JOURNAL

OF THE

UNITED STATES

AGRICULTURAL SOCIETY,

FOR 1857.

EDITED BY BEN: PERLEY POORE,
Secretary of the Society.

WASHINGTON, D. C.

OFFICERS

OF THE

UNITED STATES AGRICULTURAL SOCIETY.

FOR THE YEAR 1857–8.

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MARSHALL P. WILDER, Boston, Mass.

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Nathaniel B. Smith, *Woodbury*, Conn.
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TREASURER,

B. B. FRENCH, ... Washington, D. C.

SECRETARY.

BEN· PERLEY POORE, ... Newburyport, Mass.

Dr. *The United States Agricultural Society, in Account with* B. B. French, *Treasurer.* **Cr.**

1856.			1856.		
Jan. 11.	To Cash in hands of Selden, Withers & Co., now unavailable,....$2,149.13		Jan. 12.	Balance in Treasurer's hands, brought forward from last settlement, (available,)...	$1,868.02
" 12.	To Cash paid Ben: Perley Poore, as per receipt,.....	$100.00	" 12.	By Cash received for 9 Life and 20 Annual Memberships,.....	130.00
" 12.	To Cash paid D. I. Brown, for Corn from Patent Office,.....	10.00	Feb'y	By Cash for an uncurrent Note of Grisham,	2.00
" 14.	To Cash paid Adams's & Co's Express, Freight on Boxes to Mr. Wilder.....	5.50	Mar. 26.	By Cash for Life Membership of Putman County Aoricultural Society, N. Y.,.....	10.00
Feb. 26.	To Cash paid Polkinhorn for Printing,....	3.00	" 28.	By Cash for Life Membership of Harry Ingersol, Philadelphia,.....	10.00
May 2.	To Cash paid Star for Advertising, &c.,....	5.00	May 13.	By Cash for Life Membership of Thomas Ellison, N. Y.,.....	10.00
June 9.	To paid Bills presented by Hon. M. P. Wilder, (see vouchers on file,).....	1,393.50		By Cash for Membership of D. Edwards, N. Y. (by Hon. B. Pringle,).....	2.00
1857.			1857.		
Jan. 5.	To paid C. H. Burgess, for posting bills,..	1.00	Jan. 13.	By Cash rec'd from all sources, on account of Phila. Exhibition,..$42,062.92	
" 13.	To Cash paid for Premiums and Expenses of Exhibition at Philadelphia,.....40,990.32		Jan. 13.	By C. W. Harrison's Check for Balance in his hands,.....	1,072.60
	Balance in hands of Treasurer, as per check of C. W. Harrison, Assistant Treasurer,..... 1,072.60				$3,104.62
	$42,062.92				
	To Balance,.....	1,586.62			
		$3,104.62		Available Balance in Treasurer's hands, January 14, 1857,.....	$1,586.62

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FIFTH ANNUAL MEETING

OF THE

UNITED STATES AGRICULTURAL SOCIETY.

THE fifth annual meeting of the United States Agricultural Society commenced at ten o'clock, on Wednesday morning, January 14th, 1857, in the East Room of the Smithsonian Institution, at Washington City. It was fully attended by Honorary, Life and Annual Members, representing twenty-eight States; — by the President of the United States, Cabinet officers, Senators, Representatives, and other distinguished officials; — and by Delegations from State Boards of Agriculture, State and County Agricultural Societies.

Hon. MARSHALL P. WILDER, President of the Society, called the meeting to order, and after congratulating the friends of agriculture on the number and character of the assemblage, read the following letter: —

BOSTON, Jan. 12, 1857.

Hon. MARSHALL P. WILDER, *Pres't. U. S. Ag. Society:*

My Dear Sir, — I hereby respectfully resign my office as Secretary of the United States Agricultural Society. It has afforded me much pleasure to co-operate with yourself and other friends of the Society up to this time, but my business engagements will no longer allow me to perform the duties of the office which I hold.

With sincere good wishes for the continued success of the Society, and for the happiness of its officers and members,

I am, respectfully,
Your friend and ob't. servant,
WILLIAM S. KING.

On motion of Vice-President FRENCH, of New Hampshire, BEN: PERLEY POORE, of Massachusetts, was elected to fill the vacant place, *pro tempore*.

President WILDER called for credentials, which were handed in, and the Register was signed by nearly all of the

DELEGATES.

Maine State Agricultural Society — S. P. Benson, John D. Lang, John J. Perry, Ebenezer Knowlton, J. D. Fuller.

New Hampshire State Society — James Bell, Frederick Smyth, *Rockingham County Society* — Henry F. French, George W. Kittridge, Abner Littlefield, Moses Sanborn, M. Coffin, James Pike.

Vermont State Society — George T. Hodges, Justin S. Morrill, Alvah Sabin, Charles Linsley.

Massachusetts State Board — Marshall P. Wilder, W. G. Lewis, Moses Newell, Charles L. Flint, Ben: Perley Poore. *Essex County Society* — Timothy Davis. *Norfolk County Society* — Linus B. Comins, W. S. Damrell. *Bristol County Society* — James Buffington. *Plymouth County Society* — Robert B. Hall. *Berkshire County Society* — Ensign H. Kellogg. *Hampshire County Society* — Calvin C. Chaffee. *Hampden County Society* — Philos B. Tyler. *Franklin County Society* — William C. Fowler.

Rhode Island State Society — Nathaniel B. Durfee.

Connecticut State Society — Robbins Bartlett, N. B. Smith, H. A. Dyer, John A. Tainter, A. G. Hazard, J. B. Shultas, T. S. Gold, S. H. Huntington, A. H. Byington, Frederick Hall, Randolph Lindsley, E. H. Hyde 2d, E. Hough, S. D. Northway.

New York State Society — T. S. Faxton, L. G. Morris, E. P. Prentice, Henry Wager, Herman Wendell, Francis M. Rotch, C. S. Wainwright, E. G. Faile, B. P. Johnson, Hamilton Fish, E. B. Morgan, Samuel Dixon, A. Z. McCarty, O. B. Matteson, L. B. Crocker, Benj. Pringle, Thomas T. Hegler, John M. Parker, John H. Martindale, John Williams. *Westchester Farm School* — Henry S. Olcott. *American Institute* — George E. Waring, Jr.

New Jersey State Society — J. H. Frazee, George Hartshorne, W. W. Marsh. *Somerset County Society* — James Campbell.

Pennsylvania — Aaron Clement, John Rice, John McGowan, C. W. Harrison. *Pennsylvania Horticultural Society* — George H. Bergen.

Delaware — John Jones.

Maryland State Society — Ramsay McHenry, Samuel Sands, Samnel Smith, J. O. Wharton, Outerbridge Horsey, Martin Goldsboro, S. T. C. Brown, Charles Ridgely, James Higgins, John C. Browne, Charles Carroll, George W. Hughes, Oden Bowie, John Parrar, William D. Merrick, H. G. S. Key, G. M. Eldridge, William. B. Stephenson, James A. Pearce, James T. Earle, James M. Goldsboro, William Hardcastle, Robert Dick, William T. Goldsboro, N. Jones, Judge Spencer. *Frederick County Society* — Anthony Kimmel, Thomas Sappington, Lewis G. Kemp, J. M. Buskey, William T. Preston.

District of Columbia — Commissioner Mason, D. J. Browne, of "*Agricultural Bureau*," Professor Henry, of "*Smithsonian Institution*," W. W. Corcoran, of "*Metropolitan Institute*," Louis Marshall, *Georgetown*, George Wood, of "*American Guano Company*," Joshua Peirce.

Virginia — George W. P. Custis. *Albermarle County Club* — Thomas L. Farish.

Kentucky State Society — A. G. Talbott, J. J. Crittenden, W. L. Underwood, J. B. Thompson. *Louisville Society* — James Guthrie, A. K. Marshall.

Indiana State Society — Jesse D. Bright, Smith Miller, W. H. English, George G. Dunn, Wm. Cumbach, David P. Holloway, Lucian Barbour, Harvey D. Scott, Daniel Mace, Schuyler Colfax, Samuel Brenton, John U. Pettit.

Illinois State Society — James H. Woodworth.

Michigan State Society — Lewis Cass, Wm. A. Howard, Charles E. Stuart, D. S. Walbridge, George W. Peck, Henry Waldron.

The credentials having been handed in, and the annual members having paid their assessments, the session was opened by President WILDER, with the following

ADDRESS.

Gentlemen of the United States Agricultural Society : —

IT is now five years since this Association was organized in this city. Some of the worthy gentlemen who took an active part in its formation are present to-day ; others have ceased from their labors and gone to their rest, but the Association still lives ; yes, it not only lives, but is successfully laboring to promote the object which was dear to the heart of its founders, and we who survive are permitted once more to meet at the place of its birth and to rejoice in its prosperity.

The Society has held four exhibitions in different parts of our country, each enlarging its sphere of action and rising in interest and importance above its predecessor. It has disbursed in premiums and expenses more than eighty thousand dollars, and has called together larger assemblages of people than have been convened upon any other occasion, embracing not only our most intelligent yeomanry, but gentlemen of every art and profession from nearly all of the States and Territories of the Union, evincing that the national pulse beats in unison with our own, and that the public voice is responsive to our call.

When we realize that these results have been obtained in the incipient history of our Society, without governmental patronage and without pecuniary resources, but simply and solely by the effort and contributions of individuals, we regard our success as one of the most striking illustrations of the power of voluntary associations.

From this auspicious beginning we should derive ample encouragement to perseverance and renewed confidence and ex-

ertion. These are favorable omens, and I hail them as harbingers of future good. But this cannot be realised without wise counsel and a judicious plan, without zealous and laborious exertions, without unity of purpose and individuality of effort.

In the discharge of my official duty, I will at this time call your attention to such considerations as the events of the last year suggest, and to such recommendations in respect to our future action, as appear to me to be best adapted to secure the welfare and continued progress of our institution.

FOURTH EXHIBITION.

The fourth exhibition of the Society was held in Philadelphia in October last, in pursuance of resolutions passed at the last annual meeting, and was continued five days.

In the projection and execution of its plan, the Society was much indebted to the combined wisdom and liberality of the Municipal authorities and Board of Trade in that city, and also to the Philadelphia Society for Promoting Agriculture, to the subscribers to the guarantee fund, and to the indefatigable exertions of private citizens, and the Philadelphia press, all of which contributed largely to the unparalleled success of the enterprise.

The scale of operations was more extensive than that of any previous exhibition, embracing nearly all the departments of agriculture. These were represented in a manner honorable to the contributors, to the association, to the country, and to the city in which the exhibition was held. The weather was most propitious, the accommodations of the most ample kind, the attendance throughout large, amounting on one day to 70,000 persons. A peculiarly gratifying feature was the numerous and respectable delegations from the several States, consisting of many of the most distinguished agriculturists in America.

The receipts for entrance, memberships and admissions at the gates, were about thirty-eight thousand dollars, but the large amount awarded in premiums, and the great expense incurred by the extensive and magnificent preparations for the Show, will probably leave but a small balance to be added to our funds. There are a few premiums and bills yet to be paid, but it is believed that the balance on hand is more than ample to meet all demands.

A more particular account of the financial condition of the Society, will be made known in the report of the Treasurer.

The large premiums and expenses of the third and fourth exhibitions have subserved a very valuable purpose, exciting public attention and giving an existence and established character to the Society both at home and abroad. This object having been thus speedily attained, and the Diploma and other awards of the Society being thereby made more valuable and desirable to their recipients, and as larger patronage cannot reasonably be expected in any other section of the country, the question is worthy of our consideration and decision, whether a less expense should not be incurred in future exhibitions, so as to increase our funds if possible, and to provide us with the means of supporting a Secretary entirely devoted to the interests of the Society.

The number of entries of the late exhibition was very large, and it has seldom been our privilege to behold so many fine animals. This remark will apply to the Durhams and Jerseys, but more especially to the Devons, and to the sheep.

AGRICULTURAL IMPLEMENTS.

The department of agricultural implements was more fully represented than ever before. This occupied some acres of ground and excited a peculiar interest among the farmers and the public generally. The duty devolving upon the commit-

tee on discretionary premiums in this class was burthensome and difficult, and called forth the following very appropriate recommendation: —

"Your committee have decided with entire unanimity, and after mature deliberation, to present as the results of their labors, a respectful and earnest recommendation for a GREAT NATIONAL TRIAL IN THE FIELD, at such time and place, and under such regulations as in the opinion of the Society would be most conducive to a correct decision upon their various merits and advantages."

The importance of this recommendation, emanating as it does from men of the highest intelligence and respectability, deserves our consideration. One argument by which they enforce their opinion is alike creditable to our association and commendatory to their plan. "The United States of America have already outstripped the world in the discovery and application of scientific principles to mechanical purposes, and awards made under such circumstances, and by a Society representing so large a portion of the intelligence of the Union, would possess higher value than those of the Royal Agricultural Society of England or any other similar association in the world."

In these sentiments I cordially concur, from the belief that these labor-saving implements are eminently beneficial both to the producer and to the consumer, reducing the cost of production to the former and the price of commodities to the latter, and to none are they more beneficial than to the laboring classes, enabling them to perform work with less fatigue, with greater skill, and therefore with corresponding advance in wages. Hence every lover of his country and of his species, should welcome improvements in this department of agriculture. I therefore recommend that a special committee be appointed at this meeting with full powers to act, subject only to the approbation of the Executive Board, to designate the

time and place, and to make all the necessary arrangements to hold an exhibition for the trial of agricultural implements in the field.

CHINESE SUGAR CANE.

One of the most important articles on exhibition at our late Show, was the syrup of the New Chinese Sugar Cane (sorghum saccharatum), the introduction of which into the United States, has excited more deep and general interest than any other agricultural product within the last quarter of a century, and scarcely less in importance than Indian Corn. The samples of this article were presented by Col. Richard Peters, of Atlanta, Georgia, who is entitled to the honor of calling the attention of our farmers to it in this public manner. A detailed statement of his crop with the method of cultivation may be found in the Journal of this Society, and so confident is Mr. Peters of the success of this crop that he intends to plant one hundred acres this year. Preparations are making in most of the States for its cultivation, and we have no hesitation in affirming that it will be more extensively grown the coming season than any new agricultural product since the settlement of the country.

The increased consumption of sugar, the high prices of the same, and the decline of the sugar cane in the tropical climates has awakened an additional interest, and it is impossible to predict the importance of this crop to American agriculturists. It has the advantage over the common sugar cane, being grown easily from seed of which in many States it produces an abundance, and in its adaptation to every degree of latitude within the limits of our republic. It has also been grown in the West Indies, South America and Liberia. The past year it has been as successfully cultivated in the New England and Western States as in Georgia and

the extreme South, — and presents the prospect to our farmers of producing their sugar and molasses, as easily as they now do their corn and potatoes, and being one of the most profitable productions of the soil. It contains from fifteen to twenty per cent. of saccharine matter, and will yield from four to five hundred gallons per acre, of syrup or molasses. It makes a very valuable food, and has produced in Kentucky nineteen thousand pounds of dry fodder to the acre. It is said to be incredibly heavy when compared with corn fodder, and that its comparative loss by drying is much less.

When planted early and on rich lands, in some of the States, it yields two crops in the season, and is equally good for cattle in a dry or green state, and it is presumed that the seed, when ground, will make a valuable meal for the fattening of stock.

This seed plant, we believe, originated in China, and was introduced to this country by the way of South Africa and France, but to Mr. Browne, of the Agricultural Department of the Patent Office, our fellow associate, who procured seed while in France, are our citizens indebted for a general distribution of this product more than a year since. Mr. Browne thinks it may be cultivated to an extent equal to that of Indian corn, say twenty-five millions of acres, and he has kindly consented to address the Society on this subject. Other varieties of these sugar canes are said to exist in Caffraria, of which Mr. Wray, an English gentleman, has collected a number. These he says vary in time of ripening from seventy-five to one hundred and thirty days. What success has attended the cultivation of these, or what their comparative merits are, we are unable to state.

So favorable is the impression in relation to this new crop in all parts of our Union, and so thoroughly am I convinced of its great importance to American agriculturists, that I

recommend the appointment of a special committee to be charged with the duty of co-operating with the Patent Office and of corresponding with Mr. Wray and other European cultivators, and also with any other gentlemen interested in the production of this crop.

FRUITS AND NATIVE WINES.

Another interesting feature in the late exhibition, was the collection of fruits and native wines. Of these latter there were more than fifty different samples, coming from various States, among which Ohio, Missouri, Pennsylvania, New Jersey and California were the most prominent. The cultivation of the grape is becoming more and more extensive — every year adds new and valuable varieties of native grapes to our list, and such as are adapted to particular localities or to general cultivation. Ohio has vineyards to the amount of four thousand acres, Missouri one thousand acres. Other States have less quantity, while California bids fair to rival the vineyards of Europe.

