing the joints, and then packed in moist sawdust, where they remained until planted, April 26. They were all planted at the same time, and received the same care and cultivation.

The roots were cut into pieces $3\frac{1}{2}$ inches long, and the cions five inches. The first cut of the root is the collar, and the first cut of cion the bud, and the fourth the one with the terminal bud. Our roots were not long enough to make a fourth cut, as we did last year.

We have been dressing the joints of the grafts with warm wax this year, and have succeeded very well. The only advantage, if any, over tying them with waxed thread is that we get a water and air tight joint; by so doing we can use shorter roots, and plant them shallower. We have observed, this year, where grafts were planted shallow they started to grow sooner and made a better growth. We can wax them much faster than we can tie them with thread. The wax was composed of one-fourth tallow and three fourths resin.

Variety.	Cut of Cion.	Cut of root.	Average growth.		Per cent. living.
			Feet.	In.	
Ben Davis	1	1	1	11 1-7	70
"	2	2	1	11 $\frac{1}{2}$	80
"	3	3	1	7 3-5	50
"	4	1	2	9	70
"	5	2	2	8 $\frac{1}{2}$	90
"	6	3	2	9 $\frac{1}{2}$	60
"	7	1	3	7 $\frac{1}{2}$	60
"	8	2	3	5 $\frac{1}{2}$	80
"	9	3	3		None*
"	10	6 in. root.	2	6	70
"	11	"	2	1 $\frac{1}{2}$	100
"	12	4 in. root.	2	1	90
"	13	"	2		60
"	14	2 $\frac{1}{2}$ in. root.	2		80
"	15	"	1	9 $\frac{1}{2}$	60
"	16	Roots three times larger than the cion.	2	5	70†
"	17	Roots same size of cion.	1	9 $\frac{1}{2}$	80
Stark	18	Dressing with hot wax	1	10 15-17	68‡
"	19	Dressing with warm wax	1	8 2-11	88§
"	20	Dressing with medium wax	2	0 1-7	56||
Ben Davis	21	1 $\frac{1}{2}$ in. root.	1	10 $\frac{1}{2}$	80
"	"	"	1	7 $\frac{1}{2}$	40

* Land was low and they drowned out.

† First-cut of root.

‡ The wax would run like water and burn the hand if touched to it.

§ The wax would burn the hand if held in it a few seconds.

|| The wax would run nicely.

Experiments with Root Grafts, 1871-2.

Variety.	Cut of cion.	Cut of root.	Average growth, 1871.		Average growth, 1872.		Per cent. living.	
			Ft.	In.	Ft.	In.	1871.	1872.
Ben Davis.	1	1	1	2 7-9	3	7 6-7	90	70
"	2	1	....	9 5-14	3	1	70	40
"	3	1	....	8 1-16	3	3 4-5	80	50
"	4	1	1	7 1-16	3	7½	60	40
"	1	2	1	2 9-14	3	5	70	20
"	2	2	1	3 13-16	3	6	80	10
"	3	2	....	8½	N	one	30	None.
"	1	3	....	9	3	4	30	20
"	2	3	....	9½	2	5	40	40
"	3	3	....	10½	3	5	70	20
"	4	3	....	7	....	....	40	....
"	1	4	....	11½	2	5	40	10
"	2	4	....	....	....	....	N	one.
"	3	4	....	12½	1	9	40	10
"	4	4	....	8	2	2	20	10
"	6 in. root.	1st	cut.	10 9-16	3	11½	80	80
"	2d	"	"	8 2-15	3	13½	50	40
"	6 "	1st	"	1 4½	3	5 4-7	80	70
"	4 "	2d	"	1 7 1-7	3	2½	70	60
"	2½ "	1st	"	1 2½	2	10½	60	60
"	2½ "	2d	"	9	3	....	20	10
"	2½ "	3d	"	9	2	11	10	20
"	2½ "	4th	"	12½	4	2	30	10
"	1½ "	1st	"	1 9	3	11½	30	30
"	2d	"	"	1 11	4	2	10	10
"	3d	"	"	1 1½	2	5 1-5	40	30
"	4th	"	"	1 5	2	7½	30	20
"	2½ in. root inverted.	1st	"	1 2 5-6	3	2	30	10
"	2d	"	"	1 2½	3	0½	60	40
"	Root 6 times larger than cion.	1st	"	1 9½	3	5½	80	80
"	4 " " " "	1st	"	1 6 9-16	3	6 4-7	70	70

REMARKS.—These were grafted February 8, 1871, and wrapped with waxed thread and packed in saw dust, set in nursery April 8, 1871. The first cut of cion is the but, and the fourth with the terminal bud. The first cut of root is the collar.

Forest Plantation.

We have planted this year in the forest 10,063 trees. The Larch, Austrian and Scotch Pines were bought of Robert Douglas & Sons, Waukegan, Ills., in the Spring; the others were grown in the nursery here.

All the ground was well prepared by plowing and harrowing. We were very careful in the planting of the Australian and Scotch Pines and European Larch; the fine earth was carefully placed around the roots and all the work done in the best manner we could, still there was a large per cent. of them died, owing, I think, in a great measure to the severity of the past year (1871) on Evergreens generally. Evergreens that have not been transplanted have not suffered so badly. The White Pines and Norway Spruce were carefully taken up in the spring and heeled in immediately and remained there until wanted for planting. When we were ready to plant they were taken to the forest, and their roots well puddled in mud as they were taken from the wagon and heeled in again, and taken out as fast as needed for planting. Both were planted the same day with equal care, and you will see by the Record that nearly all the Spruces live, while most of the Pines died. One thing in favor of the Spruces is their masses of fibrous roots, while the Pines have very few. The White Grub (the larvæ of the May Beetle) has done considerable damage this year again, especially on the European Larch. We have the Larch planted on high and low land, and they are doing better on the high land.

The Chestnuts are nearly all dead. I think if they could be protected by other trees till they attain some size they would do well on dry land. I think it would be a good plan to plant the Silver Maple with them alternately, and when they get eight or ten feet high, or more, cut out the Maples. We have few in nursery protected by other trees, which seem to do well. We might stop their growth early in the season, by ceasing to cultivate. When they attain some size they seldom winter-kill. When a plantation is once established it is good for all time, for when cut off they grow up from the stumps, and be ready to cut again in fifteen or twenty years. I think the Osage will grow from the stumps in the same way.

The Osage Orange is proving to be one of our most valuable trees for this latitude and south. We cut the Catalpa and Osage off close to the ground last spring, in order to get a good straight growth, and have succeeded well.

Forest Record—1871-2.

Names of Species.	No. acres.	No. trees.	Age when planted...	Cost trees.	Cost plant- ing	Cost of cul- tivation..	Distance planted..	Per cent living.....	Average growth..	Cost for 1871.	When planted.	No. trees.	Age when planted ..	Cost trees.	Cost plant- ing.....	Cost of cul- tivation..	Distance planted.	Per cent living.....	Average growth..	Cost for 1872.....	Total cost.
Ash, Green	1	1,360	3 years..	\$27 20	\$6 95	\$6 19½	2x4	98	6 in.	\$40 34½	1871	.....	.....	.....	.....	22 59½	.....	98	2½ ft	\$2 52½	\$42 87
Ash, White	2	14,974	2 " "	149 74	35 63½	4 79	2x4	95	6 in.	190 16½	"	.....	.....	.....	.....	18 52½	.....	93	3 ft.	12 51½	208 69
Catalpa	1	1,360	2 " "	21 77	4 17	2 53	2x4	100	1 ft.	28 47½	"	.....	.....	.....	.....	5 12½	.....	100	4 ft.	5 12½	33 59½
Chestnuts	1	1,361	2 " "	30 00	6 79	3 95	2x4	50	6 in.	40 74½	"	.....	.....	.....	.....	4 3 ft.	.....	75	4 3 ft.	41 59½	.....
Elm, White	2	680	" "	4 76	3 95	3 43	2x4	100	1 ft.	12 14½	"	.....	.....	.....	.....	2 37½	.....	100	3½ ft	2 37½	14 57½
Larch, European..	2	10,890	.....	98 01	21 20½	8 50	2x4	25	6 in.	127 71½	Re-pl. '72	4,000	1 year ..	\$30 00	\$6 90	30 32½	.....	30	2 ft.	67 22	194 44
Maple, White	1	680	3 years..	8 16	6 07½	3 89	2x4	98	1 ft.	18 22½	1871	.....	.....	.....	.....	4 72½	.....	98	4 ft.	72½	18 95
Osage Orange	1	1,360	2 " "	5 44	4 78	1 30	2x4	98	2 ft.	11 52½	"	.....	.....	.....	.....	4 97½	.....	98	5½ ft	4 97½	16 49½
Pine, Australian..	1	680	9 to 12 in.	30 00	4 40	2 94	4x4	2	.....	37 34	Re-pl. '72	1,000	9 to 12 in.	25 00	6 40	6 83½	2x4	30	4 in.	38 22½	75 56½
Pine, Scotch	1	680	1 to 2 ft.	30 00	4 25	3 04	4x4	2	.....	37 29	"	1,000	12 to 15 in	20 00	3 70	4 20	.....	30	4 in.	27 00	65 19
Walnuts, White	1	1,360	2 years..	20 40	3 73½	8 5	2x4	99	6 in.	24 98½	1871	.....	.....	.....	.....	5 60	.....	99	2 ft.	5 60	30 58½
Willow, White	1	1,360	" "	8 00	4 67	1 42	2x4	92	2 ft.	14 10	"	.....	.....	.....	.....	5 67½	.....	98	4 ft.	5 67½	19 76½
Pine, White	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1872	.....	.....	.....	.....	12 00	4x4	30	3 in.	144 34	144 34
Spruce, Norway ..	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	"	.....	.....	.....	.....	10 12	2x4	98	3 in.	47 51	47 51
Totals.....	81	36,749	.....	\$433 48	\$106 72	\$42 83½	.....	.....	.....	\$583 03½	.....	10,083	.....	\$227 43	\$34 30	\$109 74½	.....	.....	.....	\$371 47½	\$954 51½

Experiments with Early Cabbage.

These experiments were made on poor land, lightly manured with coarse horse manure, and plowed under about eight inches deep. They were planted the same day, May 8, 1872, and received the same care. The gross weight given is that of the whole plant above the stalk, the net weight that of the cabbage with the leaves trimmed off ready for market.

The following list in the order of ripening have done well in the market garden and vicinity; a few little Pixie for early—two small for profit—Jersey, Wakefield, Early Wyman, Foster's Improved, Winningstadt and Schweinfurth. Winningstadt is very solid from the time it begins to head to maturity, and is very valuable on this account, as it will do to market before it is ripe. Six plants of each were set out, but as one or two plants died in some cases, the following averages are not all made from six heads.

Variety.	No. of heads	Time of maturity	Gross—lbs. and ozs....	Net—lbs. and ozs....	Loss—lbs. and ozs....	Loss—per cent.	Remarks.
Dwarf York	5	July 23	4.1	2.12	1.5	32.3	One did not head; heads solid.
Early Dwarf Savoy.....	4	" 23	3.7 $\frac{3}{4}$	1.12 $\frac{1}{2}$	1.11 $\frac{1}{2}$	50	One did not head; one destroyed; heads medium solid.
Early Wyman.....	4	Aug. 10	4.12 $\frac{1}{2}$	3.14 $\frac{1}{2}$	0.14 $\frac{1}{2}$	18	Two did not head; heads solid.
Enfield Market	5	" 10	5.7 $\frac{3}{8}$	4.1	1.6 $\frac{1}{2}$	25.8	One did not head.
Early Blood Red	5	" 10	4.15 $\frac{5}{8}$	3.2 $\frac{1}{2}$	1.13 $\frac{1}{2}$	37.5	One did not head; heads very solid.
Jersey Wakefield	6	" 1	6.4 $\frac{1}{2}$	4.1 $\frac{1}{2}$	2.3 $\frac{1}{2}$	35.1	Heads pretty solid.
Little Pixie.....	6	July 23	2.6 $\frac{1}{2}$	1.11	0.11 $\frac{1}{2}$	21.5	
Large Oxheart.....	5	" 23	5.5 $\frac{1}{2}$	3.13	1.8 $\frac{1}{2}$	28.5	One did not head.
Large York	6	" 23	4.7 $\frac{1}{2}$	3.5 $\frac{1}{2}$	1.9 $\frac{1}{2}$	35.7	
Schweinfurth	5	Aug. 1	6.9 $\frac{1}{2}$	4.13 $\frac{1}{2}$	1.11 $\frac{1}{2}$	26.1	One did not head; solid when mature.
Sugar Loaf.....	6	" 1	5.10	3.9	2.1	36.6	Head not very solid.
Winningstadt.....	6	" 10	6.13 $\frac{1}{2}$	3.15 $\frac{3}{8}$	2.13 $\frac{1}{2}$	41.7	Heads very solid.
Wheeler.....	5	" 10	2.15 $\frac{1}{2}$	1.6 $\frac{1}{2}$	1.9 $\frac{1}{2}$	53.2	One did not head.

Experiments with Tomatoes.

These were planted on poor ground, without any manure, three plants of each variety; all planted the same time (May 14) and given equal care and attention. Trophy, New York Market and Early Smooth Red succeeded best with us in field cultivation. The Trophy was at least seventy-five per cent. better than any we have tried. It is large and even size, very smooth, few seeds, very solid and of good flavor.

Varieties.	First fruit set.		First fruit ripe.		First picking Aug. 7—lbs. and ozs.....	Second picking Aug. 19—lbs. and ozs.....	Third picking Aug. 29—lbs. and ozs.....	Fourth picking Sept. 10—lbs. and ozs.....	Fifth picking Sept. 18—lbs. and ozs.....	Total lbs. & ozs.	Remarks.
Alger.....	July	9	Aug.	1	1.8	3.3	11.8	1.8	18.4	34.7	Pretty fair size, but not so smooth as some.
Cedar Hill.....	June	28	July	25	1.8	7	11.8	1.10	29.14	51.8	An abundant bearer, fair size, and pretty smooth.
Dwarf Orangefield.....	"	28	"	25	1.11½	7.10	6	.11	6.4	22.4½	Medium.
Early Smooth Red.....	"	28	"	25	.10	8	11.15	.....	17.12	38.5	Very smooth, good bearer, but rather small.
Early Prolific.....	"	9	"	27	.1½	.14½	1.11	.10	1.4	4.9	Nothing to recommend it.
Early Shipping.....	"	9	Aug.	1	3	1.1	.....	.....	5.5	9.6	Nothing to recommend it.
Fejee.....	"	28	July	28	.5½	3.15	6.17	.....	6.6	17.11½	Late, very fair size and medium bearer.
Golden Striped.....	"	28	Aug.	1	4.15	3.7	.4½	.....	11.12	20.6½	Very pretty striped, fair size, and medium bearer.
Gen. Grant.....	"	28	July	25	.4	4.7	6.3	.14½	9.3	20.15½	Very good.
Hathaway's Excelsior.....	"	28	"	23	1.3	3.8	.....	.....	7.5	12	Cracks badly when ripe, and about the same size and quality as Early Smooth Red.
Hubbard's Curled Leaf.....	"	30	"	28	.9	5.2	4.4	.11½	5.15	16.9½	Nothing to recommend it.
Large York.....	"	28	"	27	.8½	4.1½	2.8	.8	11.13	18.13	Yellow, fair size, pretty smooth, and very good quality.
Lester's Perfected.....	July	9	Aug.	1	1.13	5.10	.10	.....	14.9	21.10	Very good, but late.
New York Market.....	"	9	"	1	.4	3.7½	.....	.....	18.3	21.15½	In field cultivation was next to Trophy, and nearly as early as Smooth Red.
Orangefield.....	June	27	July	27	.5	2.11	3.1½	.6½	10.10	17.2	Nothing to recommend it.
Persian.....	"	27	"	20	.....	.12½	.....	.12½	7.5	8.14	Nothing to recommend it; yellow.
Rising Sun.....	July	12	Aug.	2	.....	2	3.8	.....	8	13.8	First planting destroyed.
Smooth Red.....	June	28	July	20	.8	3.9	3.12	.12	12.8	21.1	Very good.
Trophy.....	July	12	Aug.	5	.....	.13	3	.....	4.5	8.2	Plants injured by cut-worms, and two plants entirely destroyed.
Howard.....	"	20	"	10	.....	.....	.8½	.....	3.9	4.1½	Did not grow very well.

Very respectfully,
H. K. VICKROY.

REPORT FROM SCHOOL OF MECHANICAL ENGINEERING.

CHAMPAIGN, ILL., *March*, 1873.DR. J. M. GREGORY, *Regent of the University* :

SIR: I hereby respectfully submit the following brief statement of labors in the Mechanical Department during the past year :

INSTRUCTION.

Instruction has been given in the following named technical subjects, peculiar to the department, viz : Designing-drawing and mechanical laboratory practice, principles of mechanism, thermodynamics, pneumatics, prime movers, and finished machine drawings.

Instruction has also been given by the department, in the following subjects, mostly peculiar to the college of engineering, viz : Physics, hydraulics, and strength of materials.

Instruction in other necessary studies of the recommended course of this and other schools of the College of Engineering, has been given in other departments.

The number of students taught in each subject, is here given : Designing-drawing and practice in mechanical laboratory, fifteen ; principles of mechanism, four ; thermodynamics and pneumatics, three each ; prime movers, two ; finished machine drawings, three ; physics, twenty-four ; hydraulics, five, and strength of materials, six.

The scarcity of numbers in these classes is owing in part to the fact that the students in them are among the first who have reached these subjects at this Institution ; and partly to the fact that the number of students who pursue technical studies in colleges generally, is proportionally small.

The labor of this teaching has been great, having been done mostly by lectures, in the absence of suitable text-books, requiring some of the time two lectures per day, and at least one per day for the entire year. Besides this some of the exercises, such as drawing and practice in the mechanical laboratory, require two hours each per day, and have thus consumed much time. The number of hours I have been engaged in instruction daily, has varied from four to six. The help of two hours per day from an assistant, it would seem should afford abundant relief, but this has been fully equaled by the new studies taken up in this Institution for the first time by the advancing students.

The lectures and recitations have been illustrated by models and apparatus, and by plates. The labor of this part of the instruction has been much increased on account of the inconvenient arrangements for use of apparatus. Also many of the experiments have come far short of what they should be for the same reason. But entire relief from this source of hindrance is expected as soon as the new building becomes occupied.

ASSISTANCE.

In addition to my labor as above mentioned, the business going on in the mechanical laboratory has required from three to six hours per day on account of the general supervision of the work which I have thus far considered it advisable for me to undertake. This, with the work of instruction, including new classes formed in consequence of our older students having advanced to the higher technical subjects, overloaded me to such an extent that I was obliged to ask for assistance at the first part of this college year. Mr. E. G. Walker, formerly a student in the mechanical department, has rendered valuable aid in the laboratory practice and drawing. The time he has given to these classes is two hours per day. Experience has convinced me that in this practice a teacher can do justice to fewer students than in almost any other branch ; not only on account of the demand by the student for personal attention, but because of the valuable machinery necessarily put to his use during the hours of instruction. The assistance rendered by Mr. Walker has for the present afforded relief, although more could have been well employed. And there seems to be no prospect of less need of aid in the future, especially if instruction is expected of me in subjects outside of my department.

It is therefore hoped that assistance, if at least two hours per day, may be continued to the department. This I think may, for the present at least, be obtained either from some former student of the course, or from some of the older students.

APPARATUS.

I have no doubt but many of our visitors have noticed the meager supply of mechanical models, meager indeed compared with some of the splendid outfits of eastern institutions. The plan which I have adopted of turning the laboratory practice of beginners to account in increasing the stock of models, is likely, if permitted to continue, to slowly increase the number. The models thus added to the cabinet are excellent, as the workmanship required of the practicing student is usually good. We

all take pride in calling attention to these models as specimens of student work. A few models are now nearly completed in that way by this year students. The number yearly added will probably be less than a dozen, and hence the cabinet will not grow rapidly from this source. It has been proposed to devote a portion of the remunerated work to the production of cabinet models, but the pressure of work for parties outside of the mechanical department has thus far prevented. The addition by purchase of a quantity of models occasionally would greatly help the department.

THE MECHANICAL LABORATORY.

An inventory attached to this statement shows an increase in the machinery and tools of \$1,081 85. This is partly due to the addition of new, and partly to the improvement of the old. The same paper shows a total value of the machinery and tools of \$6,489 35. The carpenter shop is not understood as included in the mechanical laboratory.

We are still in need of additional machinery and tools for the best interest of the instruction. Our students of the mechanical department it is believed should have as extensive an acquaintance as possible with the various machines and tools common in machine shop practice. It is hoped that new machines may be added from year to year. And in this connection I would most respectfully ask a renewal of the permit to make, in our own shop, the combined drill press and milling machine, which was consented to be undertaken last spring, but which was crowded out by the pressure of outside work. A machine of this kind might be made for \$300, or perhaps less. But the first class machine which we want, might cost \$400, and representing, as it will, two machines in one, it is believed that it will be worth as much to the department as two machines costing perhaps \$600 to \$800.

STUDENT LABOR IN THE MECHANICAL LABORATORY.

Labor or practice has here been regarded as of two kinds, educational and remunerative. The educational labor is the laboratory practice of the course, and is regarded as a study and entered as such among the recommended studies of the course of the school, as given in the catalogue. For this the student receives no pay except as his instruction compensates him. But in this especial effort is made for instructing as rapidly as possible. The students are organized into classes, which always have one and sometimes two instructors present. No pains are spared to make this time count to the very best advantage for the student. Topics are in the first place assigned to the various students. These have usually consisted of models of mechanical movements for the cabinet, as explained above. A design and accurate working drawing is first made, and then followed carefully in the laboratory practice in pattern making, casting and finishing. Each student completing thoroughly the mechanical course pursues this study two hours per day during the whole of the second year, and is then prepared to undertake remunerative labor in the shop.

The student, on completing his laboratory practice, has acquired sufficient skill to enable him to work without an immediate instructor, and if he is faithful in his two hours per day of shop work for the remaining two years, he becomes a very excellent workman.

EXPENSES AND EARNINGS ON ACCOUNT OF STUDENT LABOR.

The accompanying summary statement of receipts and expenditures for the year shows a total of receipts or credits of \$8,265 29, and a total of expenditures of \$8,627 75, showing a deficit of \$362 46. The deficiency is partly explained from the fact that all work has been done by students, excepting about two or three weeks' work by a journeyman last spring, and by their working from two to four hours per day, except Saturdays, when full time has generally been made. Such dribblets of time are generally regarded as less valuable than full time. Also we have been obliged to contend with a seeming public opinion that a college shop cannot be practical. For instance the splendid forty-horse power automatic cut-off steam engine made last summer, was ordered with hesitation, after putting the price on a par with that of common engines of the market. A principal object in view in taking that job was, if possible, to demonstrate our practicability. On this account we have been obliged to take work lower than we should.

Even with the deficit shown, the instruction and information gained by the young men having the benefit of it, perhaps I might say, is among the cheapest to the State of any given at this Institution. The deficit will, however, probably be increased some by the difficulty in the way of collecting a hay press bill, amounting to \$421 63.

ARTICLES MANUFACTURED.

Besides the numerous small jobs, the following may be mentioned : One 40-horse power steam engine for H. C. Cole & Co., of Chester, Illinois; three hay presses for baling hay; two thermometer scale graduating machines; new patent photograph trimmers by the hundred; new pattern of coffee mill; iron work for one sawing machine; one 20-inch common lathe chuck; one 15-inch elliptical turning chuck.

Very respectfully, your obedient servant,

S. W. ROBINSON.

INVENTORY OF STOCK ON HAND MARCH 1, 1873.

150 lbs. 1st quality steel, (square and octagon) at 25c.	\$39 75
89 lbs. 2d quality steel, (round) at 18c.	16 02
210 lbs. 3d quality steel, (burnt) at 6c.	12 60
564 lbs. iron, less than inch diameter, at 7c.	39 48
1, 179 lbs. iron, more than inch diameter, at 6c.	70 74
300 lbs. estimated short pieces, scraps, etc., at 2c.	6 00
120 ft. one inch pipe, at 17c.	20 40
300 ft. three-quarter inch pipe, at 10c.	30 00
100 ft. one-half inch pipe, at 9c.	9 00
30 ft. three-eighths inch pipe, at 7c.	2 10
Pipe fittings, (various sizes)	29 82
Two inch globe valves, at \$2 00	4 00
Six three-quarter inch globe valves, at \$1 25	7 50
Three half inch globe valves, at \$1 00	3 00
One one inch check valve	2 00
36 lbs. brass wire, at 60c.	21 60
10 lbs. sheet brass, at 60c.	6 00
11 lbs. brass tube, at \$1 00	11 00
11 lbs. iron wire, at 12½c.	1 37
17 lbs. common steel wire, at 40c.	6 80
10 lbs. ribbon steel, at 30c.	3 00
50 lbs. scrap brass, at 15c.	7 50
150 files, (assorted sizes) at 40c.	60 00
2 lbs. stubs steel wire, at \$2 50	5 00
Old files	5 00
Nails, screws and rivets.	10 00
5 lbs. gum shellac, at 50c.	2 50
100 ft. gilt stining, at 4c.	4 00
50 gals. machine oil, at 75c.	37 50
10 gals. alcohol, at \$1 00.	10 00
Paint, oil varnish, japan, etc	5 00
50 lbs. box wood, at 12½c.	6 25
197 lbs. lignum vita, at 12½c.	24 62
110 lbs. ebony, at 12½c.	13 75
9 ft. rosewood, at 80c.	7 20
60 ft. mahogany, at 38c.	22 80
9 ft. gum-tree wood, at 20c.	1 80
8 ft. white holly, at 20c.	1 60
½ ton Blossburg coal, at \$15 00	7 50
25 bus. charcoal, at 25c.	6 25
Unfinished croquette sets	5 00
10½ lbs. block tin, at 40c.	4 20
9 lbs. antimony, at 30c.	2 70
Total amount.	\$592 35

INVENTORY OF TOOLS AND MACHINES MARCH 1, 1873.

Roots' patent boiler	\$1,200 00
Water tank, pumps and pump pipe.	75 00
Engine variable cut off	1,000 00
Heater, (Stillwell's patent)	160 00
Condense water barrel \$10 00, steam drum \$50 00	60 00
Steam heating pipes	250 00
20 inch Putnam engine lathe.	650 00
5 ft. Putnam planer	650 00
15 inch lathe	270 00
2 hand lathes, \$50 00 ea.	100 00
Shafting and pulleys	350 00
Belting	75 00
Grindstone and frame.	15 00
1 pair Fairbanks patent No. 11 platform scales	15 00
6 Parker's patent vices, at \$7 50.	45 00
1 20 inch lathe chuck \$50 00, 1 do. 10 inch \$18 00, 1 do. 3 inch \$14 00, 1 do. 3 inch \$12 00.	94 00
Elliptical chuck.	25 00
Twist drills, runners, etc.	60 00

Lathe tools, drills and dogs.....	\$40 00
Bench tools.....	150 00
Steampipe tools.....	30 00
Blower \$44 00, blast pipe \$20 25, pulley \$8 50.....	79 75
Anvil \$6 00, swedge block, 80 lbs., at 7c, \$5 60.....	11 60
Forge and twee iron.....	10 00
Tongs and other smith tools.....	5 00
Brass and boiler furnaces.....	160 00
6 tool cases (in machine shop) \$6 00 ea.....	36 00
4 tool cases (in patent shop) \$5 00 ea.....	20 00
Paint and oil room.....	8 00
Writing desk and paper case.....	12 00
Case for tools in office.....	10 00
Chairs for tools in office.....	3 00
Taps and dies (N. Y. Tap and Die Co.).....	65 00
Cases for screws, emery, etc.....	6 00
Work benches (150 ft. length).....	60 00
Step ladder.....	5 00
Clock.....	8 00
Two 40 gal. oil cans, at \$8 50.....	17 00
Patterns for 40 horse power engine.....	200 00
" 16 " ".....	150 00
" 8 " ".....	50 00
Miscellaneous patterns.....	50 00
One wheel-barrow for shavings.....	10 00
Two boiler tubes \$25 00, gaskets \$6 00.....	31 00
Pattern-making tools.....	160 00
Time-registering wheel.....	15 00
Amount total.....	\$6,489 35
Amount of stock.....	592 35
Total inventory March 1, 1873.....	\$7,081 70
" " 1872.....	5,574 50
Balance inventory for 1872 and 1873.....	\$1,507 20

STATEMENT OF MECHANICAL DEPARTMENT FOR 1872-73.

RECEIPTS.		
Work done for other departments as follows:		
Carpenter department		\$910 00
University building		762 17
Experimental farm		1 66
Library and cabinet		239 36
Military department		57 65
Horticultural department		3 30
Agricultural department		345 00
		<hr/>
Bills due department:		\$2,319 14
Woodmunsee Bro's., press, No. 2		\$616 21
John Kendall & Co		151 00
Petty bills		166 31
Cash received by University treasury		2,472 41
Unfinished and finished work:		
Woodmunsee Bro's., presses, No. 3, 4 and 5		611 39
Balance inventory of tools and stock		1,507 20
Harris press No. 1		421 63
Total receipts		<hr/>
		5,946 15
		<hr/>
EXPENDITURES.		
Bills paid by University treasury, including:		
Pay rolls, material, tools and fuel		\$7,274 63
Freight paid by treasury		69 53
Bill of carpenter department		1,333 59
Total expenditures		<hr/>
		\$8,627 75

E. A. ROBINSON, *Foreman.*

URBANA, *March* 8, 1873.

REPORT FROM CARPENTRY DEPARTMENT.

CHAMPAIGN, ILLS., March 1, 1873.

DR. J. M. GREGORY, *Regent Illinois Industrial University*:

I entered the service of the University, as foreman of the Carpentry Department, the 25th day of December, 1871. The interval of time from this to the first of March, 1872, was occupied in repairing the roofs of the University and shop buildings, work for the Military and Mechanical Departments, and in preparing for the work of the year proper, which commenced on the first of March, 1872.

At that time, the accounts of the shop were squared, and an invoice of tools and material was taken.

The report of the operations of the department for the year ending March 1, 1873, is herewith presented:

The total expenses of the shop for the year, including all charges against the department, the invoices of tools and material on hand at the beginning of the year, purchase of tools and material during the year, cost of student and other labor, salary of the foreman, and all other expenses, foot up to \$8,417 52.

For a showing of the liabilities and assets of the department, see the statement of accounts, as follows:

CARPENTRY DEPARTMENT,

To Illinois Industrial University, DR.

March 1, '73	To cash for current expenses.....	\$6,635 12
	" Mechanical Department, charges.....	909 64
	" Stock Farm Department, charges.....	16 00
	" invoice of material, 1872.....	496 02
	" " tools, ".....	360 74
		<hr/>
	Balance found (profits of the year).....	\$8,417 52
		523 21
		<hr/>
		\$8,940 73
	CR.	<hr/>
	By cash receipts.....	\$1,803 27
	" balance of account against Gehlman (assumed by University).....	413 34
	" account against J. D. Wilder.....	161 37
	" " H. O. Adams.....	21 17
	" " H. P. Harris.....	4 36
	" " Professor Wm. Baker.....	22 55
	" " Beidler & Co.....	32 80
	" " E. V. Peterson.....	12 25
	" " Mrs. Wordworth.....	1 63
	" " Military Department.....	68 01
	" " building and grounds.....	581 67
	" " Horticultural Department.....	19 85
	" " Mechanical Department.....	1,333 59
	" " not shown on Secretary's books.....	26 23
	" " Stock Farm.....	53 42
	" " Library and Cabinet.....	134 77
	" " Greenhouse.....	9 44
	" " Chemical Laboratory.....	25 89
	" " Department of Civil Engineering.....	175 07
	" " New University Building.....	439 15
	" invoice of material and finished work.....	1,104 87
	" " tools, machinery and improvements.....	2,496 03
		<hr/>
		\$8,940 73

The account for "Current Expenses" is made up as follows:

For salary of foreman.....	\$1,000 00
" student labor.....	814 43
" all other labor.....	1,867 84
" tools and other machinery purchased.....	2,324 82
" material used.....	628 03
	<hr/>
Total current expenses.....	\$6,635 12

The account of the Mechanical Department charges is as follows:

For work on dry house.....	\$166 62
" " shop (permanent improvements).....	171 21
" " and material (current expenses).....	214 30
" " power and heating building.....	327 51
	<hr/>
Total.....	\$909 64

Although I have been taught that "What can't be cured must be endured," yet, I must find some fault with the last item in this account. The account for the total expense of "power and heat," as made up, is as follows:

Amount charged to Carpentry Department.....	12-20.....	\$357 51
“ “ Mechanical “	3-20.....	89 38
“ “ Military “	1-20.....	29 79
“ “ University for lights and fuel....	1-20.....	29 79
“ “ “ for shop practice.....	3-20.....	89 38
Total.....		<u>\$595 85</u>

The shop has been charged with twelve-twentieths of all the expense of heat and power. I would not find fault with this if I had had any voice in the matter of making the expenses. There seems to have been “Taxation without representation.” That was decided by the arbitration of the battle field near one hundred years ago, to be unjust. Since the 22d day of November last, I have not required any power for more than two hours each day, and yet the engine has been run almost continually for ten hours each working day, and against my repeated protest.

The amount, \$16 00, Stock Farm Account, was for team work. The other items are the invoice, as made one year ago. The first item, \$1,803 27 cash receipt, is for jobbing of all kinds. The account against E. F. Gehlman, \$413 34, was all for University work—a balance for work done in November last, his account being settled up to that time. At that time the University was paying the bills of Gehlman. The accounts against private parties are all supposed to be good. The accounts against the different departments of the University are all correct and just, although I am not sure that in every case the charges have been made against the proper departments.

The invoice of material has been made on the basis of the cost—nothing added for the increased value by seasoning. The tools and improvements have been put in at cost. There has been no increased charges, above the actual cost of labor and material, for any of the work done for the different departments of the University, nor for any services of the foreman in the purchase of material, or in superintending work since the first of May last, when objection was made to such charges, except for service in superintending work on the New University Building.

It has been seen that there is a balance of \$523 21 in favor of the shop. The circumstances of so much work having been done for the University at no profit, and always done when required to the exclusion of profitable work, will, in a measure, be an explanation for the smallness of this balance.

Respectfully submitted,

D. A. STEDMAN, *Foreman.*

The report was laid on the table, until the several committees were appointed.

On motion of Judge Lawrence, a committee of five were appointed to report a list of standing committees, to serve next year.

The Chair thus appointed Messrs. Edwards, Cunningham, Slade, Pearson, and Blackburn.

The Board then adjourned to meet at 9 o'clock A. M.

SECOND DAY'S SESSION.

The Board assembled at 10 o'clock, after having attended services in the University chapel.

Present—Messrs. Blackburn, Brayman, Brown, Buck, Byrd, Cobb, Cunningham, Edwards, Galusha, Goltra, Hartwell, Huse, Johnson, Lawrence, Mansfield, Mason, McMurray, Pearson, Pickrell, Proctor, Pullen, Scott, Slade, Smith, Wright, Reynolds, and the Regent—27.

Absent—Messrs. Anderson, Bowen, Douglass, Eull, Haller, Lindsay, Pickard, Van Osdel, Bateman, and the Governor.

The Treasurer, J. W. Bunn, Esq., then read the following report; which was accepted:

THE ILLINOIS INDUSTRIAL UNIVERSITY,

In account with JOHN W. BUNN, Treasurer :

		DR.	
1873. Feb. 28	To Board expense.....		\$1,111 23
" "	" amount paid salaries.....		25,433 87
" "	" amount paid for fuel and light.....		2,302 28
" "	" amount paid for stationery and printing.....		835 89
" "	" amount paid on account building and grounds.....		1,806 14
" "	" " " " " incidental expenses.....		1,505 72
" "	" " " " " mechanical department.....		6,978 13
" "	" " " " " carpenter department.....		6,635 12
" "	" " " " " farm.....		4,830 23
" "	" " " " " chemical department.....		888 99
" "	" " " " " library and cabinet.....		4,709 13
" "	" " " " " experiments and lectures.....		2,923 16
" "	" " " " " taxes on lands.....		2,510 20
" "	" " " " " military department.....		149 41
" "	" " " " " new University building.....		55,873 03
" "	" " " " " horticultural department.....		3,913 15
" "	" " " " " unpaid bills.....		2,594 17
			\$124,999 85
To balance.....			5,667 87
			\$130,667 72
		CR.	
1872. March 1	By balance.....		\$8,494 60
1873. Feb. 28	By amount received on account mechanical department.....		2,472 41
" "	" " " " " carpenters account.....		1,803 27
" "	" " " " " farm sales.....		3,465 46
" "	" " " " " fees.....		6,653 50
" "	" " " " " fuel.....		1,028 66
" "	" " " " " library.....		328 90
" "	" " " " " horticultural department.....		982 85
" "	" " " " " sundries.....		78 00
" "	" " " " " Griggs' farm.....		2,123 83
" "	" " " " " rent.....		612 83
" "	" " " " " insurance refunded.....		123 70
" "	" " " " " old barn.....		25 00
" "	" " " " " interest.....		28,680 00
" "	" " " " " State appropriations.....		12,500 00
" "	For agricultural department.....	\$3,000	
" "	" " horticultural department.....	1,750	
" "	" " chemical department.....	2,750	
" "	" " apparatus and books.....	5,000	
" "	By amount received for Champaign county bonds.....		60,000 00
" "	By amount received on account Ill. Central Railroad Co. freights.....		1,294 71
			\$130,667 72

JOHN W. BUNN,
Treasurer.

CHAMPAIGN, March 11, 1873.

The committee, in reporting a list of standing committees for the next year, made the following report through their Chairman :

To the Board of Trustees :

Your Committee on Nominations respectfully submit the following report and recommendations :

Auditing Committee.—Messrs. Lawrence, Hartwell, Wright, Galusha, Buck.

Finance Committee.—Cobb, Pearson, Huse, McMurray, Scott.

Faculty and Course of Study.—Regent, Slade, Pickard, Edwards, Mason, Proctor.

Agricultural.—Pickrell, Reynolds, Scott, Smith, Blackburn.

Horticultural.—Edwards, Brown, Pullen, Galusha, Douglass.

Military.—Brayman, Mansfield, Byrd, Mason, Haller.

Mechanical Department.—Pearson, Huse, Johnson, Goltra, Bowen.

Building and Grounds.—Goltra, Van Osdel, Eull, Cunningham, Anderson.

Library and Apparatus.—Bateman, Pickard, Lindsay, Byrd, Smith.

By-Laws and Rules.—Brayman, Lawrence, Douglass.

State of Institution.—Pickard, Slade, Blackburn.

Executive Committee.—Regent, Cobb, Pickrell, Goltra, Lawrence, Brown, Pearson, Edwards, Scott.

Respectfully,

SAMUEL EDWARDS, Ch'm.

This report was accepted, and the nominations of committees adopted.

On motion of Mr. Pearson, so much of the Regent's report, and the statements annexed, as regarded them, was referred to the several committees.

On motion, the Board proceeded to the election of officers. It was voted that the election of Regent take place by ballot.

Gen. Brayman occupying the chair, Messrs. Goltra and Cobb were appointed tellers.

Dr. J. M. Gregory being nominated, the vote was taken, and he was announced elected unanimously.

The Chair appointed Messrs. Lawrence and Mansfield to apprise Dr. Gregory of his election, and conduct him to the chair.

Dr. Gregory thanked the Trustees in a few appropriate words, for the confidence and trust thus expressed.

The election for Treasurer, Recording and Corresponding Secretary, by separate ballots, then took place, resulting in the unanimous election of J. W. Bunn, Esq., for Treasurer; Mr. W. C. Flagg, for Corresponding Secretary; and Prof. E. Snyder, for Recording Secretary.

The following resolution of Mr. Alexander Blackburn was referred to the Finance Committee:

Resolved, That the changes that have occurred in the value of money, and the prices of produce and merchandise, since the organization of this University, call for a revision of the schedule of compensations made to its officers, professors and employees, and that the committee on finance be directed to make such revision on a ratio of reduction, as near as may be, of twenty-five per cent. on present allowances, to take effect at the close of the current school year, or at the termination of present engagement, and report to the present session of this Board at the earliest practicable hour.

A petition from students, asking for instruction in Veterinary Surgery during Spring term, presented by Mr. Pickrell, was referred to the Committee on Faculty and Course of Study.

A petition from students, relating to military uniforms, was referred to the Committee on Military Affairs.

A petition from students, asking the employment of an instructor in Gymnastics, was referred to the Committee on Faculty and Course of Study.

A recess was taken then, to re-assemble at 1:30 P. M.

AFTERNOON SESSION.

The Board assembled at the hour appointed.

The Regent called Mr. Mason to the chair.

Mr. J. P. Reynolds offered the following resolution:

WHEREAS Dr. Gregory, the Regent of this University, by his faithful, continuous and almost unremitting labor for several years past in discharge of the onerous duties of his official position, has fully and fairly earned a generous leave of absence; and whereas the Governor of Illinois has tendered him an honorary commission as the representative of this State at the coming Universal Exposition at Vienna, Austria, in the interest of scientific education therefore be it

Resolved, That the said Regent be and he is hereby granted a leave of absence from this date until the opening of the next fall session of the University.