It was formerly supposed that ours could never become a grape growing country, but this false theory is now entirely exploded. Thousands of cultivators are now sowing the seed of native or or hybridized grapes, and we are constantly producing new and improved varieties adapted to all sections of our land. The time is not distant when we shall not only raise our own grapes and manufacture our own wines, but we shall also be exporters of these articles. Since the disease of the vine in Europe has proved so disastrous, a demand has there arisen for the brandies made from our grapes, and of which, the last year, more than three thousand gallons were sold at five dollars the gallon, and sent to France to flavor French brandies manufactured from American rum and whiskey.

Without entering here upon the question of temperance, I may add that many of the staunch advocates of that most worthy cause, encourage the cultivation of the grape for wines, in the belief that if pure wines become common, they will promote health by supplying the place of foreign poisons now sold and consumed under the name of foreign wines, and that if the fruit of the vine comes into general use it will reduce the demand for alcoholic stimulants. On these principles a distinguished physician, President of one of our most efficient State Temperance Societies, gave a recommendation to Mr. Langworth for his Catawba wines.

HORSES.

Another prominent feature of the late exhibition, as also of that in 1855, was the interest manifested in the display of the horse. Within a few years a track for the exhibition and trial of horses has been generally introduced into agricultural shows. This subject has called forth much discussion and some ungenerous criticisms, on account of its supposed analogy to race courses, and hence the two have been compounded, and the terms "*racing*" and "*horse-racing*" applied inappropriately to these exhibitions of that noble animal at our agricultural shows. The difference is specific and wide. In the race, the course is constructed professedly for a species of gambling, which the laws of the land wisely prohibit — while in the agricultural exhibitions the track is laid for the exhibition of all the qualities which go to make up a valuable horse, as blood, strength, action, and also speed.

In all the agricultural exhibitions which I have had the happiness to witness, I have never yet seen, what may properly be denominated a *race* upon that track, nor have I seen a premium offered for a *race* or known any wager having been laid upon the speed of the horses at these exhibitions. Is not

the trial of the horse in relation to these qualities as important to the farmer as the exhibition of the superior qualities of other animals? Why should there be any more exposure of the public morals in the one case than in the others? True, the display of the horse always attracts great attention, but is that the fault of the exhibition? Says a correspondent of one of our agricultural papers, "We know that even a procession of horses will draw the attention of the crowd, or a single horse of beauty and action will excite admiration. But to have an exhibition of horses without showing their *action*, would be as incomplete as passing judgment upon a steam engine or mowing machine, without witnessing their operation."

The first Exhibition of this Society consisted of Horses entirely, and, as it deserved, received universal approbation. At that Show it was said by the late Abbot Lawrence, our Minister to the Court of St. James, "I rejoiced when I received your invitation, informing me that there was to be a real horse exhibition, and nothing but horses. We talk in these modern times of the steam engine and electric telegraph, as the great civilizers of man, but the horse has been a greater civilizer than either the steam engine or the electric telegraph."

Governor Seymour, of New York, said, "I recognise the importance of the horse to the Agriculture of our country, and his improvement as a matter of deep concern." Said Edward Everett, "Strike out of our civilization what the horse has contributed to it, and we shall find a surprisingly large blank."

Mankind in all ages have had a peculiar fondness for that noble animal. Hence the presence of the horse in relation to the saddle, carriage, draft and other purposes will be as it ever has been, an object of admiration to all classes of society.

When we consider the number and value of the horse in our country, we shall the more readily appreciate their importance and the propriety of affording encouragement to this department of American husbandry. By the statistics of the Patent Office, it appears that the value of horses in the United States is over three hundred millions of dollars, equal to four times as much as all the butter and cheese — six times as much as all the sheep — twenty times as much as all the swine, and within one-fourth as much as all the horned cattle in the Union.

The breeding of horses has, within a few years, become one of the most profitable branches of agriculture, and if we estimate the improvement which has taken place at only ten dollars each, we shall have the round sum of fifty millions of dollars.

To exclude the trial of speed in horses at our Fairs, (says the President of one of our State Societies,) would certainly have a tendency to detract from the real interest of these exhibitions. If no interest can be had except a mere examination as to form and appearance, such animals as Fashion, Black Hawk, Ethan Allen, and others, would surely remain at home — and further, he states, I advocate the trial of speed and bottom; and I venture to assert that, without a cross of thorough bred or *turf* stock, no very superior horse exists — not one that would command the price of three hundred to five hundred dollars for his superior qualities as a family horse, and not one that is really valuable for any other practical purpose without some of the blood of these thorough bred or turf horses. For myself, I never drive fast horses, neither have I or would I desire, that the display of the horse should be made prominent at the expense of other departments, but that he should receive that share of attention which his great worth and the interests of the farmer demand.

FUTURE EXHIBITIONS.

Proposals have been received from various quarters in respect to our next annual exhibition, a subject which demands much careful deliberation, in regard to its location, (previous exhibitions having been held in the Eastern, Western, and Middle States); and also in respect to its preliminaries. I therefore recommend a reference of this subject to a special committee, with full power to act in the premises.

RESIGNATION.

GENTLEMEN: By your favor I have occupied the chair of this Society since its organization. In compliance with your earnest solicitation I have waived my private preferences in deference to your judgment, and have sustained the responsibilities of the office the past year according to the best of my ability. I have labored assiduously, and at no small personal inconvenience and expense, to establish this Society upon a firm and sure foundation — to promote a cordial intercourse between agriculturists in all sections of the country, and to advance the general cause of terra-culture by such methods as appeared to me to be most judicious. For your indulgence and cordial co-operation I beg you to accept my most grateful acknowledgments. But I cannot but doubt the propriety of accepting again this trust, and I therefore most respectfully decline a re-election, and request that I may be permitted to retire from the presidency, and that some one of the worthy gentlemen I see around me may be honored with the occupancy of this chair. Gladly shall I co-operate with you, gentlemen, for the further advancement of this Society; nor will these sentiments change with the change of circumstances, for whatever position I may occupy in its future labors, I shall ever feel the deepest solicitude for its prosperity

IMPORTANCE OF AGRICULTURE.

FELLOW ASSOCIATES: In view of the wonderful progress of our country, can we look back to the past and forward to the future, without feeling the obligation which rests upon us as farmers, to be faithful to our trust in our day. My conviction of this duty deepens in importance, when I consider the rapid increase of population, destined, according to the best estimate, before some of the children of the present generation shall go down to their graves, to exceed two hundred millions of souls. These must be fed by the products of our soil, and these products must be increased in corresponding proportion. Where we now raise six hundred millions of bushels of Indian corn, we must, within seventy years, produce the enormous amount of four thousand eight hundred millions of bushels. Other agricultural products must also increase in the same ratio. How can this stupendous result be realized but by a constant advance in all the arts of husbandry? The watchword of our age is, "*Onward;*" and he who cultivates the soil must move simultaneously with his brethren of other trades and professions, for *his* interest is *their* interest. We must labor together and aid each other, and if our Government will not foster and protect us, our own enterprise will. Let other countries more limited in their geographical extent and physical resources, shape their policy as they may; be it the wisdom of our own Republic to develop our natural resources, by a wise legislation without regard to party politics, and to encourage, by prompt and liberal measures, all the great industrial pursuits of our beloved country.

The importance of agriculture to the other arts, we can never appreciate, until we can estimate the results of commerce and other pursuits which depend upon it; until we can calculate the benefits which have resulted to our country and the world, from the cultivation of cotton and of Indian

corn. Agriculture is second to no other pursuit in resource, in productiveness and salutary influence. The man who discovers a process for the rapid advancement of this art, either in the tillage of the soil or the manufacture of a valuable labor-saving implement, is as truly a benefactor of his race as a Columbus, a Newton, a Franklin, or a Fulton.

The improvement of agriculture will also do much to preserve a conservative and controlling influence in the councils of our nation, and we trust that the day is not distant when the voice of the farmer will be as potent in the halls of legislation as in the field. That nation is wise which extends the greatest encouragement to this art, for she therefore provides not only for the support, but for the health, happiness and independence of her subjects. Strange indeed that agriculture, which occupies directly or indirectly, four-fifths of the population of the United States, an art in which capital is so safe, and labor so productive, the parent of all other arts, and the source whence we derive our daily bread, has received no more encouragement from Government. We would aid and encourage agriculture by legislation, by education and by every means in the power of the nation. Why should we not have a separate department of the Cabinet for Agriculture in our national government, as well as one for the military? Why has it hitherto been so difficult, nay, *impossible*, to get a bill through Congress for the establishment of such a department, when appropriations are annually made for the support of objects not half, no, not a tenth part so important to the welfare of the country? Much good has already followed from the increased appropriations for the Department of Agriculture connected with the Patent Office, and from the judicious management of Mr. Commissioner Mason and Mr. Browne, its immediate superintendent, and we rejoice in the belief that the day is at hand, when the true interest of

the people, the primary pursuit of man, will no longer be disregarded by our national legislature, when a wise policy, a sense of justice and personal honor will give cordially to the demands for which the yeomanry of our country have so long implored.

Go forward, therefore, American farmers — persevere — our country is enlarging its boundries upon the broadest scale — keep pace with her rising greatness and with the age in which we live. Act in a manner worthy of her manifest destiny. Let us feel the responsibilities which rest upon us. Let us be faithful to our high and glorious trust. Let us sympathise and co-operate with our brethren of the soil in every part of this great republic; and let it never be forgotten, that we meet as friends and mutual helpers, without regard to party or creed, acknowledging no sectional interests, no personal preferment, but only the general prosperity, and the welfare of our whole united happy land.

On motion of Mr. H. A. Dyer, of Connecticut, it was

Resolved, That the thanks of the Society be extended to our worthy President for the ability and zeal with which he has discharged the harassing and laborious duties of his office, and acknowledge the courtesy and efficiency with which the executive duties have been discharged. The best guarantee for the future efficiency of the Society is in his retention of the post he has so ably filled.

On motion of Vice President French, it was

Resolved, That the President appoint a committee of five to fix upon the location of the next Exhibition; — a committee of three to audit the accounts o. the Society; — and a committee of twenty-one to nominate officers for the ensuing year.

Treasurer B. B. French, of the District of Columbia, submitted his annual report. After some discussion as to that portion of it which gave the receipts at the Philadelphia Exhibition, by Messrs. C. B. Calvert of Maryland, C. W. Harri-

son of Pennsylvania, JOHN JONES of Delaware, and HUMPHREY MARSHALL of Kentucky, the Report was accepted, and referred to the Committee on Accounts.

President WILDER announced his appointment of Committees.

On location of next Exhibition. Messrs. HARRISON of Pennsylvania, JONES of Delaware, RICHARDSON of New York, KELLOGG of Massachusetts, and HARTSHORNE of New Jersey.

On Accounts. Messrs. CLEMENT of Pennsylvania and FOWLER of Massachusetts.

On Nominations. Messrs. LANG of Maine, FRENCH of New Hampshire, FOOTE of Vermont, DYER of Connecticut, LEWIS of Massachusetts, THURSTON of Rhode Island, WARING of New York, FRAZEE of New Jersey, MCGOWAN of Pennsylvania, JONES of Delaware, KIMMEL of Maryland, CUSTIS of Virginia, UNDERWOOD of Kentucky, HOLLOWAY of Indiana, MCCORMICK of Illinois, STUART of Michigan, JOHNSON of Tennessee, KENNET of Missouri, BRADFORD of California, CHAPMAN of Nebraska, and BROWNE of the District of Columbia.

Hon. JAMES GUTHRIE, (Secretary of the Treasury,) stated that the credentials of himself and the Hon. HUMPHREY MARSHALL, with their instructions from the "Southwestern Agricultural Association" at Louisville, Ky., were inadvertently left at his residence, but should be forthcoming. He was instructed to propose Louisville as the place of the next Exhibition, and hoped the Society would go West and see what had been done by its people in every department of agriculture and husbandry.

Vice-President KIMMEL, of Maryland, expressed his gratification at the reception of this proposition, yet trusted that it would not be left unmatched by the large committee of Baltimoreans who also desired to secure the Exhibition for their city. He also rejoiced to learn that a generous proposition had been made by citizens of St. Louis, Missouri. Here was an occasion for open and honorable rivalry. Let the representatives of each city "lay on" their propositions, and let

the Society see who would "first cry! 'hold! enough!'" [Applause.]

A MEMBER suggested Lexington, Kentucky, as a fit locality for the purpose.

President WILDER replied that he was in receipt of a letter from Mr. Gratz, of the Lexington Agricultural Society, resigning the claims of his neighborhood in favor of the superior advantages of Louisville.

Mr. BENSON, of Maine regretted that the hour was approaching when he, with other gentlemen who were members of Congress, would be obliged to leave the Society for their less agreeable duties at the capitol. In future, he hoped, the Society would meet at an earlier hour, for farmers should never refuse to go to work in good season. He therefore offered the following resolution, which was carried: —

Resolved, That in future the morning sessions of this Society commence at half past eight o'clock.

President WILDER laid before the Society numerous specimens of apples and pears, from Oregon, which had been presented by D. T. BROWNE, Esq., of the Patent Office, to whom they had been sent by an agricultural society in that distant Territory. He appointed as a special committee to report on these gigantic fruits, Messrs. Dyer, of Connecticut; Prince, of New York, and Pierce, of the District of Columbia.

That portion of President WILDER'S address recommending a "National Trial of Agricultural Implements in the Field" was then informally discussed, and referred to a *Special Committee*, consisting of Messrs. Benson, of Maine; Tench Tilghman, of Maryland; Waring, of New York, Warder, of Ohio; Olcott, of New York, and Lang, of Maine. Power was given them to add to their number, and to make such arrangements as they might deem advisable, subject to the control of the Executive Committee.

Vice-President KIMMEL wished, as the representative of Maryland, to propose for election as an Honorary Member of the United States Agricultural Society, a gentleman who was claimed by that State as an adopted citizen, and who had

never forgotten her, although estranged by years of absence. He had, in the temporary gloom which had clouded the financial reputation of Maryland abroad, frankly and unhesitatingly vouched for her honor and for her integrity. Nor were his exertions confined to Maryland alone. The whole Republic has been placed under direct obligation to him for the public demonstrations of respect with which he has annually honored the anniversary of our national independence, and the social intercourse which he has promoted between the two nations has exerted a happy influence in producing a glorious political and commercial amity. As one who has partaken of this international hospitality, (said Mr. Kimmel,) I propose as an Honorary Member, George Peabody, Esq., of London.

Mr. Poore, of Massachusetts, claimed the privilege of seconding the proposition of the gentleman from Maryland, as his own acres were in Essex county, of the Old Bay State, where Mr. Peabody was born and was educated. It had been a source of pride to the farmers of that county to find, that when Mr. Peabody returned to his native land, he had steadily avoided the ovations that awaited him in New York and in Boston, that his first appearance in public might be at their Agricultural Festival. From the interest which he there manifested, there could be no doubt but that he would prove a valuable acquisition to this Society, and thus add to the strong hold which he has upon the hearts of his countrymen. On both sides of the Atlantic his name is coupled with good faith, financial generosity, and international cordiality. He has rendered incalculable services to America, and has a strong claim upon our gratitude. Let us then, by an unanimous vote, enrol among our Honorary Members Mr. George Peabody, who has contributed so much to the prosperity of the Union, the happiness of our fellow-citizens and the elevation of our national character abroad.

President Wilder prefaced the question with a brief yet eloquent allusion, to the commercial dignity and the noble hospitality with which Mr. Peabody had sustained our national reputation abroad. The vote was then taken, and the Presi-

dent announced that it was unanimous, constituting George Peabody, Esq., of London, an Honorary Member of the United States Agricultural Society.

Vice-President KIMMEL then remarked that, as he thought it very desirable that the United States Agricultural Society and the Royal Agricultural Society of England be brought into closer connexion, he proposed that Mr. Peabody act as the representative of this Society before the Royal Agricultural Society.

Prof. FOWLER, of Massachusetts, claimed almost a right to second this motion, for he had been at the meeting of the Royal Agricultural Society in England, where he had been treated with the greatest kindness, and had good cause to acknowledge his indebtedness to the civility and hospitality of Mr. Peabody.

Mr. PRINCE, of New York, hoped that Mr. Peabody would also be accredited to the Central Agricultural Society of France, which had done so much for pomology, and which would hold its exhibition in Paris next May. In the course of his remarks Mr. P. alluded to the exertions made by the French Society, particularly in respect to the *sorghum saccharatum*.

These motions prevailed, and Mr. Peabody was constituted a representative of the United States Agricultural Society to the English and French National Societies.

The President then appointed a Committee on the Chinese Sugar Cane, consisting of Messrs. Browne, of the District of Columbia; Peters, of Georgia; Hammond, of South Carolina; Hyde, of Massachusetts; Classham, of New York; and Hart, of Kentucky.

Mr. JOHN JONES, of Delaware, moved the appointment of a committee to memoralize Congress to organize an agricultural department, with a Cabinet Minister at its head.

Mr. MCHENRY, of Maryland, hoped that before that be done the subject would receive the benefit of a careful investigation, and that something of the scope of power intended to be conferred should be determined on.

Mr. JONES replied, insisting on the propriety of his motion,

and expatiating on the evils of the present system, and especially of the excessive importations we are now making.

Mr. WARING, of New York, hoped that the committee would report this morning.

The President nominated as the committee: Messrs. Jones, of Delaware; Crittenden, of Kentucky; McHenry, of Maryland; Waring, of New York; and Kellogg, of Massachusetts.

Hon. J. J. CRITTENDEN hoped that some other member would be substituted for him. He said he was not a practical agriculturist, and besides was so buisied to-day with legislative duties, and especially the Revolutionary claims bill, as to render him unable to give attention to the subject now pressed on him.

The CHAIR substituted G. W. P. Custis, Esq., of Virginia, in Mr. Crittenden's stead.

Mr. W. G. LEWIS, of Massachusetts, then moved the following resolution: —

Resolved, That a committee be appointed to take into consideration the subject of carrying out the plan of the Commissioner of Patents, in relation to collecting agricultural statistics in the several States, as proposed in his last agricultural report.

Mr. WALSH, of Maryland, proposed to refer the subject of the last resolution to the committee last appointed. This motion prevailed, but was almost immediately reconsidered.

Vice-President FRENCH moved the appointment of a special committee, which was carried; and the Chair appointed accordingly Messrs. Lewis, of Massachusetts; Walsh, of Maryland; and Wager, of New York.

Mr. POORE, chairman of a committee appointed at the annual session of 1856, to solicit the co-operation of Congress developing the relation of meteorology to agriculture, *Reported*, That the Senate Committee to whom the various memorials on this subject were referred, submitted the result of their enquiries in a report, on the 18th of December, 1856, accompanied by a "Bill," which provides for a minute and rigid investigation of the electrical condition, the temperature, the

humidity and the movements of the atmosphere. From a variety of causes, it is not believed by the Committee of this Society that this "Bill" will receive any attention, either in the Senate or in the House of Representatives. Yet the subject is one of great importance, and should not be lost sight of. As was stated in the memorial presented to Congress:

"The soil, climate, productions, and meteorological forces peculiar to every part of the world would soon become familiar themes for scientific discussion. And it is more than probable that this would lead to the cultivation of all or nearly all of the most useful plants and fruits of the temperate zones within the limits of the United States. The tea-plant, the olive, the fig, and the date, and all varieties of grapes are indigenous to just such climates as doubtless exist in our country, and which may be discovered by proper investigation. When the tea-fields of China, for example, shall have been carefully studied and understood in relation to soil, strength of light, amount of moisture, degree of heat, character of electrical forces, proximity to water, desert or mountain ranges, and exposure to atmospheric currents, then the same tea may be produced by the American planter simply by the discovery and proper culture of similar fields. The same would be true of the coffee tree, and of every other useful plant. In this way, doubtless, may be transferred to America, and probably to the United States, all the most valuable cereal grains, grasses, fruits, leguminous and esculent plants in the world.

"The advantages to be derived from the cultivation of new crops cannot be accurately estimated. That they would be very great, none who have given attention to this subject entertain a doubt. The potato and Indian corn have recently been brought into use. But a few years since they were unknown in many parts of the world where they now supply millions with daily food. Other plants of equal value could hardly fail to be discovered and brought into general use. And those now known would be improved in character, and their culture extended to other countries. It is now known, contrary to previous conjecture, that sugar-cane will flourish and mature in any climate that will produce and mature Indian corn, if protected from the severe frosts of northern winters. The same soil, the same amount of moisture, the same degree of light and heat necessary to produce and mature a luxuriant crop of Indian corn, will produce and mature an equally abundant crop of sugar-cane. Hence the discovery of an annual sugar-cane plant, or the transmutation by hybridation of some

one of the known species to an *annual*, is all that is now necessary to enable the people of Illinois or Missouri to produce sugar as successfully as the people of Louisiana. Whether the Chinese sugar-cane will prove to be the necessary species, time alone can determine.

"The regular report of the condition and prospects of the growing crops, from every part of our country, to a central office, as contemplated by your memorialists, furnishing the data of official bulletins, would be of sufficient importance to both producer and dealers to require the approval of the government. But when all commercial countries are to be embraced in the same system of observation and research, its importance becomes overwhelming. In consequence of the introduction of steam, the improvement of navigation, the construction of railroads the spread of commerce, the use of the telegraph, and the rapidly increasing facilities of intercourse, the farmer and planter of the United States is almost as much interested, practically, in knowing the state, prospect, and amount of crops in foreign lands, as in his own country. The wheat-grower in Illinois is not only concerned to know whether the wheat crop of other States is above or below the average, but also whether a short or very abundant crop has been harvested in Europe. The crops in other parts of the world tend to increase or diminish the price of his own grain; for in the markets abroad he is compelled to compete with the grain-grower upon the waters of the Black sea, in the Canadas, and elsewhere. In Liverpool the corn of the Danube competes with that of Kentucky and Indiana. The sugar-planter in Louisiana is directly interested in the abundance of that crop in Cuba and Brazil. A short crop of cotton in India and Egypt enhances by millions the value of that crop in the valley of the Mississippi; and so with all the other great staples of agriculture. To enable the farmers and planters to know in advance the prospects of the growing crops with which their own must compete in the markets of the world, is to enable them to reap the just reward of their own industry; to refuse it, is to place them at the mercy of the dealer."

The Committee of this Society feel deeply impressed with the importance of a national system of meteorological observation and research; yet do not deem it advisable to press the matter, at the present time, upon the attention of Congress.

On motion of Mr. Watson, of Alabama, the Report was

accepted, and the Committee was discharged from any further consideration of subject.

Mr. Lewis wished to present a series of resolutions for the consideration of the Society, rather to elicit facts than to obtain definite action. The subject of Agriculture throughout the United States, and throughout the world, is in its infancy, and he wished to see a commencement made in the acquisition of knowledge. A beginning must be made somewhere. The first thing learned by a child is the elements of its native tongue — the first movements of a community on any subject are the elements of its subsequent knowledge of that subject. So with agriculture. There should be certain primary rules established, as the elements of a more extended agricultural knowledge, and this Society would be performing a great work in establishing such rules. Take for instance cattle, where is there any text-book wherein "he who runs may read," and become conversant with the true standard of excellence. A great and alarming amount of ignorance prevails as to what constitutes a perfect animal, unlike the regular systems by which everything else can be judged. When he had been called upon to serve as a member of a committee, appointed to award premiums to the best cattle of some particular race, class, or grade, he had often consulted with his colleagues as to what should be the standard of excellence by which their judgment should be guided, and had never found any two to agree. Each gentleman had his individual opinions, but there was no code by which all were governed. To remedy this want, and to thus take one step towards order in agricultural knowledge, he would move the following resolutions, viz.: —

Resolved, That a committee of five be appointed to establish a scale of points which may be considered as constituting perfection in the various breeds of cattle, horses, sheep, and swine.

Resolved, That said committee cause accurate drawings to be made delineating each of the various breeds and sexes, with said points clearly indicated.

Resolved, That said committee recommend what number of points or degrees of perfection shall entitle any animal to receive any or what premium at the annual Exhibition.

Resolved, That said committee recommend what further regulation should

be adopted by the Society for the direction of committees in passing their judgment on stock entered for premiums.

Resolved, That said committee submit their report to this Society as soon as practicable, to be acted upon by the members.

Mr. C. B. CALVERT opposed the object of the resolutions, looking upon it that the appointment of such a committee would only end in raking together maxims from the old text books, most of which he deemed fallacious, or at least tending to error. No committee could be found which would agree, so different are the sentiments of different persons on these matters. The true points of animals held up as worthy of prizes were generally hidden and smothered under a mountain of mere fat. It was fat, that for the most part, got premiums in England and here, and thus the true points were kept out of sight. What we want is a physiological institution, where these things would be thoroughly studied.

Mr. DYER, of Connecticut, did not agree with the last speaker, and thought his arguments inconclusive. What he would propose would be the careful selection of a committee on this topic. Let all the lights they can get be before them, and let them report at the next meeting of the Society. On horses in particular he would propose a committee of three or five members.

Mr. OLCOTT, of the Farm School, New York, thought that such a committee as the one under consideration should be constructed of persons having naturally original fitness and qualifications for the duty, and not dependent on books. He instanced the appointment of a committee on agricultural implements, of which only one member had any knowledge at all of the subject. It would be useless to attempt to fix a standard of perfection unless peculiarly fit qualifications were engaged in search of it.

Mr. LEWIS insisted on the indispensability of a fixed standard of perfection. He pinned his faith on no man's sleeve, but desired the fullest investigation, and then draw results. For twenty years he had felt the necessity of some rule whereby to decide; and more than ever was this necessity forced upon him when he had been appointed on committees to judge of the merits of stock.

Vice President KIMMEL thought it would be well to have a classification of animals, and hoped a sufficient time would be allowed to the work.

Mr. CALVERT trusted more to individual experience and practical judgment; these he thought the best guides to just decisions as to the qualities of stock of any kind. He was against book-knowledge in this matter.

Mr. BROWN, of Maine, asked how the gentleman from Maryland would decide upon the merits or qualities of any animal submitted to his inspection, unless he had some mental rule or criterion?

Mr. CALVERT replied that he had never yet seen any standard published that could be relied upon.

Prof. FOWLER thought that it would be better to postpone further discussion of the subject at present. Let the committee be appointed — let them report — and next year we can discuss their scales of excellence, which we may all adopt, with perhaps some slight variations.

Mr. LEWIS certainly hoped that the enquiries would be made, and some "points" adopted by the Society, after due consideration. In reply to the gentleman from Maryland, he would say that as every one has certain reasons for his preferences, there could be no valid objection to having the reasons of practical and theoretical agriculturists collected, classified, compared, combated, until at length it shall become understood why this animal is preferred for a milker, that for beef, this for draught, that for speed, and so forth.

Mr. CLEMENT, of Pennsylvania, had no faith in book standards, and, like Mr. Calvert, relied on experience and individual judgment.

Mr. BENSON, of Maine, ably enforced the views advanced by Mr. Lewis, and desired to know if the points and reasons why one animal is preferred for a certain purpose before another could not be written down, and the knowledge thus obtained be put into other people's possession. He hoped the committee would be appointed. It was one of the missions of this Society to meet this very want. Let us get knowledge from all quarters and record it for the use of those who who shall come after us, and improve upon what we first gather.

Vice President KIMMEL suggested that the President have time to select a proper committee. He would like to have the matter investigated, and done in the best manner.

Mr. DYER moved the following resolutions amendatory of the first paragraph of Mr. Lewis's :—

Resolved, That a committee of five be appointed on each of the prominent classes of neat stock, on horses, sheep, and swine.

The amendment was accepted, and the resolutions, as amended, were passed. President WILDER enquired how the committee should be appointed?

Several gentlemen expressed the wish that the President would appoint them. No objection having been made, the President stated that he would make the appointments, but that it would require some time to do so.

The Society then adjourned until half-past seven o'clock, when they re-assembled in the Lecture Hall of the Smithsonian Institution, President WILDER in the chair. There was also a large audience of ladies and gentlemen present, by invitation.

Rev. J. G. MORRIS, of Baltimore, in accordance with previous announcement, delivered an interesting lecture on the "Entomology of Agriculture." His remarks showed that he is thoroughly acquainted with his subject, and they were of great practical value, especially that portion of them relating to the curculio, and other insects injurious to vegetation. It is to be hoped that he will re-consider his refusal to furnish a copy of this interesting lecture for publication.

The different committees appointed during the day, met for the transaction of the business assigned them, after the lecture. It was conceded by those who have attended every business session of the Society, that the present one eclipsed its predecessors, both in interest, in the number present, and in the high character of those who took part in it, as theoretical or practical agriculturists.

SECOND DAY.

Vice President UNDERWOOD, of Kentucky, called the Society to order on Thursday morning, at the request of President WILDER.

Vice President KIMMEL, in rising to present the report of the committee on nominations, alluded to the intimation in the address of the President of his desire to retire from the office, and his purpose to decline a re-election. The committee had in consequence on Wednesday evening waited on their President, and took steps and addressed arguments calculated to remove his objections to a continuance. They had happily succeeded in this object, and were now able to inform the Society that the President's intention had been revised, and he would go on to fill the position which he so much adorned. [Cheers.] There were few men to be found, even in this wide-spread land, so fitted on all accounts to fill the office in question as the present incumbent, and the zealous, untiring exertions he was ever making, set off as they were by the beautiful manner in which he presided over the deliberations of the Society, were testimonies of the fact. No matter what the duty that called upon him, whether to pull in the harness, to drag the plough in the field, or to haul the wagon, he was sure to stand up to the collar and never flinch. Mr. K. could speak of his own knowledge, and say that he could name no one in this whole country who could perform the duties of the high office in so entirely an acceptable and useful a manner. [Cheers.] He would call upon the Secretary to read the report of the committee containing the list of officers, and of which he solicited the adoption by the Society.

The report was read, and unanimously adopted, after which the by-laws were suspended by vote, and the following ticket was chosen:

OFFICERS FOR 1857-8.

President — Hon. Marshall P. Wilder, of Mass.

Vice Presidents — Messrs. J. D. Lang, Maine; Henry F. French, N. H.; Frederick Holbrook, Vt.; Simon Brown, Mass.; B. B. Thurston, R. I.; Nathaniel B. Smith, Conn.; H.

Wager, N. Y.; W. P. Robeson, New Jersey; David Landreth, Penn.; John Jones, Del.; Anthony Kimmel, Md.; G. W. P. Custis, Va.; Henry K. Burgwyn, N. C.; F. W. Alston, S.C.; Richard Peters, Ga.; C. C. Clay, Jr., Ala.; M. W. Philips, Miss.; Robert W. Williams, La.; J. T. Worthington, Ohio; W. L. Underwood, Ky.; John Bell, Tenn.; D. P. Holloway, Ind.; J. A. Kinnicott, Ill.; Thomas Allen, Missouri; A. B. Greenwood, Arkansas; Michael Shoemaker, Mich.; D. L. Yulee, Florida; T. J. Rusk, Texas; J. W. Grimes, Iowa; D. Wells, Iowa; A. C. Bradford, California; W. W. Corcoran, D. C.; Manuel A. Otero, New Mexico; H. M. Rice, Minnesota; J. H. Lane, Oregon; P. Anderson, Washington Territory; John M. Bernhisel, Utah; Bird B. Chapman, Nebraska; Gov. Geary, Kansas.

Executive Committee — Gov. John A. King, New York; Hon. Gibson Mallory, Kentucky; A. L. Elwyn, M. D. Pennsylvania; D. J. Browne, Esq., District of Columbia; Edward Hobbs, Esq., Kentucky; Hon. Frederick Smyth, New Hampshire: and A. C. Stevenson, M. D., Indiana.

Treasurer — B. B. French, Washington, D. C.

Secretary — Ben: Perley Poore, Newburyport, Mass.

The nominating committee then escorted the President elect to the chair, amid the plaudits of the assemblage.

Col. Wilder, on assuming the chair, said that it was impossible for him to give adequate expression to the feelings which this new evidence of the confidence of the United States Agricultural Society in again re-electing him to the responsible and dignified office of its President inspired within him. [Cheers.] He had borne the burdens it imposed and worked arduously in the discharge of its various duties, and most ably and cordially had he been sustained by the officers and members at large. He loved to be associated with them in the promotion of the noble cause of agriculture; he loved to take hold with them of the handles of the plough, to urge on the great interests they had in view, and, though he would on his own account prefer vacating and assist in putting some other member in the honorable position, still he must submit to wishes so kindly and urgently expressed to him by the committee last night. He had hoped to devote some leisure before going down into the grave, to his family and their interests; yet, as he did not know any better way to make himself use-

ful than in the great and good cause in which we are all embarked, he was willing to spend and be spent, and to do whatever might be required of him. [Cheers.] If, whilst thus employed, he should fall in the furrow, all he would ask would be that the Society should cover the clods over him and he be permitted to rest in peace. He hoped that thus living and acting he might feel that he had not lived in vain. [Hearty and repeated cheers followed the President's remarks.]