The resolution was passed.

The ayes and noes being called for, were thus recorded :

Ayes.—Messrs. Blackburn, Brayman, Brown, Buck, Byrd, Cobb, Cunningham, Edwards, Galusha, Goltra, Hartwell, Huse, Johnson, Lawrence, Mansfield, Mason, McMurray, Pearson, Pickrell, Proctor, Pullen, Scott, Smith, Wright and Reynolds.

Noes.—None.

Mr. Goltra, Chairman of the Building Committee, made the following report :

To the Board of Trustees of the Illinois Industrial University :

Your Committee on Buildings and Grounds have given to the matters properly coming before them due consideration.

They beg leave to report that, so far as they are advised, no repairs, except such as would result from ordinary wear, will be needed about any of the buildings now in use by the University. They recommend that the careful culture heretofore given the grounds surrounding the old building be continued during the coming year, and that the sum of \$1,000 be appropriated to defray the expense of such care, and for cleansing and preserving the old building ; and the sum of \$350 for repairs upon the heating apparatus of the same.

Your committee are advised by the report from the supervising architect (which report is hereto attached) that about the sum of twelve thousand dollars (\$12,000) will yet be required to complete the new building, and the further sum of \$18,000 for furnishing and putting in the apparatus for heating and lighting the same ; but as that sum is probably not within the reach of the Board for such purposes, your committee recommend that the entire work of completing the main building, and putting it in condition for use, be made to depend upon the action of the General Assembly upon the appropriation bills for that purpose, now pending before that body, and that if such appropriations are made, that the subject of their expenditures, in pursuance of the law, be referred to the Executive Committee.

M. C. GOLTRA, *Chairman*.

To the Honorable Board of Trustees of the Illinois Industrial University :

I herewith submit my report as Architect and Superintendent of the new University building, of its progress toward completion during the past year, and its present condition.

Work was resumed upon the building soon after your last annual meeting, and work progressed favorably, so that the roof was put on in August ; the plastering is three-fourths completed. Many of the floors are laid ; the sash and glass are all in their places. The stairs have their frames set up ready for the steps. Much of the inside joiner's work is done ; and the work ceased upon the building about the first of December on account of the inability of the contractor to proceed further with the work, on account of his financial embarrassments. It will cost at least twelve thousand dollars to complete the work embraced in Mr. Gehlman's contract. I have made estimates of the progress of the work monthly. About the first of August I gave Mr. Gehlman a certificate for \$5,400, which he deposited with a banker, and expected to draw against it to pay his bills for the month of July. He was largely indebted to the bank, and they refused his checks. He called upon me immediately for aid. I informed him that I could do nothing for him until the progress of the work would justify another estimate. I advised him to find some one to indorse for him for sufficient to pay his workmen, and refund it at the next estimate. I found, on the first of September, that an arrangement had been made with his banker to draw \$2,800, with the understanding that they were to have the entire amount of the next two estimates. I gave him a certificate for \$3,000, out of which to repay the \$2,800, and suggested to the Executive Committee, to prevent liens by workmen and sub-contractors, that they should see to it that Mr. Gehlman applied the money yet to be paid to him on such work as was yet to be done. This was agreed to by the contractor, and several of his bondsmen ; and the arrangement was carried out as far as it was practicable. You will observe by the terms of the resolution, on page 130 of the report of 1870 and 1871 : " That at each monthly meeting of the Executive Committee the contractor shall present an account of the value of materials for said building, placed on the ground by him, and also the value of labor done," which, when approved by me, " the same shall be allowed." It will be seen by this that the contractor was to be *paid in full* on the first of every month, which was done from time to time ; and on the 28th of November an arbitration was held to ascertain the value of the extras, or additional work, in accordance with the terms of the contract. The arbitrators found

Mr. Gehlman entitled to the sum of \$16,263 64 for additional work then completed, and \$3,039 50 for similar work ordered and yet to be done. On the 7th day of January Mr. Gehlman notified the Executive Committee of his inability to go on with the work, and formally abandoned the contract.

The contract price was	\$113, 954 00
Value of additional work done and to be done.....	19, 303 14
Total	\$133, 257 14
Mr. Gehlman has received	121, 897 26
Amount left to complete the work, including extras.....	\$11, 359 88

It will be seen by the above statement that the contractor was fully paid at the time of the abandonment of the contract, and it will require careful management to complete his work for the sum remaining.

All of which is respectfully submitted.

JOHN M. VAN OSDEL.

CHAMPAIGN February 26, 1873.

The report of the Building Committee was received, and so much of it as refers to appropriations referred to Finance Committee.

Mr. J. H. Pickrell offered the following resolution :

WHEREAS, The Regent, by law, is designated as the presiding officer of the Faculty, and is charged with the general supervision of the educational facilities and interests of the University; and, whereas, by his official connection with the Board of Trustees he is necessarily absent from the University considerable of his time, and his classes must be taken charge of by delegated professors; therefore,

Resolved, That he be relieved from teaching any classes, and that the Committee on Faculty and Studies be requested to report some rule for the government of the Faculty in the absence of the Regent.

Judge Brown, Chairman of the Committee on Horticulture, made the following report, which was adopted, referring so much of it as refers to funds to the Committee on Finance :

The Committee on Horticulture respectfully submit the following report :

For what has been done in this department the past year reference is made to the reports of the Professor of Horticulture and the Superintendent of the Orchard and Gardens. These reports show that satisfactory progress has been made in the work of planting, and reasonably satisfactory results in all the operations of the department.

The change made last year in the charge of the green-house and grounds around the old University building has proved to be economical and in every way satisfactory. Mr. Hays, the student who was employed last year, proposes to perform the same work the present year for a compensation of \$70 for each of the months of April and May, and \$50 per month for the remainder of the year, he providing all the labor required. Your committee recommend that he be employed on these terms.

Mr. Vickroy, the Superintendent of the Orchards, etc., was employed last year upon a salary of \$1,000, to be increased to a maximum of \$1,500 upon the contingency that the net proceeds of his operations should exceed \$1,000. He now proposes to accept a salary of \$1,000, with the use of the house, a cow, and vegetables from the gardens for the use of his family, and in addition thereto \$200, to be expended by himself at his discretion, in the purchase of small fruits, ornamental trees and shrubs, to be planted on the grounds about the dwelling house and gardens. Mr. Vickroy is a valuable man, whose services cannot be dispensed with, and as this proposition, if accepted, would not amount to more, but less than he received under the arrangement of last year, your committee recommend that it be accepted.

There will be needed for the purchase of trees to fill vacancies in the plantations already made about \$150. All other trees needed for continuing the plantations are already on hand in the nurseries.

Your committee ask an appropriation of \$3,000 to pay the expenses of the current year. Of this sum it is hoped the Legislature will provide \$1,500. The balance must come out of the general fund. Of the latter sum a considerable portion at least will be reimbursed from sales from the green house, garden and fields of the department.

Your committee recommend that one-third of the apple orchard be immediately seeded down with clover, and the remainder cultivated in corn and potatoes. They also recommend that no further

attempt be made to cultivate vegetables exclusively for market, but that all the gardening operations be restricted to planting and cultivating for experiment merely, using only so much ground as may be required to make the experiments valuable. They propose that all the land in charge of this department not embraced in the orchards, nursery, garden and ornamental grounds, be sown with timothy, to be used for hay or grazing. They think it would be well for the convenience of the Professor of Agriculture and the students studying animal husbandry, if the fine cattle now on the stock farm could be kept, at least for a portion of the year, at the barn of the horticultural department, and if this should be done, it would be necessary to fence some lots for their accommodation. The only objection to this that they conceive is that it would be somewhat inconvenient for the Superintendent of the Farm, who has these cattle in charge, and who ought to continue to have the control of their feeding and management.

The development of the original plans of planting forests, orchards, arboretum, etc., will go on, of course, during the approaching season; but your committee have no special recommendation to make in relation to them.

Mr. Flagg, who has charge of the Experimental Farm, is desirous that Mr. Vickroy shall have the superintendence of the labor on that farm, and that the teams of the horticultural department be used in the cultivation. Your committee doubt whether Mr. Vickroy can spare the time from his other duties, and recommend that this matter be referred to the Executive Committee.

A. M. BROWN,
SAMUEL EDWARDS,
O. B. GALUSHA,
B. PULLEN.

The Chairman of the Auditing Committee made the following report, which was accepted:

The Auditing Committee, to whom was referred the Treasurer's account, beg leave to report that we have examined the Treasurer's book, and compared the same with the Secretary's book and the vouchers on file, and have found that they agree and are correct. There are, however, warrants outstanding, which are included in the Treasurer's report, and are numbered 330, 614, 631, 652, 654, 661, 670 and 678, and amounting in the aggregate to \$494 23.

The balance of the warrants, numbering from 1 to 693, (excluding the above) have been canceled in our presence, and we recommend that they be returned to the Treasurer for safe keeping.

L. W. LAWRENCE,
CYRUS HARTWELL,
O. B. GALUSHA,
HIRAM BUCK,
P. R. WRIGHT.

March 12th, 1873.

On motion of Judge A. M. Brown, a recess was taken for half an hour at 3 P. M., some of the reports of committees not being fully prepared.

Board reassembled after recess.

Messrs. J. H. Pickrell, Chairman of Agricultural Committee; J. M. Pearson, Chairman of Mechanical Committee; Mr. Jas. A. Slade, Chairman of Committee on Faculty and Course of Studies; and Gen. Mason Brayman, Chairman of Committee on Military Affairs, made their reports, (which follow)—all of which were received and adopted, and so much of them as regarded funds was referred to Finance Committee:

The Committee on Agriculture, to whom was referred the portion of the Regent's Report relating to the Experimental and Stock Farms, beg leave to report that they have had the same under consideration.

They recommend that the experiments under Mr. Flagg be continued, and that he be employed to continue the experiments both in field crops and stock, with additional experiments upon feeding, commencing with one or more calves, in what is termed the "forcing system," and same number in

the ordinary way of feeding. Said experiments to be commenced with reference to a two or three year's course: *Provided*, that these experiments shall be paid for out of any appropriations that the Legislature may make for such purpose.

They recommend that the Stock Farm be under the control of Mr. E. L. Lawrence the coming year, at a fixed salary of \$1,200 per annum.

They also recommend that the net proceeds of the farm be appropriated to the permanent improvement of the same. That all the minor details of management of both Stock and Experimental Farms be referred to the Executive Committee.

J. H. PICKRELL,
A. BLACKBURN,
ABRAHAM E. SMITH.

MECHANICAL DEPARTMENT.

Your Committee, to whom was referred so much of the Regent's Address as related to the above department, report that the detailed statements have been laid before them, showing the amount of work done during the past year. Some loss has been sustained by reason of failures to pay for work done. We feel that the business management cannot succeed unless in the hands of a purely business man, with whom all contracts and agreements should be made. We commend this subject to the careful consideration of the Board.

We find much upon which to congratulate the Board in the working of these shops; much valuable instruction has been given, and the shops themselves were never in so good condition. We would like to increase the stock of tools, did our means permit, but in our present straightened circumstances we forbear.

We ask that a sufficient sum be appointed to these shops as will defray the expense of running the engine and the wages of a foreman in each shop. This will require the sum of say three thousand five hundred dollars (\$3,500).

Respectfully,

M. C. GOLTRA,
O. HUSE,
JOHN M. PEARSON,
DARIUS JOHNSON.

FACULTY AND COURSE OF STUDY.

To the Board of Trustees of the Illinois Industrial University:

Your Committee on Faculty and Study, recommend as follows:

1. That the Executive Committee be instructed to continue their efforts to engage a suitable person to fill the chair of Agriculture, to devote his whole time to that department.
2. That the Hon. W. C. Flagg be reappointed for the coming year, to take charge of the Agricultural Experiments, contingent upon appropriations being made for these experiments.
3. That Mr. N. C. Ricker be employed as instructor in Architecture for the next college year, beginning in September, at such salary as they may determine not exceeding \$1000.
4. That the Executive Committee be authorized to employ, in their discretion, Dr. F. W. Prentice as Lecturer on Veterinary Science, at such compensation as they may determine.
5. That the Faculty be requested to arrange a course of study for the School of Domestic Science; and that the Executive Committee be instructed to engage at an early day a competent instructor on Domestic Science.
6. That the petition of students in regard to an instructor in Gymnastics be referred to the Executive Committee.

J. M. GREGORY,
JAMES P. SLADE,
SAMUEL EDWARDS.
R. B. MASON,
A. S. PROCTOR.

REPORT OF MILITARY COMMITTEE.

Your Committee on the Military Department respectfully report:

That they find upon the military roll of the Institution, and receiving military instructions, the names of 352 students, of whom all except about 60 are in uniform. The students are assigned to 6 companies, comprising 50 each, rank and file. The armory contains 350 muskets and accoutrements, with 12 swords for officers. The students are drilled in companies during the first year twice each week; during the second and third years, once each week; during the fourth year, in battalion only.

This department of instruction has been under the charge of Capt. Edward Snyder, Professor of Modern Languages and Military Tactics.

The progress made in the study of Military Science and Tactics, prove the learning, judgment and efficiency evinced by the teacher, and the industry, intelligence and zeal of his pupils. The exhibition of company and battalion drill and evolutions would do credit to veteran soldiers. With the substantial knowledge and practical experience gained by these young men during their attendance here, we may have no apprehension that, should our country again call its citizen soldiers to the field, it will find men prepared to organize and command them.

A spacious drill hall has been completed during the past year, and is now occupied. This secures greater regularity and order, and will render this branch of the science doubly valuable.

Your Committee find in the influence of this department upon the students, reason to approve the wisdom of Congress and the General Assembly of the State in requiring military science and tactics to be here taught. It does not disturb the due course of ordinary studies. It teaches habits of order, precision and regularity. It requires attention, quickness of thought and obedience. It inspires dignity of manners, courtesy, self respect and manly conduct. It excites generous emulation and makes students ambitious to excel, not only in this but in all their studies. The general importance of this department is regarded as beneficial in every respect.

An application to the war department is now pending for the detail of a proper military officer to fill the place of military commandant and instructor. Recent correspondence indicates that Brevet Capt. Albion Howe, U. S. Artillery, now on duty in California, will be appointed to this duty. It is hoped that this arrangement will add to the force engaged in instruction a valuable and accomplished officer, without adding materially to our expenses.

In the meantime the Committee are content to leave the Department of Military Instruction in charge of Prof. E. Snyder, who has, with patient labor and rare ability, brought it up to its present efficiency. Should the effort to secure the service of an army officer fail, your Committee recommend that Professor Snyder be relieved from duty in other departments, so far as to enable him to give additional service to this.

On the organization of the University, a uniform was prescribed to be worn by students, similar to that worn by cadets of the military academy at West Point. Your Committee regret to find that for various reasons compliance with this resolution has been so far dispensed with that more than sixty of the young men appear to be without uniform. Your Committee suggest that young men who attend this Institution ought to be so attired that they can be distinguished from the common throng of the streets. A neat and striking uniform is a badge of honor. It brings respect and causes the wearer to respect himself. It is a pledge of good behavior, of genteel deportment and a security against vicious habits and associations. In proof that the uniform is not disagreeable to the students, the Committee have before them a respectful petition, signed by 218 of the students, asking that the rule may be more strictly enforced. Your Committee will be gratified to find, at the next annual meeting, *all* the students clad in the graceful, convenient and economical uniform already furnished. And it is recommended that the proper authorities take order to that effect; and that none be excused except for a convenient time upon first entering the Institution.

Your committee would also make an exception in favor of extreme *poverty*, were it not that the arrangements made enable students to secure uniforms at same cost as ordinary clothing. Your committee find that the expenditures on account of the military department have been managed with caution and strict economy—a former appropriation, though small, not having been exhausted.

An appropriation of \$200 is recommended for expenses of the armory, the band, and for the purchase of fencing swords. Also \$50 for needed apparatus for gymnastic instruction—a new feature which has recently attained gratifying success.

It is recommended that application be made to the proper authorities, and through them to the United States, if necessary, for the following articles:

I.—Two pieces of three inch steel artillery, with ammunition for artillery practice.

II.—Twenty-five new breech-loading muskets, for target practice.

It is recommended that formal application be made to the Governor of the State for the issuing of commissions to the captains of companies composing our military organization. These young men are required to spend their first year in the ranks. If found proficient there, they are admitted to the military class, which gives them opportunity to teach and drill new students during the second year. During the third year they drill squads and companies, act as adjutants, color bearers, and to receive such instructions as renders them competent to organize and command companies and battalions. Such a commission will be a just reward of merit, and incite the students to zeal and activity in this branch of study, and in future years will invite attention to their qualifications, should our country, unfortunately, require sudden organization and service of the militia.

Your committee, in concluding, congratulate the friends of the University on the success which has crowned the labors of the last year in its various departments, and in none more than this.

M. BRAYMAN,
R. B. MASON,
JOHN L. MANSFIELD,
J. J. BYRD.

Judge Cunningham offered the following resolution ; which was adopted :

Resolved, That in the opinion of this Board of Trustees, the needs of this University imperatively demand the early completion of the new University building, and its preparation for use, as early as the commencement of the next academic year, and the full reimbursement of the endowment fund, impaired by the use of a portion of the funds belonging thereto in carrying to its present state ; and to these ends we earnestly petition the General Assembly to enact into laws the several bills now pending before that body in behalf of this University.

Mr. Emory Cobb, chairman of the Committee on Finance, made the following report :

The Finance Committee, to whom was referred that portion of the Regent's address relating to the finances of the University and sundry resolutions, beg leave to make the following report :

The resources of the University available for the current year are as follows :

Interest on land notes.....	\$830 00
Interest on bonds.....	28,110 00
Rent of lands	990 00
Due on account sale of lands.....	3,228 00
Fees	5,000 00
	<hr/>
	\$38,158 00
Funds in hand of Treasurer.....	5,667 87
	<hr/>
Total	\$43,825 87

The estimates for expenditures for the coming year, and for which appropriations should be made, are as follows :

Regent's salary	\$4,000 00
Nine professors.....	18,000 00
Veterinarian	1,000 00
Teaching architecture.....	600 00
Assistant in chemical laboratory	1,000 00
Assistant in Eng. literature	800 00
Free hand drawing	400 00
Professor of agriculture.....	1,000 00
Treasurer.....	500 00
Librarian and assistants.....	600 00
Other assistants in all departments	2,500 00
Horticultural department.....	500 00
Mechanical department.....	600 00
Board expenses.....	1,200 00
Building and grounds.....	1,250 00
Fuel and light	1,000 00
Stationery and printing.....	750 00
Incidentals	1,250 00
Taxes on lands	3,000 00
Military department \$150 and gymnastics \$50.....	200 00
Chemical department.....	1,855 00
Library and cabinet	555 00
	<hr/>
	\$42,560 00
Leaving a balance unappropriated.....	43,825 87
	<hr/>
Endowment	\$1,265 87

The funds of the University as invested are as follows :

\$50,000 Sangamon county 9 per cent. bonds, cost.....	\$50,000 00
25,000 Morgan county 10 per cent. bonds, cost.....	25,000 00
30,000 Pike county 10 per cent. bonds, cost	30,000 00
25,000 Chicago water 7 per cent. bonds, cost.....	24,961 80
30,000 Kankakee county 10 per cent. bonds, cost.....	29,700 00

\$13,000 Putnam county 10 per cent. bonds, cost.....	\$13,000 00
115,000 Champaign 10 per cent. bonds, cost	115,000 00
31,000 Illinois 6 per cent. bonds, cost	31,653 34
	<hr/>
	\$319,315 14
Balance due scrip account.....	178 87
	<hr/>
	\$319,494 01
454,560 acres scrip roll for.....	319,494 01
25,440 acres located in Nebraska and Minnesota.	
<hr/>	
480,000	

The coupons on the Putnam county bonds, due April 1, 1872, amounting to \$1300, are unpaid—the Treasurer of said county having been enjoined from paying the same. Said bonds were issued for railroad purposes, and the injunction was granted, on account of said road, consolidating with another. We hope to realize on said coupons, and the coupons due April 1, 1873, during the current year.

The various departments, including agricultural, horticultural and mechanical, have asked for larger sums than we have been able to recommend, on account of the state of the treasury. We, however, would suggest that the Executive Committee be authorized to appropriate the earnings of each department to said department, from time to time, as earned.

The balance of scrip, amounting to 24,480 acres, was disposed of, as per instructions, at the annual meeting, March, 1872, at one dollar per acre, and proceeds invested in Champaign county bonds, at par.

The Finance Committee have also had under consideration a resolution, introduced by Judge Blackburn to-day; and while the State of our finances require we should economize our expenses as much as is consistent with reasonable compensations, yet in view of the encouragements given to different teachers during the past year for more pay, your committee at present cannot recommend the reduction referred to in said resolution.

All of which is respectfully submitted.

EMORY COBB,
O. HUSE,
L. R. McMURRAY,
JNO. M. PEARSON,
J. R. SCOTT.

This report was received and adopted.

It was also resolved that the sums of money reported by the Finance Committee, as necessary for the expense of the University for the current year, be and are hereby appropriated to the various objects and departments, as set forth in said report.

A certificate of scholarship, for a full course of architecture, was granted to Mr. N. Clifford Ricker, on recommendation of the Faculty.

On motion, a purchase of ornithological specimens from Mr. Russell, was referred to the Executive Committee.

On motion of Mr. Byrd, the Regent was authorized to make such changes in his report, relating to the library, as he may deem of public interest.

Mr. Slade, chairman of Committee on State of Institution, made the following report:

The committee on state of the Institution have at different times during the year attended the recitation of classes in several of the departments, and have taken pains to obtain from members of the Faculty and from students, information respecting the character of the teaching and the discipline of the University, and beg leave to report as follows:

The instruction appears to be both thorough and practical, and well calculated to awaken in students a spirit of inquiry and investigation, as shown by the very general use of the Library, and by the marked tendency to test, and put to a practical use, what is learned in the class room, and as further shown by the absence of any slavish adherence to text books.

The rigid examinations held at the close of each term to aid in determining the actual attainments of students in the studies pursued, are highly commended, for the reason that they teach, as no words

can, the important fact that the *ability* to re-produce and use what has been learned, rather than the *number* of pages studied, is the proper test of the character of their work.

That there is a very general and hearty co-operation of the students with the Faculty in the government of the Institution, is plainly indicated by their deportment, and it is gratifying to be able to add that during the past year there have been fewer cases demanding discipline, less boisterous noise in and about the building, and better order than ever before.

Respectfully submitted.

JAS. P. SLADE,
B. PULLEN.

The following resolution was adopted:

Resolved, That a change of the organic law of the University, permitting the annual meeting of the Trustees to be held in the month of June, is desirable.

The Board adjourned.

E. SNYDER,

Recording Secretary.

J. M. GREGORY,

Regent.

REPORT OF CORRESPONDING SECRETARY.

I respectfully report that after a delay of several months the Fourth Annual Report was received from the State Binder during the summer and autumn. In accordance with our organic law 5,000 copies were printed, 1,000 of which were, in accordance with the law, left with the Secretary of State for distribution to the members of the General Assembly. Of the remaining 4,000 I procured the binding of 1,000 in muslin, 250 of which were left with the Secretary of State for distribution to members of the General Assembly and State officers; 100 copies in paper were sent to the office of the Superintendent of Public Instruction, and 100 to the State Board of Agriculture. The remaining copies, in muslin and paper, have been received at the University.

The Fifth Annual Report has been in the hands of the Public Printer for some months, but owing, I presume, to the amount of legislative printing, has not been, so far as I yet know, taken in hand.

During the months of January and February, 1873, we have been engaged in holding seven Farmers' Conventions, of about three days' duration each, at Peoria, Jacksonville, Pana, Greenville, Gilman, Kankakee and Belvidere. At most of these points a very general and increasing interest was shown in the advancement of practical and scientific agriculture, and the attendance was satisfactory and encouraging. Addresses were made by Dr. Gregory, Professors Burrill, Taft, Carey and Turner, by Dr. E. S. Hull, Mr. B. F. Johnson, H. K. Vickroy and E. L. Lawrence, nearly all of whom gave their services gratuitously, their expenses only being paid by the University. The Illinois Central, Peoria, Pekin and Jacksonville, the St. Louis and Indianapolis, the Chicago and Alton, and the Chicago and Northwestern railroads kindly favored the University with passes to gentlemen lecturing on behalf of the Institution. The Toledo, Wabash and Western made no response to our applications.

W. C. FLAGG.

REPORT OF EXPERIMENTS.

From the Experimental Department I would make a report of the work of the year 1872. Experiments were made in field culture as follows:

1. Comparing fertility of adjacent plats—repetition of the experiments of 1871.
2. Comparing ordinary and frequent culture of corn.
3. Testing varieties of winter and spring wheat, barley and oats from the Department of Agriculture.
4. Testing the culture of sugar beets, rutabagas, carrots and parsnips.
5. Comparing the culture of corn in hills and in drills at 3, 3½, 4, 4½ and 5 feet.
6. Testing six kinds of clover and 21 of grass seeds.
7. Comparing thirty-five varieties of corn, flint, white, yellow, calico and red varieties.
8. Comparing corn grown on ground plowed at different depths, from ground not plowed at all to that plowed eleven inches deep and subsoiled, and also trench-plowed.
9. Testing and comparing seventy-five varieties of potatoes received from the Michigan Agricultural College.
10. The comparison and testing of five varieties of broom corn.

The season was more favorable than that of 1871 for agricultural production, and the general yields more satisfactory; but I am not satisfied that it was much better for purposes of comparison. A favorable season, hardly less than an unfavorable one, tends to obliterate the natural advantages of a superior fertility in soil, the inherent superiority of a variety and the advantages of a special culture.

EXPERIMENT WITH COMPARATIVE FERTILITY OF ADJOINING PLATS.

The 72 one-twentieths of an acre plats, and 6 one-fortieths of an acre plats, lying in the northwest corner of experimental grounds, were occupied with a repetition of the experiment of last year. The ground was plowed six inches deep, April 23d; rolled May 2d; marked both ways 4 feet 1 inch by 4 feet 1 inch, May 4th, and planted by hand, four grains in a hill, upon same day between 11 A. M. and 3 P. M. May 20th it was cultivated north and south, with Bakewell's Corn Harrow. On the 27th it was cultivated east and west with the double shovel plow. June 5th it was hoed, thinned where necessary to four stalks in a hill, and plowed north and south with a double shovel plow. June 20th, it was cultivated with the same implement east and west, and July 8th north and south. July 13th, it was scraped with a board scraper between the rows.

October 23d, 24th and 25th, after counting hills, stalks and ears of corn exceeding eight inches in length it was cut up, weighed and shocked. During the winter vacation, or rather before and after Christmas, the ears were husked and weighed separately.

						Hills. Stalks. Ears. Wt. s. & e. Wt. of e.
12½	64 239 214 308 103	64 265 219 280 105	64 244 209 286 114	63 216 194 303 109	64 230 213 267 109	64 227 200 265 101
12	123 489 442 600 233	128 498 431 598 235	128 496 446 589 232	128 494 411 532 238	128 479 423 530 212	100 492 423 572 243
11	123 470 450 640 237	127 468 419 615 245	127 477 461 598 251	128 428 374 580 205	126 461 402 584 247	112 462 433 549 254
10	127 503 461 599 210	128 488 448 600 250	127 519 468 633 248	127 490 408 639 233	126 449 402 591 231	127 482 436 504 226
9	124 486 425 565 221	128 449 419 570 241	127 465 437 660 253	125 423 378 622 246	126 444 397 620 233	127 471 412 626 237
8	128 477 432 490 202	127 453 446 500 219	128 464 437 677 243	126 409 382 626 225	137 460 402 589 233	128 490 417 585 236
7	127 488 438 505 235	128 504 457 480 240	127 489 446 684 254	125 439 353 608 246	123 487 400 549 229	127 482 408 566 212
6	128 501 440 558 244	128 490 457 560 244	128 516 468 691 244	127 457 351 573 241	128 486 400 532 220	128 502 431 470 215
5	126 490 429 695 231	127 490 439 579 228	128 491 443 617 237	128 471 430 518 259	126 474 401 535 216	128 504 444 583 201
4	125 461 411 589 235	128 497 424 500 224	128 501 432 568 207	127 559 415 508 217	126 479 415 540 242	127 495 422 469 203
3	126 486 425 570 235	128 518 449 490 234	128 502 438 605 227	127 477 360 533 239	127 507 438 510 219	127 499 461 444 233
2	128 506 430 550 216	128 505 430 576 222	128 500 436 584 225	128 404 344 517 223	128 477 413 493 230	128 483 439 488 222
1	127 479 435 587 216	128 496 431 580 224	127 492 453 594 235	128 515 342 539 233	128 453 413 568 246	128 459 407 580 256
	A	B	C	D	E	F

The following table shows the number of hills, stalks and ears, upon each plat :

Number.	A Plats.			B Plats.			C Plats.			D Plats.			E Plats.			F Plats.		
	No. Hills.	No. Stalks	No. Ears.	No. Hills.	No. Stalks	No. Ears.	No. Hills.	No. Stalks	No. Ears.	No. Hills.	No. Stalks	No. Ears.	No. Hills.	No. Stalks	No. Ears.	No. Hills.	No. Stalks	No. Ears.
1	127	479	435	128	496	431	127	492	453	128	515	342	128	453	413	128	459	407
2	123	506	430	128	565	430	128	500	436	128	404	344	128	477	413	128	483	439
3	126	486	425	128	518	449	128	502	438	127	477	360	127	507	438	127	499	461
4	125	461	411	128	497	424	128	501	432	127	559	415	126	479	415	127	495	422
5	126	490	429	127	490	439	128	491	443	128	471	443	126	474	401	128	504	444
6	128	501	440	128	490	457	128	516	468	127	457	351	128	486	400	128	502	431
7	127	488	438	128	504	457	127	489	446	125	439	353	123	467	400	127	482	408
8	128	477	432	127	453	446	128	464	437	126	409	382	127	460	402	128	490	417
9	124	486	425	128	449	419	127	465	437	135	423	378	126	444	397	127	471	412
10	127	503	461	128	488	448	127	519	468	127	490	408	126	449	402	127	482	436
11	123	470	450	127	468	419	127	477	468	128	428	374	126	461	402	112	462	433
12	123	489	442	128	498	431	128	496	446	128	494	411	128	479	423	100	492	423
12½	64	239	214	64	265	219	64	244	209	63	216	194	64	230	213	64	227	200
	1576	6075	5432	1597	6181	5469	1595	6156	5574	1587	5782	4742	1583	5886	5119	1551	6048	5333

TOTALS.

	No. Hills.	No. Stalks.	No. Ears.
A plats.....	1, 576	6, 075	5, 432
B ".....	1, 597	6, 181	5, 469
C ".....	1, 595	6, 156	5, 574
D ".....	1, 587	5, 782	4, 742
E ".....	1, 583	5, 886	5, 119
F ".....	1, 551	6, 048	5, 333
	9, 489	36, 128	31, 669
Average per tier.....	1, 581.5	6, 021.3	5, 333.6
" " plat.....	126.52	481.7	422.2

	No. Hills.	No. Stalks.	No. Ears.
1 plat.....	766	2, 894	2, 481
2 ".....	768	2, 935	2, 492
3 ".....	763	2, 989	2, 571
4 ".....	761	2, 992	2, 519
5 ".....	763	2, 920	2, 586
6 ".....	767	2, 952	2, 547
7 ".....	757	2, 889	2, 502
8 ".....	764	2, 753	2, 516
9 ".....	757	2, 738	2, 468
10 ".....	762	2, 931	2, 623
11 ".....	743	2, 766	2, 539
12 ".....	735	2, 948	2, 576
12½ ".....	383	1, 421	1, 249
Totals.....	9, 489	36, 128	31, 669
Average per tier.....	753.1	2, 890.2	2, 533.5
" " plat.....	126.52	481.7	422.2

The following table gives the weights of the grain and stalks when cut up on the 23d, 24th and 25th of October, being then quite dry, and the weight of the ears as husked at Christmas, upon each plat :

No	A Plats.		B Plats.		C Plats.		D Plats.		E Plats.		F Plats.	
	Wt. in lbs. shocked.	Wt. in lbs. husked.	Wt. in lbs. shocked.	Wt. in lbs. husked.	Wt. in lbs. shocked.	Wt. in lbs. husked.	Wt. in lbs. shocked.	Wt. in lbs. husked.	Wt. in lbs. shocked.	Wt. in lbs. husked.	Wt. in lbs. shocked.	Wt. in lbs. husked.
1	587	216	580	224	594	235	539	233	568	246	580	256
2	550	216	576	222	584	225	517	223	493	230	488	222
3	570	235	490	234	605	227	533	239	510	219	544	233
4	589	235	500	224	568	207	508	217	540	242	469	203
5	595	231	579	225	617	237	518	259	535	216	583	201
6	558	244	560	244	691	244	573	241	532	220	470	215
7	505	235	480	240	684	254	608	246	549	229	568	212
8	490	202	500	219	677	243	626	225	589	233	585	236
9	565	221	570	241	660	253	622	246	620	233	626	237
10	599	210	600	250	633	248	639	233	591	231	594	226
11	640	237	615	245	598	251	580	205	584	247	549	254
12	600	233	598	235	589	232	532	238	530	212	572	243
12½	308	103	280	105	286	114	303	109	267	109	265	101
	7156	2818	6928	2911	7786	2970	7098	2914	6908	2867	6893	2839

			TOTALS.	
			Weight of stalks and ears in lbs.	Weight of ears, dry, in lbs.
A Plats	.....	.....	7, 156	2, 818
B " "	.....	.....	6, 928	2, 911
C " "	.....	.....	7, 786	2, 970
D " "	.....	.....	7, 098	2, 914
E " "	.....	.....	6, 908	2, 867
F " "	.....	.....	6, 893	2, 839
Averages per tier.....			42, 769	17, 319
" " plat.....			7, 128.1	2, 886.5
" " acre.....			570.2	230.9
			11, 404	4, 618

			Weight when cut of stalks and ears in lbs.	Weight of ears, dry, lbs.
1 Plats	.....	.....	3, 448	1, 410
2 " "	.....	.....	3, 308	1, 338
3 " "	.....	.....	3, 252	1, 387
4 " "	.....	.....	3, 174	1, 328
5 " "	.....	.....	3, 427	1, 372
6 " "	.....	.....	3, 384	1, 408
7 " "	.....	.....	3, 394	1, 416
8 " "	.....	.....	3, 467	1, 358
9 " "	.....	.....	3, 663	1, 431
10 " "	.....	.....	3, 656	1, 398
11 " "	.....	.....	3, 566	1, 439
12 " "	.....	.....	3, 421	1, 393
12½ " "	.....	.....	1, 709	641
Averages per tier.....			42, 769	17, 319
" " plat.....			3, 421.5	1, 385.5
			570.2	230.9

An examination of the map of the plats and tables shows—

1. Of 9,600 hills planted, 9,489 grew to maturity, a loss of not much more than 1 per cent. against a loss of 7 per cent. in 1871.

MAP OF EXPERIMENTAL PLATS,

Containing 8 rods, each 2×4, except the half plats at north end, 128 hills planted on each full plat. The figures on each plat show: 1. Number hills matured. 2. Number stalks matured. 3. Number ears eight inches long. 4. Pounds corn when gathered. 5. Stalks and corn when cut.

1871.							1872.						
12½	57 208 112 38	62 218 122 36½	60 195 93 24½	60 190 95 28	63 199 62 18½	60 197 90 21	64 239 214 103	64 265 219 105	64 244 209 114	63 216 194 109	64 230 213 109	64 227 200 101	12½
12	125 460 318 120	124 455 272 105	125 456 280 91	121 417 225 65	122 381 162 52	124 403 174 51½	123 489 442 233	125 498 431 235	128 496 446 232	128 494 411 238	128 479 423 212	100 492 423 243	12
11	123 479 394 177	127 491 361 157	126 475 380 157	128 444 294 116	125 411 259 89	127 415 223 78	123 470 450 237	127 468 419 345	129 477 461 251	129 428 374 205	126 461 402 247	112 462 433 254	11
10	94 350 288 148	130½ 498 364 149	125 469 363 145	125 479 306 121½	121 412 242 86	121 423 263 98	127 503 461 210	128 488 448 250	127 519 468 248	127 490 408 233	126 449 402 231	127 482 436 226	10
9	112 377 270 103	118 419 298 113½	130½ 427 285 105	120 393 267 93	119 400 220 75	116 376 217 75½	124 486 425 221	128 449 419 241	127 465 437 253	125 423 378 246	126 444 397 233	127 471 412 237	9
8	133½ 380 230 57	115 348 215 74½	126 388 260 69½	115 371 239 80	113 372 201 63	118 397 201 63½	128 477 432 202	127 453 446 219	128 464 407 243	126 439 382 225	127 460 402 233	128 490 417 236	8
7	107 329 200 73	120 392 218 72	126 422 200 60½	128 427 247 63½	116 402 185 56½	119 376 169 44½	127 488 438 235	128 504 457 240	127 489 446 254	125 439 353 246	123 457 400 229	127 482 408 212	7
6	116 380 207 72	116 365 216 69	117 386 204 68	116 390 199 61½	112 348 144 44½	105 303 105 31	128 501 440 244	128 490 457 244	128 516 468 241	127 457 351 241	128 486 400 220	128 502 431 215	6
5	111 323 181 54½	101 308 170 46	119 388 192 57½	118 403 202 56	116 355 130 37	108 328 123 33	126 490 429 231	127 490 439 228	128 491 443 237	128 471 430 259	126 474 401 216	128 504 444 201	5
4	120 368 186 69½	113 359 170 42	110 337 137½ 41	119 384 191 41	114 335 130 32	114 348 100 30	125 461 411 235	128 497 424 224	128 501 432 207	127 559 415 217	126 479 415 242	127 495 422 203	4
3	122 358 187 63	117 398 235 71	124 408 197 61	125 403 902 47½	106 324 143 39	118 355 177 55	126 518 425 235	128 502 449 234	128 497 438 227	127 477 360 239	127 507 438 219	127 499 461 233	3
2	113 354 195 66	127 437 231 74	124 432 218 57	126 418 217 51	112 349 159 41½	120 365 173 52½	128 506 430 216	128 505 436 222	128 510 436 225	128 404 344 223	128 477 413 230	128 483 439 222	2
1	125 415 285 100	126 457 286 101	126 458 319 112	123 420 255 83	120 400 220 66	111 351 196 72½	127 479 435 216	128 496 431 224	127 492 453 235	128 515 342 233	128 353 413 246	128 459 407 256	1
A	B	C	D	E	F		A	B	C	D	E	F	

2. Instead of 38,400 stalks intended, 36,128 matured, a loss of 6 per cent. nearly, against 22 per cent in 1871.

3. The 36,128 stalks that matured bore 31,669 ears, or assuming that no stalk bore more than one ear, 4,459 stalks were barren, or about 12 per cent. instead of 43 per cent., as in 1871.

4. The 31,669 ears weighed 17,319 pounds, or an average of .546 of a pound to the ear against .334 of a pound in 1871.

5. The tier of C plats was the most productive both of stalks and ears. The F plats the least productive of stalks and ears, though not quite the lowest in the weight of ears. The tier numbered "4" was lowest in production, both of stalk and grain; and "9" the most productive in stalks, but not in grain. Hence, with uniformity of variation in fertility, we would expect to find plat "C 9" the most productive in the field, and "F 4" the least productive; and these do seem to be about the richest and poorest soils in the field. As a matter of fact, plat "D 5" produced the greatest weight of ears, and "F 5" the smallest. "C 6" produced the heaviest yield of stalks and ears, and "F 4" the lightest, showing that when grain and stalks are both reckoned, that the general and special calculation give nearly the same result. Tabulated, it is as follows:

	Stalks and ears in lbs.	Ears.
Maximum letter tier "C".....	7,786	2,970
Minimum letter tier "F".....	6,893	2,839
Maximum numbered tier "9".....	3,663	1,431
Minimum numbered tier "4".....	3,174	1,328
Maximum plat by calculation "C 9".....	660	253
Maximum plat by measurement "C 6".....	691	244
Minimum plat by calculation "F 4".....	469	203
Minimum plat by measurement "F 4", also, maximum yield ears. "D 5".....	518	259
Minimum yield ears "F 5".....	583	201

In 1871 the maximum yield appeared in the "A" tiers and "11" tiers, and the minimum in the "E" and "4" tiers. The dryness of the season caused the lowest and moistest ground to be most productive in that year. The place of the minimum yield has been nearly the same in both years.

6. In many of the plats there seems to be something like a tendency to make up last year's short crop by an unusually productive one this; and, again, for a short crop to follow a good one. Thus of 50 plats that ran below the average yield in 1871, 28 go above it in 1872, and of 28 that went above the average in 1871, 8 are below it in 1872.

7. It will be noticed that the yield of stalks and ears, cut up late (Oct. 23d-25th) was 11,404 lbs. or 5.7 tons per acre, whilst the ears husked at Christmas time weighed 4,618 lbs., or, reckoning 70 lbs. to the bushel, 66 bushels nearly to the acre. The variety used, as in 1871, was Johnson's Hundred Day Dent. Assuming the ears when husked to be as heavy as when cut up, we find the ratio of ear to stalk to be as 40 to 60 nearly, or 40 per cent. of the entire product

ORDINARY AND FREQUENT CULTIVATION OF CORN.

One acre of corn on the north end of Plat No. 2 north was plowed May 9th 6 inches deep and planted in hills May 13th. On the 25th the whole acre was thoroughly harrowed. May 30th the acre was plowed east and west with double shovel plows. June 24th it was plowed north and south. July 2d the first five rows on the south side were cultivated, and working northward every other five rows were treated in the same manner. This plowing was repeated in the same manner July 9th, 15th, and 22d.

<i>Result.</i>	<i>Green Corn.</i>
5 South rows, with frequent cultivation, yielded.....	380 lbs.
5 Second rows, " ".....	350 lbs.
5 Third rows, " ".....	375 lbs.
5 Fourth rows, " ".....	355 lbs.
5 Fifth rows, " ".....	350 lbs.
5 Sixth rows, " ".....	355 lbs.
5 Seventh rows, " ".....	380 lbs.
5 Eighth rows. " ".....	350 lbs.

Showing a small gain in favor of frequent cultivation. In a dryer season the advantage might have been more perceptible.

EXPERIMENTS WITH WHEAT.

One acre of Fultz wheat from the Department of Agriculture was drilled last autumn—one-fourth of an acre in 4 successive weeks—on the 4th acre of Plat No. 2 north, but it was nearly all winter killed and gave no valuable results.

White Australian Spring Wheat sown on plats 5, 6, 7 and 8 by the barn, on ground planted to potatoes last year, was prepared by cultivating with the Deere plow, and 8 quarts sown, April 12th. It was struck with rust June 30. Harvested, July 15. It was badly shrunken and nearly worthless.

EXPERIMENTS WITH ROOT CROPS.

Plat No. 3 north, which was planted with root crops last year, was again sown in 1872. The ground was cultivated May 14th with the Wier plow, and harrowed with the Thomas harrow. May 15 the north acre was drilled with one acre of Lane's Imperial Sugar Beets in rows 2 feet apart; the next acre with Silesian Sugar Beet in the same manner; the next acre in the same manner with Improved American Rutabagas. May 16th, the next acre was sown with Bliss' Long Orange Carrots; and the 5th and last acre with Long Smooth Parsnip. From May 24th to August 14th, 110 days, work were done in cultivation.

All came up well except the Silesian Sugar Beets which were rather thin, and seven rows were missing from the Imperial Sugar Beets.

Many of the Rutabagas were infested by a small beetle nearly all summer, and rotted; and the leaves of the beets were eaten by them badly.

Crop was gathered, October 26th, with the following results :

Lane's Imperial Sugar Beet (allowing for missing rows).....	9, 155 lbs.
Silesian Sugar Beets.....	3, 750 lbs.
Improved American Rutabagas.....	900 lbs.
Bliss' Long Orange Carrot.....	9, 550 lbs.
Long Smooth Parsnip.....	1, 786 lbs.

The experiments with root crops thus far are not encouraging. Compared with corn and other products used for animal food, the crop is more uncertain and costly. Where land is high, labor cheap and culture intensive, it may prove profitable, even in a climate like our own, which is too long and dry for the best success in growing and keeping many of the roots.

CORN, IN HILLS AND DRILLS, AT DIFFERENT DISTANCES.

Plats 4 and 5 north, of 5 acres each, were planted in the same manner as last year. The north acre of each was planted with corn in rows 3 feet apart—one acre in hills with 3 stalks to the hill, the other in drills with one stalk to each foot of row. The next acres were planted in the same manner, with rows 3½ feet apart, 3 and 4 kernels in a hill (on the acre in hills), and a kernel to the foot (on the acre in drills). The third pair of acres had the distance increased (and planting to correspond,) to 4 feet, the fourth to 4½, and the 5th to 5 feet.

The ground was plowed 5 inches deep April 27th to 2d May. A heavy rain occurred on the 30th. May 7th the plats were rolled and marked. They were planted on 8th and 9th with yellow Dent corn. On the 21st May, both plats were thoroughly harrowed with Blake's harrow. On the 27th and 28th, both plats were cultivated with the Deere plow. June 5, both plats were plowed with the Deere plow; that planted in hills was plowed north and south. June 20th and 21st, both plats were plowed again—that in hills east and west. July 6th, plowed with Deere plow. July 15th, plowed with double shovel and Deere plow.

No. of acres	Distance.	HILLS.		DRILLS.	
		Stalks.	Bushels.	Stalks.	Bushels.
1	3 feet.....	5, 481	69.57	5, 502	69.25
2	3½ feet.....	4, 662	67.43	4, 716	69.28
3	4 feet.....	4, 160	75.70	4, 192	62.41
4	4½ feet.....	3, 654	56.14	3, 668	56.85
Total of 4 plats.....		17, 957	268.84	18, 078	257.79
5	5 feet.....	3, 380	56.85	3, 406	*11.50

* Ground wet and unfit for cultivation.

Discarding from the calculation the acres planted at 5 feet, the result is favorable to corn in *hills* planted at a distance of 4 feet. Farther experiment, however, is necessary to arrive at definite conclusions, especially as the land is variable.

EXPERIMENTS WITH GRASS AND CLOVER SEEDS.

These seeds were procured from B. K. Bliss & Son, of New York, in the autumn of 1871, but the weather was so dry that it was not considered safe to sow them. They were accordingly sown as follows. Twenty-four plats, each two by four rods, lying on the north of the experimental grounds, and six near the barn, were sown as follows:

Sown North of Experimental Plats April 13.

1. Meadow Foxtail.
2. Timothy; good stand.
3. Red Top; good stand.
4. Orchard Grass.
5. Wood Meadow.
6. Rough Stalked Meadow.
7. Kentucky Blue Grass.
8. Damel Spiked Fescue.
10. Hard Fescue.
11. Meadow Fescue.
12. Fall Fescue.
13. Purple Fescue.
14. English Rye Grass; good stand.
15. Italian Rye Grass; good stand.
16. Yellow Oat.
17. Meadow Soft; good stand.
18. Red Canary.
19. Crested Dogtail.
20. Hungarian; came up and grew well.
21. Creeping Bent; good stand.
22. Rhode Island Bent; good stand.
23. Schroeder Brome; some grew.
24. Red Clover; good stand.

These plats were mowed to clean them of weeds, etc., June 9th and August 6th. Only eight out of the twenty-three grew well. I propose to re-seed the plats that have failed to come, with the same kinds that were originally sown on them.

Near the barn, plats 1, 2, 3, 4, 9, and 10 were cultivated, harrowed, rolled, and sowed April 15th, with the following varieties:

1. Italian Clover; a good stand.
2. Lucerne Clover; a good stand.
3. Bokhara Clover; a good stand.
4. Trefoil (yellow); thin on the ground.
9. Alsike Clover; a good stand.
10. White Clover; thin on the ground.

These plats were also renewed June 9th and August 6th.

VARIETIES OF CORN.

Experiment was made with thirty-five varieties of corn, all kindly furnished us by J. B. Phinney, Esq., of Champaign. Mr. Phinney has, for some years, been collecting and experimenting with different varieties, with many of them on a large scale, and we were fortunate in securing his assistance and observation of some of the varieties named.

The ground planted was the north three acres and the south acre of plat No. 2, south. It varies considerably in the apparent fertility of the soil, but as no test has been made, as yet, to ascertain the difference, it cannot be taken into account, except to note some of the more marked peculiarities of the soil.

The ground had been cultivated in corn in 1871, and was plowed about six inches deep on the 25th of April. May 16th it was rolled and marked for hills, four by four feet. Closer planting would have given a greater yield, but would not have been quite so good for purposes of comparison between large and small growing varieties. It was dropped by hand, about four grains to the hill, and covered with the hoe. About one-eighth of an acre was planted of each of the thirty-five varieties, except the Black Purple, of which there was but one-fortieth of an acre. In this case, however, as well as in the plat of

Langford corn, where vacancies were caused by wet ground, allowances have been made and averages taken, so as to show the yield on the same amount of land as the other.

The corn was cultivated as follows: May 25th it was harrowed with Blackwell's Corn Harrow, east and west. May 30th the same cultivation was given north and south. June 12th it was plowed with a double-shovel plow, east and west. June 26th, with the same plow, north and south. July 5th, east and west, and July 19th north and south.

The following table gives the varieties planted, with Mr. Phinney's remarks:

I. Flint Varieties not suited for our Western Markets:

1. Sanford.

II. White Varieties:

2. Arcola, from I. McCann; yield, 110 bushels in 1870; 80 in 1871.
3. Butler county, Ohio (from Tuscola).
4. Cooley's early white field corn; received in 1872 from C. C. Cooley, Adams county, Ohio.
5. Davidson's Ohio white; from Champaign county fair, 1871.
6. Early small white; from Champaign county.
7. Early white; from Tolono.
8. Mammoth white; received from Balthis Corydon, Indiana; almost a humbug.
9. Warder; small; very early; hominy; corn maturing August 15; has yielded 80 bushels in Ohio, but not over 45 with Mr. Phinney.
10. White; largest; from Champaign county.
11. White river; from Tuscola.

III. Yellow Varieties:

12. Bankers No. 1; Ohio; maturing September 10.
13. Bankers No. 2; Ohio; maturing September 15.
14. Chester county (Penn.); from L. S. Pennington.
15. Early premium; Ohio; maturing August 15.
16. Mixed 10; grown by Mr. Phinney, from a mixture of seed of the 10 following varieties: Thomas, Goltra, Bankers' No. 1, Powell's Early, Douglas, Nebraska, Premium Ohio, Petit, Terwilliger, Hundred Day Dent.
17. Premium Ohio; from Champaign county fair.
18. Pickle (Tuscola).
19. McElvery; second premium Champaign county fair.
20. Mammoth yellow; from S. R. Bailey, Lima, Ohio, 1872.
21. Lancaster county (Penn.); from L. S. Pennington, of Sterling; succeeded with him 1871.
22. H. C. Baufman's; Champaign county fair.
23. Goltra; very late variety from Kentucky.
24. Fayette county (Ohio); very early; from Champaign county fair.
25. Powell's early; September 10.
26. Reeves; from Tolono; very early.
27. Roderick; from Tuscola.
28. Thomas (5 or 6 years from Ohio.)
29. Unknown; from Clermont county, Ohio.

IV. Brown and Calico Varieties:

30. Master; from Ohio, 1870.
31. Large Strauder; an old variety; medium in ripening.
32. Little Strauder; very early.
33. Roan; from Ohio.
34. Strawberry or calico; formerly a great favorite; early, and yields well.

V. Red Varieties:

35. Black purple; from Fulton county, 1871.

Of these varieties, with his present experience, Mr. Phinney preferred the following varieties, all of which are yellow: Thomas, Goltra, Bankers No. 1, Bankers No. 2, and Powell's early.

The following table shows the degree of maturity August 2d, and the yield of corn weighed, as gathered November 9th, and following days:

	Tassel.	Silk.	Stalks.	Bushels per acre 70 lbs. to bush.
<i>I. Flint Varieties:</i>				
1. Sanford	Out.	Out.	Short suck- ered.	44.
<i>II. White Varieties:</i>				
2. Arcola	Out.	Late.	Tall.	79.4
3. Butler County	Late.	Late.	Medium.	74.2
4. Cooley's Early	Out.	Medium.	Low.	70.3
5. Davidson's Ohio	Late.	Late.	Medium.	69.1
6. Early Small White	Out.	Out.	Low.	42.2
7. Early White	Out.	Medium.	Low.	61.7
8. Mammoth White	Late.	None.	Medium.	44.4
9. Warder	Out.	Out.	Medium.	45.5
10. White, Largest	Late.	None.	Medium.	68.2
11. White River	Late.	None.	Medium.	66.2
<i>III. Yellow Varieties:</i>				
12. Bankers No. 1	Medium.	None.	Medium.	62.8
13. Bankers No. 2	Out.	Late.	Medium.	65.1
14. Chester County	Out.	Medium.	Medium.	53.7
15. Early Premium	Out.	Out.	Medium.	52.8
16. Mixed 10	Out.	Out.	Tall.	56.
17. Premium Ohio	Out.	Out.	Medium.	68.4
18. Pickle	Out.	Late.	Tall.	69.1
19. McElvery	Out.	Medium.	Tall.	76.
20. Mammoth Yellow	Out.	Medium.	Low.	53.5
21. Lancaster	Out.	Medium.	Low.	48.8
22. H. C. Bauffman	Out.	Out.	Medium.	53.1
23. Goltra	Late.	None.	Medium.	61.7
24. Fayette County	Out.	Out.	Low.	40.
25. Powell's Early	Out.	Out.	Medium.	61.7
26. Reeves	Out.	Out.	Medium.	61.7
27. Roderick	Out.	Medium.	Tall.	65.1
28. Thomas	Out.	Out.	Medium.	65.1
29. Unknown	Late.	Late.	Medium.	53.3
<i>IV. Brown and Calico Varieties:</i>				
30. Master	Out.	Medium.	Medium.	51.4
31. Large Strander	Out.	Medium.	Medium.	60.8
32. Little Strander	Out.	Out.	Low.	48.5
33. Roan	Medium.	Late.	Tall.	50.8
34. Strawberry				53.7
<i>V. Red Varieties:</i>				
35. Black Purple	Out.	Medium.	Tall.	80.

The heaviest yield, it will be observed, is from the Red Purple, which gave 80 bushels to the acre. Next comes the Arcola, [a white variety, with 79.4 bushels, and next to this the McElvery, a yellow sort, which yielded 76 bushels. The averages of the different classes is as follows:

Flint, 1 variety	44	bushels to the acre.
White, 10 varieties	62.1	" " "
Yellow, 18 varieties	59.3	" " "
Brown, etc., 5 varieties	53	" " "
Red, 1 variety	80	" " "
Total for 35 varieties	56.2	" " "

The land is said to have been in cultivation twenty years without manure.

In order to test the comparative weight of corn and cob in these different varieties, two good ears of each were selected when the corn was quite dry, weighed, shelled and then the grain weighed, with the following results :

Varieties.	Weight of two ears in ounces.	Weight of grain in ounces.	Per cent. of grain to gross.
Sanford Flint variety	17.5	15.	85.7
Arcola	22.	19.	86.3
Butler county	25.	21.	84.
Cooley's Early	18.5	15.5	83.8
Davidson's Ohio	25.5	21.5	84.3
Early Small White	20.5	17.5	85.3
Early White	20.	17.5	87.5
Mammoth White	27.	23.	85.2
Warder	21.	17.5	83.3
White, largest	26.	21.5	82.7
White River	26.5	22.	83.
Average 10 White varieties			84.5
Bankers No. 1	24.	20.	83.3
Bankers No. 2	26.5	21.5	81.1
Chester county	18.	15.5	86.1
Early Premium	20.5	17.	82.9
Mixed Ten of Phinney	21.5	18.	83.6
Premium Ohio	26.5	22.	83.
Pickle	29.	24.	82.9
McElvery	24.	20.5	85.4
Mammoth Yellow	25.5	21.5	84.3
Lancaster	29.	24.	82.9
H. C. Bauffman	19.	16.	84.2
Goltra	21.	18.5	88.1
Fayette county	23.	19.5	84.8
Powell's Early	22.5	19.	84.4
Reeves'	22.	19.5	88.6
Roderick	27.	22.5	83.3
Thomas	25.	20.5	82.
Unknown	28.	23.	85.
Average 18 Yellow varieties			84.2
Master	23.	20.	86.9
Large Strauder	22.	18.5	84.1
Little Strauder	16.5	14.	84.1
Roan	27.5	23.	83.6
Strawberry	21.	17.5	83.3
Average 5 Brown and Calico varieties			84.4
Black Purple	24.5	20.5	83.6
Average of all the varieties			84.3

EXPERIMENT IN DEEP AND SHALLOW PREPARATION OF GROUND.

Plat No. 3 south was, so far as the north part of it was suitable, devoted to an experiment to test the value of different depths of plowing in the preparation of ground for crops. It was divided into eight strips, each two rods wide, running north and south. The western strip was not plowed at all, but simply stirred with the cultivator; the second strip plowed as nearly as might be 3 inches deep; the third 5 inches; the fourth 7 inches; the fifth 9 inches; the sixth 11 inches; the seventh 11 inches, and trench plowed; the eighth 11 inches, and sub-soiled.

Owing to some vexatious mistakes in planting that were not allowed for in gathering, the exact yield of the several strips cannot be determined. It was found, however, that the sub-soiled and trench-plowed strips produced the most, and the shallow-plowed strips the least. The half of the field plowed 7 inches deep and less, yielded 72 bushels 15 lbs., whilst that plowed 9 inches deep and more, yielded 88 bushels 35 pounds.

EXPERIMENTS WITH POTATOES.

The seventy-five varieties of potatoes received from the Michigan Agricultural College, and planted last year, were replanted simply with a view to obtaining a renewal of the seed, the yield having been very small. They were planted mostly on sward land, on the lowest part of plot No. 2 south, and, generally speaking, yielded well, so that next year we can institute a comparison between varieties.

The varieties of potatoes and corn were exhibited before the State Horticultural Society at Centra-lia, and at the meeting of the State Board of Agriculture, and were awarded a medal by the latter body.

EXPERIMENTS WITH BROOM CORN.

The five acres planted in broom corn in 1871 were planted with the same varieties in 1872. The ground was plowed to a depth of 6 inches on the 23d of April, and the seed drilled May 23d. The drill was a poor one, which made it difficult to perform the planting just as desired. The ground was harrowed May 28th, with the Thomas smoothing harrow; June 15th, with Simpson's combined harrow, crusher and roller. The same date it was hoed. June 25th it was cultivated with a double shovel plow, and again July 2d. July 18th it was cultivated with the Wier plow. The Early Evergreen was cut August 22d, the Mohawk on 19th, the Missouri Evergreen on 27th, the Chinese on 30th, and the Dwarf Evergreen on the 3d of September. The following table gives the results as heretofore published:

MOHAWK.

$\frac{1}{4}$ acre, 12 seed drop, 943 lbs. green brush, 192 lbs. cleaned.		
$\frac{1}{4}$ " 10 " 843 lbs.	"	166 lbs. "
$\frac{1}{4}$ " 8 " 675 lbs.	"	164 lbs. "
$\frac{1}{4}$ " 6 " 605 lbs.	"	158 lbs. "
Total	3,066 lbs.	680 lbs. "

EARLY EVERGREEN.

$\frac{1}{4}$ acre, 12 seed drop, 705 lbs. green brush, 183 lbs. cleaned.		
$\frac{1}{4}$ " 10 " 678 lbs.	"	179 lbs. "
$\frac{1}{4}$ " 8 " 600 lbs.	"	163 lbs. "
$\frac{1}{4}$ " 6 " 525 lbs.	"	146 lbs. "
Total	2,508 lbs.	671 lbs. "

MISSOURI EVERGREEN.

$\frac{1}{4}$ acre, 12 seed drop, 492 lbs. green brush, 157 lbs. cleaned.		
$\frac{1}{4}$ " 10 " 527 lbs.	"	164 lbs. "
$\frac{1}{4}$ " 8 " 650 lbs.	"	164 lbs. "
$\frac{1}{4}$ " 6 " 630 lbs.	"	167 lbs. "
Total	2,299 lbs.	652 lbs. "

CHINESE.

$\frac{1}{4}$ acre, 12 seed drop, 300 lbs. green brush, 165 lbs. cleaned.		
$\frac{1}{4}$ " 10 " 459 lbs.	"	158 lbs. "
$\frac{1}{4}$ " 8 " 700 lbs.	"	144 lbs. "
$\frac{1}{4}$ " 6 " 575 lbs.	"	136 lbs. "
Total	2,034 lbs.	603 lbs. "

DWARF BRUSH.

$\frac{1}{4}$ acre, 12 seed drop, 1,343 lbs. green brush, 248 lbs. cleaned,		
$\frac{1}{4}$ " 10 " 1,060 lbs.	"	205 lbs. "
$\frac{1}{4}$ " 8 " 1,190 lbs.	"	173 lbs. "
$\frac{1}{4}$ " 6 " 1,040 lbs.	"	124 lbs. "
Total	4,633 lbs.	750 lbs. "

Fifty or sixty pounds of the dwarf brush were damaged and thrown out before weighing the cleaned brush.

Comparing varieties we get the following figures:

Mohawk—3,066 lbs. green brush; 680 lbs. cleaned, or 22.1 per cent.

Early Evergreen—2,508 lbs. green brush; 671 lbs. cleaned, or 22.3 per cent.

Missouri Evergreen—2,299 lbs. green brush; 652 lbs. cleaned, or 28.3 per cent.

Chinese—2,034 lbs. green brush; 603 lbs. cleaned, or 29.6 per cent.

Dwarf Brush—4,633 lbs. green brush; 750 lbs. cleaned, or 16.1 per cent.

The heaviest yield per acre comes from the Dwarf Brush, which, however, was on the best ground; but the yield of cleaned brush compared with the green brush to be handled is much lower. This, curious to say, causes the Dwarf Brush to be discarded by western cultivators, and varieties like Missouri Evergreen to be preferred.

Comparing the different amount of seeds drooped in a place, we get the following results :

Varieties.	WEIGHT OF GREEN BRUSH.			
	12 seeds.	10 seeds.	8 seeds.	6 seeds.
Mohawk.....	943	843	675	605
Early Evergreen.....	705	678	600	525
Missouri Evergreen.....	492	527	650	630
Chinese.....	300	459	700	575
Dwarf Brush.....	1,343	1,060	1,190	1,040
Total.....	3,783	3,567	3,815	3,375

Thus the number of seeds appears to make no definite difference in the weight of the green brush. In the clean brush, however, the result is more marked, thus :

Varieties.	WEIGHT OF CLEANED BRUSH.			
	12 seeds.	10 seeds.	8 seeds.	6 seeds.
Mohawk.....	192	166	164	158
Early Evergreen.....	183	179	163	146
Missouri Evergreen.....	157	164	164	167
Chinese.....	165	158	144	136
Dwarf Brush.....	248	205	173	124
Total.....	945	872	808	731

Here we find the weight of brush increasing with the amount of seed, but by no means in an equal ratio. Suckering fills up the thinly planted broom corn, but does not make so good stalks as original plants. Hence, probably, the discrepancy between the comparative yields of green and cleaned brush.

In 1871 the same five acres were planted with the same five varieties. The following table gives a comparison of results in 1871 and 1872 :

Varieties.	WEIGHT OF BRUSH.			
	—Green—		—Cleaned—	
	1871.	1872.	1871.	1872.
Mohawk.....	1,520	3,066	178	680
Early Evergreen.....	1,568	2,508	275	671
Missouri Evergreen.....	2,538	2,299	500	652
Chinese.....	2,052	2,034	380	603
Dwarf Brush.....	3,290	4,633	579	750
Total.....	10,968	14,540	1,912	3,356
Average per acre.....	2,193	2,908	382	671

The season of 1871 was very dry, and the chinch bug diminished the crop to an unknown extent. The season of 1872 was quite favorable, so far as quantity was concerned, but the brush is somewhat coarse, of inferior color and a good deal broken down from softness and weakness in the damp weather prevalent at the time of its putting out.

The average yield per acre for the two years of the different varieties is as follows :

Mohawk.....	429 pounds
Early Evergreen.....	473 "
Missouri Evergreen.....	576 "
Chinese.....	491½ "
Dwarf Brush.....	664½ "
Total.....	2,634 "
Average.....	527 "

The Dwarf Brush gives the best results, and the Missouri Evergreen, which seems to be the favorite variety with Champaign growers, comes next to it. The yield of Mohawk was exceptionally small in 1871, and makes it thus far the variety giving the smallest return.

The yield of green brush in 1872 was nearly 33 per cent. greater than in 1871, whilst the increase in cleaned brush is 75 per cent. This is a curious and perhaps significant fact, as it seems to show that the drouth and chinch bugs injured the essential part of the crop in a far greater ratio than its unimportant parts. This raises the question whether, as a general rule, adverse conditions will first cause the deterioration of the specially developed parts of a plant under cultivation.

EXPERIMENTS IN FEEDING.

The following report of experiments in feedings made by E. L. Lawrence, Head Farmer in charge of the Stock Farm, have excited a great deal of interest among stock feeders, although, as Mr. Lawrence warns us, care should be taken not to come to hasty conclusions, as the experiments should be several times repeated to furnish sufficient data for reliable generalization.

The weights of the thorough-bred bulls furnished by Mr. Lawrence will also prove interesting.

HON. W. C. FLAGG, *Superintendent of Experiments, Illinois Industrial University* :

I herewith present a table showing the result of an experiment made in cattle feeding, commencing November 25, 1872, and ending March 10, 1873.

The conditions of the experiment may be stated as follows :

The cattle were two years old past-grade, Short Horns, selected from a lot of forty-five steers, as evenly as possible.

Nos. 1 and 2 were each fed fifteen pounds of meal daily, mixed with ten pounds of chopped stalks, and cooked by steaming with a pressure of twenty pounds of steam forty-five minutes.

No. 3 had the same feed as Nos. 1 and 2, except for six weeks at the beginning of the experiment the feed was half a bushel of carrots, once a day, in place of the half daily allowance of meal and fodder.

No. 4 had the same as No. 3, except the meal and stalks were uncooked. It was the intention to have continued the feed of roots to the end of the experiment, but by reason of freezing the roots fed were much injured, and those to have been fed destroyed, so that this part of the experiment had to be abandoned ; and not knowing the value of the roots fed, and for reasons above stated, I have not given these two a showing in the final result.

Nos. 5 and 6 had the same food as Nos. 1 and 2, except that it was uncooked. Nos. 7 and 8 had the same feed of chopped stalks as the others, fed dry, and had, in place of fifteen pounds of meal, eighteen pounds of corn in the ear, husked and broken.

All the foregoing were fed in the stable, in box stalls, bedded down, and everything done to make them comfortable. They were let out at ten o'clock in the morning and put up at four, except in extreme weather, cold or stormy, when they were out a shorter time.

Nos. 9 and 10 had the same feed of meal as the others, fed dry, in the yard, with stalks uncut fed on the ground ; they were also provided a good shed.

Nos. 11, 12, 13 and 14 were fed broken corn, eighteen pounds daily in the yard, in boxes or troughs, with uncut stalks fed on the ground sufficient for feed and bedding. These were fed in with a "bunch" of thirty-three head ; about a dozen were larger and stronger than they, and the rest smaller. These had no shelter or wind-break except common board fences, but pains was taken to provide them a bed, and they had a comfortable place to lie except for three or four days of heavy snow storm.

In the column of "cost of grain," the corn is valued at twenty cents per bushel, being the value in this market, less the cost of marketing. Grinding is allowed to cost five cents per bushel, and the yield of meal fifty-five pounds for fifty-six pounds corn. This is the *actual cost* of grinding, where power and grinder is provided, as here. It would cost fifteen cents per bushel to take to the mills—ten cents for grinding and five cents for labor in transporting to and from the mill.

In the cost of grain with Nos. 1 and 2, the cost of fuel and labor in cooking is added to the "cost of grain."

In the second column of cost, the fodder in all cases is put in at the same figures ; it is estimated that the saving, in amount, by chopping, will compensate for the time spent in the preparation.

The cost of labor has been found by allowing fifteen cents per hour for the time spent, and has been made on a basis of feeding twenty head or more in each case. The balance of the table I think will explain itself.

It has been found in weighing, which has been done each Monday morning, after ten o'clock, that if the day previous was extremely cold we expected light weight ; on the other hand, if the day previous was warm, especially if following several cold days, that we got large weight. This may be accounted for by the amount of water taken and also by the amount retained. Often cattle will drink but once in two days, and sometimes in very bad weather but once in three days, which will go to explain some heavy gains and losses. I would suggest, in any future experiment that may be made, that at the beginning the animals be weighed for seven consecutive days, and also at the ending, and that a comparison of these seven weighings be made and this average of weight be taken from which to ascertain the actual gains.

Respectfully submitted.

E. L. LAWRENCE.

P. S.—I should state that in order to prove anything, that this experiment should be several times repeated. And I should also explain that the Steers Nos. 1 and 2, although they were to all appearances equal to the rest when they were first put in stable, I think are not as good feeders as the others, at least as good when put under restraint. They have not become tame, and appear restive and wild.

The color of the cattle is as follows :

Nos. 1, 2, 3, 4, 5, 6, 7, 9 and 11, are red and white and roan and white, white being largely the predominating color.

No. 8 is clear white.

No. 14 is a dark or brindle roan.

No. 10, red and white, half each.

Nos. 12 and 13, red and white, mostly red.

E. L. L.

Experiments in Feeding:

No.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.	35.	36.	37.	38.	39.	40.	41.	42.	43.	44.	45.	46.	47.	48.	49.	50.	51.	52.	53.	54.	55.	56.	57.	58.	59.	60.	61.	62.	63.	64.	65.	66.	67.	68.	69.	70.	71.	72.	73.	74.	75.	76.	77.	78.	79.	80.	81.	82.	83.	84.	85.	86.	87.	88.	89.	90.	91.	92.	93.	94.	95.	96.	97.	98.	99.	100.	101.	102.	103.	104.	105.	106.	107.	108.	109.	110.	111.	112.	113.	114.	115.	116.	117.	118.	119.	120.	121.	122.	123.	124.	125.	126.	127.	128.	129.	130.	131.	132.	133.	134.	135.	136.	137.	138.	139.	140.	141.	142.	143.	144.	145.	146.	147.	148.	149.	150.	151.	152.	153.	154.	155.	156.	157.	158.	159.	160.	161.	162.	163.	164.	165.	166.	167.	168.	169.	170.	171.	172.	173.	174.	175.	176.	177.	178.	179.	180.	181.	182.	183.	184.	185.	186.	187.	188.	189.	190.	191.	192.	193.	194.	195.	196.	197.	198.	199.	200.	201.	202.	203.	204.	205.	206.	207.	208.	209.	210.	211.	212.	213.	214.	215.	216.	217.	218.	219.	220.	221.	222.	223.	224.	225.	226.	227.	228.	229.	230.	231.	232.	233.	234.	235.	236.	237.	238.	239.	240.	241.	242.	243.	244.	245.	246.	247.	248.	249.	250.	251.	252.	253.	254.	255.	256.	257.	258.	259.	260.	261.	262.	263.	264.	265.	266.	267.	268.	269.	270.	271.	272.	273.	274.	275.	276.	277.	278.	279.	280.	281.	282.	283.	284.	285.	286.	287.	288.	289.	290.	291.	292.	293.	294.	295.	296.	297.	298.	299.	300.	301.	302.	303.	304.	305.	306.	307.	308.	309.	310.	311.	312.	313.	314.	315.	316.	317.	318.	319.	320.	321.	322.	323.	324.	325.	326.	327.	328.	329.	330.	331.	332.	333.	334.	335.	336.	337.	338.	339.	340.	341.	342.	343.	344.	345.	346.	347.	348.	349.	350.	351.	352.	353.	354.	355.	356.	357.	358.	359.	360.	361.	362.	363.	364.	365.	366.	367.	368.	369.	370.	371.	372.	373.	374.	375.	376.	377.	378.	379.	380.	381.	382.	383.	384.	385.	386.	387.	388.	389.	390.	391.	392.	393.	394.	395.	396.	397.	398.	399.	400.	401.	402.	403.	404.	405.	406.	407.	408.	409.	410.	411.	412.	413.	414.	415.	416.	417.	418.	419.	420.	421.	422.	423.	424.	425.	426.	427.	428.	429.	430.	431.	432.	433.	434.	435.	436.	437.	438.	439.	440.	441.	442.	443.	444.	445.	446.	447.	448.	449.	450.	451.	452.	453.	454.	455.	456.	457.	458.	459.	460.	461.	462.	463.	464.	465.	466.	467.	468.	469.	470.	471.	472.	473.	474.	475.	476.	477.	478.	479.	480.	481.	482.	483.	484.	485.	486.	487.	488.	489.	490.	491.	492.	493.	494.	495.	496.	497.	498.	499.	500.	501.	502.	503.	504.	505.	506.	507.	508.	509.	510.	511.	512.	513.	514.	515.	516.	517.	518.	519.	520.	521.	522.	523.	524.	525.	526.	527.	528.	529.	530.	531.	532.	533.	534.	535.	536.	537.	538.	539.	540.	541.	542.	543.	544.	545.	546.	547.	548.	549.	550.	551.	552.	553.	554.	555.	556.	557.	558.	559.	560.	561.	562.	563.	564.	565.	566.	567.	568.	569.	570.	571.	572.	573.	574.	575.	576.	577.	578.	579.	580.	581.	582.	583.	584.	585.	586.	587.	588.	589.	590.	591.	592.	593.	594.	595.	596.	597.	598.	599.	600.	601.	602.	603.	604.	605.	606.	607.	608.	609.	610.	611.	612.	613.	614.	615.	616.	617.	618.	619.	620.	621.	622.	623.	624.	625.	626.	627.	628.	629.	630.	631.	632.	633.	634.	635.	636.	637.	638.	639.	640.	641.	642.	643.	644.	645.	646.	647.	648.	649.	650.	651.	652.	653.	654.	655.	656.	657.	658.	659.	660.	661.	662.	663.	664.	665.	666.	667.	668.	669.	670.	671.	672.	673.	674.	675.	676.	677.	678.	679.	680.	681.	682.	683.	684.	685.	686.	687.	688.	689.	690.	691.	692.	693.	694.	695.	696.	697.	698.	699.	700.	701.	702.	703.	704.	705.	706.	707.	708.	709.	710.	711.	712.	713.	714.	715.	716.	717.	718.	719.	720.	721.	722.	723.	724.	725.	726.	727.	728.	729.	730.	731.	732.	733.	734.	735.	736.	737.	738.	739.	740.	741.	742.	743.	744.	745.	746.	747.	748.	749.	750.	751.	752.	753.	754.	755.	756.	757.	758.	759.	760.	761.	762.	763.	764.	765.	766.	767.	768.	769.	770.	771.	772.	773.	774.	775.	776.	777.	778.	779.	780.	781.	782.	783.	784.	785.	786.	787.	788.	789.	790.	791.	792.	793.	794.	795.	796.	797.	798.	799.	800.	801.	802.	803.	804.	805.	806.	807.	808.	809.	810.	811.	812.	813.	814.	815.	816.	817.	818.	819.	820.	821.	822.	823.	824.	825.	826.	827.	828.	829.	830.	831.	832.	833.	834.	835.	836.	837.	838.	839.	840.	841.	842.	843.	844.	845.	846.	847.	848.	849.	850.	851.	852.	853.	854.	855.	856.	857.	858.	859.	860.	861.	862.	863.	864.	865.	866.	867.	868.	869.	870.	871.	872.	873.	874.	875.	876.	877.	878.	879.	880.	881.	882.	883.	884.	885.	886.	887.	888.	889.	890.	891.	892.	893.	894.	895.	896.	897.	898.	899.	900.	901.	902.	903.	904.	905.	906.	907.	908.	909.	910.	911.	912.	913.	914.	915.	916.	917.	918.	919.	920.	921.	922.	923.	924.	925.	926.	927.	928.	929.	930.	931.	932.	933.	934.	935.	936.	937.	938.	939.	940.	941.	942.	943.	944.	945.	946.	947.	948.	949.	950.	951.	952.	953.	954.	955.	956.	957.	958.	959.	960.	961.	962.	963.	964.	965.	966.	967.	968.	969.	970.	971.	972.	973.	974.	975.	976.	977.	978.	979.	980.	981.	982.	983.	984.	985.	986.	987.	988.	989.	990.	991.	992.	993.	994.	995.	996.	997.	998.	999.	1000.	1001.	1002.	1003.	1004.	1005.	1006.	1007.	1008.	1009.	1010.	1011.	1012.	1013.	1014.	1015.	1016.	1017.	1018.	1019.	1020.	1021.	1022.	1023.	1024.	1025.	1026.	1027.	1028.	1029.	1030.	1031.	1032.	1033.	1034.	1035.	1036.	1037.	1038.	1039.	1040.	1041.	1042.	1043.	1044.	1045.	1046.	1047.	1048.	1049.	1050.	1051.	1052.	1053.	1054.	1055.	1056.	1057.	1058.	1059.	1060.	1061.	1062.	1063.	1064.	1065.	1066.	1067.	1068.	1069.	1070.	1071.	1072.	1073.	1074.	1075.	1076.	1077.	1078.	1079.	1080.	1081.	1082.	1083.	1084.	1085.	1086.	1087.	1088.	1089.	1090.	1091.	1092.	1093.	1094.	1095.	1096.	1097.	1098.	1099.	1100.	1101.	1102.	1103.	1104.	1105.	1106.	1107.	1108.	1109.	1110.	1111.	1112.	1113.	1114.	1115.	1116.	1117.	1118.	1119.	1120.	1121.	1122.	1123.
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Table showing the weights of Bulls of the different breeds, from March 1, 1872, to March 1, 1873.

They were fed all the hay they would eat. The relative amount of feed of corn meal was for the Short Horn and Hereford, three to two for the rest of the cattle, except that for the months of June, July and August, the Devon had the same as the first. After that he failed to eat so much.

Month.	Hereford, 14 months old.	Short Horn, 13 months old.	Ayrshire, 8 months old.	Devon, 9 months old.	Jersey, 6 months old.
1872. March 1	965	1,030	730	.....	360
April 1	1,070	1,070	780	.....	420
May 1	1,160	1,170	840	.....	466
June 1	1,180	1,185	885	385	506
July 1	1,235	1,240	912	480	562
August 1	1,280	1,265	940	535	610
September 1	1,320	1,270	975	600	650
October 1	1,330	1,325	970	640	690
November 1	1,410	1,380	1,070	710	790
December 1	1,430	1,375	1,094	722	810
1873. January 1	1,470	1,440	1,120	775	880
February 1	1,580	1,540	1,140	830	860
March 1	1,590	1,570	1,220	860	980
Per cent. of gain last 3 mos. ....	.082	.09	.089	.109	.113

EXPERIMENTAL GRAFTING.

Although not in charge of the horticultural departments, I have taken the liberty of working up the figures, reported in another place by Mr. Vickroy, a little farther, and accordingly repeat with some additions and omissions the report he has given as I prepared it for the Champaign Gazette :

H. K. Vickroy, orchardist and gardener, has made an interesting report upon the experimental grafting done in the University nursery, 1871-72.

Grafts of 1872, made with the cions of Ben Davis apple, each 5 inches long, grafted, except when otherwise noted, on $3\frac{1}{2}$ inch roots, February 1, and set out April 26, 1872, gave the following results. Ten grafts were made of each :

Cut of cion, etc.	Cut of root.	Growth in inches.	Per ct living
But or 1st cion	Collar of 1st cut	23.14	70
" 2d "	" " "	23.12	80
" 3d "	" " "	19.60	50
" 1st "	" 2d "	21.00	70
" 2d "	" " "	20.33	90
" 3d "	" " "	21.66	60
" 1st "	" 3d "	19.33	60
" 2d "	" " "	17.87	80
" 3d "	" " "	drown	ed out
6 inch roots	1st cut	30.00	70
6 " "	2d "	25.50	100
4 inch roots	1st "	25.00	90
4 " "	2d "	24.00	60
2 $\frac{1}{2}$ " "	1st "	24.00	80
1 $\frac{1}{2}$ " "	2d "	21.66	60
1 $\frac{1}{2}$ " "	1st "	22.62	80
1 $\frac{1}{2}$ " "	2d "	19.25	40
Roots 3 times larger than cion	1st "	29.00	80
" same size as cion	1st "	27.87	70

Taking the averages of these we get the following :

	Growth in inches.	Per ct. living.
First cut of cion.....	21.17	66.66
Second cut of cion.....	20.44	83.33
Third cut of cion.....	20.95	55.00
First cut of root.....	22.61	66.66
Second cut of root.....	21.00	73.33
Third cut of root.....	18.60	70.00
Six inch roots.....	27.75	85.00
Four inch roots.....	24.50	75.00
Two and a half inch roots.....	22.83	70.00
One and a half inch roots.....	20.93	60.00

The longest growth and largest per cent. of living grafts were on the six inch roots, not taking into account the roots three times larger than the cion from which we got no averages, and the length of growth and percentage of living grafts diminish pretty regularly as the length of root diminishes.

Comparing different cuts of cions, we find that the first, or but cut, makes the longest growth; but the second cut the largest percentage of living grafts.

Comparing cuts of roots, the first, or collar cut, makes the longest growth, and the second shows the largest percentage of living grafts.

As in 1871, so in 1872, there appears to be very little difference between the first and second cuts, both of root and cion; and further experiments are necessary to determine which is practically the best.

The comparison of roots of different lengths shows that the experiments of 1872 give much more uniform and apparently reliable results. We are probably safe in saying that, planted under the conditions given, the longest rooted plant would give the best results; not so much in greater length of growth, however, as in the larger percentage of living plants. Mr. Vickroy observes that in 1872—and the same was probably true in 1871—that grafts planted at a shallow depth started sooner and made a better growth than when they were planted deeply. This observation, no doubt, explains the remarkable growth of cions on short roots.