Vice President FRENCH reported that the following resolutions were adopted by the committee on nominations, to be presented to the meeting of the Society: —

Resolved, That the thanks of the United States Agricultural Society be presented to W. S. King, Esq., for the able manner in which he has discharged the duties of his office since the first organization of the Society, with its regrets that his business prevents his further acceptance.

Resolved, That the thanks of the Society be presented to the Municipal authorities of Philadelphia, to the Philadelphia Society for the promotion of agriculture, and to the local executive committee for courtesies extended during the recent exhibition in Philadelphia.

Resolved, That the thanks of the Society be presented to John McGowan, Esq., Assistant Secretary, to Charles W. Harrison, Esq., Assistant Treasurer, and to the other efficient officers at the Philadelphia exhibition for their valuable and efficient services.

The resolutions were then put and carried.

Vice President KIMMEL, on behalf of the Maryland committee, withdrew Maryland from competition for the place of holding the next exhibition.

Mr. HARRISON reported from the committee on the place of exhibition as follows: —

That, having considered the overtures made by the citizens of Baltimore, Maryland; St. Louis, Missouri; and Louisville, Kentucky; they award a preference to the proposition made by the Southwestern Agricultural and Mechanical Association, which offers its grounds free of expense, and guarantees an amount of thirty thousand dollars as an indemnity against any excess of expenses over receipts at Louisville, Kentucky.

Mr. WAGER, of New York, moved the acceptance of the re-

port, and that the place for the next exhibition be Louisville, Kentucky. The motion was carried by acclamation.

President WILDER remarked that, as to the time of the exhibition, it would be of importance to fix it so as not to come in conflict with the holding of any of the State or County Fairs, and especially with none in that part of the country, where it was proposed to hold the exhibition. An announcement of the time would be made at an early day.

Vice President UNDERWOOD, of Kentucky, wished to allude to an address which had been delivered by him before an audience of ten thousand persons, in Southwestern Kentucky. The address had never been fully published, but a resolution embodied in it, and unanimously adopted by those who heard it, had been brought to his recollection by a remark in the eloquent address of President Wilder. It was to the effect that — by some instrumentality — the home of PATER PATRIÆ should become the property of the country, and the location of an Agricultural College. He did not wish, (he said) to indulge in a rhetorical display, but seriously to propose a couple of resolutions couched in plain language. It was true, as had been already remarked, that whilst every other interest, in some form or other, had been fostered and helped, Agriculture, the chief and basis of all, was left to take care of itself. In a word, we have few agricultural schools. He had understood that the State of Virginia had made efforts to purchase Mount Vernon for such a school, and that another party had desired it for another purpose, but Mr. John Washington, the proprietor, was unwilling to let it go into private hands at any price, but desired it to be dedicated to some elevated and national purpose, than which none other could be found higher than the one we now propose. The resolutions are as follows: —

Resolved, That, in the opinion of the United States Agricultural Society, there is an eminent fitness in procuring for and dedicating to the cause of agriculture the home of the Father of his Country.

Resolved, That a committee of three members be appointed by the President to communicate with the proprietor of Mount Vernon, and to ascertain upon what terms that estate can be procured, in order to be exclusively dedicated to the cause of Agriculture; and that said committee, having so done'

be and they are hereby further instructed, in the event it can be procured, to memorialize Congress on the subject of purchasing it for the purpose aforesaid; and by suitable rules and regulations to establish there a national institution for the promotion of agriculture.

Vice President KIMMEL was glad the gentleman from Kentucky had moved in this matter. Maryland too was in favor of such an establishment as contemplated by the resolutions, which he hoped would pass the Society without a dissenting voice. True, Maryland has on hand a project of her own of the same character, which he could say would be successful, but if it failed she would gladly follow in this great undertaking. If Maryland and Kentucky take this matter in hand it cannot fail. The ladies of Virginia had moved in this matter, and for himself he could see no constitutional objection to it at all. If government can sometimes stretch out other things, let it stretch a little, if it must be so, in this. If boys can be taught for employment in the navy and in the army, why not also teach them to till the soil, a concern of inferior importance to none? He would like to know, if our agricultural character were taken from us, what would be left? He hoped the resolutions would unanimously pass.

Mr. CALVERT was sorry to be again called upon to speak at this time, but felt it to be his duty, and would indulge in a few remarks. He was truly ashamed to hear his colleague from Maryland leave it to be supposed possible that Maryland could fail in establishing her proposed agricultural college. She can carry out her own project and unite in the other also. His colleague did not correctly represent Maryland on this subject. He hoped it did not indicate hostility to the measure on the part of the farmers of the richest agricultural county in the State, but if it did, and that hostility were to display itself, then the poor districts would unite, and set a college that could be seen rising upon the tops of some of the Maryland hills. If the agriculturists of Maryland would not do that, why he would seek some other than her soil for a resting place for his bones. Mr. Calvert gloried in the resolution of the gentleman from Kentucky. It was national, while the other was a State affair; and the distinction should be kept in view.

Vice President KIMMEL looked upon this as a Maryland war, in which one party comes from the mountains, the other from the flat lands. He claimed to have as much State pride as his friend, but would not fear to say that Maryland farmers mostly live by the sweat of their brow. He had labored with friends of the cause of a State college, and was well disposed to it. He could not yield to the gentleman in this respect, though he knew him to be fully charged with all the noble qualities of a patriot and an American. He looked at Mount Vernon as a great national object, and would be glad to enlist Uncle Sam in its purchase for an agricultural establishment. He was willing to fall back, to retreat, to retrogade, and yet fight all the time in this behalf.

Mr. LEWIS, of Massachusetts, had waited for some Northern man to speak on this point. Others failing, he would himself say a few words. He looked upon Mount Vernon as like a New England Thanksgiving, where all the family gathered from the most distant quarters, equally and gladly met at home. To the patriotism of farmers he trusted in the last resort for the salvation of the country.

Dr. BERGEN, of Pennsylvania, thought that Congress might possibly interpose constitutional objections to this proposal, but if carried out he should propose adding merely agricultural teachings, professorships of mineralogy and geology, making it a Polytechnic School.

Mr. WARING was disposed to ask Congress to let the whole matter alone. Should it make an appropriation for purchasing Mount Vernon, and found an Agricultural College there, that institution would be very apt to become a mere hospital for decayed politicians, and a seminary for the sons of gentlemen holding political positions. Could Judge Underwood's idea be carried out, no better appropriation of the public monies could be made, yet he feared it would be difficult to carry the *theory* into *practice*. In his opinion, it would be far better for the United States Agricultural Society to undertake the purchase itself. If the city of Louisville could guarantee $30,000 for a single exhibition, surely the whole agricultural community of the United States could easily purchase Mount

Vernon. Mr. Waring said he had a resolution to offer to this effect.

Treasurer FRENCH observed that Mr. John Washington had said again and again that he would never part with Mount Vernon to any party but the United States or the State of Virginia. Mr. F. thought Congress ought to take this matter in hand.

Mr. WARING withdrew his resolution before it had been read, and the discussion of Judge Underwood's resolutions was continued.

Mr. BYINGTON, of Connecticut, was confident of the co-operation of his State, and would pledge her quota of the sum necessary for the purchase of the sacred shrine.

Mr. KELLOGG, of Massachusetts, opposed any attempt to secure the aid of Congress in this or any other side-issue. The whole force of the United States Agricultural Society, he urged, should be concentrated upon the establishment of a Department of Agriculture, as a component part of our national government. This obtained, the establishment of Agricultural Colleges, the purchase of Mount Vernon, and other objects would naturally be attained.

Mr. BRADFORD, of California, would pledge his State as one of the foremost in raising any sum requisite to purchase Mount Vernon.

The question was then put and the resolutions were unanimously carried.

A resolution offered by Mr. CALVERT requiring every candidate for election to Congress to state whether he would vote for the purchase of Mount Vernon by the general government, was briefly discussed by Gov. LAWRENCE, of Rhode Island; FRENCH, of the District of Columbia; HARALSON, of Mississippi, and FRAZEE, of New Jersey, and was not carried.

The President appointed as the committee contemplated in Mr. Underwood's resolutions, the following gentlemen: — Mr. Underwood, of Kentucky, Mr. Custis, of Virginia, and Mr. Benson, of Maine.

Mr. FOWLER, of Massachusetts, after stating that the Vice President of the Society from New Hampshire, who was justly

distinguished as an agricultural editor, and as one who had done much for the cause in his immediate vicinity, both by precept and example, offered the following resolution, which was unanimously adopted: —

Resolved, That the Hon. H. F. FRENCH, Vice President of this Society, from New Hampshire, be furnished with a circular letter, commending him to the kind attention of agriculturists in other lands, as a gentleman whose position at home entitles him to the esteem of all who promote the great cause of agriculture — a cause which has well been said to "know no limits of brotherhood narrower than those of civilization."

At this stage of the proceedings, a messenger advanced to the President's table, bearing a bouquet of large size and of exquisite beauty, accompanied by the following letter, which was read aloud: —

To Hon. MARSHALL P. WILDER, *Pres't. National Agricultural Society:*

SIR, — In token of your zeal and inspiring example in the promotion of the cause of Floriculture, please accept this humble testimonial from one who appreciates the relaxation of an hour from the business toil of life to revel among nature's blandishments, in the outer courts of earth's fruitage.

Without *flowers* there are *no fruits.*

CHARLES G. PAGE.

Washington, January 15, 1857.

President WILDER disclaimed it as a present to himself, but accepted it from Professor Page as intended for the Society, in whose behalf he returned thanks.

Mr. LEWIS, from the committee appointed to take into consideration "the subject of carrying out the plan of the Commissioner of Patents in relation to collecting agricultural statistics in the several States, as proposed in his last agricultural report," stated that they had attended to the duty assigned them, and begged leave to make the following report: —

The want of accurate statistics and reliable information as to the true resources of our immense country has always been felt, and will be so until some definite plan is devised whereby such information can be obtained. An accurately correct return is not expected at first, but if an approximate one can be obtained from year to year, the average ascertained would prove of much value to all, particularly to the agriculturist.

The merchant or dealer in any article of traffic, whether pork, cotton, wheat, wool or tobacco, may have an object to disguise the real quantity of the merchandise he deals in, whether raised, exported, or consumed, and often the unprincipled speculator will cause such quantities and prices to appear in the market as will mislead the public and suit his purpose, the ill effects of which no class in the community experiences more than the producer.

Not so with the agriculturist. Any one can tell pretty nearly what he raises, or stock he has on hand at a given time; and if the schedule proposed by the Commissioner is presented annually by the assessors in each town throughout the country, (as it is already done in several of the States) more reliable information will be obtained annually than from any other source.

We trust that the Governors of the several States and Territories, (where it is not already done) will recommend the table hereto annexed, to be adopted by their several Legislatures and co-operate with the General Government in carrying out this noble object, by annually forwarding copies of their returns to the Patent Office, where the whole may be properly arranged and presented to the public in an annual Report.

The committee, entertaining these views, offer the following resolutions: —

Resolved, That the United States Agricultural Society cordially approve of the recommendation of the Commissioner of Patents in relation to obtaining accurate statistics of the staple productions of the United States.

Resolved, That we recommend the Governors of the several States and Territories to adopt the plan proposed, or take such action in the premises as they may deem expedient in relation thereto.

Resolved, That this Society transmit a copy of these resolutions to the Governors of the several States and Territories.

On motion, the report was accepted, and the resolutions were adopted.

President WILDER called up the "special order" of the day viz.: the culture of the Chinese Sugar Cane, (*sorghum saccharatum*), and after a few introductory remarks, requested Mr. D. JAY BROWNE, of the Patent Office, to give his experience in respect to that plant. Mr. Browne first observed that he could say but little more than was already known to the public, but was willing to answer any questions on the subject which might

be put to him. The main points elicited in relation to this product from his remarks and replies may be summed up as follows: —

Mr. Browne had had three years' experience in the culture of this plant. He first saw it grow in France in 1854, and had experimented with it in the District of Columbia the two succeeding seasons. It was cultivated in various localities, differing in the character of the soil, its exposure to the sun, its moisture, dryness, degrees of fertility, &c. The seed was planted at different distances apart, and at several periods. He found that it succeeded best when sown in rows or drills, three feet apart, with the plants a foot asunder along the drills, or in hills with a corresponding number of stalks to each. The time of planting varied from the 1st of May to the 20th of June. That sown early in May did not germinate before two or three weeks, but matured its seeds somewhat earlier than that planted late; that sown on the 20th of June matured some of its seeds nearly as soon as that planted on the 10th of the same month. The seed ripened between the 10th of September and the 15th of October, but unequally in the same fields. In some instances it stood excessive drought, as well as the light frosts of September and October, without injury. When the stalks were cut or eaten off near the ground by animals in July, new shoots sprang up and perfected their growth. Other plants were suffered to stand after their ripened seeds had been removed, and new panicles put forth in October, at their uppermost joints, but did not mature. He had been informed that plants were left in South Carolina in a similar manner, the stalks of each of which ripened several successive panicles of seeds. The seeds will mature from eighty to one hundred days after planting. He also said that five crops of fodder had been cultivated in Florida the past season from the same roots, the last perfecting seeds.

The amount of seeds produced to the acre in the District of Columbia varied from fifty to sixty bushels, yielding in many cases a gill to a stalk. The weight of green matured plants to the acre he estimated to be from fourteen to thirty-three thousand pounds. He was informed that in one instance, in Ken-

tucky, nine tons of fodder were raised to an acre, as weighed after three months' drying. As a fodder plant he thought its geographical range would correspond to that of Indian corn, as it had been grown as far North as St. Paul, in Minnesota, and fully ripened its seeds in Massachusetts and Illinois. It grew with the greatest luxuriance in a moist, loamy soil, well manured, with an aspect but partially exposed to the morning and evening sun, having attained a height of seventeen feet, with stalks an inch and a half in diameter. On dry indifferent soils, unmanured, and fully exposed to the sun during the day, the plants did not attain more than half of these dimensions. He remarked that both syrup and sugar had been manufactured from the juice in this country, as well as in France. The sugar which he had seen was both in a crystallizable and uncrystallizable state, the latter technically known as "grape sugar." Syrup of a superior quality had been presented to him from New Hampshire, equally as good as that extracted from the perennial cane. By adopting the usual process in this country of making sugar from the maple, by boiling down the juice in a single kettle, one would rarely succeed in making a good article from the West Indian cane. In Cuba and elsewhere it was a common practice, in manufacturing "muscovado" sugar, first to cut the canes near the ground, deprive them of their tops and leaves, convey them immediately to the mill, crush out the juice by means of three cast-iron or wooden rollers, and cause it to flow to a series of boilers of peculiar construction, to which are applied various degrees of heat. In the first boiler the juice is raised to a temperature somewhat above blood heat, and a small quantity of lime-water is added to neutralize the acidity. It is then transferred successively into the other boilers, undergoing different degrees of ebulition, tempering, and other manipulations, which can only be learned by practice, until it reaches the point of crystallization. From the last boiler it is poured into a receptacle in which, by gradually cooling, it undergoes the process of granulation. It is next scooped out and poured into unglazed earthen pots, with small apertures in their bottoms, and conveyed to the "dripping-floor," where the mo-

lasses, or uncrystallizable portion, falls into a gutter below and runs into a receiver, preparatory to putting it up into casks. As soon as the dripping is completed, which lasts several days, and the sugar becomes moderately dry, the pots are carried to large wooden platforms, the sugar emptied out, pulverized by beating, and then packed into boxes or casks for shipment or use.

He thought that if this or some similar process were applied to the juice of the Chinese cane in the United States we might succeed in making from it a crystallized sugar; but, as about one-third part is uncrystallized, it might be questioned whether the attempt to separate it would be economical. It was stated that, by means of optical instruments, we may clearly distinguish the preponderance of crystallizable sugar of this plant, as well as that of Indian corn, and that there appears to be some relation between their maturity and the facility with which crystals can be obtained. He was of the opinion that this cane contained the greatest amount of saccharine matter when the seeds were in their milky stage, and that the richness of the juice mainly depended upon a hot sun, a continued summer heat, and a warm, moderately rich soil, but none upon the latitude in which it is cultivated, as had been inferred. From three-fourths to seven-eighths of the stalk consists of juice, which varies in richness, according to the size, vigor, and healthiness of the plant. That taken from a cane seventeen feet in height and one inch and a half in diameter, grown in the District of Columbia, on the moist loamy land referred to above, yielded only 14 per cent. of dry saccharine matter, while that from a stalk about nine feet in height, an inch in diameter, cultivated on light land in Massachusetts, gave 23 per cent. Furthermore, it was asserted that alcohol of a superior quality and agreeable taste, resembling noyau, had been manufactured from it — a bread-saving crop being thus supplied — and that, if redistilled with grape seeds, it would produce an excellent brandy. But a difficulty had been apprehended, both in the manufacture of sugar and alcohol, from the fermentation of the juice in warm weather, owing to the short time left for

the manufacture. This, however, he thought might be obviated, in a northern climate, by planting the seed sufficiently late to allow its maturity to occur during the time of the light autumnal frosts. He had observed that the juice did not ferment where the mean temperature of the day was 45° or 50° F.; but at a greater heat it soon partook of the nature of cider, and would doubtless eventually make an excellent vinegar, 1,500 gallons of which, he thought, might be produced to the acre.