The grafts of 1871, Mr. Vickroy has again counted and measured. The following table shows the growth and percentage of the same grafts in their first and second year :

Cut of cions, etc.	Cut of root.	Aver'ge growth in 1871.	Aver'ge growth in 1872.	Per cent. living 1871.	Per cent. living 1872.
But of 1st.....	Collar or 1st.....	14.77	43.86	90.	70.
" 2d.....	" 1st.....	9.36	37.00	70.	40.
" 3d.....	" 1st.....	8.06	39.80	80.	50.
" 4th.....	" 1st.....	19.08	43.25	60.	40.
" 1st.....	" 2d.....	14.64	41.00	70.	20.
" 2d.....	" 2d.....	15.80	42.00	80.	10.
" 3d.....	" 2d.....	8.50	none	30.	none
" 1st.....	" 3d.....	9.00	40.00	30.	20.
" 2d.....	" 3d.....	9.62	29.00	40.	40.
" 3d.....	" 3d.....	10.25	41.00	70.	20.
" 4th.....	" 3d.....	7.00	.....	40.	.....
" 1st.....	" 4th.....	11.66	29.00	30.	10.
" 2d.....	" 4th.....	none	.....	none	.....
" 3d.....	" 4th.....	12.12	21.00	40.	10.
" 4th.....	" 4th.....	8.00	26.00	20.	10.
6 inch root.....	" 1st.....	22.56	47.25	80.	80.
6 ".....	" 2d.....	8.13	37.50	50.	40.
4 ".....	" 1st.....	16.12	41.57	80.	70.
4 ".....	" 2d.....	19.14	38.66	70.	60.
2½ ".....	" 1st.....	14.06	34.50	60.	60.
2½ ".....	" 2d.....	9.00	36.00	20.	10.
2½ ".....	" 3d.....	9.00	35.00	10.	10.
2½ ".....	" 4th.....	12.66	50.00	30.	10.
1½ ".....	" 1st.....	21.00	47.33	30.	30.
1½ ".....	" 2d.....	26.00	50.00	10.	10.
1½ ".....	" 3d.....	12.50	41.33	40.	30.
1½ ".....	" 4th.....	17.00	31.50	30.	20.
2½ ".....	" 1st inverted.....	14.83	38.00	30.	10.
2½ ".....	" 2d.....	14.25	36.75	60.	40.
Root 6 times as large as cion.....	" 1st.....	21.75	41.25	80.	80.
Root 4 ".....	" 1st.....	18.56	42.57	70.	70.

In 1871 similar experiments were made with the same variety of apple. We have below a comparison of the growths, etc., of the two years :

	Growth in inches, 1871.	Growth in inches, 1872.	Per ct. living, 1871.	Per ct. living, 1872.
1st cut of cion	12.51	21.17	52.00	66.66
2d " "	11.59	20.44	63.00	83.33
3d " "	9.63	20.95	55.00	55.00
1st " root	12.81	22.01	72.00	66.66
2d " "	12.98	21.00	60.00	73.33
3d " "	8.96	18.60	45.00	70.00
6 inch roots	15.48	27.75	65.00	85.00
4 " "	17.63	24.50	75.00	75.00
2½ " "	11.58	22.83	40.00	70.00
1½ " "	22.00	20.93	20.00	60.00

The length of growth and percentage of live grafts was much greater in 1872 than in 1871, which was a very dry and unfavorable year.

Taking averages we have the following results :

	Growth in inches, 1871.	Growth in inches, 1872.	Per ct. alive, 1871.	Per ct. alive, 1872.
But or 1st cion	12.51	28.46	52.	30.
" 2d "	11.59	36.00	63.	30.
" 3d "	9.63	33.93	55.	26.66
" 4th "	11.35	34.62	40.	25.
Collar or 1st root	12.81	40.98	72.	50.
" 2d "	12.98	41.50	60.	15.
" 3d "	8.96	36.66	45.	26.66
" 4th "	8.21	25.33	30.	10.

These figures go to show as the same grafts did in 1871 and as those of 1872, that the nearer the collar of the root and the but of the cion, the better the graft, but with hardly any difference between the first and second cuts of either.

The averages of the roots of different lengths of the grafts set in 1871, give the following report for their first and second year :

	Growth in inches, 1871.	Growth in inches, 1872.	Per ct. living, 1871.	Per ct. living, 1872.
6 inch roots	15.34	42.37	65.	60.
4 " "	17.63	39.61	75.	65.
2½ " "	11.18	38.87	30.	22.
1½ " "	17.87	42.54	27.	22.
2½ " "	14.54	37.37	45.	25.
Root 6 times larger than cion	21.75	41.25	80.	80.
4 " "	18.56	42.57	70.	70.

Comparing length of roots we find, as in 1871, the largest percentage living among the 4 inch roots, but the superior growth from the short roots—when they survived—is maintained from last year ; but the short roots die out considerably more, even in a favorable season. Perhaps deep planting and treading, however, would prevent this.

Inverted roots seem to have succeeded better than roots of the same length properly set. This is probably accidental.

With roots larger than the cion the best results of all have occurred both in percentage of living grafts and in the length of growth ; but this is not borne out by the grafts set in 1872. Probably the results of a wet and dry year would vary in this respect. The extra amount of root would be quite advantageous in drouth, but not specially so in a moist atmosphere.

EXPERIMENTS IN FOREST PLANTATIONS.

The report of H. K. Vickroy, Orchardist and Gardener, who has had charge of the forest plantations thus far, shows that he planted in 1871, seven acres, with 14 species of forest trees, comprising 36,749 trees of 1, 2 and 3 years of age, and in 1872, 1½ acres more with 4,083 trees, making a total of 40,832 trees, or, including 4,000 Larch, 1,000 Austrian and 1,000 Scotch Pine replanted, 46,832 trees. All the trees, except the Evergreens, were planted 2 x 4 ft., or 5,444 trees to the acre. The Evergreens were planted 4 x 4 ft., or 2,722 trees to the acre.

The following table, compiled from the more detailed report of Mr. Vickroy, gives the species planted, the number of trees of each, the percentage living, and the average growth of the trees planted in the first year:

Species.	No. trees.	Pr. cent living.	Growth in inch.
Ash, Green	1,360	98	6
Ash, White	14,974	95	6
Catalpa	1,361	100	12
Elm, White	680	100	12
Chestnut	1,361	50	6
Larch, European	10,890	25	6
Maple, White	680	98	12
Osage Orange	1,361	98	24
Pine, Austrian	680	2	-----
Pine, Scotch	680	2	-----
Walnut, White	1,361	99	6
Willow, White	1,361	98	24
Pine, White, 1872	2,722	20	3
Spruce, Norway, 1872	1,361	98	3

The Catalpa, White Elm, White Walnut, Green Ash, White Maple, Osage Orange, White Willow and Norway Spruce were not diminished in numbers to exceed 2 per cent., although most of them were planted in the very dry season of 1871; but the Austrian and Scotch Pines were about annihilated, and the European Larch and Chestnut made but a poor showing. The Osage Orange and White Willow made the best growth, and stand just even in vitality and vigor, whilst the timber of one is of little value, and that of the other among the best.

The cost of an acre of each of these species of trees up to the end of the first year, including cost of trees, planting and cultivation, is as follows:

Ash, Green	\$161 38
Ash, White	69 16
Catalpa	113 00
Elm, White	97 12
Chestnut	162 98
Larch, European	63 86
Maple, White	145 78
Osage Orange	46 08
Pine, Austrian	119 36
Pine, Scotch	149 16
Walnut, White	99 94
Willow, White	56 36
Pine, White	144 34
Spruce, Norway	190 04

The most costly tree, it will be seen, is the Norway Spruce, next to which stands the Chestnut and the Green Ash, and the two other Evergreens, the Austrian and Scotch Pines, for which a comparatively high price has to be paid.

The cheapest tree is the Osage Orange, next to which come the White Willow, European Larch and White Ash. Thus the Osage Orange was not only one of the healthiest and fastest growers, but also the cheapest, making three points in favor of that species.

Coming now to the second year, 1872, we make the following table of the species two years planted, showing the per cent. living, the average growth, and the cost of an acre of each to the close of the year 1872, including cost of tree planting, replanting and cultivation:

Species.	Pr. cent living.	Av'rage growth.	Cost per acre.
Ash, Green.....	98	30	\$171 48
Ash, White.....	93	36	75 88
Catalpa.....	100	48	134 38
Elm, White*.....	100	42	116 12
Chestnut.....	4	24	166 38
Larch, European.....	30	24	97 47
Maple, White.....	98	48	151 60
Osage Orange*.....	98	66	65 98
Pine, Austrian.....	30	4	312 26
Pine, Scotch.....	20	4	260 76
Walnut, White.....	99	24	122 34
Willow, White.....	98	48	79 06

* These varieties were cut to the ground in the Spring in order to get a straight growth.

The most expensive acres are those set with Evergreens, but, compared with the results obtained, the Chestnut has proved the less satisfactory. The cheapest tree as well as the most vigorous, is still the Osage Orange, with the White Ash and White Willow succeeding it.

If we may regard the ratio of percentage of living plants as the "survival of the fittest," the argument is strong against the planting of conifers, excepting the Norway Spruce, for forests in our Champaign county, and overwhelmingly against the Chestnut. Mr. Vickroy is of the opinion, however, that if the Chestnut trees were protected for a time by other trees, they would succeed.

The showing thus far is also strongly in favor of the Osage Orange and White Ash, both valuable timber trees, and rather against the White Willow and White Maple, trees that have been encouraged because of their supposed easy and rapid growth. Many more years, however, will be needed to settle these questions conclusively.

AWARDING OF PRIZE FOR BEST AND GREATEST YIELD OF CORN, ON TEN ACRES.

SPRINGFIELD, *January 15, 1873.*

The undersigned, having been appointed a committee to award the premium of one hundred dollars in gold to the person who should raise the greatest amount of corn on ten acres of land, during the season of 1872, planted with the Climax Corn Planter, manufactured by the Springfield Manufacturing Company of Springfield, Illinois, met this day in the office of the company, and find the following competitors for the prize, and the amount raised by each; each case being substantiated by affidavit that ten acres did produce by actual measurement, as per report below:

PRODUCT OF TEN ACRES OF GROUND.

Names.	Residence.	No. of acres plant'd.	Av'rage per acre.	Amount on 10 acres.		Average per acre.	
				bus.	lbs.	bus.	lbs.
Ephraim Dragoo.....	Camargo, Douglas county, Ill.....	70	60	1,313	..	131	21
Thomas Casey.....	Sycamore, DeKalb county, Ill.....	25	100	1,296	..	129	42
Harvey Otter.....	Garret, Douglas county, Ill.....	75	100	1,222	..	122	15
A. V. Washburne.....	Garret, Douglas county, Ill.....	40	86½	1,184	35	118	31
George Spence.....	Hale, Warren county, Ill.....	55	85	1,142	60	114	20
Daniel S. Rose.....	Garret, Douglas county, Ill.....	30	95	1,076	20	107	44
Frank J. Arenz.....	Beardstown, Cass county, Ill.....	80	70	1,070	30	107	02
Josephus Dori.....	Indian Creek, Mills county, Ia.....	80	70	1,057	35	105	52
S. L. Busick.....	Bement, Piatt county, Ill.....	40	60	1,039	..	103	63
Robert J. Collins.....	Loami, Sangamon county, Ill.....	50	83	1,008	..	100	56
Amos Rutledge.....	Rutledge, DeWitt county, Ill.....	35	.....	992	30	99	19
A. M. Shively.....	Sadorus, Champaign county, Ill.....	100	80	956	40	95	46
Benjamin Crispin.....	Madison, Mahaska county, Ia.....	70	73	932	20	93	16
Michael Gore.....	Carlinville, Macoupin county, Ill.....	80	85	926	42	92	46
Enoch Primm.....	Petersburg, Menard county, Ill.....	45	75	888	10	87	57
George Conklin.....	Otoe, Otoe county, Neb.....	70	65	800	..	80	..
P. W. Phillips.....	Prairie, Mahaska county, Ia.....	80	75	772	60	77	20

The committee having considered all the cases submitted, have awarded the gold prize of one hundred dollars to Mr. Ephraim Dragoo, of Camargo, Douglas county, Illinois, and also recommend that a corn planter of the best workmanship be presented to Mr. Thos. Casey, of Sycamore, DeKalb county,

Illinois, and also one of like quality to be presented to Mr. Harvey Otter, of Garret, Douglas county, Illinois.

The committee also congratulate the other competitors upon the unparalleled success they have attained in the cultivation of the great staple of the West, and express the belief that an exhibit of greater productiveness of the soil has not heretofore been presented in this country.

Very respectfully submitted.

(Signed,) ALEXANDER STARNE,
WM. H. HERNDON,
WM. M. SPRINGER.

EXECUTIVE COMMITTEE MEETINGS.

OCTOBER, 1872.

The Committee met on Wednesday, October 2d, 1872, at 4 P.M., in the Regent's office.

Present—Messrs. Brown, Cobb, Cunningham, Goltra, Scott, and the Regent.

Absent—Messrs. Lawrence, Pearce, and Pickrell.

The Committee at once proceeded to inspect the state and progress of the new University building, the architect, Mr. J. M. Van Osdel, being present.

On returning to the office, the Committee went into session.

The reading of the minutes of the last meeting was dispensed with, and after a discussion on the subject of the new building, the Committee took a recess to reassemble at 7:30 P. M.

EVENING SESSION.

The Committee met at the time appointed.

The bills presented for payment were then audited and allowed.

Mr. T. R. Leal's bill of \$150 for purchases for the University cabinets, was allowed.

He reported the following donations made to the cabinets:

Mrs. Maxwell, Boulder City, Colorado—Rocky Mountain crow, jay, magpie, and prairie dog owl, one mounted specimen each.

Mr. Leopold Buckhardt, Denver, Colorado—One antelope, mounted.

Capt. Nickols, Boulder City, Col.—One Indian calumet.

Mr. James Anderson, Boulder City, Col.—One squaw's bonnet.

Mr. Dennison, Estis Park, Col.—One stone knife.

Mrs. S. S. Chamberlain, Laporte, Col.—One pair elk horns.

Mr. A. E. Sprague, Big Thompson, Col.—One pair elk horns.

Mr. T. R. Leal.—One box fossil leaves, one box fossil shells, Indian mortar and three clubs; collections invoiced at \$46 15.

The Committee extended their thanks to Mr. T. R. Leal and the parties named for the donations received for the University cabinet.

The bills of Messrs. Flynn & Scroggs for bookbinding, and Mr. E. V. Peterson for stationery, were referred to the Regent, with power to settle, if correct.

The reports of the Horticultural Department, the Farm Superintendent, the Mechanical Department, and Carpenter Shop were read and accepted.

A requisition from the mechanical and carpenter shops for divers articles, was referred to a Committee consisting of Dr. Gregory and Mr. Pearson.

The report of Mr. W. M. Beatty of his recent survey of the University lands in Minnesota was received, the amount of \$160 for expenses and services allowed, and the thanks of the Committee expressed to him for the faithful survey and accurate description of the University lands in Nebraska and Minnesota.

Mr. E. Cobb offered the following resolution :

WHEREAS, The business of the University in its various departments has greatly increased, and is constantly increasing; and whereas it is deemed vitally essential to the interests of the University that all purchases be made through the Regent or his assistant; therefore, be it

Resolved, That Prof. Snyder be relieved from his classes in bookkeeping and act as such assistant to the Regent.

This resolution was adopted, and the Secretary instructed to inform the heads of departments of the above action of the Board.

The following resolution, offered by Judge Cunningham, was adopted :

WHEREAS, In accordance with a resolution of the Board of Trustees, at the annual meeting held in March, 1870, a sale of the south half northeast quarter section 21, town 13, range 9 east, has been negotiated to C. R. Griggs, therefore

Resolved, That the Regent, upon receiving the agreed consideration, execute and deliver to Mr. Griggs a deed conveying said lands with the usual covenants of warranty.

It was decided that handbills, advertising the sale of University lands, be printed, and that the interest of deferred payments shall be 6 per cent. for the lands in Minnesota, and 8 per cent. for the lands in Nebraska.

The architect, Mr. J. M. Van Osdel, then read his report on the progress of the new University building, which was accepted, and on his recommendation, an amount of \$9,679 39 (payments assigned) was allowed to Mr. E. F. Gehlman, the contractor.

It was directed to leave off the construction of a new gallery in the chapel of the new University building.

A report of Prof. J. B. Webb, of the Department of Civil Engineering, was read by the Regent, requesting additional instruments for the Department. The report was accepted, and it was ordered that the recommended purchases be made, or such part thereof as the appropriation for library and apparatus may allow.

The Regent was instructed to attend the meetings of the Presidents of State institutions, and there to represent the financial wants of the University.

The Regent was directed to have a suitable flagstaff erected on the northeast tower of the new University building.

The Committee approved the following appointments of tutors and assistants made by the Regent:

Mr. E. S. Steele, tutor in Latin and English, salary \$600 for the year.

Mr. Chas. W. Silver, assistant in chemical laboratory, salary \$700 for the year.

Miss Charlotte E. Patchin, teacher of free hand drawing, at \$10 a week.

Mr. P. Gennadius, teacher of French, salary \$30 per month.

Miss M. E. Gregory, private secretary to the Regent, at \$30 per month.

Mr. Charles W. Rolfe, assistant in library and cabinet, at \$40 per month.

Mr. H. C. Ricker, instructor in architectural or projection drawing, at \$50 per month.

The Committee then adjourned to meet Wednesday, November 6th, 1872.

NOVEMBER 6, 1872

The Committee met on Wednesday, November 6, 1872, in the Regent's office, at 4 o'clock P. M.

Present—Messrs. Brown, Cunningham, Goltra, Pickrell, Pearson, Scott, and the Regent.

The Committee took a recess to inspect the new University building.

EVENING SESSION.

The record of the last meeting was read and approved.

The Bookkeeper's statement of expenditures to date and collections was read and accepted.

The following resolutions and rules were adopted:

Resolved, That the order of this Committee passed at the October meeting, directing that Porf. Snyder be relieved from his classes in bookkeeping, and that all purchases for the use of the University be made through the Regent, be modified by the adoption of the following rules for the government of all persons in the employ of the University.

First. No purchases or sales shall be made for the University, nor debts be contracted against the University by any officer, Superintendent, or other employee of the University, or of any of its departments, without an express order of the Board of Trustees, or of the Executive Committee, except in the following cases, viz:

1. The Regent may procure in intervals of the meeting of the Executive Committee, such necessary labor, service, tools and materials, as cannot be dispensed with till the next meeting of the Committee: but he shall give full account of the same, at such meeting.

2. The Superintendent in charge of either of the shops may purchase such articles as may be required for immediate use, and may make such sales and cause to be performed such work as may be required during the month; but these purchases shall be entered upon a pass-book, and shall be reported, together with all work done and sales made, to the Regent's office, at the close of each month.

3. The head-farmer of the stock-farm, and the head-gardener or superintendent of Horticultural Department may purchase articles of immediate necessity, and procure such blacksmithing and repair of tools, as the work of their departments may require, and may make sales of such farm and garden products as may need to be sold; and all such purchases, repairs and sales, shall be reported to the Regent's office, at the close of each month.

Second. The several superintendents of heads of shops, farms, and other practical departments shall keep memorandum books, in which they shall note, from time to time, the articles wanted in their respective departments, and shall report their want monthly to the Regent, who shall report them to the Executive Committee for their action.

Third. It shall be the duty of the Regent to report every violation of these rules to the Executive Committee at the next meeting after such violation shall become known.

The bills presented for payment were audited and allowed.

A bill of W. C. Burnett, for one quarter mile of division fence on the University farm, was referred to Mr. James Scott, to report at next meeting.

The reports from Horticultural Department, the Mechanical and Carpenter Shop and Agricultural Department were read and adopted.

A bill of \$50 to A. Johnson, for stone spawls, was allowed.

The Regent was authorized to have such printing and advertising of the University done, as he may deem proper.

On motion, \$60 were allowed toward furnishing the Drill Hall with gymnastic apparatus.

On motion of Judge Cunningham, it was

Resolved, That the Regent be authorized to cause such grading to be done around the new building as will be necessary to turn the surface water away from the building.

The Regent was instructed to have the floor of the two Society rooms in the new University building laid in alternate strips of walnut and ash.

The subject of arrangements of the outside course of lectures was referred to the Regent and Corresponding Secretary.

The Superintendent of Experimental Farm was authorized to sell such products and crops of the farm as, in his discretion, he may find desirable.

On motion of Mr. E. Cobb, a warrant was ordered to be drawn to Mr. Gehlman, for such an amount as J. M. Van Osdel, the architect, shall certify as due him under the contract.

On recommendation of J. M. Pearson, chairman of the Mechanical Committee, a blower was ordered to be bought for the Mechanical Shop, and further, that the price of the engine transferred from the Mechanical Department to the Farm, be fixed at \$500, same amount to be charged to the Mechanical Shop.

The Regent was authorized to have the chimney for engine-house raised 20 feet.

The Committee adjourned, to meet again at the call of the Regent.

NOVEMBER 19, 1872

The Executive Committee were called to order at 10 o'clock A. M.

Present—Messrs. Brown, Cunningham, Scott and Pearson; also, John W. Bunn, Treasurer, and J. M. Van Osdel, Architect.

The minutes of last meeting were read and approved.

The architect, Mr. J. M. Van Osdel, made his report on the state and progress of the new University building. The bond of contract and the contract itself were read, and Judge Cunningham offered the following resolutions:

WHEREAS, In the construction of the new University building various changes in the work have been ordered by the committee and executed by Mr. Gehlman; and whereas, the contract with Mr. Gehlman, of date June 7th, 1871, provides that the price of said work shall be determined and fixed by three referees, one to be chosen by the Trustees of the University, one by said Gehlman, and one by the two thus chosen; therefore,

(1) *Resolved*, That George Chambers, Esq., of Chicago, be and is hereby chosen to act as referee on the part of the Board of Trustees.

(2) *Resolved*, That the Secretary at once cause to be served upon Mr. E. F. Gehlman a notice of such selection and appointment, with a request that said Gehlman select on his part some person, who, with a third referee, chosen by the two above named, shall determine and report the value of said extra work.

The motion was laid on the table until afternoon, and the Committee took a recess till 2 P. M.

AFTERNOON SESSION.

The Committee reassembled at the hour appointed.

The preamble and resolutions offered by Judge Cunningham, tabled in the forenoon, were taken up and adopted.

Prof. S. W. Shattuck's bill for surveying and mapping of the Experimental Farm was allowed.

It was ordered that a sheet-iron drum be added to the heating apparatus of the green-house.

The Regent was authorized to ask the War Department for the detail of Capt. A. Howe, U. S. A., as instructor of military tactics.

The Committee adjourned to the call of the Regent.

DECEMBER 10, 1872.

The Committee assembled at the Regent's office at 10 A. M.

Present—Messrs. Brown, Cobb, Cunningham, Pearson, Pickrell, Scott, and the Regent.

The report of Mr. Van Osdel, the architect, and that of the referees on the amount and price of extras to be allowed to the contractor, E. F. Gehlman, were read.

On motion the same were accepted and ordered to be placed on file.

The minutes of last meeting were read and adopted.

The report of the Book-keeper and statement of receipts and expenditures were then received.

The bills presented for payment were audited and allowed.

Mr. J. R. Scott reported as a committee on valuation of a division fence on University lands (Griggs' Farm), that the said fence was not yet completed, and, therefore, no action necessary. Report accepted.

The Committee took a recess till 2 P. M.

AFTERNOON SESSION.

Committee met at the hour appointed.

The chairman of the Horticultural Committee moved that the rent for gardener's house be fixed at \$15 per month from first of November, 1872. Voted.

On recommendation of the Professor of Chemistry, A. P. S. Stuart, to purchase working apparatus for fifty more desks in the chemical laboratory, the Professor was authorized to order the same, to be charged to the State appropriation of 1872.

Professor Robinson, from Mechanical Department, reported the need of various articles for use of shops, asking an appropriation of \$132. Granted.

The balance of Mr. Thomas Waddell's salary as Superintendent of new University building was ordered to be paid.

Mr. E. Cobb was instructed to settle with the Kankakee Planing Mills for extra work and glass for new University building, and a warrant ordered to be drawn for amount found due.

The reports from the carpenter shop about work done, earnings, etc., were read and accepted.

On motion, the accounts of the arbitrators in the matter of extras at \$50, were audited, and one-half the amount ordered to be charged to Mr. Gehlman.

Judge Cunningham offered the following resolution, which was unanimously adopted :

Resolved, That the Regent be requested to prepare, have printed, and transmit to Congress, a memorial favoring the passage of the bill now pending before that body for the further endowment of Agricultural Colleges out of the revenues to arise from the sale of the public lands, and that he be authorized to affix the names of the members present of this Committee to said memorial.

The account of Mr. Gehlman for repairs on roof of mechanic and drill hall was referred to a committee consisting of the Regent, Messrs. Scott and Cunningham, with request to investigate and report.

Dr. Gregory reported that he had the promise of the Corresponding Secretary, W. C. Flagg, Esq., to deliver gratuitously a regular course of agricultural lectures to the students of the University during the winter term. The report was accepted.

The Regent was authorized to subscribe for such periodicals for 1873, as he and the faculty may decide upon.

The Committee adjourned to the call of the Regent.

JANUARY 7, 1873.

The Committee met at the call of the Regent, at 4:30 P. M.

Present—Messrs. Cobb, Cunningham, Pickrell, Scott, and the Regent.

The minutes of the last meeting were read and approved.

Dr. Gregory then read the reports from the machine and carpenter shops, also a communication from Mr. D. A. Stedman. All of which were received and ordered to be placed on file.

The following communication was then read :

To the Board of Trustees of the Illinois Industrial University :

Owing to the unprecedented advance in the price of material and labor since I undertook to erect your main University building, I find myself wholly unable to complete the work for the original price, including "extras" allowed. Since the sum of \$75,000 appropriated by the State at the first session of the 27th General Assembly was exhausted in the payment for material, and freights for the transportation of such material, I have received from the Trustees the sum of \$34,848 05, and have paid out during the same time for other material and labor used in construction of said building the sum of \$61,055 92. There are now outstanding claims against the building for material and labor amounting to about the sum of \$16,000, mostly due to men who are in actual need of their money.

From estimates made, there will yet be required to complete the building the sum of \$15,000.

I am prepared to make a full showing of all my accounts and vouchers whenever called upon to do so by your Board, or by any person authorized to examine the same.

Respectfully, E. F. GEHLMAN.

CHAMPAIGN, ILL., January 2, 1873.

The communication was received, and the Committee took a recess until 8 P. M.

EVENING SESSION.

Committee reassembled as per adjournment.

Statement of Book-keeper of receipts and expenditures read and received.

The bills presented for payment audited and allowed.

The matter of collection for hay presses manufactured for Woodmansee Bros., of Urbana, was referred to Judge Cunningham.

The settlement for a hay press made for W. Harris, of Champaign, was referred to Mr. J. R. Scott.

Bills of Mr. Gourley for services as watchman on University building, and Mr. Gehlman for office building, were laid on the table.

The following resolution was adopted :

WHEREAS, Written notice has been served upon the Regent, from Mr. E. F. Gehlman, of the fact that he has abandoned his contract with the University, of June 7, 1871, for the erection and completion of the main University building; and whereas, the building is left upon the hands of the Trustees in an unfinished condition; therefore

Resolved, That notice of these facts be at once personally served upon Adam Johnson, David G. Evans, Francis Taylor and George B. Merriman, securities upon the bond for Mr. Gehlman.

The following resolution was offered by Mr. E. Cobb, and adopted by the Committee :

Resolved, That we believe the office of State Entomologist very important to the agricultural and educational interests of the State, and that we respectfully ask the General Assembly to make the proper appropriations for the salary of its incumbent, and for the expense of illustrating the work he has prepared for instructing the people of the State in practical Entomology.

The Committee adjourned, to the call of the Regent.

FEBRUARY 26, 1873.

The Committee met on Wednesday, February 26, at 9 A. M., in the Regent's office.

Present—Messrs. Cobb, Cunningham, Goltra, Lawrence, Pearson, Pickrell, Scott and the Regent.

Absent—A. M. Brown.

The reading of the minutes of the last meeting was dispensed with.

On motion of Judge Lawrence, a Committee was appointed, consisting of Messrs. Pearson, Cunningham and Cobb, to draw up a resolution expressive of the sense of this Committee in relation to the appropriation now pending before the Legislature.

Mr. E. Cobb offered the following resolution, which was adopted :

Resolved, That the following amounts are hereby appropriated as current expenses, in addition to the appropriation made by the full Board at the meeting of March 12th, 1872 :

Board expense.....	\$300 00
Building and repairs.....	1,000 00
Incidental expense.....	300 00
Library and Cabinet.....	200 00

Mr. Cunningham, from the sub-committee, reported the following resolution, which was adopted :

WHEREAS it is represented to this Committee that a bill is now pending before the General Assembly of Illinois, appropriating to the University the sum of \$75,000, which sum is by said bill charged with the payment of certain alleged claims of the creditors of Mr. Gehlman, contractor; therefore,

Resolved, That this Committee has no knowledge of any legal claims of any person whatever against the University, on account of work performed or materials furnished for the University Building. All dues under our contract with Mr. Gehlman having been promptly paid, upon the approval by the architect, according to said contract.

Judge Cunningham then offered the following resolution :

Resolved, That the Regent be requested to communicate with the Attorney-General of Illinois, in relation to the defense in the courts of Champaign county, of all suits now pending against the University.

Carried.

The following communication from Prof. Robinson was referred to the Regent and Mr. Pearson :

To the Regent and Executive Committee:

GENTLEMEN: I would respectfully submit for your consideration the question of our lumber-drying house.

The main question is: how shall we furnish steam to Mr. Steadman, who uses it, and receives the proceeds? It may also be questioned, as to whether repairs should come out of the proceeds. The pipes have been frozen and burst, causing repairs amounting to an item.

Yours, obediently,

S. W. ROBINSON.

The following communication in relation to the manufacture of thermometer graduating machines, from Prof. Robinson, was received:

To the Regent and Executive Committee:

GENTLEMEN: Accompanying this, please find two letters from Rochester, each containing an order for a graduating machine. The price named in correspondence is \$25 00 more than that of machines we have made heretofore, viz., \$175.

I think we should clear 50 or 75 dollars on each. The state of our work in the shop is now such as to admit of our going ahead with the machines. I would respectfully ask if we shall proceed with them.

Respectfully,

S. W. ROBINSON.

On motion of Mr. Scott, Prof. Robinson was authorized to make the machines, if the Regent, on inquiry, should find the parties responsible, and that accurate accounts of outlays on said machines be kept.

Mr. James R. Scott, to whom was referred the matter of the hay-press sold to Mr. Harris, reported that no settlement has been made with Mr. Harris. Mr. Scott further recommended, that the claim against Mr. Harris be abandoned; which was adopted.

Mr. Pearson, from the Committee on Mechanical Department, reported in favor of retaining the services of Mr. Steadman under his minimum salary, until March 18th.

Adopted.

On motion, it was

Resolved, That the Regent be authorized to return a proportionate sum of the term fee to students who are prevented from prosecuting their studies by protracted sickness: *Provided*, That in no case shall the amount returned exceed one-half of the fee paid for the current term.

The report of the Book-keeper, of expenditures and collections, was read and approved.

The bills presented for payment were audited and allowed.

On motion, the sum of \$25 00 was appropriated towards the purchase of apparatus for gymnasium for the ladies of the University.

The Committee then adjourned to meet at 4 P. M., March 10th, 1873.

J. M. GREGORY, *Regent*.

E. SNYDER, *Secretary*.

MARCH 10, 1873.

The Executive Committee met Monday, March 10, 1873, at 4 P. M.
Present—Messrs. Cobb, Cunningham, Goltra, Lawrence, Scott, and the Regent.

The bills presented for payment were audited and allowed.

Mr. Jas. R. Scott's report of final settlement with Mr. Harris was accepted.

Committee adjourned to the call of the Regent.

MARCH 12, 1873.

The Executive Committee assembled after the regular meeting of the Board, at 8 o'clock P. M., Wednesday, March 12th, 1873.

Present—Messrs. Brown, Cobb, Edwards, Lawrence, Pickrell, Pearson, Scott, and the Regent.

A bill of books to Mr. Bicknell, was allowed.

Dr. Gregory was authorized to arrange for Veterinary Instruction by Dr. Prentiss, for the spring term, and an appropriation made for this purpose, not to exceed \$450.

The following resolutions, offered by Mr. Pearson, were adopted :

Resolved, That Prof. S. W. Robinson be requested to reduce the expense of his Department to the lowest point, incurring no debts for labor or materials, except such as will produce immediate returns in cash, dispensing with the use of the engine to an extent of at least one-half the time during the next two months.

Resolved, That Mr. Steadman be employed temporarily as foreman, in charge of the carpenter shop, with instructions to incur no debts for labor or material, except in such directions as will produce immediate returns in cash, and so be no charge on our funds, and also that he be paid the monthly sum of \$85 00.

The following motion, offered by Judge Brown, was sustained.

Resolved, That Mr. Vickroy be directed to supervise the labor of the experimental farm, as well as on the lands heretofore under his charge, employing teams and tools belonging to the Horticultural Department for that purpose, and that the value of the labor so performed by himself and the teams be paid for, at prices to be agreed between him and Mr. Flagg, from the Experimental Fund. In case the legislative appropriation for experiments should fail, Mr. Vickroy shall be authorized to cultivate the experimental plats in ordinary farm crops, on account of University. It was

Resolved. That the Regent and Mr. Cobb be a Committee, whose duty it shall be to negotiate for the services of a business agent, through whom all purchases for any and every department of the University shall be made, and who shall also act as book-keeper for the University, and perform such other services as shall be convenient, and report at the next meeting of the Committee.

Committee adjourned to the call of the Regent.

TUESDAY, MARCH 25, 1873.

The Committee assembled at 9:30 A. M., in the Regent's office.
Present—Messrs. Cobb, Lawrence, Goltra, Scott, and the Regent.
The Regent read the following report:

To the Executive Committee :

GENTLEMEN :—As this is the last meeting at which I shall be with you before taking the furlough granted me by the Trustees, I wish to lay before you, for your consideration, several points with regard to the management of the institution during the summer.

In view of our diminished income, we have made our arrangements to do the work of the University with the least possible expense, and I have endeavored to impress upon all the departments the necessity of the closest economy, that we may safely meet whatever emergency may come upon us. Taking it for granted that the appropriation will be made for the completing and furnishing of the new building, it is evident that the work upon it should be resumed at the earliest practicable day, in order that it may be fully completed for use at the opening of the Fall term. I have conferred with the proper officers, and they will lay before you, when it is needed, the conclusions we have reached in regard to the work.

It must be left, of course, to your wisdom to determine whether new contracts shall be formed for the several parts of the work, or whether a competent foreman shall be employed and the work completed under him. I am inclined to believe that it will be done best, and with most economy under the latter plan.

Prof. Robinson has in hand the details of a carefully considered plan for the steam heating, which, I trust, will meet your approbation. After securing proposals from competent parties, I hope that Prof. Robinson may be allowed to undertake the work, if his bid is as low as others; and I have no doubt that with the assistance he will procure, it will be done in a thorough and workmanlike manner.

The seating and furnishing, at least so much as may be needed immediately, will be best procured, in my judgment, by getting proposals from the several manufacturers, after the style and number of seats have been determined.

A part of the casings for the library will need to be put in at once, and the remainder, as well as the casings for cabinets, may, if necessary, be deferred till the opening of the Fall term, and will furnish then some labor for our shops.

As I am required by the by-laws to nominate, in case of my absence, some one to act in my place, I have concluded, after careful consideration, to present the name of Prof. S. W. Shattuck. In making this nomination, I offer no slight to the merits of other members of the faculty, equally competent and equally worthy of your confidence; but as he has already been employed by you in some superintendence of buildings and works, I have thought that in this juncture, when so much remains to be done in our business arrangements, that his services might prove more valuable to you than that of any other Professor. I am confident that all will concur, not only in this appointment, but in yielding him the heartiest support.

J. M. GREGORY, *Regent.*

The Committee on procuring the services of Book-keeper and Business Agent, made the following report:

The Committee to whom was referred the duty of employing a Book-keeper and Business Agent for the University, would report that they have engaged the services of Mr. W. L. Card, at a compensation of \$125 a month, and the use of a house belonging to the University, after the first of June, if his services should be continued; all subject to the approval of the Executive Committee. In order to define more clearly the duties of the Business Agent, we would recommend the following statement of such duties:

1st. He shall keep all books of the University, and do its business correspondence under the direction of the Regent.

2d. *Books of Departments.*—He shall also act as book-keeper of the several business departments, and keep, or cause to be kept, the books in these departments under the general direction of the superintendents in such departments. He shall make, in concurrence with the Regent, all purchases for the University or any of its departments; but no purchases shall be made except upon requisition from the heads of departments, approved by the Trustees, or such as may be ordered by the Trustees.

3d. *Sales.*—He shall aid the Regent and superintendents of the several departments, in effecting

such sales as may be authorized by the Trustees. He shall aid the Treasurer when required by said Treasurer, in making collections of all fees, rents, and other dues or debts due the University.

He shall also render such aid as may be required of him by the Regent or Trustees, in securing needful care or repairs of any property of the University, and do such other business as may from time to time be intrusted to him.

He shall keep the Regent and Trustees informed as to the state of finances and business affairs of the University, presenting the Executive Committee a monthly statement of all collections and expenditures in the several departments.

He may also be required to give instruction in book-keeping and business customs in the University classes.

His title shall be Business Agent of the University. The sales and purchases of the Stock Farm are exempted from the foregoing provisions, on account of the distance of such farm from the office.

The report of the Committee was adopted.

On motion of Mr. Scott, it was ordered that the salary of Prof. W. M. Baker be continued until further order from this Committee.

The following bills were audited and allowed :

McAllister, Coal.....	\$92 50
Doan House.....	31 25
Hosford & Spear, glass and lamps.....	7 35
Enterprise Coal Company, 3 cars coal.....	45 00
J. M. Gregory, nursery stock.....	39 61

Mr. E. L. Lawrence was authorized to purchase a set of harness.

Upon recommendation of the Regent, Prof. S. W. Shattuck was appointed Regent *pro tem.* during the absence of Dr. Gregory.

The further recommendations in the report of the Regent were accepted, and reserved for further consideration.

It was decided that Mr. Stedman be paid to the first of April under the rules existing, and that Mr. Card receive the inventory of material of shop from Mr. Stedman until further directions from this Committee.

The Regent's salary was ordered to be paid for April, and a warrant drawn for same.

The Regent reported that Dr. Prentice, Veterinary Surgeon, had accepted the proposition made by this Board, and he will remain to give instruction during the Spring term. It was decided that a stable be put up south of the mechanical shop, to be used as clinic for the Veterinary Department.

Voted that the Business Agent be instructed to examine into all accounts of Mr. Stedman and Mr. Vickroy, to ascertain the amounts, if any, which may be due them over and above their minimum salary, and report the same to the next meeting of the Executive Committee.

Adjourned to the call of the Regent.

MAY 7, 1873.

The Executive Committee met at the Regent's office, at 4:15 P. M. No quorum being present, the Secretary was instructed to notify the members absent of the adjournment of the meeting to Tuesday, May 13th, at 9 o'clock A. M.

MAY 13, 1873.

The Committee met at the Regent's office, as by adjournment.

Present—Messrs. Cobb, Goltra, Brown, Lawrence, Pickrell, Scott, and Prof. Shattuck, Regent *pro tem*.

The minutes of the last meetings were read and approved.

The Regent then read the following report :

To the Executive Committee of the Illinois Industrial University :

I have the honor to make the following report :

Since you last met, the University has lost its senior professor, by the death of Wm. M. Baker. He was much beloved and respected by his colleagues and students. Proper respect was paid to his memory by the Faculty and students. You are asked to authorize the settlement of Prof. Baker's salary account at an early day and upon a liberal basis.

Measures should be taken at once to provide a head for the Department of English Language and Literature, either by appointment of a new member of the Faculty or the assignment of one of the present ones to the position.

Under date of March 21st, the War Department refused to detail Capt. Howe, of the 4th Artillery, as Military Instructor at the University. He has since been killed in battle. Under the circumstances, I recommend that Capt. Snyder be retained in charge of the Military Department, and that he be relieved from teaching Book-keeping the coming year.

For the well-working of the University, the several assistants in departments for the coming year should be appointed by the last of the present term; the same may be said of any new professors. Under the supposition that we will occupy the new building this fall, the grounds around it should be put in as forward a condition of ornamentation as the lateness of the season will allow. I ask that this be authorized, but that the expense shall not exceed — dollars.

Mr. Stedman was not relieved of the charge of the carpenter shop until the 23d inst., on account of absence and illness of Mr. Card. In the meantime he was employed in putting up the stable for Veterinary purposes, in guarding against injury from water the new building by laying the floor of the piazza in the court, putting up troughs, etc.

You are asked to authorize the payment of Mr. Stedman for the time employed by the University in April. The settlement of his maximum salary account also calls for your attention. The Business Agent's report will give the points in the matter. In this connection, I also call your attention to Mr. Vickroy's maximum salary account. Mr. Lambert, a student, has had charge of the shops since the 23d ult., only the necessary work for the University being done.

The Business Agent's report will show you, as near as the matter can be made out, the financial results of the last year's work in the Mechanical and Carpenter Shop. He also shows the result for the last two months in connection with the usual statement of expenses to date, unaudited bills, etc. Prof. Snyder reports collections for treasurer during March and April at \$2,611 13.

Several expenses, authorized during the past year, but not yet met, not having been presented before, call for your attention. Of these I may mention some \$580 for Engineering Instruments, and about \$50 on the account of Industrial lectures last winter.

I approve the recommendation of Mr. Flagg, that the University accept the charge of specimens of soils of the State, collected by the State Geologist, and ask for the authority to incur the necessary expenses of their removal from Springfield to the University.

Your attention is asked to the letter of the State Attorney-General in regard to University suits, also the communication from Governor Beveridge in regard to the semi-annual financial report, which will be due on the 31st inst.

Favorable attention to the report of wants in Horticultural Department is invited/ It is thought desirable, under the present circumstances, that Mr. Vickroy should take charge of the experiments which Mr. Flagg has had in hand for the past two years. Mr. Vickroy thinks that if this additional responsibility is placed upon him, his salary should be increased by \$200.

Your consideration is asked for a communication from Prof. Stuart in regard to the Laboratory, and from Prof. Robinson in regard to using the Mechanical Shops the coming vacation.

The State Legislature, at its recent session, passed two bills appropriating money to the University. The first is for \$7,500—\$6,000 for taxes, and \$1,500 for carrying on the experiments commenced by Mr. Flagg. The second bill appropriates \$41,550 for finishing and furnishing the new University building, and the heating and lighting fixtures; also, \$3,000 for furniture and apparatus of a physical laboratory. The necessities of the University require that the new building be ready for use at the opening of the next year, the first of September. This being true, I hardly need say that immediate action of your part is called for. As Dr. Gregory, at your last meeting, presented his recommendation on this matter, I will offer none, except to draw your attention to a communication from Prof. Robinson bearing upon the matters of heating the building, and the apparatus for the Physical Laboratory.

All of which is respectfully submitted.

S. W. SHATTUCK, *Regent pro tem.*

The report was received, but consideration deferred until afternoon. Bills presented for payment were then audited and allowed.

The reports of the Business Agent of general expenses to date, Mechanical and Carpenter Departments, were then read and received.

The following communication from the Architect, J. M. Van Osdel, Esq., was read and accepted:

CHICAGO, May 11, 1873.

To the Executive Committee Illinois Industrial University:

I am not able to be present with you on the 13th inst., but can, perhaps, by this communication enable the committee to take such action on all matters pertaining to the completion of the new building as well as if I were present. I have not had time to write all the specifications of the unfinished parts of the building, including heating apparatus, and would ask for instruction in regard to heating, as the fourth or attic story is not furnished with flues to receive the hot air from coils placed in the basement. Therefore, I would ask: 1st, shall I specify that the fourth story rooms shall have coils placed in the rooms (similar to those in the present Regent's office); and if any, shall they be placed in all the rooms? 2d. Shall coils be placed in the principal corridors or passages on the first floor; if so, the heat will ascend the stairways to the fourth story. 3d. How many rooms in basement require heating? Coils must be placed in such rooms same as in the fourth story.

The Committee will please take action upon these several points, and have the instructions sent to me.

I would respectfully suggest that the Committee order proposals to be obtained for the completion of the building in accordance with the plans and specification now in possession of the Board; also, for steam heating apparatus of sufficient capacity to heat all the rooms in the building simultaneously to a temperature of 70° in the coldest winter weather.

Or, if it is necessary, to have complete specifications of such apparatus before ordering the estimates, they can be made ready for your next meeting, and will not delay the building, provided estimates and proposals are obtained in the meantime for the finishing of the building, which proposals may be opened and acted upon at your next meeting.

I am obliged to be in Springfield on Wednesday next, and my health will not permit me to travel three nights in succession. Hoping you will not be inconvenienced by my absence, I remain

Yours, respectfully,

J. M. VAN OSDEL.

The Committee took a recess till 1:30 P. M.

AFTERNOON SESSION.

Committee re-assembled, as by adjournment.

The Regent's report was taken up for action.

A warrant for \$181 was ordered to be drawn in full settlement of Prof. Baker's salary to April 17, 1873. The appointments for the chair of English, and Assistants, was deferred until next meeting.

It was decided that Prof. Snyder continue in charge of the Military Department, also of Modern Languages, and be relieved from teaching Book-keeping for the next year.

The Regent was authorized to begin the grading and laying out of the grounds around the new University, and a sum not to exceed \$200 assigned for the purpose.

Mr. Stedman's salary to the 23d of April, was ordered to be paid, as also was, upon the report of the Business Agent, the amount of \$504 37 as the ascertained amount of his maximum salary for last year.

Mr. Vickroy was allowed the sum of \$336 81 in full settlement of his maximum salary.

Authority was given for the purchase of an Engineer's Transit, for \$430, to be charged to the appropriation for Library and Apparatus.

A warrant for \$50 was ordered to be drawn for Dr. E. S. Hull, of Alton, for lecturing expenses last winter.

The Regent was instructed to have the specimens of soils collected by the State Geologist removed to the University Cabinet, and expenses allowed.

The action of the Regent, in employing counsel in the suits brought against the University, was approved.

The Regent and Recording Secretary were instructed to prepare the semi-annual report, and submit same to the next meeting.

The following motion of Judge Brown was adopted :

WHEREAS Mr. Flagg, who had charge of the Experimental Farm, desires the services of Mr. Vickroy as superintendent of the detail of the work ; and whereas this service will add so greatly to the labor and responsibility of Mr. Vickroy as to make an addition to his salary fair and equitable ; therefore,

Resolved, That Mr. Vickroy's salary be increased to \$1200, exclusive of the perquisites now allowed him, of which sum \$300 shall be charged and paid out of the fund appropriated to Farm Experiments.

The Regent was instructed to have an additional team and harness purchased for the Horticultural Department, such purchase not to exceed \$260. The necessary repairs on barn and house on Horticultural grounds were ordered to be done.

It was resolved that the Architect be requested to prepare full and exact specifications for the various kinds of works, except heating apparatus, yet to be done on the new building, as soon as the 28th inst., and report the same to the Regent. The Regent was instructed to advertise as soon as such specifications are received, for proposals for all the work or parts of the work to be done on the new University building.

The Regent was also authorized to forthwith advertise for proposals to put a first-class heating apparatus in the new building ; bonds to be required, which will not be discharged until March, 1874.

The Regent was authorized to employ the service of a competent Mechanic to take the inventory of material and assist contractors by showing to them the work to be done, and material on hand. The Regent and Mr. Scott were appointed a Committee on Mechanical Department.

Certificates of scholarships were granted students G. H. Lyman and A. C. Bradway.

The communications from Profs. Stuart and Robinson were received, but action postponed until next meeting.

The Committee adjourned, to meet on Wednesday, June 4, 1873, at 4 P. M.

WEDNESDAY, JUNE 4, 1873.

The Committee met in the Regent's office, at 4 P. M.

Present—Messrs. Cobb, Lawrence, Edwards, Pickrell, Scott, and Prof. Shattuck, the Regent *pro tem*.

The minutes of last meeting were read and approved.

An amount of \$31 85 was ordered to be refunded by warrant to Prof. S. W. Robinson, for overcharges on duplicate books from February.

A motion to open bids received for finishing the new University building was carried, and the same were opened, except those for the heating apparatus.

The Committee took a recess to 7:30 P. M.

EVENING SESSION.

Committee assembled as per adjournment.

The following motion was adopted :

Resolved, That the Regent be authorized to accept the bid of Mr. Samuel H. Gehlman for the entire finishing of the new University Building, at \$13,150, he being the lowest bidder; and contract with him provided he furnish bonds to the amount of \$5,000, by Friday, the 6th inst., noon. And provided further, that in case Mr. Gehlman fails to furnish such bond by the time aforesaid, the Regent is authorized to close contracts with the next lowest bidders, to-wit :

Messrs. Patrick & Peter Ward, plastering.

Messrs. Tobias & Besore, carpenter work.

Messrs. Price & Bros., painting.

The Regent was authorized to employ an attorney to draw up contracts and bonds.

The following motion was adopted :

WHEREAS the time has arrived when we should decide whether Mr. Card shall continue as the business agent of the University; and, whereas, the new board provided by law will come into office in July next; therefore,

Resolved, That this Committee dispense with the further services of Mr. Card.

It was decided that the Regent and Recording Secretary be authorized to procure such clerical help as may be necessary to keep the books, etc., of the University, at an expense of not to exceed \$50 per month.

On motion, the bids for heating apparatus in the new building were opened, and after reading, referred to Mr. VanOsdel, the architect, for report.

The Regent submitted the following report:

Gentlemen of the Executive Committee, Illinois Industrial University :

I have the honor to make the following report:

According to your instructions, the following advertisement was published in Chicago, St. Louis, Cincinnati and Champaign papers :

"To CONTRACTORS—The Trustees of the Illinois Industrial University will receive proposals—

1st—For heating apparatus, complete, to heat, perfectly, the whole of the new University Building in the coldest winter weather.

2d—For the completion of the above mentioned building, according to the plans and specifications of the architect, which may be seen at the Regent's office in the University ; also, at the architect's office, in Chicago, after May 26, 1873.

3d—For any one class of the work and material required to complete the said building. "

The Trustees reserve the right to reject any or all bids or plans, or parts thereof, if they shall deem it necessary for the interest of the State.

All proposals must be directed to 'Trustees of the Illinois Industrial University,' and indorsed 'Illinois Industrial University Proposals.' They will be delivered at the Regent's office in the University by four o'clock P. M., on June 4, 1873.

If one or more contracts are awarded to any party under the above mentioned proposals, a good and sufficient bond in each case, to insure the fulfillment, will be required.

The bond for the first class will not be discharged until March 1, 1874.

Work, under all classes, must be completed within ninety days from the time the contract is signed.

S. W. SHATTUCK, *Regent pro tem.*

J. M. VANOSDEL, *Architect.*

For the Trustees."

URBANA, May 19, 1873.

The architect not coming to Champaign, as was expected, I consulted with him in Chicago. The advertisement was issued immediately after. Parties from Chicago, Cincinnati and other places have answered to it. Under the authority granted at your last meeting, Mr. John Mann, of Urbana, a competent mechanic, was engaged at a compensation of \$3 per day to take the inventory of the material on hand for finishing the University Building, and amount of unfinished work, also assist the contractors in getting a correct idea of the condition of matters.

He commenced work May 19. and has given satisfaction.

According to the specifications under which bids to complete the building will be made, the University will be called upon to furnish all the necessary flooring and moulding for it, which matter will demand your immediate attention. It is thought sufficient lumber is now on hand for this purpose, but it will require going through the dry houses and working up.

But little has been done to the grounds of the new building. Student labor sufficient could not be had, and it was not thought desirable to employ laborers from outside until a closer personal attention could be given to the matter. If thought best I will give this attention after the close of the term. Five hundred dollars can well be spent on the grounds in front of the building.

The specimens of soils of the State which you authorized to have removed from Springfield have not yet been moved, as Mr. Worthen thought it necessary to have some member of the Faculty go to Springfield to attend to the packing of them, and no one had the time to do it.

A team has been procured for the Horticultural Department, the horses costing \$240.

I believe it to be necessary that action should be taken at your present meeting to provide for seating the Chapel, and for the Library and Cabinet cases.

The Chapel seats and Library cases should be in by the first of September. This can be, but it requires immediate action in order to have it well done.

Prof. Carey, the Librarian, has had some plans and estimates for the Library cases made. Prof. Taft is having the same done in regard to those for the Cabinet.

Several communications from Professors, in addition to those received at your last meeting, call for your attention.

Action in regard to confirming, or not continuing the engagement of Mr. W. L. Card, is called for.

I am glad to be able to say to you, gentlemen, that though two of the most important members of the Faculty have been absent during the greater part of the term, the work of the University has been carried on to the general satisfaction of the students and public, I believe. This good result has been gained by the hearty co-operation of all members of the Faculty present and the general good will of the students.

The following named students are recommended to you for certificates, authorized by section 10 of our charter :

Charles P. Graham, of Champaign, Ill.
 F. L. Hatch, of Bliven's Mills, Ill.
 Charles I. Hays, of Bridgeport, Ill.
 A. S. Hennessey, of LaSalle, Ill.
 E. L. Hill, of Watson, Ill.
 Samuel H. Hook, of Urbana, Ill.
 J. A. Ockerson, of Elmwood, Ill.
 P. A. Phillips, of Damascus, Ill.
 N. E. Porterfield, of Sidney, Ill.
 H. E. Robbins, of Wenona, Ill.
 A. C. Swartz, of Fairview, Ill.
 Howard Silver, of Urbana, Ill.
 Charles W. Silver, of Urbana, Ill.
 J. H. Day, of Nokomis, Ill.
 C. M. Tate, of Champaign, Ill.
 J. M. Baker, of Tarboro, N. C.
 T. Yamaou, of Yeddo, Japan.
 David Meade, of Fairmount, Ill.
 E. J. Wiley, of Mason, Mich.
 L. E. Williams, of Montrose, Iowa.

Proposals or bids for the whole or part of the work on the University Building have been received and are presented for your inspection and action.

All of which is respectfully submitted.

S. W. SHATTUCK,
Regent, pro tem.

The Committee on Mechanical Department were authorized to make such arrangements with Prof. Robinson as may enable him to continue work in the machine shops during vacation.

Professors Shattuck, Snyder, Taft and Carey were appointed a committee to present plans and estimates for the furniture and fixtures needed in the new building.

The Recording Secretary was instructed to call the new board, when notice is received of their appointment.

The appointment for the chair of English Language, also of all the assistants, was deferred till next meeting.

The Regent was authorized to employ a competent mechanic for superintending the work in carpenter shops and on new University Building, at reasonable wages, until next meeting.

The fund accrued for the Chemical Laboratory from breakage, etc., was ordered to be deposited with the Treasurer.

The sum to be expended in leveling and adorning grounds around the new building was increased to \$500.

A request from Horticultural Department for purchase of fruit drier was deferred till next meeting.

A report from Captain E. Snyder, on repairs needed on Drill Hall roof, referred to Regent, with instructions to have such repairs made.

Prof. Robinson's recommendations in regard to Physical Laboratory were referred to next meeting.

The report of the Book-keeper of expenditures to date, was read and accepted.

The bills presented for payment were audited and allowed.

The architect, Mr. Van Osdel, now reported on the two bids for steam heating, which, on motion, were rejected.

It was voted that the Regent re-advertise for proposals for heating apparatus for the new building—such proposals to be handed in at the architect's office, at Chicago, 41 Clark street, by eleven o'clock A. M., June 14, 1873.

A committee consisting of the Regent, the Architect, Messrs. Cobb, Scott, Lawrence, Edwards and Goltra, were appointed and instructed to meet at the above mentioned time and place, to receive and decide upon such proposals, and also make contract with the accepted bidder.

Adjourned to the call of the Regent.

E. SNYDER,
Recording Secretary.

MINUTES MEETING OF BOARD OF TRUSTEES,
AS RE-ORGANIZED.

The Board of Trustees assembled in the University Building on July 10, 4 o'clock P. M.

Present—Governor Beveridge, Messrs. Reynolds, Brown, Slade, Gardner, Pickrell, Cobb, and Sabin.

Absent—Messrs. Boyd, Blackburn, and Mason.

The oath of office was administered to the members by Judge J. H. Hesse, and subscribed to by all present, as follows :

STATE OF ILLINOIS, }
Champaign County. } ss.

We, and each of us, do solemnly swear that we will support the constitution of the United States, and the constitution of the State of Illinois, and that we will faithfully discharge the duties of the office of Trustees of the Illinois Industrial University, according to the best of our ability.

JOHN L. BEVERIDGE,
JOHN P. REYNOLDS,
J. H. PICKRELL,
D. D. SABINE,
JAMES P. SLADE,
A. M. BROWN,
EMORY COBB,
D. GARDNER.

Subscribed and sworn to before me, this 10th day of July, A. D. 1873.

J. H. HESSE, J. P.

The Board then organized, with his excellency Governor J. L. Beveridge in the chair.

On motion, a recess was taken to inspect the building and grounds of the University.

EVENING SESSION.

The Board met at 8 P. M. Governor Beveridge in the chair.

On motion, the Board proceeded to decide their terms of office, by drawing lots, resulting as follows :

A. M. BROWN.....	Villa Ridge.....	2 years.....
J. P. SLADE.....	Belleville.....	4 ".....
J. J. BYRD.....	Cairo.....	6 ".....
D. GARDNER.....	Champaign.....	2 ".....
J. H. PICKRELL.....	Harristown.....	6 ".....
ALEXANDER BLACKBURN.....	Macomb.....	4 ".....
EMORY COBB.....	Kankakee.....	2 ".....
D. D. SABIN.....	Belvidere.....	6 ".....
R. B. MASON.....	Chicago.....	4 ".....

On motion, the Board proceeded to elect their President.

Judge A. M. Brown nominated Mr. Emory Cobb, who was elected.

On taking the chair, Mr. Cobb, in a few very appropriate words, expressed his appreciation of the confidence shown him by the Board, in conferring this honor upon him, assuring them of his determination to faithfully discharge the duties of his office, and asking the hearty support and earnest co-operation of the members.

On motion of Gov. Beveridge, a committee was appointed to revise the by-laws, and report to the next adjourned meeting.

The Chair appointed Messrs. Slade, Brown and Pickrell.

The Regent's report was then read by him and received. On motion, it was made the special order for to-morrow.

REGENT'S REPORT.

Gentlemen of the Board of Trustees of the Illinois Industrial University :

I have the honor to make the following report of my official acts since the last meeting of the Executive Committee, of the present condition of the University and its wants, to some extent.

Under a resolution of the Executive Committee, a contract with Samuel H. Gehlman was made June 7th, for the finishing of the new building for \$13,150 (thirteen thousand one hundred and fifty dollars), he furnishing a good bond for \$5,000 (five thousand dollars), and 20 per cent. of each estimate being retained by the terms of the contract until the entire completion of the building.

The following advertisement was issued, as directed by the committee :

"TO CONTRACTORS.—The Trustees of the Illinois Industrial University will receive proposals for heating apparatus complete, to heat, perfectly, the whole of the new University building in the coldest winter weather. The Trustees reserve the right to reject any or all bids or plans, or parts thereof, if they shall deem it necessary for the interest of the State.

"All proposals must be directed to 'Trustees of the Illinois Industrial University,' and indorsed 'Illinois Industrial University Proposals.' They will be delivered at the Architect's office, 41 Clark street, Chicago, by 11 o'clock A. M., June 14, 1873. Bidders are invited to be present at that time.

"If one or more contracts are awarded to any party under the above mentioned proposals, a good and sufficient bond in each case, to insure its fulfillment, will be required, and will not be discharged until March 1, 1874. Work must be completed within ninety days from the time the contract is signed.

"S. W. SHATTUCK, *Regent, pro tem.*,

"J. M. VAN OSDEL, *Architect,*

"URBANA, June 5, 1873.

For the Trustees."

The architect, Messrs. Cobb, Scott, Lawrence, Edwards, and the Regent, members of a committee appointed and instructed to meet at the architect's office in Chicago, June 14, 1873, at 11 A. M., met as per instructions. The minutes of the meeting are as follows :

The sub-committee of the Executive Committee met at the office of J. M. Van Osdel, Esq., at 11 o'clock A. M.

Present—Messrs. Cobb, Edwards, Lawrence, Scott, Van Osdel, and Prof. Shattuck, Regent *pro tem.*

On motion, the bids received for heating apparatus were opened, and appeared as follows :

Crane Bros. Manufacturing Co. of Chicago.....	\$26, 250
John Davis & Co., of Chicago.....	19, 200
Bennett Hot Air Furnace Co., Cincinnati.....	17, 100

The specifications and plans of Messrs. Crane Bros. and John Davis & Co., were read and discussed, Committee took recess until 2 o'clock P. M.

AFTERNOON SESSION.

Committee re-assembled at 2 o'clock P. M.

The proposals and bids of Messrs. Davis & Co. and the Bennett Hot Air Furnace Co., and also the excellence in shell and pipe boilers, were at length considered and discussed.

The committee finally accepted the proposition of the Bennett Co., of Cincinnati, provided inquiries and correspondence with parties using their system show it to be what it is represented, and further provided that 20 per cent. of the payment for work and material furnished be withheld until March 1, 1874; also a good accepted bond unto \$10,000 be given, which is not to be discharged until March 1, 1874. It was resolved that under the conditions above mentioned the Regent and architect be and are hereby authorized to contract and close with the Bennett Hot Air Furnace Manufacturing Co., of Cincinnati, Ohio, for the furnishing of a heating apparatus to the new building at Urbana, Ill., in full accordance with the proposal and specifications received from said firm, the work to be finished within ninety days, from June 14, 1873.

Under the above instructions, correspondence was had with seven different leading parties who were using the low pressure system of heating. The result being in the main quite favorable, I met the agent of the Bennett Hot Air Furnace Co., at the architect's office, on the 25th of June, when a contract with the company was made under the required condition—bond for \$10,000, and 20 per cent. retained on all estimates.

The Committee on the Mechanical Department made the following arrangement with Prof. Robinson for continuing work in the shop during the vacation.

Mr. Jno. Mann has been engaged as superintendent of the carpenter shop and the new University building, at \$3 per day, until the time of the present meeting.

Mr. F. A. Parsons has been employed as clerk in the Regent's and Recording Secretary's office, at \$50 per month, time limited as above.

About \$200 of the \$500 appropriated for work on ornamental grounds of the new building has been spent; \$20 of this is for gravel drawn to the grounds last winter, and some \$38 should be charged to the new building, as it was for drains conducting the water from the down spouts on the north side of the building, and a connection made on the west side.

The most needed repairs upon the drill hall roof have been made, but more complete ones should be made, involving an expense, I am told, of \$100 to \$175.

The specimens of soils of the State have been removed to the University from Springfield, with as little expense as possible. The required semi-annual financial report was made to the Governor of the State June 19.

The Committee on furnishing the new building, offer the following report:

It seems very desirable that immediate action be taken to provide for furnishing the chapel, and the cases of the library and cabinet. If it was a private matter, I would not hesitate to make a contract with Walker Bros. for the library cases and railing, at \$2000, knowing the completeness of the work proposed. Repairs and additions to the copper spouting of the new building, involving a small expense, have been made—further ones are required.

The Recording Secretary reports the assets of the University, as given in detail in the inventory books, to be as follows:

Assets of the Illinois Industrial University, taken June 30, 1873.

Building and grounds	\$232, 300 00	
Stock farm, per inventory	51, 366 00	
Horticultural and experimental farm	34, 965 00	
Inventory of mechanical shops	7, 081 70	
" carpenter shops	3, 600 90	
" library	16, 862 00	
" chemical laboratory	6, 007 40	
" furniture	2, 312 50	
" cabinets of natural history	3, 074 00	
" mechanical models	1, 071 00	
" physical laboratory	885 25	
" civil engineering and astronomical instruments	1, 637 33	
" military department and gymnasium	317 00	
" drawing copies, models	367 00	
Green house plants and tools	4, 134 75	
Bonds bearing interest, cost		\$365, 981 83
Notes on hand		319, 315 14
25,302 acres land in Minn. and Neb., at \$4		8, 479 93
160 acres of Griggs' farm, at \$40		101, 208 00
		6, 400 00
Total		\$805, 384 90

He also makes the following financial statement of appropriations and expenditures since March 1 1873, and the usual presentation of bills and accounts:

	Appropriations.	Earnings and credits of dept.	Total.	Expenditures to date.
Board expense	\$1,200 00		\$1,200 00	\$682 10
Salaries.....	30,400 00		30,400 00	12,649 10
Fuel and lights	1,000 00	\$164 47	1,164 47	904 82
Building and grounds.....	1,250 00		1,250 00	237 44
Incidental expenses.....	1,250 00		1,250 00	417 23
Stationery and printing.....	750 00		750 00	338 68
Farm account.....		1,660 27	1,660 27	2,914 63
Horticultural department.....	500 00	718 30	1,218 30	2,405 99
Mechanical department.....	600 00	644 58	1,244 58	1,272 50
Carpenter shops.....		223 94	223 94	882 88
Chemical laboratory.....	1,855 00		1,855 00	233 91
Military department.....	150 00		150 00	63 95
Agricultural experiments.....				282 90
New University building.....				329 34
Taxes on lands.....	3,000 00		3,000 00	2,660 49
Gymnastic apparatus.....	50 00		50 00	
Library and cabinet.....	555 00		555 00	581 38
Totals	\$42,560 00	\$3,411 66	\$45,971 56	\$26,857 34

The following bills, presented for payment July 10, 1873, were

AUDITED AND ALLOWED.

1	Trevett & Green	Hardware	\$33 05
2	Nicholet & Schoff.....	Printing	4 50
3	E. V. Peterson.....	Blank books	3 00
4	W. S. Maxwell.....	Paints, etc.....	5 40
5	S. W. Robinson.....	Petty expenses.....	3 35
6	Inter-Ocean Co.....	Record book	8 00
7	Cairo Box and Basket Co.....	Mat for boxes	5 55
8	J. M. Keys	Painting blackboards.....	2 00
9	Geo. Knapp & Co.....	Advertising	15 75
10	E. Snyder.....	Petty expenses.....	20 01
11	Wm. Price.....	Paint and putty.....	11 03
12	S. W. Shattuck.....	Sundry expenses.....	9 75
13	G. E. Hesse.....	Harness, etc.....	22 90
14	Carpenter department.....	Work for cabinet.....	2 25
15	"	" new University building.....	27 90
16	"	" building and grounds.....	35 66
17	"	" military department.....	90
18	Mechanical	"	40
19	"	" horticultural department.....	5 60
20	Mrs. P. W. Frisbee.....	Books.....	5 13
21	Salim Bros.....	Tile.....	65
22	S. M. Marble.....	Salt.....	2 75
23	C. B. Smith.....	Attorney fees.....	10 00
24	Dodson & Hodges.....	Hardware	11 37
25	Mechanical department.....	Carpenter shop.....	9 74
26	Champaign County Gazette.....	Printing	4 70
27	E. A. Robinson.....	Petty expenses.....	4 15
28	Mechanical department.....	Building and grounds.....	4 20
29	A. Snedaker	Castings	19 56

BILLS REJECTED.

Beidler & Son, lumber, \$73 71; Strong Bros., vinegar, \$6.

I believe these are all the bills that exist against the University, or nearly so.

There are connected with the University, as the Board of Instruction, one Regent (now on leave in Europe), eight resident professors, one non-resident professor in agriculture, one resident instructor in architecture. In addition to the above there are: one head farmer, one orchardist and gardener, who is now in charge of the work on experimental farm, one florist. Other positions were occupied during the past year, but the appointments to them for the coming year have not been made.

Allow me, as representing, at present, the educational interest of the University, to urge upon you the importance of furnishing the University a resident professor of agriculture. I believe I express the opinion of a large majority of the faculty, that such is one of the essentials for the future success of the University in the direction which it is desirable for it to take.

This appointment, and that of a Professor of English Language and Literature, call for your immediate action. I well understand that it will not be easy to fill either of the positions with the right man. A common man will not do for them.

I also recommend the appointment of Dr. F.W. Prentice as Resident Lecturer in Veterinary Science, at a salary of \$1000 per annum.

The Commercial Department will require an instructor or assistant, as Prof. Snyder, who has had charge of it for some years, was relieved on account of the amount of work required from him in the Departments of Modern Language and Military Science. The above are, I believe, all of the additional appointments necessary to be made at the present time, though other positions could be filled with advantage to the University, did its funds allow.

The salary of the Corresponding Secretary has not been fixed for the year commencing March 1st, 1873. In a recent communication, he requests that it be determined. It would seem that the position is an important one, in the plan of the University, and could demand even more attention than it has received in the past.

Your attention is called to several communications from the professors to the Ex. Committee, but which were laid over for your action. In connection with one from Prof. Robinson, in regard to the Physical Laboratory, I submit one from Dr. Gregory to the Professor. This matter is an important one to the University, and will, I trust, receive prompt attention; \$3000 were appropriated by the State Legislature at its last session, for that purpose. Favorable attention is asked for communications from Professors Burrill and Snyder, and Mr. Lawrence, the head farmer.

A notice of an assessment for a sidewalk on the south side of Green street is submitted. Your attention is also called to the condition of the walk, and want of a road from Springfield road to Green street, on the west side of the University grounds.

Proper provision for the water coming from the roof of the New University Building, and for the sewerage of the building, has never been made. Its importance I need not state.

Mr. Leal, the School Superintendent of Champaign county, asks permission to hold a teachers' institute in the University chapel, from the 4th to the 23d of August next. Though the granting of it will necessarily cause us considerable inconvenience, I recommend that it be given, if consistent with your arrangements for this building.

S. W. SHATTUCK, *Regent pro. tem.*

The report of the architect, Mr. Van Osdel, on satisfactory progress of the work on the new building, was received, and from the amount of the estimated work, per \$3,184, the amount of \$2,547 was ordered to be paid, retaining 20 per cent., as per contract.

1873, July 10.	Carpenter work.....	\$1,089 52
"	Nails for such work.....	49 75
"	Plastering.....	800 00
"	Painting.....	350 00
"	Stairs.....	400 00
"	Sash weights, \$290; Teaming, \$25.....	315 00
"	Hard lumber.....	180 00
		\$3,184 27
	Less 20 per cent. retained per contract.....	636 85
		\$2,547 42

The Treasurer read his report, which was received, as follows:

Mar. 1, '73	By balance.....	\$5,667 87
	" amount received on account of Mechanical Department.....	819 62
	" " " " Horticultural Department.....	718 60
	" " " " Chemical Department for collections and interest.....	1,447 68
	" " " " Carpentry Department.....	223 94
	" " " " farm sales.....	1,660 27
	" " " " fees.....	1,869 00
	" " " " fuel.....	164 47
	" " " " Illinois Central R. R. freights.....	367 14
	" " " " land and interest.....	757 00
	" " " " notes for rent.....	310 00
	" " " " last year's account.....	276 68
	" " " " interest on bonds.....	21,055 00
		\$35,337 27
	To warrants paid.....	26,857 34
	Balance.....	\$8,479 93

The bills presented for payment were audited. The following communication from Mr. Van Osdel was read, but action deferred :

To the Hon. the Board of Trustees of the Illinois Industrial University :

GENTLEMEN: The State Board of Trustees audited my bill for services as Architect and General Superintendent on the Drill Hall and University Building, and asked the Legislature to appropriate funds for the payment of the same, which, by reference to the law, you will notice that the sum of \$15,000 was appropriated to pay the Architect and finish the building. I have therefore to request that an order for \$2000 of the amount appropriated be given me.

Very respectfully,

J. M. VAN OSDEL.

Mr. D. Gardner was appointed a committee to report to the next meeting on the condition and valuation of a division fence between University land and that of W. Burnett.

The President, calling Gov. Beveridge to the chair, asked the Board to consider section six of the act of the legislature passed April 15th, regulating and revising courses of study.

Hon. J. P. Reynolds offered the following resolutions, which were adopted :

Resolved, That a compliance with the spirit of the law of Congress, which provides for the establishment of Agricultural Colleges in the several States, requires that this Institution be devoted, as a leading object, to imparting such instruction to its pupils as shall be necessary to the intelligent practice of agriculture and the mechanic arts, and instruction in other branches of learning, whether enjoined or only permitted by the aforesaid law, is to be regarded as merely secondary.

Resolved, That in establishing a curriculum, in selecting the corps of teachers, and in the general policy as adopted, this Board of Trustees will adhere to the views expressed in the foregoing resolution.

A committee of four was appointed, composed of Messrs. Reynolds, Brown, Slade, and the Corresponding Secretary, to report to next meeting of this Board a curriculum in full keeping with the resolutions adopted.

On motion the President was asked to report to this meeting as early as possible the state of the finances, and also a full report of the salaries of Professors, and the possibilities of employing new members of the faculty.

An order was passed to allow to Mr. J. M. Van Osdel, Architect; the sum of \$1,500.

Adjourned to meet at 8 o'clock, July 11, 1873.

JULY 11, 1873.

The Board assembled as per adjournment.

The oath of office was administered to Alexander Blackburn by Judge J. H. Hesse, and subscribed to by him.

The Regent's report was taken up.

Mr. F. A. Parsons was continued as assistant in the office.

Mr. D. Gardner and the Regent were appointed a committee to have the roof of the Drill Hall repaired and painted, and a sum not to exceed \$150 was appropriated for the purpose.

The Regent, Messrs. Sabin and Gardner were appointed to make the purchases under and within the limits of the State appropriation for furniture and fixtures.

The following communication from Prof. Robinson was read :

To the Regent and Executive Committee :

GENTLEMEN : In compliance with a request of the Regent, Dr. Gregory, I have written to Professors in charge of Physical Laboratories, and obtained their replies, which I submit with this communication.

These laboratories are the leading ones in the country. The advice obtained is that we procure our apparatus from certain celebrated manufacturers in Europe and this country, and construct many of the simpler models at our Mechanical Laboratory. They also advise that some one visit their laboratories, to profit by their experience.

Please allow me to submit to you the question of our undertaking such manufacture this coming vacation, which may undoubtedly be done, especially after a visit to one or more of the laboratories.

I also accompany this by two new elementary treatises on Physical Laboratory Practice, that you may see that some of the apparatus is very simple, and could undoubtedly be made by us. I recommend the following apparatus for purchase: A good Microscope, with Polarscope attachment; a Spectroscope, of Browning, of London; an Optical Circle, (see Jannin's *Physique*, Vol. III, Pl. 3, pp. 677 and 680); a Cathetometer and Photometer; Apparatus on Heat, for illustrating Regnault's Experiments on Heat, of Salleson, of Paris; a Galvenometer and set of Resistance Coils, of Elliott Bros., London; a Thermomultiplier and Ruhmkorff's Coil; a DuBose's Lantern, of Hawkins & Wells, of Hoboken, N. J.

I cannot too strongly call attention to the advice of the letters, that we make as much of the apparatus ourselves in our Mechanical Laboratory as we can. I have not yet had opportunity to learn the prices of the instruments named above.

Letters from Professors Heinrichs, Mayo and Pickering.

Yours, truly,

S. W. ROBINSON.

The following resolution, offered by Judge Brown, was passed :

Resolved, That the Regent, now in Europe, be and is hereby authorized to purchase, to an extent not exceeding \$1,000, such apparatus for the Physical Laboratory of the University as he may deem essential, and as can be had there at advantageous prices, and that the sum of \$1,000 be placed to his credit in the bank of D. Gardner & Co. for this purpose.

On motion, the Board dispensed with the services of Mr. J. Mann as Superintendent of Building.

The following resolutions were offered and passed :

Resolved, That Prof. Shattuck be appointed Superintendent of the work on the new building and grounds, and he is authorized and required to have drains laid for carrying off the rain water from the house, and sewerage from the privies; and he shall also have charge of the grading and road-making on said grounds, and for every day employed in this work he shall receive a compensation of five dollars per day.

Resolved, That the sum of \$500 be appropriated for the labor and material necessary for constructing the drains referred to in the foregoing resolution.

Resolved, That Mr. Gardner be appointed a sub-committee of the Board to advise with Prof. Shattuck in the manner of constructing the drains and performing the work aforesaid.

The President and the Regent were authorized to engage a Professor of Agriculture.

The following communication from Prof. Stewart, of the Chemical Department, was read :

To the Executive Committee of the University :

DEAR SIRS : The undersigned respectfully asks your honorable body to consider the following requests, and, if consistent with your judgment, to grant the same :

1st. That the Chemical Laboratory remain where it is until a new building shall be erected especially for the Chemical Department. The reasons therefor can be given in full, if desired.

2d. That the Professor in charge be authorized to appoint his assistants, and to discharge the same when found to be inefficient. Experience has taught the advisability of this measure. Of course it is understood that the amount appropriated by the Board for assistants is in no case to be exceeded.

3d. That the Professor in charge be authorized to issue orders as formerly for the ordinary supplies of the Department, said supplies to be paid for out of the proceeds of the Laboratory.

The undersigned claims that if the Department is made self-sustaining, as it has been thus far, it is justly entitled to all its proceeds, and that these proceeds should be available whenever needed. When, therefore, these proceeds pass into the hands of the Treasurer, the undersigned asks that the Chemical Department be credited with them, and that he be authorized to draw on such fund, through the proper officials, whenever the needs of the Laboratory shall require. It is simply the old system of orders that is asked. It worked so well in the Chemical Department that its disuse has always been a source of regret.

In preferring the above requests, particularly the last two, the undersigned begs leave to say that they are nothing more than what is accorded to men in similar positions in other institutions. At Cambridge, or at Ann Arbor, as also in the German Universities, these privileges are accorded to the heads of departments. Hoping this may not seem unreasonable to you, the undersigned begs leave to submit the same to your consideration.

Very respectfully,

A. P. S. STEWART.

On motion of Mr. Sabin, it was resolved that the Chemical Department remain in the old University building until further ordered.

The following resolution, offered by Mr. Blackburn, was passed :

Resolved, That the Professor of Chemistry be authorized to appoint his assistants, subject to the approval of the Faculty.

On motion of Mr. Gardner, the Professor of Chemistry was authorized to issue orders as formerly for the supplies, to be paid for out of the proceeds of the Laboratory.

On motion of Mr. Blackburn, an appropriation of \$30 was made for a fruit drier for the Horticultural Department.

On motion, the repairs of the green house were referred to the Regent and Mr. Gardner, with power to act.

On motion of Mr. Blackburn, it was resolved that the Governor be requested to issue commissions in the Illinois State militia to Capt. E. Snyder as Colonel, and to Edgar L. Hill, of Watson, and Franklin C. Platt, of Warren, graduates of this year, as Captains.

On motion of Mr. Sabin, it was resolved that the following communication from Prof. Snyder, in relation to arms, be approved, and the Governor requested to furnish such arms :

PROF. S. W. SHATTUCK, *Regent pro. tem.*:

DEAR SIR: I herewith submit to you the following requisition for arms, etc., stating that the articles asked for are very much needed for the efficiency and advancement of instruction in the Military Department: 100 breech-loading rifle muskets and accoutrements; 4,000 rounds of ammunition for target practice; 50 non-commissioned officers' swords and belts; 2 light steel cannon, complete, for artillery practice, with a supply of ammunition.

Very respectfully,

E. SNYDER,
Captain in charge.

Mr. Lawrence's communication in reference to feeding experiments was deferred.

Assessment for sidewalk on Green street, and road or walk from Springfield road to Green street, referred to Regent and Mr. Gardner, with instruction to report at next meeting on cost and kind of sidewalk.

On motion of Mr. Sabin, it was voted that the County Teachers' Institute be permitted to hold sessions in Chapel.

The Governor, being obliged to depart, made a short address to the Board, expressing his satisfaction with the state of the Institution, and his confidence in the ability of the Board to successfully manage its affairs.

The appropriations for the next fiscal year were regulated as follows :

ESTIMATE OF RECEIPTS TO FEBRUARY 28, 1874.

Balance on hand.....	\$8, 479 93
Interest on Sangamon county bonds.....	2, 250 00
Interest on Chicago water bonds.....	875 00
Interest on Illinois six per cent bonds.....	930 00
From State appropriation for taxes.....	2, 660 00
Fees.....	4, 000 00
Sales from farm.....	1, 500 00
Sales from Horticultural department.....	1, 200 00
State appropriation for experiments.....	750 00
Rents of land and interest.....	4, 000 00
	<hr/>
	\$26, 644 93

Appropriated as follows :

Board expense.....	\$500 00
Salaries—Regent.....	\$2, 333 33
Eight Professors.....	8, 000 00
Corresponding Secretary.....	500 00
Treasurer.....	500 00
Instructor in Architecture.....	600 00
Instructor in Veterinary.....	500 00
Assistants in Chemical Laboratory.....	720 00
Assistants in Languages.....	450 00
Assistants in Civil and Mechanical Engineering.....	450 00
Com. department and clerk services.....	600 00
Teacher in free hand drawing.....	260 00
Library assistants.....	450 00
Math. and other assistants.....	450 00
	<hr/>
	15, 813 33
Fuel and lights.....	750 00
Building and grounds.....	1, 500 00
Incidental expenses.....	1, 200 00
Stationery and printing.....	500 00
Chemical and mining apparatus.....	3, 000 00
Library and cabinet.....	750 00
Military department and gymnasium.....	150 00
	<hr/>
Total.....	\$24, 163 33

The President was ordered to draw the State appropriations for taxes and agricultural experiments.

The following resolution was adopted :

Resolved, That, considering the state of the finances of the University, we deem it inexpedient to continue a full Professorship of Ancient Languages, and instead of that an assistant should be employed for teaching those languages.

Mr. Sabin moved that the President and Regent be appointed a committee to procure a Professor of English Language and Literature. Carried.

On motion, it was decided that when the adjournment be made, it be to Thursday, August 14, 1873, at 3 o'clock P. M.

The communication from Mr. Lawrence was taken up.

Mr. Lawrence requested authority to make experiments in feeding cattle and hogs, to ascertain whether or not it will pay to feed on grain, during the summer months, cattle designed for the market while on good pasture lands. He also asked to be authorized to expend about \$150 in making light fences, six feet high, about the farm yards.