In respect to its nutritive properties he cited instances of cows which had been fed upon this cane exclusively giving a diminished quantity of milk, but of increased richness of quality. He had seen two stock cows, not giving milk, which had subsisted entirely upon it for six weeks, that were in good condition for the butcher. In another case the seeds were sown broadcast and the crop used for soiling. The animals fed upon it in a green state throve well, afforded excellent milk, without exhibiting any symptoms of "hoven" or flatulency, which are sometimes produced in feeding upon succulent clover, or Indian corn. The most serious objection to this plant he conceived to be the woody nature of the covering of the stalk when fully matured, which renders it more difficult to crush for the purpose of obtaining its juice, and its unfitness as fodder for animals without being reduced to fragments by cutting, though, when thus reduced, it is greedily devoured by cattle, horses, sheep, and swine. The only insects he had observed to attack it were a species of green plant-lice, (aphides,) which appeared to do no essential harm. The seeds, he thought, could be raised at about the price of oats, and would prove highly valuable for the purpose of feeding to animals, if not employed for human food. When deprived of their pellicles or covering they have been used in France in the manufacture of chocolate — the pellicles themselves being employed for dyeing silk, imparting shades varying from a pale-violet to a rose-carmine.

As to the fact of this plant exhausting the soil, Mr. Browne thought there was no doubt. Judging from its analogy to the perennial cane, he believed that at least half of its ash

consists of phosphates, and more than one-fourth of silica. He did not think it advisable to apply to this crop much, if any, stable or other ammoniacal manures, as it would flourish on an indifferent soil, by the addition of a moderate quantity of bone dust, phosphatic guano, wood ashes, or poudrette. If thus cultivated, and the crop fed out to the animals on the farm, and their manure returned to the fields on which the plant grew, it could not fail to be a direct and economical mode of restoring fertility to exhausted lands.

In conclusion, on being asked for his candid opinion as to the adaptation of this species of cane to the wants and economy of the United States, Mr. Browne averred that, as a forage crop and a restorer of exhausted lands, more especially those of the Atlantic and Gulf States, wherever the corn plant would thrive, it cannot be surpassed by any other product. It was also his belief that it would produce sufficient syrup, and perhaps sugar, alcohol, and vinegar, to supply the demands of the whole country, in all situations where the plant would develop its seeds to a milky stage. He would not, however, advise the farmers to be too sanguine in adopting his views, and thereby run into undue speculations by excessive cultivation, nor in making unwarrantable expenditures for the purchase of machinery and seeds. He had no hesitation in predicting that its adoption would be general, and that at no distant day it would be ranked among our staple crops.

Among those who questioned Mr. Browne, and endorsed many of his statements as they were made by citing facts of which they were personally cognizant, were Mr. Prince, of Long Island; Vice-President Jones, of Delaware; Professor Nash, Editor of the "Plough, Loom and Anvil;" George E. Waring, Jr., of the American Institute, New York; Dr. Higgins, State Chemist of Maryland; Dr. Clemson, of Maryland; Mr. Lewis, of Massachusetts; and H. S. Olcott, Esq., of the West Chester Farm School, N. Y.

Mr. Olcott, in his remarks, stated that as fodder the *sorgho* would prove a mine of wealth to graziers. He had kept a team of horses on the cane and a small quantity of English

hay, for six weeks or more; and, although of the huge Conestoga breed, and kept at work during that period, they remained sleek, fat and healthy. In feeding it green, the cane should be cut and wilted during the previous day.

The seed, he said, could be ground into meal, and was excellent in this shape for feed. When parched in the usual manner they made an excellent substitute for pop-corn. They were very prolific of alcohol — *ceroise* or vegetable wax, (a specimen of which was exhibited and fired — burning freely and clearly,) which, mixed with purified tallow, made fine candles. The Chinese, in the northern portion of that country, used this wax for the purpose of light. Sorgho juice contained 6 to 10 per cent. of alcohol, and doubled the beet in the production of sugar — the former yielding from 8 to 10, and the latter 16 to 20 per cent. of that article. The sugar cane was also superior for the production of brandy, wine, rum, cider, taffia, &c.; but as to the flavor of the productions the lecturer would give no opinion. As many as 796 gallons of alcohol had been produced from an acre in France. As alcohol was necessary for other purposes than those of mere intoxication, the use of the sugar cane in place of our cereals, would prove a public advantage. Then there was the molasses which flowed from the sugar. That could be used in the still for the purpose of eliciting its alcoholic properties; but these productions would not be attempted by the small farmer. One thing, however, was of consequence to him; about 1500 gallons of vinegar had been had from the juice of one acre of cane, and of a very superior description to the dilute sulphuric acid and such abominations as were prized by pickle houses and cider vinegar manufactories.

The saccharine properties of the cane, were governed by latitude, the drougth or moisture of the soil, and the perfection or imperfection of the process of manufacture. A sample of cane grown near Washington, produced 14 per cent. of dry saccharine matter; and one grown at the arsenal near Boston, gave 23. The proportions of Vilmorin and Turrel in France were severally 10 to 16 and 10 to 20 per cent.; M. Arequni's in Louisiana, a little over 10; Dr. Butler's, of

Georgia, from 10.50 to 10.85. The per centage of sap depended entirely upon the mill used to express it. From 50 to 84 per cent. had been had in this country. Where no means of crushing the cane existed, farmers who wished to experiment a little could cut the buts of the stalks into short pieces, and boil them in pure water — treating the product in the same manner as sap sugar is treated.

It was his opinion that the discovery was one of the greatest importance. A really important, economical, and industrial plant had been brought within the domain of Agriculture, and the United States Agricultural Society might count with certainty upon the different varieties of the *sorgho* as an additional source of wealth to the farmers of America. He would, at the present stage of the discussion, offer the following resolution : —

Resolved, That in view of the apparent great importance of the *Sorgho Sucre*, or Chinese Sugar Cane, the President be requested to assign to the members of this Society, residents in various localities, separate experiments, to decide upon its respective value for the several purposes of sugar and sugar-making, soiling cattle, manufacture of alcoholic liquors, use of seed for feeding stock, and for making bread, and for paper-making. Each experiment to be adapted to an appropriate latitude.

The resolution was adopted, with the understanding, at President WILDER'S request, that the assignment of the experiments should be made by the Committee, with whom he would cheerfully co-operate.

The discussion was then resumed, and a desultory conversation sprang up between Hon. T. G. CLEMSON, of Maryland; Dr. ANTISELL, of the Smithsonian Institution; and Messrs. WARING and OLCOTT, of New York, as to the exhausting effect of the Sorgho upon soils. [The remarks of Mr. CLEMSON were subsequently requested, by a vote of the Society, for publication with other papers appended to this report.]

Dr. ANTISELL remaked, that sufficient was known about the sorghum to justify extended trials by individuals upon it; thus its great value in its native country, *China*, as a sugar-producing plant should be a recommendation to its use here, where the climate and latitude are so similar. We learn by

the trials of its growth in this country, mentioned by several members, how well adapted it is, and from the French chemists we have the analysis of the plant to know what matters it derives from the soil. From their labors we learn how great an exhauster of the soil and how necessary *high cultivation*, as it is termed, will be wherever it is grown. Like its congener, broom corn, it takes up large quantities of alkalies and phosphoric acid — the latter substance always accompanying the development of the sugar plant and increasing with its age; but this acid is never free or in the acid state in the plants. The acid matter found in the fermenting stems is acetic acid, arising from the slow decomposition of the sugar.

The sorghum, like all analogous sugar plants, is an intertropical plant, and produces the most sugar in the warmer latitudes, and the farther north it is cultivated the less sugar may it be expected to contain; so that in the extreme north we cannot say with confidence that the sorghum can produce sugar which may be economically extracted. In such latitudes, the fabrication of sugar from it may be carried on just as the beet or the maple sugar is extracted for the supply of a small district; but it is only in the Middle and Southern States that it can rival the cane.

But if it be unfit for sugar manufacture in the North, it is admirably adapted for soiling and foddering. Soft, succulent and saccharine, it yields not only as much nutriment to cattle as other green fodder, but being very palatable it leads them to eat larger quantities, and they thus fatten quickly. The qualities which this plant possesses of yielding sugar in abundance, and of being an article of nutriment, are not separable, but are necessarily connected — its nutritious property being to a great extent dependent on its sugar.

From the analogies of this plant with broom corn, and from the amount derived from an acre of ground, as stated by Dr. Browne, we can estimate to what extent its cultivation impoverishes the soil. Thus, the Dr. states, that nine tons of dry stalks were harvested from an acre, allowing over 60 per cent. of water to be lost by the drying, one ton of dry would nearly represent three tons of fresh sorghum stalk;

twenty-five tons of fresh stalk would be represented by the dry nine tons, which, at the rate of 150 lbs. of mineral matter abstracted from the soil by each dry ton, would amount to more than 1,400 lbs. abstracted by the whole crop.

Since irrigation is needful in some climates for its favorable growth, but little fear need be entertained in the Atlantic States, as they occupy a region where the rains fall plentifully during summer. It grows best on calcareous soils, and cannot be said to thrive well on granitic lands.

President WILDER, after alluding to the interest and the importance of the facts elicited during the discussion just closed, announced that he had received invitations from the Executive Mansion, from President Pierce — the National Observatory, from Lieut. Maury — and the Coast Survey Office, from Professor Bache.

On motion, the invitations were accepted, with the thanks of the Society, and it was agreed to proceed to the Executive Mansion in a body, after the adjournment.

Mr. DYER, from the committee on the fruits received from Oregon, presented the following report, which was accepted:

The Committee to whom was referred a collection of apples from Oregon, regret to report the unfavorable condition of the fruit. From the protracted journey at this season, it had in a great measure lost its flavor, and acquired a foreign one from the material in which it was packed. Some of the varieties were misnamed, as mentioned below. The fruit was evidently originally very large and fair, but the character could with no accuracy be ascertained. The apples misnamed are the following: — Blue Pearmain; the Rhode Island Greening, proved to be the Gloria Mundi; the Green Newton Pippin, proved to be the Yellow variety; the apple called the Hubbardston Nonsuch, was an apple misnamed and unknown to the Committee. The Fallowater, Winesap, and Esopus Spitzenberg, were correctly named. The Pound Pear proved to be the Uvedales St. Germain.

Prof. HENRY presented a report from Prof. Webster on Phosphorus in its relations to the animal and vegetable kingdoms, which was made the "special order" of the next morning.

Mr. PRINCE made a few pertinent remarks on the advan-

tages likely to result from the establishment of an Agricultural Library, and offered a resolution proposing a system of "exchanges" with kindred societies, which he withdrew on learning that a similar one had been passed at the annual session of 1856.

Prof. HENRY kindly offered to effect such exchanges, through the agencies of the Smithsonian Institution.

President WILDER read at communication from Dr. ROBERT HARE, of Philadelphia, on his new methods of "desicating, preserving, and reducing to powder the whole bodies of animals, which may die or be slaughtered, and thus converting what is now a nuisance into valuable manure." It was referred to the Executive Committee.

On motion, the Society adjourned its session until nine o'clock the next morning, and repaired in a body to the Executive Mansion, where they were ushered into the East Room.

President PIERCE, on entering the room, was briefly addressed by the President of the Society, who alluded to the report in circulation, and expressed a hope that on resigning his present office he would enter upon a no less honorable position, the cultivation of the soil of New Hampshire. President Pierce, in his reply, said that he had ever cherished a strong love for the soil, to the culture of which he intended soon to direct his attention, and he assured the Society it would give him pleasure, in years to come, to heartily cooperate with them in forwarding the glorious cause in which they were engaged. The members present were then individually introduced, and before leaving, they were cordially invited to attend the "reception" on the following evening.

THIRD DAY.

President WILDER called the meeting to order on Friday morning, at half past eight o'clock.

On motion of Mr. McGOWAN, of Pennsylvania, an Honorary Diploma was awarded to Richard Peters, Esq., of Atlanta, Georgia, in accordance with the recommendation of the Committee on "Field Crops," for his specimens of the syrup of the Chinese Sugar Cane, exhibited at Philadelphia.

Vice-President WAGER, of New York, offered the following resolution, which was seconded by Mr. LEWIS, of Massachusetts: —

Resolved, That the thanks of the United States Agricultural Society, are due, and are hereby tendered to the Board of Regents of the Smithsonian Institution for the use of their rooms, and for the valuable co-operation which the Society has received from the Institution.

President WILDER, before putting the question, expressed the many obligations which the Society is under to Professor Henry, individually, and to the Smithsonian Institution. The resolution was unanimously adopted.

Mr. LEWIS, of Massachusetts, called the attention of the Society to a fatal malady which had of late prevailed among hogs throughout the Western country. He had seen it estimated that between 60,000 and 70,000 have fallen victims to the destructive distemper within a radia of a hundred miles surrounding Cincinnati. The disease is considered incurable, having baffled the most critical investigations into its nature, and as steadily resisted all remedial agents. The malady has been vaguely denominated "cholera," from the failure to discover its true character, and upon that principle which a few years ago prompted mankind to apply the same term to all ills which resembled "cholera" in the human body and which they did not comprehend. Efforts to fathom the mystery of this disease, thus far, had been of no avail. Hogs had been observed from the earliest stages of the distemper until dissolution; while others afflicted were killed and examined through all the stages, but without affording any clue

exposing the origin of the disease, or developing any facts that could suggest appropriate remedies. The first symptoms are manifested in the staggering motion of the hog, which is succeeded by violent purging, with spasms. The disease then extends to the throat, which inflames and swells until the hog stifles and dies. In this respect the disease may be said to resemble erysipelas, rather than cholera. A valuable branch of agricultural wealth was thus endangered, and he would offer the following resolutions: —

Resolved, That a Committee of five be appointed by this Society to inquire into the origin, cause, effects, and extent of the disease which has appeared in this country, denominated the "hog cholera," now said to prevail to an alarming extent in some of the States.

Resolved, That said Committee be directed to ascertain the most approved modes of treatment for swine thus diseased.

These resolutions prevailed, and the Committee subsequently appointed on this subject are Messrs. Charles L. Flint, of Massachusets; J. T. Worthington, of Ohio; Allen Dodge, of Maryland; Frazee, of New Jersey; J. C. Holmes, of Michigan; and G. H. Dadd, of Massachusetts, Veterinary Surgeon.

A paper by Prof. Webster, of Virginia, presented by Prof. Henry, on the subject of Phosphorus in its relations to the animal and vegetable kingdoms, was then read aloud by Mr. Olcott, of New York, and ultimately referred to the Executive Committee.

Vice-President Underwood moved that the Society request Prof. Henry to permit the incorporation of a paper read at the last meeting on the "Origin and action of the power as applied to the vegetable kingdom." The motion prevailed, and Prof. Henry, who was present, gracefully acceded to the request.

Charles L. Flint, Esq., Secretary of the Massachusetts State Board of Agriculture, read a carefully-prepared lecture on the "Grasses of the United States." During the course of his remarks he showed the loss experienced by too much seeding, the benefits derived from a considerable mixture of varieties of seed, when laying down meadows and pastures, and the necessity for cutting grass either in the blossom or

soon after. He exposed a matter of great importance to New England farmers, in the sale of a grass known as *Willard's Bromus*, at very high rates, accompanied by the exaction of a pledge from each purchaser that it should not be allowed to ripen its seed. A sample of this grass was sown at the State Farm of Massachusetts, and cut, according to agreement. This year it matured its seed-heads, and was found to be, instead of a valuable grass, a most intolerable nuisance — no more nor less than our old enemy Chess, (*Bromus Secalinus.*)

Subsequently, on motion of Mr. FRAZEE, it was

Resolved, That the thanks of the Society be presented to Charles L. Flint, Esq., Secretary of the Massachusetts State Board of Agriculture, for his very instructive and interesting address on "grasses," and that a copy of the same be requested for publication in the Transactions of the Society.

Prof. HENRY, Secretary of the Smithsonian Institution, was then called upon, and addressed the Society with great acceptance on the subject of the system of meteorological observations, the joint labors of the Smithsonian Institution, the Patent Office, and the War Department. In the course of this, Prof. Henry entered into an explanation of the modifying effects of marine currents upon climate in different latitudes, which he illustrated by reference to a map of North America, on which the course of the main sea currents was shown. He suggested that the field of meteorology was by far too immense a one to be managed by a single individual, and that the greatest results could only be attained by unity of efforts between many laborers. If Lieut. Maury would confine his researches to the ocean, the western division of our army could take the West, the Canada and Hudson's Bay Company the North, and the Smithsonian Institution the East, and thus would a system of meteorological research be set on foot such as was never known before.

On motion of Mr. MARSHALL, the thanks of the Society were voted to Prof. Henry, and he was requested to furnish a copy of his remarks for publication.

Dr. NEWBERRY, of the Smithsonian Insitution, delivered an address of great value on the agricultural capabilities of the

far West. He said he had spent a large part of 1855 in traversing Northern California and Oregon while connected with the Government railroad survey under the commands of Lieutenants Williamson and Abbott, and that he had availed himself of the permission of the War Department to make the statements which he presented to the Society; because, judging from his own previous impressions in reference to the country he had visited, the public entertain erroneous ideas in reference to the extent and fertility of the arable land lying west of the Rocky Mountains. With the exception of a limited district in the Willamette Valley, Oregon, and in Central California, near San Francisco, he thought the country bordering the Pacific was agriculturally far inferior to the Valley of the Mississippi. He confirmed the statements of Prof. Henry in reference to the climate of that country, the cooling influence of the northern ocean currents, the effect of the parallel and continuous mountain chains in depriving the inferior valleys of moisture and producing the high summer temperature.

The Sacramento Valley he described as a plain lying between the coast range and Cascade mountains, possessing inherent fertility, but in summer baked by the unobstructed rays of the sun to such a degree as to arrest the labors of the husbandman, to prevent the cultivation of other crops than those maturing early, to prevent the growth of forests except along the streams, and seriously impairing the profit and pleasure of farming.

He said the great want of water, the ravages of grasshoppers and squirrels greatly restricted the produce of a country which, if these obstacles could all be overcome, would be of unexampled fertility.

The Willamette Valley, he said, was better supplied with moisture and was covered with perhaps the densest forest in the world, and was agriculturally rich; but its relations with the great centres of population prevented the farmer there from obtaining any good market for his surplus produce, and, therefore, after supplying his own simpler wants, his progress and success were limited.

The country east of the Cascade range and Sierra Nevada, he said, had the characteristics of the Sacramento Valley highly magnified, and that the supply of moisture was so inadequate that it must ever remain, for all practical agricultural purposes, a desert.

On motion of Mr. COMINS, of Massachusetts, the thanks of the Society were voted to Dr. Newberry for his interesting and clearly expressed remarks.

Prof. NASH, of Massachusetts, introduced the subject of wool, and, availing himself of information derived from Mr. A. D. Brown, of Philadelphia, gave a curious account of the three leading qualities of wool, and of their respective agencies in the production of flannels and fulling cloths. The first and best quality is that from the hair-bearing sheep, another kind is from the merely wool-bearing sheep, and the third from a sheep which bears both hair and wool. The first kind makes a fabric that will not shrink, and wears whilst any of it remains; the second kind shrinks all over, whilst the third shrinks irregularly, depending on the comparative proportions of hair and proper wool contained. The key to this difference is found not only in the different degrees of ovalness in the kinds, but in the diversity of the barks, or cortical envelopes of these wools. The first is smooth and unyielding, but the second is irregular and allows of greater or less contiguity of surface, according to the attrition to which it is subjected. One kind is therefore best for flannels and the other for fulling cloth.

Mr. WILLIAMSON, of California, moved that Prof. Nash be requested to write out his interesting remarks, and furnish them for publication. The motion was carried.

Mr. BENSON, of Maine, stated the necessity for an act of incorporation, in order to properly manage the business affairs of the Society, and offered the following resolution, which was adopted: —

Resolved, That the President, Secretary, and Treasurer of the Society be a Committee to apply to Congress for the passage of an act to incorporate the same.

Mr. HODGES, of Vermont, in behalf of the author, presented several copies of a work entitled: "Morgan Horses — a premium essay on the origin, history and characteristics of this remarkable American breed of horses; tracing the pedigree from the original Justin Morgan, through the most noted of his progeny, down to the present time." By D. C. Linsley, Middlebury, Vermont.

On motion of Mr. NOYES, of the District of Columbia, the thanks of the Society were voted to Mr. Linsley for his valuable work.

Mr. WOOD, a delegate from the American Guano Company, at New York, announced that they expect to receive, early in April, their first cargo of guano from the Jarvis Island, and placing samples at the disposal of the Society, that its qualities as a fertilizer may be tested.

Mr. DYER, of Connecticut, offered the following resolution, which was seconded by Mr. SHAW, of Tennessee, and, after an informal discussion, in which several gentlemen participated, was laid on the table.

Resolved, That a sufficient sum of money be appropriated from the Treasury of this Society, for the purchase of an amount of seed of the Chinese sugar cane, sufficient to plant one hundred acres of land, the same to be distributed by the Committee on this plant to such gentlemen in various sections of the country as may be designated to experiment with this seed and report in reference to the various points for which it is claimed that it is valuable.

Vice-President JONES, of Delaware, then brought up as unfinished business the subject involved in certain resolutions of the Illinois Legislature of 1853, and which was referred at the last annual meeting of the Society to a select Committee, consisting of Prof. Henry, Mr. J. D. B. DeBow, and Mr. Byington. The object of these resolutions was to urge on Congress the endowment of an industrial university in each State of the Union by a grant of public land of a not less value than $500,000. Prior to moving the adoption of the report of said committee, Mr. Jones wished to state why he favored the scheme.

No class of people, (he said,) contribute more to the interests of agriculture than the farmers themselves. In the

last few years we have spent immense sums in importing choice species of stock, often paying abroad as high as five thousand dollars for a single animal, to which the cost of transportation had afterwards to be added. Large sums have also been spent in endeavoring to acclimate and render profitable here, the silk worm, the olive tree, the tea plant, and other foreign branches of agricultural industry.

But this has been the work of private enterprise, and our Government, which educates soldiers and sailors, civil engineers and (indirectly) artists, will not give a copper for agricultural education. The nations of Europe have their Agricultural Universities, their Industrial Colleges, their Farm Schools, all liberally endowed, yet our Federal Government is so blind to its interests that it will do nothing to encourage education in that pursuit which is the foundation of all her power and greatness.

In this, I think, (continued Mr. Jones,) our Government is making a great mistake, and I will endeavor to prove it to you, if I can do so in my own way. Extraordinary as it may appear, notwithstanding the reputation which we have as living in the "granary of the world," we actually are importers of breadstuffs. To sustain this assertion, Mr. Jones quoted from various public documents and statistical publications. He then went on to show that from an average of more than thirty bushels of wheat per acre not many years ago, we have drooped to below seventeen bushels; and that from all these and many more indications it behooves all who are concerned for their country, and its greatest interest, agriculture, to use every means likely to restore the nation to an ability to support itself; that schools of agriculture are among the most eminent of these means; and therefore he moved the adoption of the report, which heartily sanctions the petition to Congress, and recommends it to the Society.

Mr. Arny, of Kansas, addressed the Society at length on the subject of industrial education, and moved as an amendment to the resolutions that the Territories be included with the States in the prayer to Congress for the endowment of lands for industrial universities. The amendment was accepted.

Mr. Poore, of Massachusetts, opposed the resolutions, as calculated to do no good, and as depriving the Society of its real power by making it an unsuccessful suppliant. He did not think that any gentleman acquainted with the practical workings of Congress would believe for a moment that there was the slightest chance of obtaining such an immense donation, for such vague purposes. He hoped that the resolution would not pass.

Mr. Waring, of New York, was also opposed to the resolutions. He had no fear in asserting that there was not a person in the room who felt a deeper interest than he did in the subject of agricultural education, and no one who would be more solicitous to advance in every way all that might tend to the dissemination of the truths of agricultural science, but it appeared to him that the Society would be proceeding in a wrong direction in adopting the resolutions presented by Mr. Jones.

Agricultural Colleges in various parts of the Union would doubtless be productive of good results if they were only met by such a spirit among the people, as would sustain them as needed and valuable institutions. But although Congress may appropriate money sufficient for the most perfect arrangements of such schools, they could appropriate no sum which would make up for the lethargy of the people with regard to such institutions. Indeed he could see no way in which we can overcome the prejudices which is so prevalent throughout the land (and it seemed to him not quite unfounded) with regard to the justice of such appropriation. In the countries of Europe those who are the proprietors of the soil can devote their time to the attendance of agricultural colleges, and such institutions are there doubtless the best institutions for the improvement of the agriculture of the country; but in America the case is very different, and very large majorities of the proprietors of the soil are men of small means, and they cannot afford the time of their children, nor indeed the expense of tuition which would be requisite for their availment of the advantages of the plan proposed. Such institutions, he would repeat, if paid for by private subscription and kept in success-

ful operation by the labor of those who receive instruction therein, would be of more value to the country than any thing which we could devise; but that under government patronage, the attendance by those who were not incited to work by the strongest desire for improvement, agricultural colleges can never be in accordance with our republican ideas of the just apportionment of the public money.

In his opinion the gentleman proposes to begin at the wrong end of the matter. If the government is to do any thing for the agricultural education of the people, it is not by aiding the few who are able to procure their own instruction (those who have influence in the political circles of this capitol) but by aiding those who are scattered over the length and breadth of the land — those who are to constitute the future vaunted "bone and sinew of the nation." We have already in America an abundance of schools in which all our future farmers may receive instruction. He alluded to the common schools which are to be found in every part of the country. It is in this way must be instructed the masses of our people, those whom our constitution was framed to aid and protect. The remote college is available only to the richer few; these common schools are available to all, rich as well as poor. There is none so high that he need despise such media for enlightenment, none so low that he may not aspire to the proudest position to the industrious. It is to these schools, sir, that he would have the government direct its assistance, for it is in these that all who lend power to the government have equal rights and opportunities for instruction. Let it not be said that in these schools we should have no teachers capable of giving the necessary aid to agricultural pupils. The elementary sciences which are applicable to agriculture are not more abstruse, not indeed so abstruse as these which are now taught so largely in the schools of New England.

Take for example the common schools of Connecticut. In these we find scholars learning arithmetic and geography and even chemistry and astronomy. They have the abstract science at their command; all that they need is that these should be drawn into the proper channels. At present their arith-

metic teaches them that two yards of calico at sixpence per yard comes to one shilling; their geography teaches them the distance to the nearest seaport, town or factory, or to the rich bottom lands of Illinois; their chemistry teaches them that hydrogen and common air make a good charge for a hydrogen gun; their astronomy teaches them that it takes light eight minutes to pass from the Sun to the Earth. Nothing that they learn teaches them the obvious arithmetical principle that the mineral matter removed from the soil by ten tons of hay cannot be returned by the results of five tons fed to cattle; nothing in their geography teaches them that it is of less consequence to them of knowing the distance to the nearest seaport town or factory than to the nearest lime-kiln, and that it it farther to the rich bottom lands of Illinois than to the subsoil of the old farm at home; nothing in their chemistry teaches them that hydrogen and common air have uses more important than the projection of corks; nothing in their astronomy teaches them that it is of less use to know how long it takes the light of the sun to come to the earth, than to know what it does when it arrives here. In short, all of the instruction given in our schools at the present time, even in the best agricultural districts, tends away from the farm; the scholar is not led to see any of the applications of science to his own occupation; and he naturally feels that if he would lift himself above the stigma of a daily plodding occupation, he must seek for employment in other branches of industry. Let the abstract science, now taught in our common schools, be turned into a more useful channel, let them tend to elevate the life of the farmer to its just position and dignity, and it will not be long before we shall have such an improvement among our agricultural people as will cause our glorious calling to be appreciated, not alone by the orator who can compliment our communion with nature, but by the farmer himself; and we shall have a demand for agricultural colleges; and need it be said, that these will rise like magic before the touch of the American nation as has all else whose invention has arisen in necessity.

Sir, (said Mr. W., in conclusion,) we need no aid from

government further than to place in our public schools elementary works on the science pertaining to agriculture. Let the American Farmer only see what may be done by the requisite instruction, and no power on earth will be able to restrain him from its attainment. Industrial universities we undoubtedly require, but in my opinion, sir, they will be of no value until they arise from the demand for them among the farmers themselves, and then, sir, they will not need governmental influence to advance their usefulness.

The question was then called for, and the resolutions, as amended, were carried by a majority of three. President WILDER appointed Messrs. Jones, of Delaware; Kimmel, of Maryland; Arny, of Kansas; and Poore, of Massachusetts, as the Committee.

Vice-President JONES, from the Committee appointed to consider the necessity of an Agricultural Department, reported the following resolution: —

Resolved, That the United States Agricultural Society appoint a Committee of five, to memoralize Congress, asking in the name of the Farmers of the Republic the organization of a Department of Agriculture, with a Secretary at its head entitled to a seat and a voice in the Cabinet.

The report was accepted, and the resolution passed. The President appointed, as the Committee to carry the subject to Congress, W. W. Corcoran, G. W. P. Custis, C. B. Calvert, B. B. French, and D. J. Browne, Esqs.

On motion of Mr. CALVERT, it was resolved that Mr. Clemson be requested to give in writing the substance of his interesting remarks made on Thursday.

Mr. OLCOTT, of New York, moved that the resolution providing for the purchase of Chinese Sugar-cane seed be taken from the table, and passed, which was done.

Mr. PRINCE presented to the Society a colored engraving of the Chinese Potato (Dioscorea Patatas,) accompanied by a fine specimen root, which measured eighteen inches in length, and weighed nineteen ounces. It was referred to the Committee on *Sorgho Sucre* for examination, and as for the time adjournment was near at hand, Mr. Prince proposed to

write out his intended remarks, and forward them to the Executive Committee.

Mr. FRAZEE, of New Jersey, offered the following preamble and resolution, which were unanimously adopted: —

Whereas, The collection and dissemination of *practical information* upon Agriculture, Horticulture, and kindred topics, should form a prominent feature in the operations of this Society, therefore,

Resolved, That the members of this Society be requested to make accurate and careful experiments during the ensuing year upon the general cultivation of the soil, the culture of fruit, the raising and feeding of stock, and such other topic as may be convenient, and report the results to this Society in writing at the next annual meeting. The same, if approved by the Executive Committee, to be published in the transactions of the Society for general information.

An invitation from the President (W. W. Corcoran, Esq.) of the Metropolitan Mechanics' Institute to visit their fair in March next, was received and acknowledged.

Vice-President KIMMEL was requested by the President to preside for a few moments.

Dr. NEWBERRY, of the Smithsonian Institution, offered the following resolution, which was adopted: —

Resolved, That properly organized Geological surveys, such as provide for a careful enquiry into the chemical composition and physical structure of soils, and which investigate the distribution and character of minerals, plants and animals, beneficial or injurious to the farmer, are among the most important aids to the progress of Agricultural science. And as such, we earnestly recommend their authorization by those States of the Union which have not such surveys in progress.

Vice-President WAGER, of New York, wished to avail himself of the temporary absence of the President, and to offer the following resolution before he resumed the chair: —

Resolved, That the cordial thanks of this Society are extended to the Hon. Marshall P. Wilder, for the renewed evidences of his distinguished urbanity as the Executive of the Society, during the session now drawing to a close.

The resolution was received with applause, and carried unanimously. President WILDER, resuming the chair, acknowledged the compliment paid him.

Resolutions were passed complimenting the Secretary, and the gentlemen who had so correctly reported the proceedings of the Society, especially the representatives of the Washington "National Intelligencer," and "Evening Star;" the Baltimore "American," the New York "Times" and "Tribune," the Boston "Journal" and "Traveller," and the "Associated Press" telegraphic agent.

President WILDER then introduced the Hon. G. W. P. Custis, Vice-President of the Society from Virginia, on whom he had deferred the duty of pronouncing the valedictory. [Applause.]

VALEDICTORY ADDRESS OF HON. G. W. P. CUSTIS.

Mr. President and Gentlemen of the U. S. Agricultural Society: The time has come when, by the request of our worthy President, I am to bid you Good-Bye. I shall not detain you long. The papers, those oracles of public opinion, say that the Old Orator has been both fortunate and unfortunate in his remarks, for that by one speech, I made a President of the United States; and that by another speech, I killed one; I hope my present address will kill nobody. [Laughter.]