The following, in reference to Mr. Lawrence's report, was adopted :

Resolved, That the head farmer be authorized to make any experiments, with the consent of Mr. Gardner, that the funds of the farm will justify.

Engineering instruments were ordered repaired at an expense not to exceed \$50.

Mr. Gardner and the Regent were appointed a committee to attend to and report on the suits pending against the University.

Adjourned.

AUGUST 14, 1873.

The Board assembled in the University building at 4 P. M.

Present—Messrs. Blackburn, Byrd, Brown, Mason, Pickrell, Sabin, Slade.

President Cobb in the chair.

Absent—Gov. Beveridge, Messrs. Reynolds and Gardner.

The reading of the minutes of the last meeting were dispensed with.

The report of the Recording Secretary, showing collections and expenditures from last meeting to date, was read and approved.

Collections as follows for the month of July to date :

From farm sales.....	\$1,135 14
“ sales from experimental farm.....	106 95
“ sales from horticultural department.....	216 46
“ sales of catalogues, etc.....	20 15
“ carpenter department.....	76 45
“ mechanical department.....	28 02
	\$1,583 17

The following bills of current expenses were audited and allowed :

C. I. Hays	Salary, July.....	\$50 00
W. S. Chase.....	Various work.....	10 00
F. A. Parsons.....	Salary, July.....	50 00
D. S. Covert.....	.....	15 92
Enterprise Coal Company.....	2 cars coal.....	13 00
The Student.....	126 copies.....	17 90
Waters & Pancake.....	Lumber.....	14 31
W. B. Keen, Cooke & Co.	Books.....	1 27
E. V. Peterson.....	Books and stationery.....	1 25
Trevett & Green.....	Work on drill hall.....	6 30
Stock farm.....	Expense, July.....	1,246 55
Geo. Immell.....	Fruit drier.....	15 00
Illinois Central Railroad Company.....	Freight on donation account.....	102 57
.....	from Springfield.....	9 70
Horticultural department.....	Labor on experimental farm.....	60 90
E. Snyder.....	Expense for July.....	283 72
Beidler & Son.....	Petty expenses.....	22 19
N. A. Williams.....	Lumber.....	73 71
New building and grounds.....	Pipe, tile, cement, etc.....	405 20
Dodson & Hedges.....	Pay-roll.....	248 70
Horace S. Leland & Co.....	Tin tube and rope.....	3 12
.....	Board.....	22 50
		<hr/> \$4,403 51

The following warrants were ordered to be drawn on State appropriations :

S. J. Surdam, hooks.....	\$13 50
S. W. Shattuck, Superintendent, services and expenses.....	164 95
Field, Leiter & Co., carpets, shades, etc.—20 per cent. off.....	707 48
E. F. Hollister & Co., matting and furniture—20 per cent. off.....	759 10

Recess until 7:30.

EVENING SESSION.

The Board re-assembled on time.

Mr. D. Gardner, being detained on business, joined the meeting.

Prof. Shattuck, Regent *pro tem.*, made the following report as chairman of a committee on furniture for new building :

Trustees of the Illinois Industrial University :

GENTLEMEN:—Your committee on furnishing the new building, beg leave to make the following report of progress : After consultation, it was considered best that the chairman should visit Cincinnati to inspect settees, etc., and get bills on the proposed library cases. This he did. After this visit, the full committee met in Chicago on the 23d ult. They found it necessary to spend two days in the work of choosing and contracting for seating the chapel, curtains for the building, matting for chapel, library and halls, carpets for recitation and dressing rooms, and furniture for reception room. The whole amount thus far contracted for is :

Library cases and railing.....	\$2,000 00
Settees for chapel.....	1,067 20
Matting for library, halls, etc.....	464 10
Carpets for reception and dressing rooms.....	239 30
<hr/>	
	\$3,770 60
Furniture for reception room, chapel, etc.....	414 00
Curtains for building.....	468 18
Gas fixtures—including street conductors—about.....	1,200 00
Clothes and hat hook.....	13 50
<hr/>	
Assigned.....	\$5,866 28

Amount brought forward.....	\$5,866 28
Physical laboratory.....	3,000 00
Draughting rooms.....	950 00
Cabinet cases.....	1,000 00
	<hr/>
	\$10,816 28
Amount of appropriation.....	11,550 00
	<hr/>
Balance.....	\$733 72

This balance will be needed in setting up settees, making carpets, curtains, etc., for blackboard platforms, some additional furniture, etc.

Respectfully submitted.

S. W. SHATTUCK, *for Com.*

The report was received and ordered placed on file.

The following report was further made by him as Superintendent of the building :

Gentlemen of the Board of Trustees of the Illinois Industrial University :

I have the honor to make the following report as Superintendent of operations at the new University building :

The general work for the completion of the building has gone forward with reasonable dispatch, though some delay was caused by the flooring being short by some 16,000 feet. Mr. Gehlman interprets the contract that the University is called upon to furnish this, also the required hardware. I cannot understand it thus. Your attention is asked to the matter. In this connection I may also say that 50 pieces more of perforated base, 4 feet by 6 inches, are required.

Many of the blackboards made last year are not in good condition. No more of them have been put on, but the places have been finished like the rest of the wall. Some — square yards of slating will be required for these spaces, which will cost I suppose about —.

Some 18 desk platforms will be required for the recitation rooms.

The University bell has been mounted in its proper position.

Because of the general settling of the building some three inches in depth of earth had to be taken from the basement floor.

The general grading and laying out of the grounds have gone on, though not so fast as desirable. The large amount of labor called for in the building and its immediate vicinity is the reason for this.

Upon consultation with Mr. Gardner, a system of sewers and drains for the building was adopted. The proper material was procured, and the most difficult part of the work performed, but it will require some six days more of good weather to complete it. A further appropriation of \$50 is required for this purpose.

It is noticed that four of the down spouts of the building do not take the water fast enough, the gutters overflowing.

All of the proper material belonging to the University is being used to form the drives and walks on the grounds, but it will be necessary to have in addition at least 100 cubic yards of stone and 200 yards of gravel to do what is necessary at this time. Gravel can be had for 25 cents per yard, at the bank, and a team will haul 6 yards a day. Stone, I suppose, can best be had from Kankakee.

Attention is called to the fence in front of the University building. It and the proposed walk will be some 50 feet distant from each other.

About 230 feet of inch service pipe for water closets is required. This can best be put in in connection with the heating pipes.

S. W. SHATTUCK.

The report was received.

The perforated base was ordered to be purchased.

An additional appropriation of \$50 for the sewer was made, and \$75 were appropriated for purchase of gravel for finishing of walk.

Twenty-five dollars were appropriated for cartage of stone.

Mr. Gardner reported that he had purchased the necessary lumber for constructing the sidewalk.

The report was accepted, and Mr. Gardner authorized to have the work completed, and the fence removed to its proper position.

The Regent was directed to have the leaks in the roof of the new building repaired.

Messrs. Gardner, Cobb and Mason were appointed a committee to control the future operations of the mechanical shops, and report on same.

Mr. J. M. Van Osdel, jr., Architect, presented the following report :

AUGUST 14, 1873.

To the Trustees of the Illinois Industrial University :

This is to certify that S. H. Gehlman is entitled to a payment of four thousand fifty-eight dollars and fifty-nine cents, on account of work done and materials furnished in the new University building, at Urbana, classified as follows :

Carpenter work.....	\$1,800 00
Nails	75 00
Plastering.....	800 00
Painting.....	500 00
Stairs.....	500 00
Iron work.....	1,000 00
Framing.....	40 00
Concreting.....	250 73
	<hr/>
	\$4,965 73
Less 20 per cent. per contract.....	993 20
	<hr/>
	\$3,972 53
Hardware from Surdam & Covert.....	86 06
	<hr/>
	\$4,058 59

J. M. VAN OSDEL, JR., *Architect.*

A warrant to the amount of \$4,058 59 was ordered to be drawn on State appropriation.

Mr. Van Osdel also reported work to the amount of \$9,025 55, done on heating apparatus.

A warrant was ordered to be drawn for such amount.

Prof. Shattuck made his report as Regent *pro tem.*, as follows :

Gentlemen of the Board of Trustees of the Illinois Industrial University :

As Regent *pro tem.*, I have the honor to make the following report :

Since your last meeting quite the usual amount of office work has been done ; the students record completed to date, a large number of inquiries in regard to the University answered, and catalogues sent representing it in part.

The appointment of Dr. Prentice as Resident Instructor in Veterinary Science, at \$1,000 per annum, is again recommended.

Mr. A. C. Swartz, a graduate from the school of civil engineering, is recommended for an appointment as tutor in that school, at \$40 per month.

An arrangement with Mr. Hays, similar to the present one, for the coming year, is proposed. Mr. Hays has given satisfaction, and I hope his services may be retained.

I suggest that authority be given to a committee to engage the still required tutors and instructors, subject to the assignment of funds made at your last meeting.

Dr. Gregory thinks it desirable that the University should have the services of Professors in Agricultural Chemistry, and in Physics, as soon as its funds will allow. I heartily concur in this opinion.

Authority is asked for having done the usual annual binding and repair of books in the library ; also for having printed the usual examination blanks and circulars to county superintendents.

The annual cleaning and repairs of the University building and furniture calls for attention.

In this connection the question to what use the proposed vacated portions of the old building shall be put, may be raised. Some fifty students could be accommodated in the room thus made, not including the chapel. The use the present heating apparatus is to be put to, calls for settlement. You are requested to assign the rooms of the new building to their several purposes, either directly or by

committee; also to give the authority to remove the library, cabinet, offices, etc., to their rooms in the new building. I suggest that the time of the opening of the academic year in September, be extensively advertised. Attention is asked to the request of Mr. Ed. Lynch, also to the communication of Prof. Snyder, in regard to an application from Students Kasson and McCoy, for permission to establish a University book store.

Respectfully,

S. W. SHATTUCK.

The report was received.

Dr. Prentice was appointed Professor of Veterinary Science, at \$1000 for the year.

The appointment of necessary tutors and assistants was referred to the committee consisting of the President of the Board and the Regent, with power to act.

The necessary binding and repairs of books in the Library were ordered to be done.

The President, as Chairman from the Committee to appoint a Professor of Agriculture, reported that a liberal offer had been made to Prof. M. Miles, of Michigan, but had been declined. No further arrangements have yet been entered into. Report adopted, and Committee continued.

The Board adjourned to meet August 15, at 8 A. M.

SECOND DAY'S SESSION.

The Board assembled on time.

The following motion of Mr. Blackburn was adopted :

Resolved, That the Regent, *pro. tem.*, and Faculty of the University, with the President of the Board, be constituted a Committee to make any preparation or arrangements of buildings or rooms, not otherwise provided for, necessary for the opening and carrying on the approaching session of the University, limiting the expenditures to the appropriations, and reporting to the Board.

On motion, one hundred dollars were appropriated from the Incidental Expense Fund, for moving library and cabinet furniture, and cleaning of the new University building.

The Regent was directed to advertise the opening of the Fall session.

Mr. C. I. Hays was continued University Florist.

A request of student E. Lynch, in regard to fees, was not granted.

An application of students Kasson and McCoy, for permission to open a University book and stationery store, was tabled until next meeting.

The President, as Chairman of Committee on Appointment of Professor of English Literature, made a report and read applications for chair of English Literature from Professors J. F. Carey, J. C. Pickard and D. H. Pingrey.

Judge A. M. Brown moved that J. F. Carey be appointed Professor of English Language and Literature.

Mr. Blackburn moved that this motion be laid on the table, action deferred, and Committee continued. Carried.

On motion, Col. R. B. Mason was added to the Committee on Appointment of Professors.

Mr. D. Gardner reported on subject of Division Fence of University Lands, asking further time for investigation. Report accepted, and Committee continued.

The following Report of Mr. J. P. Slade, from the Committee on By-laws, was received, and the By-laws, as amended, adopted :

To the Board of Trustees of the Illinois Industrial University :

Your Committee appointed to revise the By-laws, would respectfully report as follows :

I.—Meetings of the Board.

SECTION 1. All meetings of the Board of Trustees shall be held at the University Building, in Champaign county, and a majority of the Board shall constitute a quorum.

SEC. 2. The Board shall hold an annual meeting the 2d Tuesday of March, and other meetings as often as once in three months, at such times as the Board may designate.

SEC. 3. Special meetings may be called, whenever necessary, by the President or any three members of the Board, by mailing to each member of the Board, at least five days before the day of meeting, a notice of the call: *Provided*, that in such notice the business to be attended to at such meeting shall be specified.

II.—Order of Business.

SEC. 1. The order of business at each annual meeting of the Board shall be:

1. Reading of the Scriptures and prayer.
2. Calling the roll of members.
3. Reading, correction and approval of Minutes of last meeting.
4. Reports of Officers.
5. Reports of Committees.
6. Unfinished and new business.

III.—Rules of Debate.

SEC. 1. In discussion, and the disposal of business, the Board shall be governed by the parliamentary rules and usages usually governing deliberative bodies.

SEC. 2. Every resolution offered shall be reduced to writing and sent to the Secretary's table.

IV.—Officers and Appointees.

The officers of the Board shall consist of the President, Treasurer, Corresponding Secretary, and Recording Secretary; and the Board may, from time to time, appoint such Professors, Tutors or Instructors, and such subordinate officers and employees as they may deem necessary to carry on the Institution.

V.—Terms of Office.

SEC. 1. The Regent and Treasurer shall be elected at each biennial meeting, and hold their offices for two years, and until their successors are elected and qualified.

SEC. 2. The Corresponding and Recording Secretaries shall be elected at the annual meeting and hold their offices for one year, and until their successors are elected and qualified.

SEC. 3. Professors, and other officers and employees, shall be appointed at such time, in such manner and for such term, as the Board shall, by resolution in such case, direct, and be subject to removal at the pleasure of the Board.

VI.—Treasurer.

The Treasurer shall give bond, with approved security, in the sum of three thousand dollars. He shall be custodian of all moneys and securities belonging to the University, except such as are, by law, placed in the custody of the State, and of the land scrip, until same shall be sold or located. He shall invest the funds of the University, as directed by the Board, and he shall pay no money out of the treasury, except upon a warrant of the President of the Board, countersigned by the Recording Secretary. He shall also, annually, and oftener when required, make a detailed report to the Board of all receipts and disbursements, since making his last report.

VII.—Corresponding Secretary.

The Corresponding Secretary shall perform the duties indicated and required by the act creating his office. He shall hold his office in the University building.

VIII.—Recording Secretary.

SEC. 1. The Recording Secretary shall perform the duties required of him by law, and usually appertaining to his office. He shall keep the books and papers belonging to his office at the University building, at Urbana, and the same shall be open to inspection of any member of the Board, or officer of the University. He shall be the clerk of the Executive Committee, and reside at or near the University.

SEC. 2. He shall countersign all warrants on the Treasurer, and note on each the appropriation of the Board or Executive Committee authorizing the issue of the same.

IX.—*Salaries.*

The salary of each officer, professor, instructor or other employee of the University, shall be fixed by resolution, at the time the appointment is made, subject to alteration, in the discretion of the Board and a warrant shall be drawn for the same according to law, on the Treasurer, as the same shall fall due: *Provided*, there are funds in the treasury to pay the same. Salaries shall be payable quarterly, on the first days of April, July, October and January, of each year.

X.—*Duties of Executive Committee.*

SEC. 1. The Executive Committee shall meet at the seat of the College, at least quarterly, and oftener if they shall find it necessary for the transaction of any business necessary to be done in the vacation of the Board.

SEC. 2. The Executive Committee shall, for the purposes for which they were appointed, possess all powers of the Board: *Provided*, that they shall not revise or change the acts of the Board, not act upon any matters referred to any Committee of the Board that may be intrusted with any special business; shall not purchase or sell real estate, nor the land scrip nor bonds belonging to the University, without the consent, in writing, of a majority of all the members of the Board, and shall be strictly confined to such business as cannot be left till the quarterly meetings of the Board.

SEC. 3. The Committee shall hold their office till the annual meeting next after their appointment; and they shall submit the minutes of their proceedings, or make a report through their Chairman, to every meeting of the Board, of all their transactions since the last meeting of the Board.

SEC. 4. Special meetings of the Executive Committee may be called in the same manner as special meetings of the Board.

These By-laws may be repealed or amended, at any meeting of the Board, by a vote of a majority of all the members of the Board.

JAMES P. SLADE,
A. M. BROWN,
J. H. PICKRELL,

Committee.

The Chairman from the Committee of Course of Study asked that further time be allowed for their report. Granted.

The Board adjourned to meet on Thursday, Sept. 4, at 3 o'clock, P. M.

LAWS RELATING TO THE UNIVERSITY.

An act making an Appropriation in aid of the Industrial University, and for payment of Taxes on Land held by the State for use of said Institution.

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly,* That there be and hereby is appropriated to the Industrial University at Urbana, in aid of the experiments in progress upon the experimental farm, the sum of fifteen hundred dollars. For the payment of taxes accruing in the years 1872 and 1873 on lands owned and held by the State for the use of said Institution, in the county of Gage in the State of Nebraska, and in the counties of Pope, Kandigoh and Reuville, in the State of Minnesota, the sum of three thousand dollars per annum.

§ 2. The Auditor of State is hereby authorized and directed to draw his warrant upon the Treasurer for the sum herein appropriated, upon the order of the Board of Trustees, signed by the President, and attested by the Secretary, with the corporate seal of the Institution: *Provided*, that no part of this money shall be due and payable to the said Institution, until satisfactory vouchers, in detail, approved by the Governor, have been filed with the Auditor for the expenditure of all sums previously drawn.

§ 3. This appropriation shall be and continue in force from the first day of July, 1873, until the expiration of the first fiscal quarter after the adjournment of the next General Assembly.

APPROVED April 29, 1873.

An act to regulate the Illinois Industrial University, and to make Appropriations therefor.

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly,* That it shall be the duty of the Governor, within ten days after the taking effect of this act, to appoint nine

trustees—three in each of the three grand divisions of this State—who, together with the Governor and the President of the State Board of Agriculture, for the time being, shall constitute the Board of Trustees of the Illinois Industrial University, and shall succeed to and exercise all the powers conferred by the act entitled “An act to provide for the organization and maintenance of the Illinois Industrial University,” approved February 28, 1867, except as is herein or may be hereafter provided by law. The said appointments shall be subject to approval or rejection by the Senate, at its present or next session thereafter, and the appointees shall be and are hereby authorized to act as Trustees of the said University from the time of such appointment, unless in case of rejection by the Senate, until their successors shall be appointed by the Governor, and such appointment shall be approved by the Senate.

§ 2. The members of the Board of Trustees, and their successors, shall hold their office for the term of six years each: *Provided*, that at the first regular meeting of said Board, after such appointment, the said members shall select by lot three of their number to hold office for two years, three to hold office for four years, and three to hold office for six years, from the time of convening of the present General Assembly. The Governor, by and with the advice and consent of the Senate, shall fill all vacancies which may at any time occur by expiration of term of office or otherwise in said Board, by appointment of suitable persons resident in the respective grand divisions in which such vacancies may occur. Said Board of Trustees may appoint an executive committee of three, chosen out of their own number, who, when said Board is not in session, shall have the management and control of the said University and of its affairs, and for that purpose shall have and exercise all the powers hereby conferred on said Board, which are necessary and proper for such object, except in so far as the said Board may and does reserve such powers to itself; and any powers granted at any time, by said Board to said Executive Committee, may be by them at any time revoked.

§ 3. No member of said Board shall hold or be employed in or appointed to any office or place under the authority of the Board, of which he is a member, nor shall any member of said Board be directly or indirectly interested in any contract to be made by said Board for any purpose whatever.

§ 4. The fiscal year of the said University is hereby declared and required to terminate on the thirty-first day of August, in each year, and all reports of the University, except catalogues and circulars, shall be addressed to the Governor, and the annual reports shall contain a full account of the financial and other transactions of the University to the close of the fiscal year as aforesaid, together with a full statement of the

then condition of the endowment fund, and shall be presented to the governor on or before the fifteenth day of October in each year: *Provided*, that no less number of said reports be published annually than is now authorized by law.

§ 5. The Trustees of the said University shall elect, annually, from their own number, a President, who shall also be one of the Executive Committee of three authorized by this act, in case such Committee should be chosen and appointed by the said Board; and no money shall be drawn from the treasury of the University, except by order of the Board of Trustees or of the Executive Committee aforesaid, on the warrant of the President of the said Board, countersigned by the Recording Secretary.

§ 6. All pupils attending the said University shall be taught, and shall study, such branches of learning as are related to agriculture and the mechanic arts, and as are adapted to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life, without excluding other scientific and classical studies, and including, for all male students, military tactics.

§ 7. The Treasurer of the said University, and the said Board are hereby required in future to invest the principal of the funds arising from the endowment of the United States, in interest-bearing bonds of the United States, or of this State, or of other States which did not participate in the late rebellion. They are hereby prohibited from changing the securities in which said fund may be invested, without the express permission of the General Assembly, except that county bonds, in which some of said funds are now invested, may be sold, and the proceeds thereof invested in interest bearing bonds of the class and character specified above in this section.

§ 8. All charges for freight heretofore or hereafter accruing over the Illinois Central railroad, for the use or benefit, directly or indirectly, of the said University, shall be applied on the subscription of fifty thousand dollars to the funds of said University, until the said subscription shall be exhausted, and no such freights shall be paid in money by the Trustees to any person or corporation, nor shall any money be drawn from the treasury of the State on account thereof, nor on account of such application.

§ 9. There is hereby appropriated, for the full payment of the Architect, Superintendent, and the entire completion of the main University building of the said Industrial University, the sum of fifteen thousand dollars; for heating apparatus for the same, eighteen thousand dollars; for gas fixtures, including street main connection, one thousand two hundred dollars; for fitting and furnishing said building, seven thousand three hundred and fifty dollars; for furniture and apparatus for

the physical laboratory, three thousand dollars; or so much of the sums specified for each of the above named purposes as may be necessary.

§ 10. The Auditor of Public Accounts is hereby authorized and directed to draw his warrant upon the Treasurer for the moneys herein appropriated, in favor of the parties to whom the same may be and become due, upon proper vouchers, signed by the President of the Board of Trustees, and attested by the Secretary, with the corporate seal of the University attached, and approved by the Governor.

APPROVED May 7, 1873.

RECEIPTS AND EXPENDITURES, Etc.

Statement of Receipts, Expenditures, State Appropriations Expended, and condition of Endowment Fund, as presented to the Board Meeting, September 4, 1873.

The Recording Secretary presented the following statement of receipts and expenditures, also statement of invested funds :

Statement of receipts and expenditures from current funds and State appropriations, from March 1, 1873, to August 31, 1873.

RECEIPTS.

Balance on hand March 1, 1873.....	\$5,667 87
Interest on Sangamon county bonds	2,250 00
" on Champaign county bonds	11,500 00
" on Morgan county bonds	2,500 00
" on Pike county bonds	3,000 00
" on Chicago water bonds	875 00
" on Illinois State bonds	930 00
Rents, etc., of lands	670 00
Collections outstanding from last year	276 68
" from Chemical department	1,447 68
" from students (spring term)	18 69
" from farm sales	2,795 41
" from Mechanical shops	847 64
" from Horticultural department	995 69
" from Carpenter shops	300 39
" fuel from students	164 47
" Illinois Central Railroad donation	469 71
Sundry collections	417 15
Total receipts	\$36,976 96

EXPENDITURES.

Board expense	\$1,006 69
Salaries	13,149 69
Fuel and lights	904 82
Stationery, printing and advertising	378 03
Buildings and grounds, repairs, etc	466 09
Incidental expenses janitor, cleaning, etc	573 30
Mechanical department, running expenses	1,394 29
Carpenter shops, running expenses	886 18
Horticultural department, running expenses	2,802 21
Agricultural	4,271 18
Chemical	233 91
Library and cabinet	610 21
New University, buildings and ground	1,137 42
Military department and gymnasium	67 05
Balance on hand August 31, 1873	9,572 73
Total	\$36,976 96

STATE APPROPRIATIONS.

	Appropriated.	Expended.	Undrawn.
New University building	\$15,000 00	\$8,106 01	\$6,893 90
Heating apparatus	18,000 00	9,090 05	8,909 95
Fitting and furnishing	7,350 00	1,550 71	5,799 29
Taxes on lands	5,000 00	2,660 49	339 51
Agricultural experiments	750 00	342 80	406 20
Total unexpended			\$22,348 94

ENDOWMENT FUND.

Statement of the Endowment Fund of the Illinois Industrial University, on the 31st day of August, 1873, in accordance with the act of Legislative Assembly, dated May 7, 1873.

Securities.		Amount.
Champaign county 10 per cent. bonds	.....	\$115,000 00
Sangamon county 9 " "	.....	50,000 00
Morgan county 10 " "	.....	25,000 00
Pike county 10 " "	.....	30,000 00
Kankakee county 10 " "	.....	30,000 00
Putnam county 10 " "	.....	13,000 00
Chicago water 7 " "	.....	25,000 00
Illinois State 6 " "	.....	31,000 00
Total	.....	\$319,000 00

Three hundred and nineteen thousand dollars invested as above, and an undrawn balance of \$178 87 on hand.

URBANA, September 1, 1873.

E. SNYDER,
Recording Secretary.

FIFTH ANNUAL SERIES OF AGRICULTURAL LECTURES.

Space only permits the insertion of a few of the papers read before these Conventions of Farmers. The discussions and some of the lectures which were familiar *talks*, illustrated by black-board and drawings, are omitted.

[CIRCULAR.]

LEARNING AND LABOR—ILLINOIS INDUSTRIAL UNIVERSITY.

FARMERS' CONVENTIONS.

The Fifth Annual Series of Agricultural Talks and Discussions, held under the auspices of the Illinois Industrial University, will be held during January and February of 1873, at the following times and places:

At Peoria, Peoria county, commencing Monday evening, January 20th, and continuing, with three sessions daily (9 A. M., 2 P. M. and 7 P. M.) until Thursday, January 23d.

At Jacksonville, Morgan county, commencing Tuesday evening, January 21st, and continuing until Friday, January 24th.

At Pana, Christian county, commencing Monday evening January 27th, and continuing until Thursday, January 30th.

At Greenville, Bond county, commencing Tuesday evening, January 28th, and continuing until Friday, January 31st.

At Kankakee, Kankakee county, commencing Monday evening, February 3d, and continuing until Thursday, February 6th.

At Gilman, Iroquois county, commencing Tuesday evening, February 4th, and continuing until Friday, February 7th.

At Belvidere, Boone county, commencing Monday evening, February 10th, and continuing until Thursday, February 13th.

These Farmers' Institutes have a two-fold purpose: One is, to bring before our farmers and the citizens of the State generally, new facts and new theories affecting the Practice, the Social Condition and the Economy of Rural Life. Another object is, to learn the views of practical men and compare their observation and experience. We desire to bring the man of Science and the practical man together, that they may learn of each other, and that general intelligence upon agricultural matters may be advanced.

The Board of Trustees of the Industrial University provides the speakers, who open the discussion upon the various topics with a short address. The citizens, at the different localities named, furnish halls properly warmed and lighted, and the courses are free to all interested to attend. The live farmers of the State are earnestly invited to attend and to participate in the discussions. Every locality named should begin early and do the work to secure a good attendance of such men. This is essential to success.

SUBJECTS AND SPEAKERS.

Among the speakers already engaged, and the topics proposed to be discussed, are the following:

Prof. J. B. Turner, of Jacksonville, will lecture upon the "Conservation of Animal Force in Agriculture," and perhaps upon other topics.

Dr. J. M. Gregory, Regent of the University, will give an address upon "The Farmers and the Middlemen," and upon "The Scope of Domestic Science," and, when desired, upon "The New Education in the Common Schools."

E. H. Singleton, Observer of the Signal Service, U. S. A., is expected to give an address, at one or more points, explanatory of the advantages to the farmer of the meteorological observations made by that Bureau.

Dr. Wm. LeBaron, State Entomologist, will lecture upon "Entomology."

Dr. E. S. Hull, it is hoped, will be able to talk, at one or more places of those named, upon Horticultural topics.

Thomas J. Burrill, Professor of Horticulture, will open discussions upon "The Treatment of Soils" and "The Propagation of Plants."

Judge A. M. Brown, of the Board of Trustees, will give an address upon "Orchard Management."

Don Carlos Taft, Professor of Geology and Zoology, will lecture upon "The Origin and Nature of Soils and Coals."

J. R. Scott, of the Board of Trustees, will speak upon "Feeding Stock."

Joseph F. Carey, Professor of Ancient History, Languages and Arts, will give an address upon "Plows and Plowing."

B. F. Johnson, Illinois Correspondent of the *Country Gentleman*, will lecture upon "Something More than Corn and Something Better than Oats."

W. C. Flagg, Corresponding Secretary of the Board of Trustees, will give addresses upon "The Agriculture of Illinois in the Census of 1870," upon "How to Make an Orchard," and upon "Rings, or the Combinations against the Farmer."

H. K. Vickroy, Orchardist and Gardener, will talk upon "Timber Growing; and How to make a Nursery."

E. L. Lawrence, Head Farmer, will speak upon "Rearing and Feeding Cattle."

J. M. GREGORY,
Regent.

W. C. FLAGG,
Cor. Sec'y.

SOMETHING MORE THAN CORN, AND SOMETHING BETTER THAN OATS.

BY B. F. JOHNSON, OF CHAMPAIGN.

Mr. President, Ladies and Gentlemen:

One year ago I read before the students of the Illinois Industrial University, and before several conventions similar to this one, a somewhat lengthy paper on "Indian Corn—its varieties, their cultivation and use." That paper had for its main object how to improve the corn crop—how to get three bushels where we formerly got two, and how not only to make a wide and general increase in the yield, but also how its consumption might be enlarged and extended. These seemed to be very desirable and legitimate things to be done, for until the year 1872 we had all of us believed the larger we could make the corn crop, the better should we be entitled to the thanks of farmers and the wide and general gratitude of the country. But the corn and oat crops of 1872 seemed to have changed all previous conception of such great and abounding yields, and we begin to understand and to have the fact brought forcibly home to us, that there may be, under an artificial state of society, such a thing as the over-production of corn, even, and that for the farmer's profit there may be, also, too many cattle, hogs, horses and

sheep. Indeed, we begin to see how it is, that too much of a good thing is good for nothing.

The very large crop of corn and oats, and the astonishing estimated increase of cattle and hogs appear to have demoralized the market and so affected the commercial mind of the country, that under this pressure prices have fallen a good deal below the reasonable and natural limit.

Some inquiry on the question of prices enables me to state this curious law, which is well illustrated in the present condition of the markets of the West. "Investigations in England, extending over a period of two hundred years, have shown approximately that a deficit of one-tenth in the crop of cereals raises the price three-tenths; and so on to a deficit of one-half, which raises the price four and one-half times the average." And so of the converse of this proposition. That is, a large surplus, such as that of the corn and oat crop of 1872, depresses prices out of all proportion to the excess of the supply. So you see if I had undertaken last winter to diminish the corn crop one-half, and had I succeeded, I should have been entitled to the thanks of the farmers of the State, for corn would now be 80 cents, instead of 20 and 25 cents, and oats 45 cents, instead of 15 or 18 cents. Indeed, if we looked no farther into the question of production than the single relation of prices, we might regard as beneficent a calamity, which would sweep out of existence one half the agricultural production of the Northwest, because the money value of the remaining half would be three or four times more than the original whole.

But nobody wishes to decrease the production, either in that way or any other, but we should, and indeed it is imperative upon us to enlarge the narrow boundaries of our primitive agricultural system, and for that reason I have undertaken to suggest that with the one at 25 cents a bushel and the other 18 cents, there should be grown in Illinois "something more than corn and something better than oats." Still I suppose if we had the markets of the world free to buy and sell in; if we had a currency of equal value to specie, so that a dollar at home would be equal to a dollar, not 80 or 85 cents abroad, and if all ranks, classes and conditions of men—the farmer, mechanic, miner, banker, manufacturer, railroader and laborer—were each and all alike protected, with a uniform revenue tariff of 10 or 15 per cent., then we might here in Illinois go on with growing corn and oats, and raising hogs and cattle, horses and sheep, increasing each with increasing age and development; and even without any considerable advance in present prices, we might continue that prosperity which marked the not distant past. But violent interference with the laws of trade and commerce, in the form of a high protective tariff, which robs the Western farmer just in proportion to which it benefits and enriches the Eastern manufacturer, together with

a depreciated paper currency, and general and wicked railroad conspiracy, produced violent results, and the time has come when the Western farmer asks himself if he must not abandon that system and method of agriculture for which the soil, the climate and the situation were specially designed and created. To-day the farmers of Illinois are in the precise condition the farmers of Georgia would be if forced to abandon rice culture; those of the cotton States, cotton-growing, and those of Louisiana sugar-cane. That is, government interference has been so violent as to break up the order and design of nature.

East of the Alleghanies, manufactures and the country generally were never more prosperous than at the present time—due, principally, to a twelve years' continuance of a high protective tariff; west of these same mountains, farmers were never in a condition of distress and poverty more wretched. East, the benefits of the tariff seem to increase with the length of time it has been in operation; West, since the war, the prices of farm produce have steadily declined; and now we are on the down grade to bankruptcy and ruin, with broken brakes, and the oppressive weight and momentum of three full crops behind us. And here in the present condition of things, is made conspicuous the cool effrontery of that infamous tariff dogma, that the best way to enrich the Western farmer is to protect the Eastern manufacturer. This is akin to the old-world maxim, "Take care of the rich and the rich will take care of the poor," and is about as reasonable and sensible as it would be to teach to shepherds that, in order to save sheep, they must stimulate, protect, and foster the breeding of cur dogs.

To resume, then. Since in my mind we owe the present depressed and deplorable condition of the farming interest: First, mainly to a depreciated paper currency, which forces us to sell low at gold prices (the prices in gold for corn and oats in Liverpool makes the price in Illinois), and buy high at paper ones; second, to a high protective tariff, which robs the West to enrich the East; and third, to high and extortionate railroad freights, which have been produced by both; and since we have, ninety in a hundred of us, helped to bring this state of things about, there can be no permanent improvement until there is a radical change in the public sentiment of the country. And since such changes are slowly brought about, we must look toward diversifying our industry; we must try, we must study, we must observe, we must experiment and ascertain what in Illinois we can grow which will pay us better than corn at 20 to 25 cents a bushel, and oats at 15 to 18 cents.

"Men sometimes are master of their fates—
The fault, dear Brutus, is not in our stars,
But in ourselves, that we are underlings."

And here at the outset of my subject I want to be understood as rather making suggestions than giving advice right out, and as addressing my-

self to a few rather than expecting to influence or impress the many. Illinois, so far as the present state of agricultural science will allow us to judge, is, and always will be, a corn and cereal growing, and a cattle and stock-raising country, and nothing, in my mind, can permanently change that high destiny. But now, just as a conspiracy of unfavorable circumstances has produced a crisis in our affairs, we may offer a partial solution by suggesting and pointing out some few of the many changes which may be made in the agricultural productions of the State.

One of the greatest objections to growing, to sell abroad, corn and oats and other cereals, hay, fruit, potatoes and other bulky products of our western agriculture is, that so large a per cent. of their home price is consumed in transportation, whether to interior cities or the seaboard, and therefore any change I shall suggest or recommend will be to products of the soil which have great value in proportion to their weight and bulk. Indeed, if we grew here in Illinois nothing of large consequence to market abroad, which sold at home for less than two or three cents per pound, the present extortionate rates for transportation would not so much injure as when it takes the price of two or three bushels of oats or corn to carry one to market. Then the growing of either becomes a ruinous business. But when we pay the same rate per hundred pounds for broom corn, butter, cheese, flax, hemp, tobacco, hops, madder, and the like, it takes only about an average of one-tenth or a twentieth, instead of two or three times the home price. And so the freights on live stock, though excessive, are not ruinous, because the drover can choose his shipping point, get the benefit of competition, and is not confined, as the grain growers are, to one road, one route, and one depot. The consequence is stock, especially good grade cattle, pay better at this time than the fruits, the cereals, vegetables or other bulky product of the farm.

So, since Illinois is, beyond all question, the grazer's paradise, and since, under the present depression, cattle feeding pays better than any other business, I shall not only not suggest that any cattle farmer change to untried things, but recommend that those engaged in any of the numerous branches of stock growing industry remain where they are, and that just as fast as the necessary capital has been accumulated, that any and every farmer who likes any one or more branches of the calling engage in it.

But you ask how and with what crops shall we diversify our farming industries; and what have you to recommend to us as "something more than corn and something better than oats." Of the products of agricultural industry, having an almost world-wide demand, which are valuable in proportion to their weight and bulk, which require a deep, rich soil, two of which are very exhausting crops, but which are suited

to the soil, latitude and climate of Illinois, I name tobacco, hemp and madder in the first category.

The consumption and consequent demand for

TOBACCO

is increasing and has been for two hundred years. Indeed, the surprising increase in the use of this narcotic is one of the most difficult problems the social philosopher has to determine at the present time. The price ranges from forty cents for the best Connecticut, down to twenty-four cents and even ten for the products of Kentucky, Missouri, Illinois and Wisconsin. Tobacco has been a staple production of Southern Illinois for many years, and during the war its cultivation was undertaken to a considerable extent in St. Clair, Madison and neighboring counties. It has generally, however, been abandoned there, not so much, however, because the quality was not good, but rather from want of special knowledge in the handling. Tobacco grows, and grows luxuriantly, on our strongest prairie soil, but it is claimed that the quality is coarse. Nevertheless, there are several million acres of timber lands lying all about the State, which, if the proper trial were made, would, I have no doubt, produce as good tobacco as Wisconsin. Doubtless some persons remember when it was quite the common belief that we could successfully neither grow apples nor grapes on the rich soil of the prairies, and there is a belief too general that wheat, especially winter wheat, is pretty sure to fail there also. But the better experience of the last ten years has taught us that, on the whole, for apples and grapes the prairie is rather preferable to the timber—and we are also slowly learning, if we only adopt the right methods of preparation and seeding, wheat growing is as successful on the open prairie as in the sheltered timber. So I shall never be willing to believe that there are not as good tobacco lands in Illinois as in Connecticut and Wisconsin until the trial has been thoroughly made in every county in the State. And while the cultivation of tobacco on a large scale demands, not only skill and special knowledge, but capital, still the farmer of a few acres only may find a fortune in them, if he gives his time, his mind, his money, his days and nights to tobacco.

I say, if a farmer would succeed with it, he must give his mind, his money, his days and nights to tobacco. It is so in everything. And one of the strongest objections which can be urged against the exclusive culture of the cereals, is that they do not give employment much more than half the year. The mechanic and the laborer who succeeds and makes something more than a bare living, goes to work at 7 in the morning and works till 6 in the evening, at least 300 days in the year. The merchant, the banker, and the manufacturer who makes a fortune,

does even better than that, while the successful railroad man puts in from 12 to 20 hours every day of the year. I beg of you, gentlemen, to look at the example of the most successful business men you know. Did you ever visit their places of business between sunrise and 9 o'clock in the evening without finding them at their posts. Do you ever find them idle or indifferent to their interests, or to your propositions to buy or sell? Do you see them in the country half as often as they see you in town? But how is it with you? "You know how it is yourself."

Now let me call your attention to

HEMP GROWING.

Of hemp there was imported into the United States in 1872, 260,000 bales of 200 pounds each, more or less. On hemp there is a duty of \$25 per ton. The price ranges from \$125 per ton for American, to \$300 for the best Italian, while manilla hemp ranges from 9c to 11c a pound in gold. In Illinois there are of the 35,000,000 acres area, 15,000,000 acres at least suited to the growth of hemp. Indeed, the strong black soils of our middle counties are peculiarly suited to this crop. Of all crops, it is conceded hemp pays best, the only difficulty being how to procure labor to harvest and handle it. This problem I do not undertake to solve, but leave it to those who are going to wreck and ruin on corn at 20 cents per bushel and oats at 15 cents, to find out. Neither can I give special directions as to the cultivation and handling of this crop. Suffice it for me to repeat that hemp suits the strong soils and fervid summer climate of Central Illinois admirably well, and that the profits on one good, full crop would be sufficient per acre to purchase the fee of the best farm lands in the State. Those desirous of making a trial of hemp growing may consult the agricultural papers or the encyclopedias; or what is better, they may take a run into Missouri or Kentucky, where they could obtain all the information they need at first hands. The demand for hemp is world-wide, and is fast increasing, and if the railroad extortionists get their just deserts in 1873, there will be twice the demand there was in 1872. To the farmer of independent means, who is strong handed in the way of a large family of robust and willing boys, who can at his pleasure devote forty or fifty acres, more or less, to the growth of hemp, even if he has to begin with the A B C of hemp husbandry, I recommend its trial, satisfied it will pay him better than any new crop he can lay his hands to. Although hemp is an exhausting crop, when made part of a rotation, hemp will succeed hemp, as corn succeeds corn, time out of mind. Hemp leaves the land, like flax and buckwheat, in admirable tilth and condition, just suited, after two or three crops in succession, to the growth of winter wheat. I would suggest to those who, on the strong, black soils of the middle counties, find

great difficulty in making a crop of winter wheat, on account of the weight of the straw, to put these soils in hemp two years in succession, and then try winter wheat. The hemp crop will have taken up the surplus fertility, cleaned the land of weeds, and made successful winter wheat growing hardly doubtful.