Gentlemen, I congratulate you on the present condition and bright prospects of this Society. I assisted to rock its cradle in its infancy, and I am rejoiced to find that it has become such a bouncing baby. [Laughter.] "There is a tide in the affairs of men which, taken at its flood, leads on to fortune." Advantage has been taken of that turn in agriculture and the coming events foreshadow the near approach of its fortune. I congratulate myself that I am spared to see the Tiller of the Soil honored. "*Palmam, qui meruit ferat.*" For him you may well wreath your chaplets, for he is the public benefactor — as he who leads you towards advancement in agriculture, leads to the source of power. This principle has been recognized from the earliest days of antiquity. Yes, friends; times have changed. This infant country, now so great though so young, feels the power to which she owes her greatness, and knows the art that sustains the pillars of gov-

ernment. Why, gentlemen, it is but the other day that our country imported everything; in my early days every article of clothing which I wore, was brought across the water; even the toys which amused my infantile hours, were imported. How is it now? We are self-sustaining in all manufactures, so far as concerns the necessaries of life. As old Lord Chatham said to Sir Joseph Banks when the latter was very anxious to obtain specimens of the Bread Fruit, but did not know how to do it—"Go to Bristol and there enquire if there be found any of that race called Marblehead Fishermen. Commit your task to their charge and they will find that which you want, if it be in the world." So is it now with our country—if what you want is in the world, you can find it in the United States. [Laughter.] When the Father of his Country was inaugurated he was clothed entirely in fabrics of home manufacture, thus setting an example worthy to be followed by all, in encouraging domestic industry. If his example were followed in this respect at the present day, how great a nation should we not become? How independent! A man out of debt is indeed independent; so is a self-sustaining State. Let us then rely upon our own self-sustaining powers and be independent in fact as well as independent in name.

Let me now call up a reminiscence of the olden time, as a tribute to the Society which I now address. The "pocosen" meadows, as we call them, in contradistinction from fresh water marshes, abound on the shores of the Potomac. Some thirty years ago I attempted the reclaimation of a tract of such land. It was cut down and then came such soil and such productions as I never saw before. When it became dry enough to plough, I planted it with corn, in rows three feet three inches apart, each way. In due time there was a forest of stalks twelve feet high, so near together that the mighty ears overlapped and intertwined. At that time I was honored by the visit of two gentlemen eminent in agriculture, one of whom had but lately spent eight years in Europe. I invited them to visit this corn-field; they were greatly astonished, and in order to satisfy themselves as to the actual crop, laid off a portion of the field and calculated its crop, when they were

still more astonished to find that it produced twenty-two barrels of corn to the acre! A part of the tract was sowed with timothy which also excited their astonishment, for it grew as thick as the hairs on a dog's back; this they proceeded with in the same way, and found that it would cut four tons to the acre! Another gentleman, Mr. Steinberger, one of the most extensive stock-breeders of the day, visited this reclaimed morass and was equally surprised. He said, "I have seen lands in all parts of the country, but I never before saw lands that were all manure?" On examination we found that the soil was thirty feet deep; and as the crop was not at all dependent upon rains, he calculated that it would annually be worth $100 per acre; never less, perhaps more. You may wonder why I mention this. I will tell you why. It is because there are 100,000 acres at least of such land lying on each side of the Potomac, which, by the same, or better treatment than my land received, might be worth to the possessor $100 per acre, in corn or hay, which land is now the abode of the frog and the muskrat and the mole. Let but these lands be reclaimed and put into proper cultivation, and it would make a difference of one-half in the price of provisions in the National Capitol.

Well, here we are. We need not turn to books to learn our progress and position in the world. Books contain history of old conquerors and ancient conquests. We should learn our position by looking at the temple of our liberties which was reared by patriot hands and cemented by patriot blood, and the sight of which will strengthen us to emulate our forefathers in deeds of equal devotion. As we gaze on that temple we will resolve that its foundations shall never be weakened by the nibbing political rats and mice, but that it shall stand till it shall be crushed by weight of years, and that when it does fall, if fall it must, that the crash shall echo through all future time. Fall! no, it will never fall, for it is supported by the Tillers of the Soil; it will stand until America is the mistress of the world! [Applause.] Only follow out her destiny — obey her laws — preserve her constitution, and while she is so well supported she never can

fall. [Long continued applause.] You wonder that I display so much feeling on this subject in this place. Pardon me — but I was coeval with the commencement of this great government and have watched the progress of this glorious empire from infancy to vigorous youth — so when the Old Man speaks, his country must have a part of his argument. [Applause.] Yes, gentlemen; I saw the dawn of the blessings we now enjoy. I have grasped the hand of him we all love; — all my early memories are of the brave, the great and the good; and the remembrances of my childhood go back to the first President and linger among the shades of Mt. Vernon. And now, when called upon to address an audience of my countrymen — I can but point back and say, "See what we once were — look at us now!" And therefore, gentlemen, when I see clouds rising and hear the mutterings of far off thunder, I say, "No matter, we have passed the greater trials in the commencement of the Republic — what can we not do now?" And I put my trust in Providence and believe that all these trials will pass away, and that brilliant sunshine will cause our land to blossom as the rose.

During the fifty years in which the Old Orator has occupied the American Rostrum, he has never stood before an audience for which he had a greater respect. No institution would have found more of love in the heart of him who is now no more. If then you wish to throw laurels on the tomb of the Farmer of Mount Vernon, go on as you have begun. Agriculture he thought the bulwark of the land. And when he put off the cares of State he retired to Mount Vernon, and gave himself up to the advancement of its interests, thus showing by his example that he considered it the bounden duty of the great man, on leaving the helm of the nation, to retire to the bosom of his family and busy himself in domestic affairs or rural economy. How well his example has been followed. We now see great men lay aside the purple and grasp the handles of the plough. Gentlemen, he and they, by his example, have made Agriculture HONORABLE. If he was a Farmer, who would not be a Farmer! [Applause.] Had you seen him, as I have thousands of times,

engaged in rural pursuits, you would have said with me on beholding the spectacle — He has laid his laurels at the feet of the nation, and when engaged in domestic occupations, he is as much to be *loved* as he before was to be honored. You see, then, what Agriculture is; — let the art take its proper place. [Continued applause.] We honor the statesman, the patriot soldier, the philosopher; but we honor still more the man who teaches us to make two blades of grass grow where but one grew before, for that man is a benefactor to the whole race of humanity. This is the great end of our Society, and as we look back to its small beginning among the faithful few — and when we look around upon the highest dignitaries of the land who have, during this meeting, deliberated with us, what have we not to hope? The Institution will thrive, and when it comes under the wings of the eagle, as I trust it soon will, the country will find that our past benefits to Agriculture only foreshadow the greater deeds in the future. Then you can say — Our Government affords it aid and protection and gives its sanction to our acts. And our people will honor and engage in Agriculture. And surely our government ought, and eventually will, give its aid and protection, for is not the government the people, and the people the government? And is not agriculture the most general, the most useful, and should it not be the most *honorable*, employment of the people? [Applause.]

But the time has come for me to say, — *Farewell!* And when a man, on whose head rests the snows of seventy-six winter bids you farewell, the probabilities are that it will be a long farewell. You will now return to your homes with hearts cheered and hands strengthened, by this mutual communion and this brotherhood of farmers from all parts of our great country. And you will come up to our National Capitol in another year, each one with fresh cause of encouragement for the rest, each one with more information, the result of the year's observation and labors, which he will interchange with his fellows and thus scatter broadcast over the land. And as you come up from all portions of the country — from these classic grounds where our fathers died — let your heastr

be invigorated by their patriotism and your hands labor for the prosperity of the country they bought with their blood.

And now, Gentlemen of the United States Agricultural Society — Farewell! Go back to your homes and tell your friends what has been done at this meeting for the cause of Agriculture, and encourage them as you have been encouraged. Continue your devotion to this bulwark of our country, continue inviolate our great Constitution, obey our self-imposed laws, preserve our blessed Union, and our Republic will be IMMORTAL! [Long continued applause.]

President WILDER. Gentlemen of the United States Agricultural Society, I give you: The long life, health, and continued welfare of our worthy Vice-President from Virginia — the Honorable George Washington Parke Custis. [Continued applause.]

Vice-President KIMMEL moved that the Society rise, report progress to those whom they have left at home, and obtain permission to sit again twelve months hence.

President WILDER declared the motion carried, and the session was accordingly adjourned, *sine die*.

TREASURER'S REPORT.

To the U. S. Agricultural Society: — The undersigned, Treasurer of the Society, respectfully reports, — That the money on deposit with Messrs. Selden, Withers & Company, amounting to $2,149.13, mentioned in his report of last year, still remains as it then was, and the collateral security mentioned in that report, is still in the Treasurer's possession.

The Trustees of that firm have commenced paying persons who had money on deposit, and it is believed that, in the course of a few months, the sum due to this Society will be paid over to your Treasurer, in full.

My report of last January showed that there was a balance in my hands of $1,868.02, the principal portion of which was then on deposit in a Bank in Boston, and was subject to drafts by the President, to pay bills and premiums, at that time unpaid, arising out of the exhibition at Boston, in 1855.

Those bills and premiums called for much exceeded the expectation of the President—absorbing, as they did, $1,393.50 of the money on deposit in Boston, and leaving in my hands only $474.52 of available funds.

I have received from all sources, (excepting money received on account of the exhibition at Philadelphia,) during the year, $164, which, added to the money available, as above stated, makes $638.52.

I have paid out, on account of incidental expenses attending the last annual meeting, $124.50, leaving in my hands, exclusive of money received on account of the Philadelphia exhibition, $514.02.

The sum received from all sources on account of the exhibition at Philadelphia, was $42,062.90.

The money already paid out for expenses and premiums on account of that exhibition, amounts to $40,990.32, leaving a balance in my hands of $1,072.60. Which balance is subject to premiums, and a few unpaid bills, that may absorb nearly or quite all of it.

Adding to this sum the $514.02, above mentioned, and there is, at this moment, an available fund of $1,586.62 in the Treasury. To this may be added the sum due from Selden, Withers & Co., which, not including interest, will increase the present funds of the Society to $3,735.75.

It is proper that I should state, that the local arrangements for the great Exhibition at Philadelphia, were made by a Committee of gentlemen residing in that city. That an Assistant Treasurer residing there, C. W. Harrison, Esq., was appointed to perform all the financial duties, up to the commencement of the exhibition. On my arrival there I found every arrangement made in the most perfect and satisfactory manner, touching the financial department, by Mr. Harrison, and I received from him, during the two weeks arduous duties performed in that city, constant and most valuable assistance.

I submit, herewith, my account current, and all my vouchers.

Respectfully submitted,

B. B. FRENCH,

Treasurer U. S. Agricultural Society.

WASHINGTON, Jan'y 14, 1857.

APPENDIX.

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Among the curious inventions presented to the inspection of the United States Agricultural Society, was "*Ayres' Self-Acting Farm Well.*" This consists of a platform fifteen feet long suspended by chains from pullies on an axle at the end of the platform next the well, and fastened to the ground at the other end. The axle is raised nine or ten feet from the ground, having in its centre a wheel four feet in diameter, on the periphery of which runs a rope suspending a bucket which drops into the well. This bucket is arranged with a float and valve, which permits the water to escape from the bucket until it is adjusted to the weight of the animal on the platform. The weight of any animal upon the platform causes the axle to turn, and of course the wheel upon which the bucket is suspended, bringing up water in proportion to the weight of the animal seeking it. To the platform are attached air cushions preforated, which cause the platform to come to its bearings without noise or jar. This is a very simple, cheap and effective apparatus for the purpose sought, not liable to breakage or derangement. It can be used at all seasons and anywhere, and must prove of great value in any section of country where water can be obtained for stock only by mechanical means.

B. M. Rhodes, Esq., of Baltimore, exhibited samples of his "*Super Phosphate of Lime*," prepared after a formula prepared by Dr. James Higgins, State Chemist of Maryland. Its composition in "per cent." as analysed, is as follows: —

Sulphuric Acid, (real dry,)	27.33
Lime,	27.66
Phosphoric Acid,	18.78
Animal Charcoal,	3.00
capable of producing of Ammonia 0.22	
Per Oxide of Iron,	0.86
Sand,	2.77
Water,	19.60
	100.

The above constituent parts are united to each other in the following combination: —

Acid Phosphate of Lime,		27.25
containing of Lime,	8.47	
" " Phosphoric Acid.	18.78	
Hydrated Sulphate of Lime,		58.80
containing of Lime,	19.19	
" " Sulphuric Acid. (real dry.)	27.33	
" " Water,	12.28	
Animal Charcoal, Per Oxide of Iron and Sand,		6.63
Moisture,		7.32
		100.

James Green, of 422 Broadway, New York, exhibited samples of the *Meteorological Instruments* manufactured by him, under the direction of the Smithsonian Institution, and sold at the prices annexed: —

Green's Standard Smithsonian Barometer,	$35.00		
" Thermometer External,	5.00	and	$2.50
" " Maximum Register,	5.00	"	3.00
" " Minimum "	5.00	"	3.00
" Psychrometer, (Wet and Dry bulb Ther.)	6 75		
Rain Guage,	10.00	"	5.00
Snow "	2.50		
Wind Vane,			

A description of these Instruments and instructions on the method of observing will be sent with them. They will be described in full in Prof. Guyot's forthcoming report to the Smithsonian Institution, on Meteorological Instruments.

PHOSPHORUS,

IN ITS RELATION TO THE ANIMAL AND VEGETABLE KINGDOMS.

By Professor Webster, of Virginia.

Nearly two hundred years ago, a Dutch Alchemist, an *adept* in the mystic art of transmutation, sat anxiously watching the varied contents of his crucibles, amid the mephitic atmosphere and noisome odors of a dingy laboratory in the city of Hamburgh. He was seeking with untiring assiduity, the "lapis philosophorum," which Midas-like, should transmute into real gold the more common, and really more useful metals.

The good old Brandt knew no such word as fail, but, with the unwearying zeal of his chimerical conferers, subjected substance after substance to the test of experiment, until he was rewarded by the discovery of an element before unheard of, and which perhaps deserves more than any thing known to modern science, to be called the philosopher's stone.

The eyes of Brandt first saw the pale light, and his fingers were first burned by the almost spontaneously inflammable substance—phosphorus. The discoverer soon learned that the slightest friction on the yellowish and translucent product of his experiment, caused its rapid combustion, and that it could only be kept and handled with safety under water. What would have been his astonishment had he known of another substance (potassium) that could *not* be kept under water, on account of the very same property, possessed in a higher degree, that made this caution necessary for phosphorus—viz: its affinity for oxygen.

Marked as are the properties of phosphorus, we shall scarcely be surprised that it remained unnoticed to so late a period in the world's history, when we consider that unless in its passive state, to which we shall presently refer, it is nowhere found uncombined with some other element, where its appearance and properties are very different from its elementary form.

Procured with difficulty, and not known to be of any practical importance, it was a very expensive article, and only

valued as a curiosity, or at most was employed by jugglers in their necromantic tricks.

For a long time the demand for phosphorus was supplied by a London apothecary, named Hankwitz, but about the year 1769, it was found to exist abundantly in bones, from which it could be procured much more readily than before; and as a consequence, the price was materially reduced, and the article more abundant, and extensively known.

When chemistry became a science, phosphorus was detected not only in the skeleton, but in the fibrin, albumen, brain and nerves of animals, and also in the ashes of all cultivated or nutritive plants, as well as in the mineral kingdom, but it is yet procured almost entirely from the ashes of bones, which consist chiefly of phosphate of lime.

Phosphorus which has received its name from the property of shining in the dark, is, when pure, nearly transparent and colorless, or of a slight lemon color, is of a wax-like texture and consistency, tasteless, and devoid of odor, though when slowly consuming in the air, it evolves fumes having the smell of garlic. It is so inflammable as to burn spontaneously in the air; fuses in an atmosphere void of oxygen at 108° F. and boils at 550° passing off as a colorless vapor. It is insoluble in water, but if long kept some of the water is decomposed, and the phosphoric acid diffused through the remainder renders it poisonous—a property possessed in a high degree by the phosphorus itself. In sulphuret of carbon, the fixed and volatile oils, naptho, petroleum, ether and alcohol, phosporus is more or less soluble, and imparts to them the property of luminosity, and also renders them irritant poisons.

The combinations of phosphorous with oxygen, and the remarkable series of salts which its acids form with the alkaline or metallic bases, are subjects of unusual interest to the chemist, who recognizes four compounds or oxides. These are, the

Oxide of Phosphorus proper, whose symbol is,.....P 2 O
" Hypophosphorus Acid, " " ....P O
" Phosphorus " " " .....P O 3
" Phosphoric " " " .....P O 5

These form various phosphites and phosphates, but with water $PO5$ forms three distinct hydrates, and also three classes of salts, and affords a striking illustration of the substitution of a metal for hydrogen, which is itself probably a gaseous metal. In other words, one atom of phosphoric acid unites with one atom of water, forming monobasic or metaphosphoric acid; or with two atoms of water, forming bibasic or pyrophosphoric acid; or with three atoms of water giving rise to tribasic or common phosphoric acid, but the monobasic can only yield one series of salts when all the hydrogen of the water is replaced by some metallic element, while the bibasic furnishes two series of salts, according as the metal replaces one or both of the basic atoms; and the tribasic acid is capable of yielding three series of salts, according to the number of hydrogen atoms replaced. Phosphorus also combines with other elements than oxygen, giving rise to chlorides, iodides, bromides, and phosphureted hydrogen, which latter compound is the genuine "Jack o' the lantern" or "Will o' the wisp."