MADDER.

Then there is madder, a plant, the root of which is very largely used in dyeing. The production of madder is limited to a few hundred square miles in the north of France and Germany. Yet is the consumption in civilized countries almost universal. All the brilliant and lively colors on cotton and calico, all the Turkey reds, all the other kinds of reds, all the yellow, all the browns, indeed, nine-tenths of all the prints now in every-day use, owe their colors to the root of the *rubia tinctorium*, or madder plant. Madder is a principal ingredient which makes the scarlet of the uniform of the British army—and is the foundation of the reds so largely employed in the clothing of the infantry and cavalry of the French and other continental armies. The madder plant is in a manner a perennial, or rather a tri-ennial in some such way as the dandelion and the coffee chickory. It is sown one spring, cultivated two years, and harvested the fall of the third year from sowing. Madder has a long slim tap-root, which hilling up lengthens, while it helps the growth of laterals, and demands a deep, strong soil, special knowledge and special handling, but is a profitable crop, selling from ten to fifteen cents the pound dried and ground.

I suggest madder as a crop to be tried by our German fellow-citizens whose home antecedents make them familiar with the process of growth and handling.

THE ADVANTAGES

for the profitable growth of the three crops of tobacco, hemp and madder here in Illinois, over most countries and States, are that we have a soil on which manure is not at present needed, and a climate of special fitness. To prepare the tobacco lands of Connecticut, the hemp lands of Italy, or the madder lands of France and Germany involves an expenditure equal to the price of the strongest lands in this State. In the cultivation of these crops we have the single disadvantage of the high price of labor and the lack of a little special experience and training. So it remains to be seen whether the farmers of Illinois will suffer themselves to be starved on corn at twenty cents per bushel and oats at fifteen cents, rather than put themselves to the severe but profitable labor of growing tobacco, hemp and madder, or some other great and leading product of the soil; in fine, whether they will undertake to grow "something more than corn and something better than oats."

And here I suggest there is an opportunity for the labors of a class of public-spirited men, men who have made great fortunes out of Illinois agricultural products, like some of the leading business men of Chicago, such men as are not absent in the dullest communities, and to whom we owe, to a great extent, most of our material and political progress. I mean those who do good for the sake of doing good. Let these men, not with the object of profit, not for curiosity alone, but solely for the purpose of spreading truth and knowledge, make some experiments in the way of growing tobacco, hemp and madder, and other new crops as well. An acre, or the half of an acre, devoted to these trial crops, and the processes and results reported through the press, surely would be of the highest interest, and might be of incalculable value to the State.

DAIRYING.

And now into the second division of my subject, as a very important means of developing our industry, I put dairying, or the making and manufacture of butter and cheese. Certainly Northern and Central Illinois, the home of the whole tribe of grains and grasses and forage plants, corn, wheat, oats, rye, barley, white and red timothy, red top and blue grass, and fifty other grasses not necessary to name, in fine a champagne country, made for, of all others, and suited to the breeding, rearing and feeding of the bovine race, should be that one in which the products of the dairy largely engaged the labors of its farmers. We have the soil and the climate for the cheap production of cattle food, in that we can have no successful competitors. Against us is the summer and the winter temperature. Can we overcome these objections, at a cost so inconsiderable as to leave us as far in advance in dairying as we are in cattle feeding and related industries? This is the question. Up to this time, so far as the dairy industries are concerned, Central Illinois has made little progress. I suppose we make butter enough for home consumption; but I think we eat and consume five pounds of cheese where we make one. Our hot summers and cold, intense winters, the almost level plain of our prairie lands, and the consequent deficiency of perennial springs, and the difficulty of obtaining a liberal or sufficient supply of cool, fresh water, have made the necessary preparation for the successful manufacture of butter and cheese too costly to be undertaken by private enterprise. No matter how rich and wide the pastures may be, how little the cost, and how abundant the supply of cattle food, the climate that gives us from the 15th of June to the 15th of September a mean temperature of 75 degrees in cool summers and 82 to 85 degrees in warm ones, and in which there are days at 90 degrees, and nights at 85 degrees, something more is required for butter and cheese making than the simple preparations

common to cool, hilly and springy countries. To be sure, butter is made with us in any quantity in June and July, but it is butter only in name—butter in quality, equal to second rate soap grease, which has to be measured by the quart, rather than weighed by the pound. It is next to impossible to make good butter, butter that will keep the whole season through, where the opportunities afforded do not warrant a steady temperature, not above sixty-five or seventy degrees, nor can cheese be made, handled, cured and kept where and when liable to the fever heats of eighty-six and ninety degrees for days and weeks together. Two months in the spring and two in the fall are as about as many out of the twelve of the year as the private dairy farmer, with the facilities common to the country, can count upon; for we need as much protection in dairying in this State from the frigid days of our arctic winters as we do from the torrid days of our sub-tropical summers. It is only a few years since the packing of pork in Chicago, Cincinnati and St. Louis was confined to the winter months, and we had little or no hog market but in the cooler months of the year. But now by the liberal use of ice and cool cellars and packing-houses, the work is done quite as cheaply and expeditiously in the summer. So when our grazing counties shall have become so thickly settled that the farmers of a neighborhood can employ associate capital, to provide side-hill and other cellars, where an even temperature of sixty-five and seventy degrees may be maintained through the year; when every farmer, especially every milk farmer, shall provide warm winter shelter for his beasts, and store clover and oats for their use; when every man of them shall lay up his summer's ice as regularly as he puts down his pork, or hangs up his hams, then, I predict, the difficulties of the climate overcome, dairying in Illinois will have become established as one of its leading and most profitable industries. I put it to you earnestly, gentlemen, now, when corn is worth from 20 to 25 cents, and when tax collectors are conspiring to rob and ruin us, and drive us out of the land, whether, when you have a tolerably thickly settled community, it is not a good time to talk about the results which may follow associated efforts in this branch of farming.

HOPS, BROOM-CORN AND CASTOR BEANS.

Within the second division of my subject I may also include hops for the north part of the State, broom-corn for the central, and the castor oil bean for the south. I know that so far as our experience goes, hops have failed in Central Illinois, but I believe it is one of those failures due rather to unskillful handling than to a want of adaptation in the plant to the climate. In Northern Illinois, and especially Wisconsin, hops have been a great success, and though during one or two seasons

the price got down to the parallel of those now ruling for corn and oats, hogs and cattle, nevertheless, hop growers there are pretty confident, if they stick to their business, they will pay better than any single crop. I believe that if the farmer, who, in Central Illinois, has high, dry, and well-drained land, should steadily engage in hop husbandry, he would in ten years make himself rich. The soil of the prairies is so abounding in fertility and the climate generally so well suited to almost every cultivated crop common to the temperate zone, that persistent, thoughtful and skillful cultivation in any particular line is pretty sure to be crowned with success.

Broom corn is and has been a profitable crop in Northern Illinois for many years, say twenty-five, and in Central Illinois for the last ten years. To be sure, that commodity has suffered fluctuations in price, common to every agricultural product, but the broom-corn grower, who has held steadily on to his specialty, has found it a profitable one. The soil and the climate of the center of the State favor the growth of the large evergreen varieties of broom-corn, which require a strong soil and a long summer.

These are the main advantages the middle have over the northern counties, and over the growers of Ohio and New York, all of whom are compelled to confine their labors to growing the early varieties and dwarf kinds; and have to submit to a stronger competition in consequence. Considering the cultivation of broom-corn in all its relations, I think, it may be safely claimed that the central counties of our State produce the best article grown in the country. However, broom-corn production must necessarily be confined, for some time yet, to the near neighborhood of considerable interior towns, since the labor required is to a great extent suited to women and children, and requiring not more than four out of the twelve months of the year.

Of the castor beans suited to the soil and climate of the south half of the State, I know but little. Formerly a good deal of it was grown in Southern Illinois, so much so that a special law was made prohibiting its cultivation unless strong fences were built and maintained to keep stock off. I suppose the bean is still cultivated; but if so, to a very limited extent. The St. Louis prices current inform me that castor beans are worth from \$1 50 to \$1 75 per bushel. At these prices one would think they would pay better than corn at 20 cents and oats at 15 cents.

ABOUT ROOT CROPS

I am not certain, remembering how hot and dry our average summers are, and how, if you have to sell a short distance only from home, the transportation eats up the price. The truth is, the successful cultivation of roots for forage purposes is almost as necessarily confined to

countries and States having a cool and comparatively moist summer climate as the corn crop is to countries having a fervid one. To be sure one may succeed with corn in Canada and Northern New York, and sometimes we get good root crop returns in Central Illinois, but in both cases there are more failures than successes, and more out-goes than incomes. The cultivation of the sugar-beet being still of doubtful profit I would not recommend its trial, except on contract, to supply a beet-sugar factory already established. However, there is one forage root, one vegetable I would heartily indorse as almost the only one I know which gives a sure return. I refer to the parsnip. Of all root crops on our prairie soils it has the most striking advantages and conspicuous good qualities. Among which are: It may be sown, and indeed should be, the moment the frost is out; it is easily distinguished from weeds at its first appearance above ground, holds firmly to the earth from the start, stands dry and wet weather equally well, grows the whole season through, and may remain in the ground uninjured all winter. It is always a precious recourse of the kitchen when other vegetables fail; hogs will eat it, horses like it, sheep love it, milch cows and steers adore it. In fact, as an auxiliary food for fattening stock, and especially to increase the flow of milk without a disagreeable taint, it is worth, pound for pound, more than any forage root that can be named.

COTTON.

When the cry went abroad that king cotton was dethroned, it was declared that king corn should succeed to his inheritance. The succession has been a short one, and now king corn is so poor and dishonored as to sell three pounds for a penny, it may be worth our while to recall to mind our former ruler. Cotton is pretty well suited to the soil and climate of the lower third of our State. Indeed, one may say with allowable hyperbole, that cotton has been grown in Egypt from remotest antiquity. I am aware many unsuccessful attempts have been made to push the cultivation of this plant north, but the failures have not been such as to warrant its abandonment to an arbitrary line below 37 degrees or 36 degrees north latitude. In experiments with cotton, made some years since, I found a wonderful difference in maturity between the product of seed obtained from Tennessee, and that from tropical South America. The Tennessee cotton, planted in May, stood a pretty severe frost in June, and the summer being cool got ready to open a few bolls only, when killing frosts came, early in October, whereas the tropical cotton, protected from early frosts, pushed vigorously after the 10th of July, continued on that line all summer, and had barely opened its first blossoms at the close of the season. So, said I to myself, climate and circumstances, without man's aid, has produced the wonderful dif-

ference in the maturity of an annual plant; there is not a man capable of making as wide a difference in the period required for growth and maturity between the Tennessee cotton, and a cotton suited to latitude 40 degrees north, as nature and circumstance has established between the cotton of Tennessee and the cotton of the tropics. That is, cotton having been acclimated from the tropics to the region of Tennessee, what reason is there to doubt the accommodation to climate may not be continued, so as it may be successfully grown considerably north of 40 degrees north latitude? I suggest experiments be made, and particularly since it is a well-authenticated fact that a cotton "sport" has been discovered in Georgia, remarkable for its fecundity in bolls and its early maturity.

MINOR INDUSTRIES.

And now for the minor industries—industries suited to farmers of few acres, narrow circumstances, and but a limited amount of stock and other desirable worldly goods and possessions. And I want you to bear in mind, gentlemen, in these my various suggestions and recommendations to a wider diversification of our agriculture, that I do not wish to break up or break into the plans of a well-ordered farm life. Of course, rich and well-to-do farmers, men of large means and large holdings of improved lands, who are engaged in the more profitable branches of agriculture, such as the raising and feeding of stock, and the breeding and improving of thoroughbred animals, farmers native here and to the manor born, who have acquired a liking for any single specialty, I do not wish, I repeat it, to see change to new and untried paths. These men are capable of taking care of themselves, and would, and probably should, regard as impertinent any and all changes recommended to them by gentlemen who have no better right to advise than that which comes of a limited theoretical and practical knowledge of the subject.

However, I venture as one of the minor industries, to name for small farmers, especially for those of foreign origin, who shall retain and teach their children the prudent economy and industrious habits of the "old country," as well suited to this climate, and requiring little land, less money, and a small amount of preliminary teachings and experience, the cultivation of

THE POPPY

for the purpose of making opium. Opium is the thickened and dried juice of the poppy capsule or seed-pod, for which there is, like tobacco, hemp and madder, an almost unlimited demand. Opium sells for from \$6 to \$10 per pound, and is as easily made as anything can be. The poppy succeeds well and accommodates itself to all soils, and when and where not watched, becomes a pernicious weed, the plants volunteering and re-appearing with as much persistency as the morning-glory.

In growing the poppy for the purpose of making opium, all that is needed is that it be sown at corn-planting time, in drills three and a half feet apart, and then thinned in the row so that the plants will stand fifteen to twenty inches apart. It may be cultivated like corn. Sometime late in June or early in July, when the plant has flowered and the petals have fallen from the capsules, they (the capsules) are sliced on the side in such a way as not to kill them. From the capsule a milky juice exudes, which is scraped off the next morning, and on the third morning the capsule is again sliced and scraped as before. This operation goes on as long as the plant continues to bloom, and by planting at different times the harvest is prolonged until severe frosts come. To be sure, from each capsule one gets only a grain or two of opium, and it takes many grains to make a pound. But a grain of opium is worth more than many pounds of corn, and you can send \$1,000 worth of opium to market for what it would cost to send \$10 worth of corn or oats. This, indeed, is one of the branches of agricultural industry which requires patience and perseverance, and prolonged and unremitting attention and labor; but one can see how a poor man, with few acres and many children, can make more money off one acre in poppies, opium being worth from \$6 to \$10 the pound, than off ten acres of corn, fetching in the market a penny for three pounds.

MEDICINAL PLANTS.

Then there is the herb peppermint, and, in fact, the whole tribe of medicinal plants, out of which the Shakers and Quakers make great gains in growing, curing, pressing, distilling, and marketing. Peppermint oil is worth from \$2 50 to \$3 the pound, and the essential oils of several other common enough herbs sell quite as high. I am not able to give you special directions in this regard, but refer you to the authorities in the newspapers and the encyclopædias. I could name as among other minor industries, the growing of small and large patches of hemp, flax and millet for seed, saffron as a medicinal plant, the osier willow, which I was not long ago surprised to learn was supplied of the very best quality from Kentucky, and a hundred other new crops to which I have not time to refer. But it is worth one's while to remark here, that though the leading staples are low, universally low, winter apples, potatoes, and vegetables generally are in good demand, at home and abroad, at fair prices, even that diversification which makes of a farm a truck patch; and a kitchen garden pays better, under present circumstances, than corn and hogs, cattle and horses, and oats.

NUTS.

Now I will wind up by considering and recommending the planting of the nut-bearing trees. So far, in this State, neither privately, as I

have heard of, nor in the transactions and debates of our wide-awake State Horticultural Society, have we made any account of the nut crop. The groves and forests of Illinois are rich in the nut-bearing trees; and all, or nearly all, of these trees grow to a large size, are beautiful both for shade and ornament, and furnish timber of strength, durability and beauty. First of merit as a nut, is the shell-bark hickory. If its surpassing excellence were known as well abroad as at home, its consumption would become world-wide. Unfortunately the multiplication of the finest varieties has been found a very difficult business—grafting and budding succeeding only in rare instances. However, by planting shell-bark nuts, you will be sure to get shell-bark bearing trees, the first of which may be better or not as good as the nuts planted. By root pruning, for a year or two, the young seedling may be safely transplanted at the third or fourth year.

Next comes the pecan, which grows magnificently on the American Bottom, and on all low, rich lands, but is seldom found abundant north of Springfield. When at home, on a soil that suits and a situation that fits its wants, it makes one of our handsomest shade trees, bears profusely, and in company with the broad-spreading honey-locust, for which it seems to have a particular affection, the two together become strikingly beautiful objects, when seen a quarter or third of a mile away.

Then there are the native walnuts—the black walnut and the white, or the butternut. Of its strength and majesty as a tree, of the beauty, durability of its timber, of the profusion of its rich fruits, I need say nothing in praise of the black walnut to an audience of Illinois farmers. But I will remind them of a fact of which they may not be aware. It is that there is not only a striking difference in the size of the nuts from different trees, but a difference quite as striking in the thickness of the shell and the flavor of the kernel. It is possible, and indeed probable, when horticultural improvement shall take that direction, that we may get fruit from the walnut almost equal, in flavor and thinness of shell, to that of the Persian or English walnut. The butternut would be considered a striking and beautiful tree, were it not so overshadowed by its magnificent half-brother already described. The butternut is not so impatient of cultivation and the exigencies of civilization as the black walnut, nor is its temper as strong, durable, hard, or high colored, but it grows faster, transplants easier, bears fruit earlier, and makes a broader shadow, if not a denser shade. Both walnuts transplant safely, may be propagated by starting seedlings, and both may be grafted and budded. It should be borne in mind, however, that both operations are of considerable difficulty, when compared with the ease with which such processes are performed on fruit trees. The black walnut and the white walnut, the shell-bark hickory and the pecan, these are all native nut-bearing trees, and each should have a representative near every

home and farm-house in Illinois. The timber of these trees will become, in course of time, one of the most precious and desirable commodities our farms will yield or produce.

Then there is the chestnut, which deserves and shall have a paragraph by itself, partly because of its merits, and partly because it is a stranger to our State, but a near neighbor. I know it is still an unsettled question among farmers and horticulturists generally whether the chestnut can be safely transplanted, and then whether it will make a vigorous, large, healthy, fruit-bearing tree. If the nuts are planted in the fall before they are dry, or the germ shrunken, and protected from vermin, the young plants appear soon after the frost is out of the ground in the spring. The plants attain from ten to twenty inches in height the first year. The spring the plants are a year old they may be transplanted as easily, or nearly so, as apple seedlings, for the first roots are almost as fibrous. After that, and for five or six years, the plants grow slowly, like nearly all hard-wood trees produced from roots; then having obtained a firm hold on the soil, they break away outward and upward into strength, shade, and magnificence. So much for the nut-bearing trees.

Then, in conclusion, let me ask who it is, among our Illinois nurserymen, who desires to make a fortune and build up a name? If there is such an one, let him produce for the markets seedlings of the oaks, the hickories, and the nut-bearing trees. This thing can be done, and, if in skillful hands, successfully and profitably done. Suppose there were on the market in Illinois to-day a million of seedlings of the trees I have named, ten feet high, and two inches through at the collar, so trained and pruned and peeled as to be sure to live and grow vigorously, is it not evident they might be sold at ten or fifteen times the price asked for elms, maples and poplars, and other soft-wood trees?

THE SOCIAL WANTS OF OUR RURAL COMMUNITIES.

BY W. C. FLAGG.

I purpose to preach you a sermon to-night, from the text: "It is not good for man to be alone." This was a remark made of a distinguished horticulturist, by the way a man of great originality, but who was discharged as a gardener for eating too much fruit. I shall preach, of course, a good deal more than I practice, and, like Ovid of old, praise the better way whilst I follow the worse. But in that I shall only do as other sermonizers, and I am sorry to say even some of our horticultural essayists; and if our aspirations and our ideas were *not* a

good deal better than our lives, I am afraid we should be worse men and women than we are. So let us dream our dreams of a better life, even though we are unable or unwilling to make them real. And my dream, if not exactly Arcadian, shall be of a happier, more healthful and wiser ordering of social affairs in country neighborhoods. I presume it is a topic not unthought of by most who hear me, and it is one to which my own attention has been frequently called by the vague speculations on that frequently recurring conundrum: "Why do young men leave the farm?"

Mankind, like many of the lower animals, including our Darwinian progenitors, are very gregarious, and hence are dissatisfied and uneasy when alone, and quickly seek the company of their fellows. This is more especially and universally true of unintelligent or rather of illiterate persons. One who is fond of reading finds no bad substitute for companions therein. Indeed, as they can choose and keep the best and wisest of all ages their associates in this way, many have deemed the library a more profitable and pleasant place than the drawing-room, or the public place, where one must receive all who come, and waste time upon frivolous matters. The enthusiast in natural science or other pursuits, in which one is independent of living men in a great degree, is measurably in the same position. But to the man who cannot or will not read, society is a daily necessity, without which his mental and moral nature will be stunted, like a plant without water. This is true of the small intellects that we meet, the product of successive generations of ignorance; it is still more true of the shrewd, practical man we occasionally see, who, ignorant of books, is as thirsty for conversation as the plant for sunshine. It is his great channel of information, and even to the more literary or scientific man there is vitality and vividness in the spoken thought, in the ideas vibrating with living passion and personal interest, that the dead inscription of the page cannot have. Hence all men, unless preoccupied, or embittered, desire the society of their fellows, just as the babe in its mother's arms crows and chuckles over the approaching child, in which its early awakened instinct detects a peer and a playfellow.

Hence the long miles traveled by our early pioneers to attend the barbecue, the horse race, and the camp-meeting; hence the corn-husking, the apple-pearing, and the singing school; hence the gatherings at the beer house and the feminine teas of the leisurely country afternoons; hence, too, according to some, the continual unrest and desertion of the farm by our young men and women; though I am inclined to think that is the result of a regular law of supply and demand. Our cities cannot grow their able men in sufficient quantity any more than they can their own beef or wheat.

Without stopping to consider the evolution of this social instinct, and the curious suggestion of Darwin and others, that it is the source of the moral sense or conscience, I pass on to discuss its varied phases as we find it existing in human societies to-day. The causes that lead us to seek the society of our own fellows seem mainly these :

1. There is the desire of amusement, the wish to hear and learn some new thing from simple curiosity. The loafers at the country stores and at the railway station provoke our criticism, but they come together by a very human affinity. The group around the table in the beer house may quaff the mild stimulant, but no doubt the song and the jest that go round are far more to their taste. Men go to church to worship, drawn strongly thither by their reverence of a supreme being, but not less by the desire to see friends and neighbors, and know how their little world goes on. There is a wonderful distraction and refreshment in these human fellows of ours. How we stand in the fields and stare at the passenger train, yet hardly heed the unpeopled freight.

2. Then we seek in society the means of self-improvement. Our manners are awkward ; we go to see our more experienced and graceful friends comport themselves. We are ignorant, and have not books or the wit to use them ; we seek the company of more learned or traveled men who can make us wiser. We are slow in thought, or slower in speech ; we want the brighter-witted to express our embryo ideas, and go home with our ideas quickened and our tongues less halting.

3. Again, we seek the society of our fellow men from an interest in them that takes a benevolent shape. We desire to help them in whatever way may be most practicable and acceptable. We desire to make others more religious, more moral, intelligent, or refined, and we seek them out and associate with them to gain their good will and a favorable hearing.

These, I suppose, are about all the legitimate reasons to be alleged, though they hardly exhaust the catalogue of causes that might be assigned, springing out of this great human instinct, or rather the instinct that pervades the higher orders of creation, so far as we know. Given them a very strong natural instinct of this kind, by virtue of which great uses may be subserved, and by the abuse of which great evil may be done, and what shall we do with it ?

The question is protean in its shapes ; but I need not dwell much, except on those phases of it that concern country life—the country life as contrasted with town and city life—the life of communities divided into not more than two or three strata, rather than the many caste development of older and metropolitan life.

Social life in cities and towns is developed in excess, in corrupt forms often, but to a harmful extent always. The city man sees too much of business, and too little of the weather, which he thinks of merely as the fair or foul time for trading or pleasuring, with no conception of the human needs that hang upon sunshine and storm. He knows too much of men as traders and sharpers, and too little of nature and solitude. He knows too many isolated facts, and too few thoughts. He is alert, glib, shallow and impulsive.

Nearly all permanent dwellers in cities and towns become cockneys. They become so impressed with the special merit of their own peculiar town that they have no interest in the broader world of their State, their country or mankind. But the dweller in the city shows the good as well as the evil of mental attrition. The sharp corners of his character have been rubbed or knocked off. He is more liberal in his opinions and purse than the country man. Still, the problem of society in the cities is to furnish better for worse places of social gathering; to stimulate reflection and repress levity; to furnish solitude rather than companionship. Emerson says: "The high advantage of University life is often the merely mechanical one, I may call it, of a separate chamber and fire." Our townsmen are boys in large families that see too much one of another.

Social life in the country is more difficult. Our solitary farm houses are too often nurseries of morbid thoughts, and brooding monotonous sentiment that distort and often madden the mind. There is excess of thought—if it can be called such—thought, that for want of more outward pressure and excitation runs in grooves, and furrows the brain year by year. The farmer thinks, but is often morbid and misanthropic. He is somewhat slow, dull and incurious concerning much that is nearest to him. He is illiberal and intolerant of opinions different from his own. Yet, his opinions are generally sound, and in political and religious crises, strange to say, our republican democracy reverses the experience of Europe, and shows that the rural districts rather than the cities are the nurseries and strongholds of liberal and radical opinions.

His observation of men is too limited, but he adds his observation of weathers and soils and minerals—of plants and animals; and his thoughts abutted upon true facts of nature, and of human life, are necessarily broader, deeper and better.

But the physical separation made by broad acres of meadow and grain make it difficult to choose company, or to keep it when chosen. The social instinct is repressed and stunted, or makes unhealthy growth from unnatural food. It is pitiful to see, sometimes, the efforts of unassisted human nature reaching out for human sympathy, as the tendrilled vine to the tree—the wistful child gazing longingly after the passing stranger; the young woman wandering from the parents' house

and seeking companionship in distant and perhaps unfit homes; the young man straying into the drinking "saloon," that is at least brilliant, warm, jovial and companionable. Then see how every occasion is seized upon to minister to this half-satisfied desire. The very prayer meeting and funeral are impressed into uses not their own.

All this tells us that country people lack social opportunity. How shall we make it? First, by using the incidental opportunities that come within our reach. For instance, when your Alton Horticultural Society meets to discuss the varieties and culture of fruits, one of its members gives a dinner, and you not only learn more about apples, but more of the kindly neighbors you have about you. Our Farmers' Club is a good medium for communicating and sharing practical knowledge, but many will say, and justly, that it does a no less valuable work in giving general opportunity for men and women to meet and see one another in an unconstrained way.

The average American feels it necessary, as yet, to have some proper excuse other than the need of social intercourse, for leaving his farm and attending even a monthly meeting; and we must cover his advance into society with the pretext of business or some other well-sounding reason.

But the Farmers' Club does not meet the wants of all. The young men and women, of country life even, are often indifferent to good crops of wheat and the proper fattening of pork. Their thoughts may be of other things. Then there are many who regard Farmers' Clubs and Horticultural Societies with suspicion. They look distrustfully upon farmers who talk about farming as if they were betraying the best secrets of the craft, or were mere babblers of empty theories. Hence, we must have other and varied forms of social intercourse.

Some of us will remember the spelling school as a prime necessity of its day. It has been well described in Eggleston's story of the Hoosier Schoolmaster. The young, and even the old, came far and wide; and Webster's Spelling-book was thoroughly ransacked for hard words. But none the less attractive, doubtless, were the social opportunities given, and except to an ambitious few the *ph's* and *th's* of phthisis were a secondary matter. This was, and though somewhat fallen into disuse, still is a form of intercourse in rural districts.

Another, and less common form in the same line, is the literary club, whether taking the form of the debating society, in which the discussion of controverted questions is the alleged business; of the dramatic club, or of the literary society, where the reading of good authors or of original essays become the prominent business. The literary club, as the outgrowth of an old and now somewhat waning belief in literature as the sole means of culture, is being replaced, to a

limited extent, by the scientific club, in which natural history in its various phases becomes the special object, but this change, so desirable in the rural districts, goes on very slowly where the habit and appliances of the study of natural history are still very rare.

Then we have reform clubs, religious or moral in their character, such as our temperance organizations, with the object of combining social influences against vice or bad habits. These are apt to be a little "slow," and not to succeed in making themselves pleasant enough to hold the volatile spirit, and hence are too much frequented from a supposed efficacy in a good example and from a so-called sense of duty. But the Church and the Sunday School, the Good Templars, or other organizations so supported, can never be a very vital force in the community.

We have again those allied agencies known as sewing circles, sociables and the like, where an effort is made to combine charitable and religious work with social enjoyment; and some of these, perhaps, have been among the most successful of social organizations. Somewhat similar in their character are those organizations whose professed object is amusement and the enjoyment of social intercourse. Such are our social clubs where dancing, cards, base ball, skating or other recreation is made the basis of union. These are pleasant but apt to be short lived, from their not having a sufficiently earnest motive in them. Enjoyment simply does not satisfy; and mankind, especially Americans, grow weary of play that has not something more earnest back of it.

The secret benevolent societies—the Masons, Odd Fellows, etc., might be mentioned, but these do not affect much the rural districts, however important in the cities and villages.

Now, in our country life we find it somewhat difficult to combine upon any one of the various forms of which I have spoken. In the city, within a limited area, you may get a knot of persons together upon almost any given idea, from Platonism to Mormonism. In the country, even within a scope of many miles, it is somewhat difficult to get enough harmonious elements together to form a permanent organization of any kind. Hence, in organizing the social elements of the rural districts, we must endeavor to so broaden our platforms that many may stand upon them. Our Farmers' Club and Horticultural Society meeting monthly and dining at the houses of the members, succeed because they appeal to a variety of motives.

It is hard to keep together men who go to discuss agriculture and horticulture only; not many would drive from five to ten miles simply for a good dinner. They could get it more cheaply at home. Not many go out that often simply to attend a social gathering. But sum up these motives, and you have continuous success. The combination becomes irresistible. Then these organizations exclude nobody. They are essen-

tially democratic. The doubter and the scorner, the stranger whom a friend introduces, the child in its mother's arms, the patriarch tottering on the verge of life, all attend, and all are welcome. So that clubs of this kind command a large constituency for their support, and in this respect afford a model for others.

Hence, I say that whatever clubs are organized, be they religious, moral, intellectual or æsthetic in their character, must, to succeed in the country, be broad, charitable and hospitable; and to be specific, I will enumerate some of the real and ideal organizations that seem to me worthy of consideration.

1. First, as to religious organizations. Ten or twelve years ago, in a Southern Illinois settlement, a number of new-come fruit-growers found themselves just located and isolated. The surrounding population was densely ignorant, and regarded the strangers with dislike and even hostility. They were thrown upon their own resources—social and otherwise. Scarce any two held the same religious convictions, and they had not means to support a minister. So they met and organized and built a house of worship, and held a weekly service at which those who were competent officiated in turn, and read a published sermon or prepared a discourse at will. The widest liberality of thought was permitted, though, of course, under the circumstances, they were careful not to abuse it. Theodore Parker's views would be given one Sunday; Henry Ward Beecher's or Spurgeon's, the next. This organization is continued to this day. The community has increased in numbers, and already two organized churches of the old stamp have come out from among its members. Yet, I am informed, it is still the popular organization, and its broad tolerance makes it so. This is an example of church organization worthy the consideration of country dwellers, in communities where a dozen families or less make the sum total of any church membership. If it is objected that it gives too much opportunity for the dissemination of error, I can only reply with Milton: "Since the knowledge and survey of vice is in this world so necessary to the constituting of human virtue, and the scanning of error to the confirmation of truth, how can we more safely and with less danger scout into the regions of sin and falsity, than by reading all manner of tractates, and hearing all manner of reason."

2. Again we want, and at this particular epoch imperatively need, a proper opportunity to discuss certain social and economical questions affecting the farmer, both as producer and consumer. The questions of Labor, Capital, Production, Co-operative Farming, Railway Transportation, Middle-men, Free Trade and the like are all of grave importance, and some of them press for an early solution. With corn below the cost of production, and high freights to the sea-board; with diminished means, and labor as high as ever, we find ourselves in an anomalous

position that requires discussion and agitation to get it properly adjusted. We want organizations for the proper discussion and elucidation of these, as free as may be from the bias of partisan politics, but bringing those who have a common interest in the work and products of agriculture together, to deliberate upon the farmer's political economy. There should be the same tolerance and freedom of discussion as I have instanced in religious exercises, but the agricultural class, of all others, should be considering the changed relations in which they stand to production and consumption. Clubs tending to this are already rapidly organizing—clubs looking to sale of products and the purchase of necessities. These must, of necessity, more or less consider many economical questions.

3. Our rural communities need, also, clubs organized for the study and discussion of rural topics, that shall be more thorough and frequent in their work than our ordinary clubs can be. One of these should have its scientific committees, who should report what plants and trees are native in the neighborhood, what animals and insects abound, and their effect on the crops; the nature of our soils and the peculiarities of our climate. They should explain the failure of the butter to "come," and why the bread does not rise. It should have its literary side also, and the rhyme and reason of country life should be furnished by its proper committee, who should ransack the pages of Hesiod and Virgil, Cato and Columella, Tusser and Thomson, for what has been worthily said of rural life and rural affairs. It should hold its weekly meetings at the house of one of its members, and a part only of the time should be devoted to business. It should have its refreshments and its social hour. It should welcome all worthy outsiders, without reference to membership, and endeavor at once to learn to teach and to be happy.

CATTLE REARING.

—
 BY E. L. LAWRENCE, HEAD FARMER.
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"The object of agriculture is to develop from the soil the greatest amount of certain kinds of vegetable and animal produce at the least cost."

The object of cattle rearing, an important branch of agriculture, is to produce the largest amount of milk, butter, cheese and beef, in the shortest time and at the least expense, and in quality that will sell for the largest amount of cash. Cattle rearing bears so directly upon every operation of the farm, that I shall not attempt to exhaust the subject in

any one of its many bearings, but shall touch lightly on each branch, and only hope to open the way for an interesting and profitable discussion, which may follow the few suggestions I make.

Probably the first to be considered is the breeds of cattle to raise. Then to follow with care, feeding, shelter, pasture and water; conducting the whole with our eyes open to the fact that even the rich prairie soil of Illinois may, in time, become exhausted.

We have at the University stock farm five brands of cattle: the Short Horns, Herefords, Devons, Ayrshires and Jerseys or Alderneys. A bull and cow of each breed, also some calves. It was the intention in selecting these to fairly represent all the different cattle-growing interests of the State.

The Short Horns are so well-known that it is not necessary to describe them here; they are becoming more and more popular both in this country and in England, and the demand for them is constantly on the increase, both for breeding pure bloods and for crossing on native stock. The statistics of the Royal Agricultural Society of England, kept since 1852, go to show that they are fast superseding the other breeds, and it is now estimated that there are more short-horn cattle in England than of all the other breeds combined.

The Herefords are among those classed with the Devons as middle horns. They have the same characteristics, in many respects, as the short-horns. They fatten easily—in fact to be fat seems to be their natural condition; they arrive at maturity at an early age, and are possessed of that mild and quiet disposition so essential to the laying on of fat. They are more coarse in the head and horn, and also in the limbs, than the short-horn. I have but little acquaintance with the breed, and can only say that if they are all as good as those we have on the farm, they are animals of which any breeder may well feel proud.

The Devons, like the Short-Horns, are well-known. They are such a distinct breed that when crossed to the third and fourth generation with native stock, they show the color and many characteristics of full-blood. It is said, however, that when crossed with Hereford cattle, the Hereford characteristics predominate. Years ago the Devon was bred principally for the yoke, and it is related in Morton's *Cyclopedia of Agriculture*, that in their native county in England they have often been driven eight miles an hour. Should the epizootic visit us often, they will be popular with fast drivers. Lately they have been bred both for beef and the dairy, and their admirers claim a superiority in them for both these purposes above all other breeds.

The Ayrshire cow is "queen of the dairy." For feeders, they will not compare with the Short-Horns and Herefords.

The Jersey cow is a little pet; all the favors you may show her will

be returned. She produces a fair amount of very rich milk, almost cream, which is churned to butter in a very short time. The butter is such as can be produced from no other breed of cows. Near large cities, in the east, many dairymen keep them and sell the butter for a large price. Should you visit Boston and refresh the inner man at the Parker House, you will be feasted on Jersey butter, for which the dairyman receives one dollar and twenty cents per pound. Many dairymen near Boston, New York and Philadelphia furnish their customers with Jersey butter at from seventy-five cents to one dollar per pound. This breed is of but little value for beef, and as the slaughter-house is the ultimate end of all our cattle, it will not be found a profitable breed for the general farmer.

The Jerseys, Alderneys and Guernseys are the same breed, Jersey being the larger of the Channel islands, from which they are imported.

Were it possible I should think it advisable to breed from none but thoroughbred animals. It must be evident to every one that where animals have been bred for a long time with special reference to the development of certain desirable qualities, that a degree of excellence will be reached that cannot be attained by the hap-hazard manner of breeding practiced by those who have bred natives. It being impossible to breed from pure bred animals on both sides, we may do the next best thing, that is breed from pure bred males.

The characteristics of the pure bred animal being of general fixed type—careful breeding and selection having established and fostered, in a measure, the qualities sought for, and the qualities being strengthened and concentrated by time—it stands to reason that when this force is brought to bear on the scattered and weaker forces of the animal of a mixed breed—there being here as elsewhere strength where there is union—that the qualities of the pure bred animal will, in a large measure, be transmitted to the offspring. Thus, by crossing a pure bred bull with a native cow, we have three-fourths to seven-eighths of the qualities of the sire, and only one-eighth to one-fourth of the less desirable qualities of the dam in the progeny, though, in fact, we have but a half-blood. But when this half-blood animal (the progeny) is bred to an animal of the same breeding, that is, a half-blood, while we still get in the offspring a half-blood, we lose that preponderance of the qualities of the full-blood first noticed, and get only an animal with qualities half of the full-blood and half of the native.

Then I would say, procure choice full-blood bulls at whatever cost, and breed up our native stock to the standard of the pure bred animal. It will not do to prophecy ruin to a man because he pays one thousand dollars for a breeding animal, as those who, directed by judgment, have been most liberal in these purchases, have been most successful in the end.

The breed of cattle should be selected with reference to the requirements of the breeder. If we are breeding for beef alone, or for beef in connection with the dairy, we should breed from bulls, pure bred, of one of the three breeds first named; my own judgment would say one of the two first named. If for general dairy purposes, let us take the Ayreshire. If for cream and excellent butter, the Jersey, though small, is large enough to "fill the bill." We have had many visitors at the farm, during the past year, to see the five breeds of cattle together, and I think nothing has been more coveted than our little Jersey, "Cream Pot."

Having thus given my ideas with reference to the selection of breeds of cattle for the various purposes of the farm, believing that the saying that "a bad beginning insures a good ending," does not apply to cattle rearing, I wish to be understood as considering the keeping of them good as of equal importance.

It has taken several thousand years to make up the enlightened man of the present day, from the crude specimens who first peopled the world; and how many millions of years—by Darwin's theory—to make these from apes I will not pretend to say. And yet man becomes a savage at once if removed from the influences of civilization in infancy. It is now one hundred years since Robert Bakewell gave his whole energies to the improvement of cattle, and in that time improvements have been made that are wonderful. (Bakewell bred the less desirable Long Horns of England, but his success stimulated others, who have taken the other breeds.) But it takes only a short time to degenerate improved animals and make scrubs; and many think that because the Short Horn cattle, that have been bred principally for their flesh, when deprived of their flesh make homely skeletons, that this proves them to be of little value. They say "they can't rough it like our native cattle." We do not want animals to "rough it," if this means to scrimp them in their food. Shelter them the first winter, keep them fat and give them something better to lie on than snow or mud, and they will prosper. Last winter, in experimental feeding, I fed a high grade Short Horn steer, three years old this spring, that weighed when sold, April 15, 1,570 pounds, having gained in one year and fifteen days 690 pounds. This steer had no shelter, but was fed in an open lot with thirty others. Shelter, of course, would have been desirable, but I give this to prove that they do well without it. Others that gained less through the summer months gained much more during the winter months when sheltered. When we allow well bred animals to degenerate we have neither the qualities of the enlightened Short Horn, nor the vigor of the half-civilized Texan.

While many in England and America have been laboring to improve cattle, others seem to work in an opposite direction. How often have

we seen the latest and poorest calf left a bull for no other reason than that he was good for nothing else. Such bulls have a wonderful amount of energy, and can make up in the numbers of their progeny what they lack in the more desirable qualities of size and beauty. Too many farmers keep such bulls at the present time to serve their own cows, and those of their neighbors, for "fifty cents to insure." The "insure" might be left out, as they never fail—as some can testify to their loss. Many of us have said hard words where such animals have broken out, or been let out, and go over the country breaking gates, smashing fences and doing damage less easily repaired.

As nothing can make amends for the lack of care in breeding, so nothing can make good the lack of a good and vigorous growth in the young animal.

Many have recommended other food than milk for young calves, some say "whey is good," some give "gruel of corn meal," some "hay tea," etc. I have yet been unable to find a substitute for the food that nature has provided. Calves may be raised in connection with the dairy, and fed skimmed milk at the age of four to six weeks. At this age they will begin to eat oats or meal, which should always be provided. It will be found that the more grain the calf consumes, the more profitable the operation, till it is turned to grass after the first winter. I once tried raising calves on whey, and I think where water can't be had they will live on whey, but I should prefer the water.

It was once thought that to have a steer in proper shape to feed well he should be four or five years old. And I have often heard it said that "a *young* animal will grow, but will not fatten." Where this opinion prevails, it is thought that if an animal does not have to be "tailed up" in the spring he is all right. And if he has ceased to grow for the last six months and fallen off, it is all the same. Under the old theories, cattle were supposed to be like the toper's cider—he said, "all it wanted was age to make it perfect."

With the improved breeds of cattle, this has all been overthrown, and the thoughtful farmer has discovered that, with an animal less than one year old, the food required to give them three pounds of growth daily will give but two pounds from one to two years old, and but one pound from two to three years of age, (these figures are given as an approximation only.)

Our steers for slaughter are now heavier and much better at three years of age than they formerly were at the age of from four to six years, and the question now is, shall we make our steers weigh 1,400 pounds at the age of twenty-four or thirty-six months? I believe that the "forcing process," as it is termed, which gives us this weight at two years of age, will be found most profitable.

It is essential that young stock be provided good comfortable quarters, at least for the first winter. While young stock should be kept growing the whole year round, it will be found that the most of growth is made from pasture. For this reason, bountiful pasture should be furnished.

We too often allow our pastures to be too closely cropped, especially in the latter part of the season. We should have more pasture or less stock; and I think if we have more pasture and raise less grain for a foreign market—or, I should say, raise *no* grain for a foreign market—we should be better paid for our labor.

It was once thought that it was an advantage to “summer fallow” land to enrich it and destroy the weeds. Science has shown and experience demonstrated that summer fallowing, when nothing is grown to be turned under, is of no particular benefit to the soil; that the land should be covered. Thus, pasture or meadow is better, when plowed, if some crop, or even weeds, should be grown to be turned under. When land is too closely covered, we lose the benefit of this covering of the soil, and also the protection which should be furnished the roots of the grass or clover from the drouths of summer and the frosts of winter. Then, by pasturing too closely one season, we very much diminish the yield the following. One animal well kept, summer as well as winter, will be found to pay better than two but half fed.

Much has been written to prove to farmers that there is a great gain by planting trees in pastures for shade for stock (perhaps these zealous writers have had trees to sell). My experience and observation have shown, to my own satisfaction at least, that there is no pasture so good as the dry open prairie without trees. Time will not allow me to give extended reasons for this belief; but I would recommend that each one give the subject of shade in pastures a careful investigation.

There have also been no lack of advisers who have told us to construct artificial ponds to hold water for stock. Such watering places furnish a supply of very poor water in a wet time, when not wanted, but fail entirely in times of need. The babbling brook and the flowing river, (where farmer boys may go fishing when it rains so that they can’t work out of doors) have each their charms; but I should prefer them on my neighbor’s farm, and not on my own. The land occupied and made useless by standing or running water, if used for pasture will more than pay for appliances by which the winds, so bountifully furnished in this country, may be made to supply the best of water and at all times, and one square rod of land is all that is required.

Returning to the subject of breeds of cattle, I am prepared to lay down this proposition: That a grade steer from a good short-horn bull and a fair native cow, will bring more money at three years old than a

pure native at five, provided always that both shall be well kept. While studying this subject, I noticed the following in the Marengo "Journal" of Nov. 30th: "Mr. I. E. Searls, of Riley, shipped to Chicago last week a car load (sixteen head) of fat steers, which were probably as fine beeves as have been shipped from this part of the country. The sixteen head weighed 21,380 pounds, being an average of 1,336 pounds. The most of these were three years old, and some of them weighed 1,400 pounds. In this county, most of the cattle are Short-Horn grades. Many farmers, being from Kentucky, brought from there many choice Short-Horn bulls, that have left their marks on a l the cattle in the region where used." The same day that I noticed the above in the "Journal" (first week in December), I weighed for my neighbor nine two-year old steers, which weighed 12,744 pounds, an average of 1,416 pounds—80 pounds more than Mr. Searls' cattle, and one year younger. These were all two-year olds, and some of them weighed 1,600 pounds (the inference being that those of which friend Babcock wrote were a part four-year olds). Give these cattle another year, and they will press 2,000 pounds each. These cattle have never been in a barn or under a shed. Cattle are as well fed and much better sheltered in McHenry than in Champaign county. Again, the former are taken as an exception, and considered worthy of a newspaper article. The latter are not. The difference is all in the breeding.

To show that this is not caused by the climate, I will relate that in August last, wishing to purchase stock cattle, I applied to a dealer from one of the counties not a hundred miles south of Champaign. He informed me, in answer to my question, that his best two-year old cattle would weigh 700 pounds each. I replied that our cattle of that age weighed from 1,000 to 1,200 pounds. He seemed to understand the situation, and rejoined that they had had no county fairs, and no farmers' clubs, and no effort had been made to improve the breed of cattle. I submit that this would be a suitable place to send missionaries.

As the cash dividend is what the stock-grower is laboring for, it is always in order to look into the future and calculate the prospects. By the light of the past we may judge something of the future. By comparing the census of 1870 with that of 1860, we find that the increase in cattle in the United States has not kept pace with the increase of population. It has been estimated that for each one hundred inhabitants there should be eighty head of cattle to insure a supply of beef, milk, butter and cheese. In 1860 there were eighty-one cattle to one hundred inhabitants, while in 1870 there were but seventy-three. It would have required 2,200,000 in 1870 to make the supply good. Temporary causes will of course cause the markets to fluctuate, but the rule of supply and demand will govern prices. While many are complaining

of losses, I see nothing to discourage the cattle-growers. The trouble has been with feeders, who have paid too much for stock cattle, and not with the cattle raiser.

It is the best article that always finds a ready and liberal buyer, and is most profitable to the seller. This can only be produced by diligence, care and perseverance, directed by judgment, without which we are sure to make a failure.

THE AGRICULTURE OF ILLINOIS IN THE CENSUS OF 1870.

By W. C. FLAGG.

Illinois, according to the census of 1870, contains a population of 2,539,891 inhabitants, and, as in 1860, ranks fourth in this respect. Its relative gain, however, as compared with the States standing nearest above and below it, shows that it is still rising in the scale, and will take at least a third place in the census of 1880 :

<i>States.</i>	<i>Population 1870.</i>	<i>Per cent. gain.</i>
New York.....	4,382,759	12.94
Pennsylvania.....	3,521,951	21.19
Ohio.....	2,665,260	13.92
Illinois.....	2,539,891	48.36
Missouri.....	1,721,295	45.62
Indiana.....	1,680,637	24.45
Massachusetts.....	1,457,351	18.38

It surpasses in area all these States except Missouri, which has about 10,000 more square miles, the area of Illinois being, according to the census report, 55,410 square miles, whilst that of Missouri is 65,350. The area, however, is stated by our State Auditor to be 55,872 square miles. Its density of population, using the census figures, is 45.84 to the square mile, or 45.47, using the State area for a divisor.

It is twelfth in area of the organized States, and eleventh in density of population. Texas has five times its area, and California three times as much. Massachusetts has four times the population to the square mile, and Rhode Island three and a half times. Although a large State, equal nearly to half the British Isles, or one-quarter of France, to forty-two Rhode Islands, or twenty-six Delawares, it stands by no means first in extent of surface. Whilst containing a population of two and a half millions, it is far from the maximum density of population. Probably, however, no State in the Union has less waste land, nor can, when its farming lands and coal mines are fully developed, support a larger population to the square mile.

"These soils," says Prof. Voelcker, "are very rich in nitrogenized organic matter. Indeed, I have never before analyzed soils which contained so much nitrogen. Nor do I find any record of soils richer in nitrogen than these." Very long in a north and south direction, it unites the climates, or at least the latitudes, of Boston to that of Norfolk, and wheat that matures at Cairo as early as the first of June, does not ripen at Galena until more than a month later. The ripening wave of grain and summer fruits rolls northward at the rate of ten or twelve miles a day, and the strawberry yet lingers at Rockford while the early apple blushes and mellows at Villa Ridge.

Thus fair, fertile and various are the broad acres of the Prairie State. Of these, 19,329,952 acres, or about 53 per cent., are reported as improved in farms; 5,061,578 acres, or about 14 per cent., are woodland; 1,491,331 acres, or about 4 per cent., are returned as unimproved land in farms; whilst 9,875,219 acres remain unaccounted for. Uncle Sam, it will be seen, has very imperfectly provided for correct census taking, and this is one result of imperfect legislation. I think we have every reason to believe that the present Superintendent is an exceedingly able statistician; but he could not overcome the defects of an imperfect law. So that more than one-quarter of the area of our State must be conjecturally assigned to unfenced woodland and prairie, to large streams, highways—common and railway—and town plats. So that we have perhaps 15 or 16 per cent. of woodland, against 7 per cent. in Iowa, and 10 per cent. in Wisconsin, 21 in Missouri, and 35 in Indiana.

Compared in its parts we find Illinois most heavily wooded south of a line drawn through the north line of Macoupin. The region of the Grand Prairie, and the northeast portion of the State, shows the least woodland. The most heavily timbered county in the State is Randolph, which, although settled in 1683, nearly two centuries ago, has yet to-day two hundred and eighty-one acres of woodland for every square mile of its surface. Next to it come Calhoun, Hardin, Pope, Williamson and Edwards. The opposite pole we find in Ford county, with only six acres of woodland to the square mile, and this is succeeded by the adjacent counties of Livingston and Grundy. In general, we may say, in Illinois that the existence of forests depends chiefly and primarily upon drainage. The well-drained counties have natural forests, the badly drained have not.

As density of population bears upon agricultural statistics, it may be well to notice the difference in our counties. Cook, of course, with Chicago included, has the most dense population, or 356 to the square mile. Excluding the city, it sinks to about 50 inhabitants to the square mile. St. Clair, Peoria and Kane come next, with 77, 76, and 72 inhabitants, respectively, to the square mile; two counties range between 60 and 70; eight between 50 and 60; twenty-one between 40 and 50; fifty-

six between 30 and 40; ten between 20 and 30; and one—Ford—has only 19 inhabitants to the section; whilst Iroquois and Jasper have but 22. The whole State averages about 45 inhabitants to the square mile, or one for every fourteen acres of land. We are not over populated.

The territory of which Illinois is composed has contained, at different eras, the following

POPULATION :	
1800.....	2,458
1810.....	12,282
1820.....	55,162
1830.....	157,445
1840.....	476,183
1850.....	851,470
1860.....	1,711,951
1870.....	2,539,891

Most notable in this great increase of population is the decade 1850-60. "So large a population," said Superintendent Kennedy, in his preliminary report, "more than doubling itself, in ten years, by the regular course of settlement and natural increase, is without a parallel."

Of the population of 1870, 2,511,096 were whites, 28,762 free colored persons, one Chinese, and thirty-two Indians. The counties containing more than 1,000 free colored persons, were the following :

Adams.....	1,567
Alexander.....	2,296
Cook.....	3,858
Madison.....	2,214
Pulaski.....	2,394
Randolph.....	1,137
Sangamon.....	1,166
St. Clair.....	1,297

Considerably more than half the colored population is concentrated in these eight counties. The solitary Chinaman is accredited to Morgan, and Pope has eleven of the thirty-two Indians.

Looking to nativity and foreign parentage, we find that we have 2,024,693 native, against 515,198 foreign born inhabitants; or, speaking in general terms, one person in five is of foreign birth. Nearly as many more were of foreign parentage on one or both sides, making nearly two in five of our population foreign or of foreign parentage.

The counties having exceeding 10,000 foreign born inhabitants are :

Cook.....	166,772
Henry.....	10,278
Kane.....	10,336
La Salle.....	16,262
Madison.....	12,880
Peoria.....	11,673
St. Clair.....	18,321
Will.....	14,587

About half the foreign born population is found in these eight counties, the ratio of foreign born to native population being largest in Cook.

Of the native population our good commonwealth herself can now claim to be the mother of 1,181,106. Of other States the following have sent us more than 25,000 each :

Indiana.....	86,432
Kentucky.....	63,297
Missouri.....	26,824
New York.....	133,290
Ohio.....	162,623
Pennsylvania.....	98,352
Tennessee.....	44,012
Virginia and West Virginia.....	33,668

Of the foreign population the following countries sent us each more than the same number :

British America.....	32,388
Germany.....	203,750
England.....	53,886
Ireland.....	120,162

Examining localities, we find that the Ohio emigrants have gathered in the greatest numbers in Champaign, Cook, Fulton, McLean, Shelby and Vermilion ; those from New York, in Cook, DeKalb, Kane, Knox, LaSalle, McHenry, Ogle, Whiteside, Will and Winnebago ; those of Pennsylvania, in Carroll, Cook, Fulton, Henry, LaSalle, Lee, McLean, Ogle, Stephenson and Whiteside. Indiana, as might be expected, simply overflows into our adjacent counties without the same selection of abiding places that is made by more distant States. The Kentuckians have come specially to Adams, Coles, Cook, Edgar, Macoupin, McLean, Morgan and Sangamon.

The German born citizens are found, in numbers exceeding 5,000, in Adams, Cook, Madison, St. Clair and Will.

The acres of land reported as in farms, as I have stated, are 25,882,861 acres, valued at \$920,506,346, or about \$37 per acre. These farming lands are divided into 202,803 farms, or an average of 128 acres to a farm, against 146 acres in 1860 and 158 in 1850. The average of all the farms in the United States is 153 acres, showing us already below the average and settling down to small farms. Utah has the smallest farms—30 acres to a farm—and the District of Columbia comes next, with 56 acres to a farm. California shows 482 acres to the average farm, and Georgia 338, being the highest on the list.

Of the Illinois farms, 43 contain less than 3 acres ; 3,552 less than 10 ; 10,229 less than 20 ; 53,240 less than 50 ; 68,130 less than 100 ; 65,940 less than 500 ; 1,367 less than 1,000, and 302 more than 1,000 acres.

Taking the small farms, under 10 acres in size, we find the Egyptian and fruit growing county of Union to stand first with 240 farms, whose owners seem to reckon "ten acres enough." Vermilion comes next with 183 of these, and Cook and Effingham follow with 133 and 123 ten acre farms. The southern and wooded counties, as might be expected, furnish

a large majority of the farms of from 3 to 20 acres—Union county leading, and Vermilion over eastward coming next.

Of large farms we find, curious to say, that extremes meet, and Vermilion, one of the counties leading in small farms, has 23 farms of over 1,000 acres each; McLean has 21 and Morgan 17. Of farms exceeding 500 acres, McLean has 89, Sangamon 88, and Vermilion 67. So that we have no lack of large farms.

The largest farm in the State is undoubtedly that of M. L. Sullivant, of Ford county, who is said to have about 40,000 acres in a body. This gentleman, probably feeling somewhat cramped by the twenty odd thousand acres of his Champaign county farm, sold it and occupied this. The Champaign county farm has since been cut up and diminished in size. Jacob Strawn, of Morgan county, formerly owned one of the great farms of the State, about the size of a township, I believe; and Mr. Gillett, of Logan, has a ten thousand acre farm at Elk Hart Grove, Logan county. Praise a large farm, cultivate a small one is the Horation motto, and undoubtedly large farms are a great check to the growth of a community in intelligence and wealth. So much for our Illinois farms.

The farms of Illinois are surpassed in their aggregate value by those of Ohio, New York and Pennsylvania in that order. Whilst their value per acre somewhat exceeds those of Indiana, is considerably more than those of Wisconsin and Iowa, and is far ahead of those of Missouri, they are considerably below those of the eastern and older States of Ohio, Pennsylvania, New York and New Jersey.

Of farm implements and machinery Illinois has the value of \$34,576,587, or fourteen dollars' worth for every man, woman and child in the State, or about \$170 to a farm. The implements are 3.7 per cent. of the farm valuation. Compared with other States, we find it does a much larger portion of its farm work by machinery than the New England or Southern States, not quite so much as New York, rather more than Pennsylvania and Ohio, and decidedly less than the more prairied Iowa. The great prairies of the northwest are singularly favorable to the use of farm machinery.

Comparing county with county, the cash value of farms was greatest in Sangamon county with \$25,388,118 valuation. This is closely followed by LaSalle and McLean. The cash value of farms shows the lowest aggregate in the somewhat marshy county of Alexander, \$546,250; Massac and Pulaski, adjoining counties, comprising the peninsula lying between the Ohio and Mississippi.

Comparing the value per acre, we get about the same relative value per acre as is shown by the reports of the Board of Equalization. Counties near the large cities show the highest value per acre, Cook, St. Clair and Madison standing first. At the other extremity of the list

are counties lying in the Ohio and Illinois peninsulas, such as Alexander, Palaski, Massac, Hardin and Calhoun. These are now the counties of cheap lands, although containing tracts that for special purposes are among the best in the State.

In farm implements and machinery, LaSalle and McLean, the largest two counties of the State, come first, the former with \$895,963 worth, and the latter with \$810,167. Alexander stands lowest, with only \$22,353 invested in farm implements, or about \$100 to the section, and Pulaski next, with \$27,730. This compares curiously with the county of Putnam, which, although the smallest in area of any, shows \$70,491 valuation of farm implements, or \$420 worth for every square mile of its surface. But this is not extraordinary, as the prairie county of Champaign has about \$700 worth, and McLean somewhat more. As a rule, the prairie, level and easily worked lands, will show a greater per centage of investment in farm implements.

In the interesting matter of wages, we find that Illinois paid \$22,338,767, whilst New York and Pennsylvania only exceeded her in this respect. Of our own counties, Knox leads in the aggregate amount of wages paid, but this is undoubtedly a mistake. LaSalle is more probably the leader, having paid \$691,373 for farm labor. Madison comes next, \$638,773, and McLean close after, with \$632,051. Boone, considering its area and population, stands very high, paying \$498,080, an amount so large as to again create the suspicion of error. Of counties paying small amounts for farm labor, Richland has a pre-eminence, being put down at \$10,960, and amount so low as to lead us to suppose that this also is an error, as the county is considerably larger than Boone. We find, however, that Pope paid only \$16,496, and Saline \$16,867, showing that low wages or small farms predominate in the southeast, along the Wabash.

The total estimated value of all farm productions, including betterments and additions to stock, was \$210,860,585. This is exceeded only by New York, which reports \$253,526,153, and is succeeded next by Ohio, with \$198,256,907.

Only 17 counties of Illinois produced less than a million dollars' valuation. Lowest stands Hardin, with \$235,462, and next comes Alexander, with \$268,950. LaSalle produced most, or \$5,502,502, and next came McLean, with \$4,860,898. Adams, Champaign, Cook, Morgan and Sangamon produced in excess of \$4,000,000.

In orchard products Illinois stands fourth. It is surpassed by New York, Ohio and Pennsylvania, yet produced the value of \$3,571,789. Adams county is first in orchard production in 1870, being credited with \$170,540. Union, the great Egyptian fruit county, succeeds with \$150,576. Hardin is credited with only \$376, and Gallatin with but

\$1,045. The counties producing in excess of \$50,000 are Bureau, Edgar, Fayette, Fulton, Hancock, Johnson, Knox, Madison, Marion, McLean, Randolph, Rock Island, Sangamon, St. Clair, Tazewell, Vermilion, Washington, Wayne. These indicate pretty well the regions where orchard fruits are well established and successful. It will be noticed that they are very generally counties along the great rivers.

In the produce of market gardens, as we might anticipate, the counties near the great cities come first. Cook produced, in 1869, the value of \$149,489, St. Clair (opposite St. Louis,) \$93,142, and Madison, lying next to St. Clair, \$69,753. Some counties return nothing, and many but a few dollars, showing that we have yet much advancement to make in that direction. This is still more obvious when we make comparisons with other States. The value of the product of market gardens was only \$765,992 in Illinois, and it was excelled in this respect by seven other States, among which are Maryland and Massachusetts.

The value of forest products, as might be expected of a prairie State, is not very great—\$1,087,144—less than that of thirteen other States. Of our own counties, curious to say, Knox stands first, DeWitt second, Henderson third and McHenry fourth; although popular belief would have assigned those places to some of our southern and more wooded counties. I very much suspect that the returns were imperfect.

Home manufactures, as given in the census, indicate a more primitive state of society where they abound, and hence while we find Illinois to have the value of \$1,408,015, we are not surprised to find it outranked not only by the large States of New York and Pennsylvania, but also by such States as Missouri, Kentucky and Tennessee, the products of whose home manufactures exceed in value those of any other State.

So in Illinois itself. The county of Wayne, far down in southeastern Egypt, reports \$280,773 in home manufactures, and is followed by its neighbor, Hamilton, with \$98,620, while the great county of LaSalle has \$91,928, and McLean only \$74,694. The county of Cook reports but \$605.

In the value of animals slaughtered and sold for slaughter, Illinois occupies an enviable position. It amounted to \$56,718,944, the next State being Ohio, with \$40,498,375. This represents, however, not only animals grown, but those fed and fattened, and probably overstates the fact. Still the production of beef and other meats is great. Sangamon leads with a valuation of \$2,293,734; McLean comes next with \$2,133,735, and Knox is third with \$1,891,483. Fifteen counties in all exceed \$1,000,000 each. The counties that rate low are Alexander with \$40,806, followed by Pulaski and Massac as heretofore.

In value of all live stock, Illinois comes second to New York. The latter has a valuation of \$175,882,712, whilst Illinois has \$149,756,698.

Of our own counties, McLean ranks first, having a valuation of \$4,129,814; LaSalle comes second, with \$3,906,367, and Morgan third, with \$3,875,150. Sixty-two out of one hundred and two counties had live stock valued over \$1,000,000 each. Alexander had only \$120,047 worth, and Massac, \$133,439.

Coming to details, we find that of horses Illinois had 853,738, a horse for every three persons in the State and for every $2\frac{3}{4}$ acres in cultivation. This exceeds the number in any other State. Ohio comes next, with 609,722. Illinois has 9 per cent. of the horses of the country, enough to draw all its own population, and take Ohio into the wagon.

These horses are found in the largest number in LaSalle, which has 24,673; in McLean, with 19,943, and Bureau, with 19,193. Alexander has fewest, 488, and Pulaski comes next with 871. They more and more replace oxen except in the more wooded and primitive counties.

Of mules and asses Illinois has 85,075 less than Georgia, Kentucky, Missouri and Tennessee. These animals abound in a different class of counties. Madison has 3,070, Sangamon, 3,046, Adams, 3,018. Thirty counties have more than 1,000 each. They seem to accompany the southern rather than the northern element of our population. There are but 90 in Putnam, 94 in Lake and 95 in Boone counties.

Of milch cows, Illinois has 640,321. New York has nearly double that number, and Pennsylvania and Ohio both exceed it. Cook county has 23,063, a result of the proximity of Chicago. Will has 18,193, LaSalle, 17,605, McHenry, 16,378. Twenty counties have more than 10,000 each, the southernmost of which is Adams, and most of which are in the valleys of the Fox or Rock Rivers. In other words dairying thrives most in northern latitudes, and where the water is clear. Alexander, Pulaski and Massac furnish the minima again, with 496, 842 and 948 cows, respectively.

Of working oxen, Illinois has 19,766, or less than *twenty-six* other States; and against 90,380 that we had in 1860. Milch cows have more than doubled, but oxen have fallen off nearly 80 per cent. The "Bull Whacker," with his detonating lash and strange cath, like Horace Greeley's ideal young man, has "gone west," to exhort the impenitent bullocks of the plains. They linger in our southern counties; Hamilton has 1,124 working oxen; Union 1,079; Williamson 1,047, and Pope 1,016. All the counties having more than 550 are Egyptian, and many of the northern and central counties report none at all.

Of other cattle, Illinois reported 1,055,499, far in excess of any other State, except Texas, which in turn had nearly three times as many as Illinois. Of our own counties, Morgan comes first with 30,344; La Salle comes next, with 29,244, and Bureau next, with 28,999. The minimum of other cattle is found in Alexander, with 642; Massac with

1,064, and Pulaski with 1371; forty-two counties have more than 10,000 cattle each. South of Macoupin, with the exception of Hamilton, there is not a county of these forty-two, and with a few exceptions they lie north of Springfield. This is partly a result of difference of climate and soil. The southern counties are strongly tempted by their success in winter wheat and fruit growing to neglect animal husbandry, and their hotter summers are less favorable to the growth of grass; whilst the northern counties succeed specially in grass growing, and cultivate the cereals with some drawbacks of climate, etc.

Of sheep, Illinois has 1,568,286, less than six other States. The number has doubled, however, since 1860 in Illinois, while it has not increased thirty per cent. in the United States. Vermilion county is credited with the largest number of sheep, 67,890, with Lake close after it with 67,763; sixty-four counties have more than 10,000 sheep each. Alexander has the fewest, 1,007, and Woodford only 1,331. Yet, upon the whole, sheep seem better distributed than cattle.

Swine, however, are a more common and popular domestic animal. Of these, Illinois had 2,703,343, or something more than a pig for every person within its borders. This is only a small increase over 1860, but Illinois is now the leading State in pork production, Missouri standing next, and not far removed. Sangamon county comes first with 76,429; McLean second, with 62,007; and Knox third, with 61,768. Only eight counties have less than 10,000 each, the lowest being Alexander, with 4,986, followed by Massac and Putnam. The southern counties are relatively stronger in this than in other domestic animals, and make a better showing than the advocates of a greater variety of meats might desire.

In wheat, Illinois, as heretofore, though less emphatically, leads the van of grain producing States. She had 23,837,023 bushels of all kinds of wheat in 1860, and in 1870 shows 10,133,207 bushels of spring, and 19,995,198 bushels of winter wheat, making an aggregate of 30,128,405 bushels. This is 12 bushels of wheat for each of its inhabitants, or a ration of 10 pounds of flour a week for every man, woman and child throughout the year.

I have taken some pains to classify the figures, and find that twenty-five counties, lying solid in the north end of the State—excepting Ogle—extending down to Rock Island and Ford, on either hand, produced less than 5,000 bushels each of winter wheat, and may be designated as spring wheat counties. Forty-four counties, lying solid in the south end of the State, and extending up to Pike and Coles, produce less than 5,000 bushels spring wheat each, and may be properly called winter wheat counties. In aggregate yield, in the remaining counties, St. Clair comes first, with 1,562,621 bushels of winter, and 2,550 of spring wheat. This is over 30 bushels of wheat to every person of its popula-

tion, or half a barrel of flour a month. Madison comes next, with 1,207,181 bushels of winter wheat, and 550 of spring. Stephenson and Ogle give the largest aggregates of spring wheat, the former returning 527,394 bushels of spring, and 2,118 of winter wheat; the latter 497,038 of spring, and 5,580 of winter wheat.

Looking at yield per acre, without reference to aggregate, and we find Randolph, also the most wooded county in the State, standing first. This is not an unexpected result. The quantity and quality of the wheat and flour of Randolph and surrounding counties have long been recognized by dealers and millers. Monroe, Alexander and Scott come next; St. Clair, Madison and Calhoun not much after. The minimum of product per acre is returned from Ford, Grundy and Livingston, the three least wooded counties in the State. The association might mislead somewhat, as some would infer that forest protection in Randolph, and the lack of it in Livingston, was the cause that produced the result. But the relative abundance and scantiness of wood and wheat in these two counties is more probably a result of the same cause—drainage in one county, and the lack of it in the other. 1869, which generally furnished the products that appear in the census of 1870, was a wet year, and the flat, though fertile prairies that lie in the upper part of the Grand Prairie did not appear to good advantage in consequence.

Of rye, Illinois produced 2,456,578 bushels, about a bushel a piece for each of its inhabitants. It was slightly surpassed by New York, and a good deal by Pennsylvania. The crop has increased in Illinois since 1860 250 per cent., but has diminished in total production. In this State it has undoubtedly taken the place, to a certain extent, of winter and spring wheat, as a hardier grain, ranking, in this respect, after oats and barley, but before wheat and Indian corn. Ogle comes first with 157,504 bushels, and next to it, Woodford, with 137,985, and Stephenson with 135,362. It is found in quantity exceeding 10,000 bushels in just one-half of our 102 counties, but in many southern counties the amount sinks to a few hundred bushels or nothing.

Of Indian corn, Illinois produced 129,921,395 bushels, and has been doing better ever since. The next State is Iowa, with 68,935,065 bushels, or not much more than half as much. The increase over the product of 1860 is not large, being about 12 per cent. Yet such a product is an immense fact. It is 52 bushels of corn to every person—man, woman and baby—in the State, or a bushel of corn a week every day in the year—four rations under the slave systems.

We are not less amazed when we examine the aggregate product of counties. Sangamon produced 4,388,763 bushels; Logan 4,221,640. Each of these counties, if they were such bad farmers as to ship and sell all their corn, could load a train of 40 cars a day 300 days in the

year. That illustrates the need the west has of every possible and practicable outlet for its immense surplus. Five other counties produced between three and four million bushels; fourteen range between two and three millions, and thirty-four more exceed one million.

The greatest percentage of surface was planted in Stark, if we may rely on the assessor's reports, and the smallest in the wheat growing counties of Randolph, Monroe and St. Clair. The best yield per acre was in Morgan, and next to it stood the adjoining and nearly adjoining counties of Scott and Menard, with Logan not far off, showing a little north and west of Springfield to be the pre-eminently fit corn ground of the State, at least in a wet season. Richness of soil and natural drainage seem to meet here.

The poorest product of corn, as well as of wheat, appears in the flat prairies of Grundy, Livingston and Ford, and emphatically declare the policy of the farmers of that part of our State. A friend suggests that there has been less exaggeration in the returns of production from that quarter; but after duly weighing his argument, I cannot concede that it has much force, though it may qualify my statement.

Of oats we produced 42,780,851 bushels, leading by six millions any other State, with Pennsylvania and New York coming next. We nearly trippled our product of 1860. Oats, like rye, have probably gained at the expense of the wheat crop, and replaced to some extent spring wheat in the northern counties. The greatest aggregate production was in Will county—1,868,682 bushels. Next comes Cook, with 1,584,225, and La Salle with 1,509,642 bushels. De Kalb, the one other county producing in excess of one million bushels, lies in the same part of the State. The cause of this excessive local production I hardly understand. Fourteen counties produce less than 100,000 bushels each, lowest of which stands Scott, with 13,462 bushels. Classed among the first in wheat and corn production, that fertile little county can afford to be last in this not very profitable crop. The oat crop is found mainly in the northern counties, and diminishes southward.

Of barley, Illinois produced 2,480,400 bushels, or nearly two and a half times as much as in 1860. California and New York grew more than three times the quantity however, and though we come next there is no reason to say that the crop has received special attention in this State. The census returns make no distinction between winter and spring barley, but I presume our State would show the same facts as in regard to wheat—that the best yield and finest product is winter, and that it is grown in the southern counties. Ogle gives the largest product, 317,462 bushels; De Kalb comes next, with 289,417, and Stephenson, with 165,266. The other counties having more than 100,000 bushels product, are Carroll, Kane and Lee, all among the most northern coun-

ties and lying adjacent to those already named. Thus, barley is clustered in its greatest production, like oats, into a few neighboring counties. No county south of Sangamon produces as much as 10,000 bushels except St. Clair, which, lying next to the St. Louis breweries, and producing some fine crops of winter barley, at least ran up its products to 48,192 bushels. But barley, more than oats and rye, seems to be a northern crop.

Of buckwheat, a still less important crop, unless in respect to fertilization, Illinois produced only 168,862 bushels, whilst New York reached nearly 4,000,000, and Pennsylvania 2,500,000. This was not much more than half its product in 1860. Only one county—McHenry—produced 20,412 bushels of this, and the counties producing more than 5,000 bushels are all in the upper north, except Wayne, which returns 6,399 bushels. Many counties return none or a few bushels. To what extent this growing neglect of the hot-cake crop is owing to an increasing distaste for flap-jacks and golden syrup, or a conviction that the crop is unprofitable, I am unable to decide.

Rice, though grown as far north as Tennessee, and a possible product, does not appear in the census of Illinois. It is given in 10 States, but South Carolina, Georgia and Louisiana have almost a monopoly of its production.

Of tobacco, Illinois produced 5,249,274 pounds, less by more than a million than in 1862, being surpassed often greatly by 10 other States. Kentucky produced 105,305,869 pounds. In the production of Illinois tobacco, two new counties come to the front, Saline with 1,155,941 pounds, and Williamson with 1,152,589. Thus, two counties far down in the southeast produce more than 40 per cent. of our crop; and the only counties north of Coles producing more than 10,000 pounds are the adjoining counties of Stephenson, with 87,803 pounds, and JoDaviess, with 12,935. But the counties on the Wabash and Ohio slopes grow nearly all the filthy weed which tobacco haters assign to a satanic origin, and loving smokers consign to a satanic fate.

Of cotton, the product of 20 States, Illinois grew only 465 bales against 1,482 bales in 1860. This was produced in 14 of our southern counties—a majority of them growing none. More than half of the amount was produced in the adjoining counties of Jackson and Williamson.

In the more important product of wool Illinois has done better. It stood eleventh in 1860. It stands sixth in 1870, with 5,739,249 pounds. Lake county leads with 318,042 pounds. The adjoining county of McHenry comes next with 290,022 pounds. 12 counties produced more than 100,000 pounds, and several of these, like those named, lie in the north-east corner of the State. Comparing the wool with the sheep statistics, we observe the satisfactory fact that whilst the sheep have

increased 104 per cent. the wool from them has gone up 185 per cent., tending to show that we have better sheep.

Coming to root crops, we find that in potatoes Illinois is far behind New York, Pennsylvania and Ohio, producing 10,944,790 bushels, or something more than 4 bushels for each of its inhabitants. Among our own counties, rather unexpectedly, Madison leads with a product of 557,460 bushels. This is the result of growing in the American Bottom for the St. Louis and Chicago markets. Cook comes next with 444,554 bushels, grown probably for the Chicago market. Thirty-six counties produce more than 100,000 bushels. Nearly all of these are northern and central counties; but Hardin, the little county of the Ohio, and St. Clair are among the number; Scott reports the smallest amount, 12,457 bushels, and Massac stands next to it with 13,125.

Of sweet potatoes only 322,641 bushels are credited to Illinois, which is little more than it produced in 1860; 75,052, or nearly a quarter of these, were grown in Union county; Williamson, Jackson and Madison come next. It is interesting to notice that they were grown in every county in the State except Jo Daviess—and probably in that—a thing that ten years ago would hardly have been deemed possible.

Passing from potatoes to wine upon a principle of association only suggested by the arrangement of the census tables, we find Illinois to have produced 111,882 gallons, being exceeded by California, Missouri and Ohio; 44,711 gallons of this, or 40 per cent., was produced in the single county of St. Clair, a result of the German population and favoring soil and climate of that county; Hancock, Boone, Madison and Monroe come after. Seventeen counties return more than 1,000 gallons. Most of these are in proximity to St. Louis, and more or less occupied by a German population. Upon the whole, wine culture is not much developed, although it has made a great advance since 1860.

Of dairy products, Illinois returns 36,083,405 pounds of butter, 1,661,703 of cheese, and 9,258,545 gallons of milk sold. Its butter product has increased 22 per cent.; its cheese product has diminished 11 per cent.; and its milk product has been built up since 1860. It is the fourth State in the production of butter, but is far behind New York, Pennsylvania and Ohio; it is seventh in the production of cheese; it is fifth—though far behind—in the amount of milk sold. In short, our dairy production is one of the most unsatisfactory results of the census, and would be more so but for the consciousness of our good work in fat cattle. Cook, LaSalle and Will are rival counties in dairy production. One leads the other two in butter, another in cheese, and a third in milk. Many of the northernmost counties, especially those in the northeast, are heavily engaged in one form or another of dairy production.

In the southern, hotter and less watered (I allude to the county, not the

milk) region of Southern Illinois, the production sinks to a very low point.

Of hay, Illinois produced 2,747,339 tons, more than Ohio, a little less than Pennsylvania, and not half as much as New York produces. Its relative position is not far different from that of 1860, but the absolute increase in the hay product is nearly 60 per cent. Of our counties, Cook leads in hay production with 129,210 tons, and is succeeded by the adjoining county of Will with 106,196 tons. The counties producing less than 10,000 tons are nearly all south of Springfield, and mostly in the south-east. Those producing 50,000 tons and over are all north of Springfield, and most of them quite in the north end of the State.

Of seeds Illinois produced 10,486 bushels of clover, and 153,464 of grass seed, far below its product of 1860, but leading other States in grass seed though ninth in clover seed production. Wabash county furnished the most clover seed, Schuyler came next, and Lawrence, adjoining Wabash county, came third; so that clover seed seems to have been made a specialty in that region. LaSalle raised 22,087 bushels of grass seed and DeKalb 13,367.

Hops are produced to the extent of 104,032 pounds, our State being only eighth in that product, and far behind New York, which runs up to 17,000,000 of pounds. What little we have is mainly the product of a few counties in the north-east corner. McHenry 19,391, Boone 18,710, DeKalb 15,580. 66 counties produce it.

Hemp has nearly disappeared, only 174 tons having been grown against nearly 3,000 in 1860, and the whole product of the country is not more than one-tenth what it was ten years ago. It was grown in 10 Illinois counties—Douglas, Hamilton and Pope being the principal.

In the production of flax we were exceeded by New York, and especially by Ohio, but increased on our production of 1860 largely; we have 2,204,606 pounds. Kane, Ogle, DeKalb and Lee produced a very large part of this. It was grown in 46 counties. Flax seed is reported from 58 counties to the amount of 280,043 bushels, showing that the plant is grown more for seed than for lint. Iroquois, Lee and LaSalle grew the most.

Maple sugar is made in sixty counties, to the amount of 136,873 pounds, only a slight increase over 1860. Fifteen States do better, many of them largely so. Our sugar is mostly made in Clark, Edgar, Hancock, Menard, Schuyler and Vermilion. Over on the Indiana line and up the Illinois is the best sugar ground.

Maple molasses was made to the amount of 10,378 gallons in thirty-six counties. This is less by half than in 1860.

Of sorghum molasses we had, however, 1,960,473 gallons, which is a little less than Ohio or Indiana produced. Every county but one returns

a production of it. Shelby and Edgar lead with 75,183 and 67,984 pounds. Some of the northern counties return but a small amount, and I suspect its production will go to the southern counties.

Of wax we had 46,262 pounds, and of honey 1,547,178, the former decreasing, the latter increasing slightly since 1860. New York, North Carolina and Tennessee lead us in wax, but we are first in honey, flowing with that if not with milk. Franklin and Wayne, wooded counties, lead in wax, which is still to a considerable extent, I believe, a product of the bee hunter. Sangamon, McLean and Franklin produce the most honey. All but these counties make some return of it. The counties producing least are in the southeast.

Such are the facts of our agricultural production, to which I beg leave to add the following

REFLECTIONS.

1. Our State produces an undue proportion of grain. We grow a great deal more animal-feeding grains and fodder than we consume. There is a bad balance between animal and plant production. See the cheap stock fields, and the fact that stock men can winter animals at less expense than they can summer them—perhaps for one half. Wheat, or rather flour—reserving the manufacture and the bran and other offal to ourselves—should be the only grain carried out in quantity. Our corn should be fed to animals, made into high-wines, into corn starch, or anything else; but don't, for the sake of good farming, ship so cheap and bulky an article, unless the price is high. Don't constitute yourself a railway freight producer, and pay forty-two cents to carry a twenty-three cent bushel of corn to New York. Do anything but ship the highest fertility of your soils for high freight and low prices to New York. You are not worthy the name of farmers, or freemen, if you do.

2. We want more of the home industries or farm manufactures. We should make more butter and cheese, more ciders, wines and vinegars; more canned fruits and the various secondary products that will give the farmer and his family something more than the price of the raw products of his farm; and so

3. We want a more diversified industry, such as begins already to appear around Chicago in the Fox river counties. We find there more of the grains not commonly grown, more grass and hay, more butter, cheese and milk, more hops, and so on. To a certain and less extent this is true around St. Louis on the Illinois side. But there are dead levels of husbandry throughout central and southern Illinois where corn and oats, perhaps cattle and hogs, constitute the entire ways and means of rural economy. Employment is inconstant and uncertain. The success or failure of the year is staked upon one or two products. This has succeeded to a wonderful extent in some cases, but it cannot under ordinar

conditions, and in the long run. So in the south, and especially in the south-east, we see an adherence to old practices now unprofitable, and oxen and short supplies of farm implements prevailing.

4. We want extensive drainage in the broad and fertile prairies of the east. They grow short crops of timber, short crops of corn, and short crops of wheat on a rich and exuberant soil. Ford county has 6 acres of woodland on the square mile, whilst Randolph has 280. Grundy has less than 5 bushels of wheat to the acre, whilst Randolph shows 30. Livingston has perhaps 20 bushels of corn to the acre, whilst Morgan has 50. These are results of the wet summer of 1869.

5. Ours is the Empire State of the West and the garden and glory of the Union. We can feed the teeming millions of the East with bread and meat, and lead the agricultural production of the age. We can provide the country with food, as we have with presidents and statesmen, generals and armies. We furnish New York with cattle and with a model constitution. We have coal enough to drive the steam engines, the looms, the forges and furnaces of future ages; and there stands only in our way the looming power of the gigantic monopolies that succeed the lordly aristocracy of former ages. Putting them under our feet as our servants and not masters, making corporations and their aggregated wealth serve the public interest for fair wages and not for extortionate gains, and there is no perceptible limit to the growth of our magnificent State. Forward, then, to the great and glorious work of making two blades of grass grow where one grew before, and protecting the sons of toil in the enjoyment of their fairly-earned wages. "Equal and exact justice to all men" is a motto worthy of freemen and farmers.

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