Sulphur and phosphorus combine with great energy, and form a very dangerous compound, as is also the case with the chlorate of potassa.

When phosphorus consumes slowly in a jar of damp air, a change is effected in the air or vapor, whereby it is enabled to decolorize a solution of indigo as readily as nitric acid, and even dissolve India rubber.

The name *ozone* has been given to this apparently new substance, though it is now usually supposed to be but an allotropic state of oxygen. It is worthy of remark, that electric sparks discharged through dry oxygen impart to it the same extra-active properties as does the slow oxidation of phosphorus. Even the odor of oxidizing phosphorus, which chemical writers usually give as one of its distinctive properties, is perceived in the air in proximity to an electrical machine in active operation. Ozone appears to be emphatically nature's disinfectant — certainly being capable of decomposing sulphuretted hydrogen, which is an active malarious agent.

Writers on malaria have asserted that the products of the decomposition of animal matter are far less deleterious than those of vegetable substances, and cite instances of immunity from disease to those in the vicinity of slaughter-houses and tanneries, in infected places, during times of epidemics. I am not prepared to say that this is really so, as no opportunity has occurred to investigate the matter, but if it is true, there must be some natural cause, and may not the cause be the formation of ozone by the oxidation of the phosphorus of the animal structures? Should it be urged that in such bodies, phosphorus is not in an oxidizable state, I would inquire into the cause of the luminosity or phosphorescence of many kinds of animal matter, undergoing putrefaction. I would be understood as merely *suggesting* such an hypothesis, rather than *advocating* it.

The action of light, even when phosphorus is surrounded by an atmosphere of pure hydrogen, nitrogen, or carbonic acid vapor, causes a change in the color, and wonderfully alters its properties. So also does an exposure of a few hours to a temperature of about 500° — a point near that of vaporization, in which case it assumes a red color and is generally known as red or amorphous phosphorus. Instead of its peculiar waxy, semi-transparent, delicately yellowish appearance, it becomes not only red but perfectly opaque. If, however, phosphorus is strongly heated and suddenly cooled, it becomes black and opaque, but gradually recovers its former aspect. A similar change has been observed of the diamond, which is an allotropic state of carbon. It is very probable that all elementary matter is capable of either an active or passive state, and in regard to many of them, this is positively known to be the case. One degree of heat, or electrical condition may cause an element to assume a particular allotropic condition, while the same agent in another degree may restore the body to its former state. Thus amorphous or red phosphorus, when heated in an atmosphere void of oxygen, to a point *above* that of vaporization, is reconverted to its original condition, and ozone heated to 140°, loses its characteristic properties. The amorphous or allo-

tropic phosphorus, exhibits in many respects, very different properties from the ordinary article.

Its melting point instead of being 111° is over 480°, and it no longer manifests the property to which it owes its name, even at a temperature of 400°. Its specific gravity is also considerably increased, and its affinity for other elements, as sulphur and oxygen, very much impaired, so it may be kept and handled with comparative safety. On account, probably, of this inertness it is far less poisonous than in its active state. Operatives in manufactories of friction matches, of which phosphorus is a constituent, have been subject to dreadful diseases of the bones, especially a necrosis of the lower jaw, arising from breathing or absorbing the fumes of phosphoric or phosphorus acids, due to the slow combustion of the material used; but by employing the passive or red variety, the danger attending the process may be avoided, and the matches thus made may be kept or transported with greater safety. Although in a free state, amorphous phosphorus is but little disposed to combustion, yet, when it is mixed with the ordinary ingredients of lucifer or friction matches, as sulphur, sulphuret of antimony and chlorate of potassa, it burns readily.

Phosphorus takes fire spontaneously in the vapor of iodine or bromine, or in chlorine, but olefiant gas or the vapor of ether, or the essential oils, prevents its slow oxidation in the air, though this property may be restored by adding to the gas or vapor, a minute portion of nitrous acid.

The affinity of phosphorus for oxygen has led to its employment in endiometry, a stick of it being placed in a jar of air, inverted over water it will in a few hours combine with all the oxygen present. With pure oxygen, however, it does not combine so readily, except under diminished pressure. It is a singular fact, that when phosphorus is dusted over with powdered rosin, sulphur, charcoal or even fine sand or chalk, and placed under the receiver of an air pump, it becomes luminous as exhaustion commences, and finally inflames.

Such are some of the properties of a substance but a few

years ago regarded merely as a wonder inspiring curiosity, but now recognized as an indispensable element in the animal and vegetable kingdoms, and it deeply concerns the agriculturist to understand the relations of phosphorus to the organic products of his farm. Sometimes one element may replace another in the vegetable organization, as when soda takes the place of potash, but phosphorus can find no substitute which shall perform its functions in the growth, maturity or perfection of the plant or recent animal structure. I say *recent*, for it appears that in some instances the fluoride of calcium has taken the place of phosphate of lime in the teeth and bones of fossil animals.

The ashes of all plants, and the teeth and bones of all animals that have been examined, contain it; and we may safely assert that no animal nor plant can reach maturity without the aid of phosphorus. In the body of an adult man is about one and three-fourths pounds of phosphorus, which must have been obtained, directly or indirectly, from plants, and by the plants, from the earth. The seeds of plants especially, contain phosphates, and without their presence, in soluble form in the soil, the plant could never reach maturity.

Phosphate of lime is required for the skeleton of a chicken, and free phophorus is provided in the yolk of the egg, while the shell furnishes lime. During incubation the free phosphorus combines with the oxygen contained in the well known air-bubble of the egg, or with that permeating the porous shell — phosphoric acid is formed, which, having a stronger affinity for the lime than the carbonic acid, which it finds in combination with it, displaces its weaker acid brother and forms phosphate of lime for the osseous matter of the chicken. Here we have a scientific explanation of the often observed fact, that egg shells become thinner during incubation.

Analysis has proved that phosphorus is essential to the constitution of nervous and cerebral matter, and that its proportion varies with the period of life. The brain in infancy has been found to contain but eight thousandths of its weight, of phosphorus — in mature age the proportion is eighteen

thousandths, and in old age ten thousandths; while in the brain of adult idiots the quantity scarcely exceeded that of infancy. This analysis from L'Heritier, is given by Dr. Draper in his recent work on physiology, and will not fail to indicate some of the important relations of phosphorus to the animal economy. Furthermore it is known that excreta containing phosphates of soda and ammonia, are rich in these salts in proportion to the activity of the nervous system. To supply the waste of such phosphorized compounds, their equivalents must be introduced into the system as food.

The suggestion of Dr. Draper, that the tissues of plants deoxidize phosphorized compounds under the influence of solar light, which at the same time throws them into the condition of inactivity or allotropic state, is deserving the most careful examination. It is estimated that an average crop of beans removes twenty pounds of phosphorus from a single acre, while a crop of wheat requires but twelve pounds; and as all cultivated plants require more or less of it, we infer that it is an indispensable ingredient in all fertile soils, and where the plump kernel and abundant yield of wheat or other grain fails to reward the farmer's toil, he may reasonably expect, first, a deficiency of this important element. The sad change from the good old time,

> "When every rod of ground maintained its man,"

and

> "Health and plenty cheered the laboring swain,"

to that when "desolation saddened all the plain," and "blossomed furze, unprofitably gay" usurped the place where once the "garden smiled," was, doubtless, caused by the abstraction of phosphates from the soil, without repaying in kind.

Constant change is impressed on all nature. The vast masses of subterranean coal, once waved in graceful undulations in the pliant reeds and arborescent ferns of former ages: the ocean has often been in the clouds; rivers have been rainbows! Mountains of solid marble have doubtless lived in organized beings. "The earth that's nature's mother,

is her tomb." The millions of tons of phosphorus now existing in the animal structures of the globe, were obtained through the agency of plants, from the soil. To supply the deficiency thus caused, various fertilizers are employed, often at enormous expense, when from lack of knowledge, of the constitution of common things, and of the elements needed by the soil for the growth of any desired crop, substances of greater value are partially or entirely wasted. How often do the means of fertility lie but a few inches below the barren soils of worn out fields, ready to enter the spongioles of the first fibrous root that reaches them. Tons of valuable phosphates are waiting the greedy roots of peas and clover, whereby they may be elevated to the position they were doubtless designed to occupy in the vegetable world. Whether from rainless Peruvian islands, the farm, pen, or sub-soil of cultivated fields, the same substances are equally valuable, and the judicious farmer should seize on phosphates as on truth

"Wherever found,
On Christian or on heathen ground."

It is not alone on account of the inorganic elements made available, that certain plants should be sown, to be incorporated with the soil as fertilizers, but also on account of the materials they extract from the atmosphere.

Chemical analysis clearly shows that phosphorus is one of the most important elements in the animal economy, and that, in no insignificant proportion. This phosphorus must be derived from food, and as men do not obtain sustenance directly from the mineral kingdom, but indirectly through the vegetable, it becomes a matter of importance to the agriculturist to be able to feed the vegetable most effectually and with the least trouble and expense, from the great store-house, the earth. Chemical analysis has also shown that phoshorus has its home in such minerals as greenstone, basalt, trap, gneiss and granite, by the disintegration of which many soils have been formed. It is, however, from the rock known as *apatite*, in America, and from *coprolitic strata* in England, that the mineral kingdom has most abundantly furnished phosphates for agricultural fertilizers.

Silex is certainly indispensable in every soil worth tilling, and so are the alkalies, but there is very little to apprehend from the absence of the former in comparison with that of the latter, but the liability to a deficiency of the phosphates is far greater than of the alkalies — and hence their great value when applied to exhausted soils. In plants the phosphates find their way to the seeds, and even then, collect around the germ, a fact which will explain the surprising advantages of the application of cotton seeds to land, especially when the next crop is Indian corn, a grain which requires an abundant supply of such salts.

That all the phosphorus in milk, blood, bone, and in nervous and cerebral matter, was taken from the earth by plants, and introduced into the system as food, no one will question; and it is of much importance to understand *how* this element is presented by the vegetable to the animal.

It is, I believe, admitted by physiological writers, that all articles of food must be of a combustible nature, or capable of oxidation, and that in various excreta the products of this oxidation return to the mineral world in the form of carbonic acid, water, ammonia, and sulphuric and phosphoric acids. Now, the question arises, in what state is phosphorus an article of food? Most writers on chemistry aver it is nowhere free in nature, but we have reason to believe that it does exist in a free but inactive state, deoxidized as Dr. J. W. Draper suggests, by the influence of sunlight.

How far the yet mysterious principles of *catalytic* action, and the capacity of bodies to assume both the active and passive forms by the influence of light, heat and electricity, may modify the received views of organic chemistry, it is impossible to say, but I cannot resist the conclusion that more extended and accurate knowledge of these subjects is among the desiderata of agricultural science.

ORGANIC MATTER.

By Hon. S. G. Clemson, of Maryland.

A desultory conversation having sprung up, upon the Sorgho sugar plant, in which I took part, and the discussion of that subject being finished, I further remarked, that the great amount of organic matter which it yielded to the acre, might make it prominent as a fertilizer, and prove even more valuable in certain cases than even clover, &c. I was one of those who did not accept as satisfactory the usual explanation given for the fertilizing effects of the last named plant, viz.: the extended tap root, pumping inorganic ingredients from below. There were other influences at work. Dense foliage shaded the soil, arrested evaporation, thereby insuring humidity; and heat, together with humidity, being the great generators of vitalities; plantations and colonies of organisms were invited, and fertility ensued; heat without humidity produces sterility.

Exception having been taken to these views, I replied, that exhaustion was not so much a consequence of cultivation as the mode of cultivation. That all the requirements of vegetation existed in the air and soil; that the want of phosphoric acid and ammonia were more imaginary than real; that the former was found to be present in all rocks in the oceans, all water, the air and the soil, and in ample proportions for the supplies of animated nature. That it had not been detected by chemical experiment in the air was not conclusive proof of its non-existence; that there was higher evidences than the results obtained by chemical re-agents and balances; that the omnipresence of phosphoric acid and the known presence of ammonia in the air, water and soil, was the natural consequence of the order of creation. That it (chemistry) had settled the question that phosphorous was a constituent of organic substances; that it existed uncombined in the brain of animals, fish, &c.; and that Thenard had given an explanation of the cause of those lights seen over grave-yards, marshes, &c., called Jack o' Lanterns, Will of the Whisp, &c. He attributed them to the decomposition of animal matter giving

rise to perphosphorated hydrogen, which it is well known takes fire when it comes in contact with the air, and finally is resolved into phosphoric acid. It would not, therefore, be extraordinary, considering the solubility of phosphoric acid ; that it should exist dissolved in the atmospheric humidity. Without accepting those views as satisfactory for the entire range of phosphorescent phenomona, they were based on certain facts that could not be denied. But that I took higher ground, that I would command the assent of every member of that audience, when I stated, without fear of contradiction, that the invisible world was vastly more important in amount than the visible ; that the constituents of organic substances was not dependent upon volume, and that if the ocean, running water and the soil was peopled by an infinite variety of myriads of millions of invisible organisms, and insignificant taken separately, but whose incessant and concrete action produced results beyond our finite comprehensions, it was not surprising that I should find supplies always present and adequate to the requirements of organic existence.

It has been said in the course of this discussion, that as the mineral constituents of plants were not volatile, my views could not be sustained. To which I answered, that it does not follow, because a substance is not volatile, that it should not exist in the atmosphere ; for, independent of those mineral constituents which form part of vegetable and animal organisms, finally comminuted sand and other substances are held in suspension and carried by the winds, small bodies, such as fish, frogs, &c., fall down as rain, and certain vassels of meteorites had been found to be composed of organisms. The Island of Cuba owes its fertility, in part, to its proximity to the ocean ; the salts of the sea are carried by the winds over the entire land, and that, together with imbibition, maintains a fertility that could not otherwise exist. Observations made under Arrago, at the observatory of Paris, showed that the chloride of sodium was found to be a constant constituent of the atmosphere, and yet that salt is not volatile.

The subject is one of immense importance, and I never approach it without becoming humility, and a proper sense of

my own inadequacy to comprehend the beginning of such a gigantic subject. My attention was first drawn to this matter in 1832, during a voyage I made in the ship Sully, from New York to Havre. We encountered adverse winds, and were driven far south, where we were becalmed. The sea became motionless; there was no swell, not even a ripple upon the surface of the water. Lightning fell, not in streaks, as I had been accustomed to see, but like an electric discharge in vacuo. It blurred and floated around and about. The surface of the ocean all around the ship, (as she lay motionless upon the water,) became irridescent, with decomposing organic matter. Every one on board was under the influence of this sinister and unnatural state of things, and the first cats-paw that rippled the water was greeted with delight.

Again, in 1836, on board the Garronne, Capt. Skiddy, in mid-ocean, I was awakened about the middle watch, by the captain, who told me to come on deck with all haste; when I got there the sea was illuminated as far as the eye could reach. The water appeared one mass of liquid fire, of a deep chrome red and yellow appearance. This gorgeous sight, which it was my good fortune to see, lasted some time, and gradually the water assumed its usual pale phosphorescent appearance. Capt. Skiddy told me that he had been at sea from boyhood, but that he had never but once seen anything like it before, and then much less brilliant. Ehrenberg states that oceanic organisms become luminous when irritated; as for instance, by the addition of a small quantity of acid to the medium in which they may exist. Whalers who have cruised in the Northern oceans aver that the medusa are so abundant as to impede sensibly the progress of a ship. And who has not seen, in sailing over the ocean, turbid appearances, as if on soundings, this is not adventitious, but a grade, or variety of more dense population. Indeed, when I close partly my eyes, as painters do, to catch the general tone, the sea always appears red to me; and if I were to paint the ocean, I would prepare the canvass with a red tone and bring the other colors in adventitiously.

The invisible creation that peoples the great deep, is not more

interesting or more important than the marvellous faunas of the air, running water and the soil; one and the other are peopled with organisms of infinite variety and incalculable numbers, having parasite upon parasite down to imaginary indivisibility. They are born, live, procreate, die, in an incredibly short space of time. Ehrenberg has made a calculation (approximate) of the wonderful powers of increase of one of these animals. He says, that all the conditions fulfilled, a mass as large as this globe would be formed in a few hours. The atmosphere may be divided into spaces, each one having its fauna. The same with regard to all matter. They penetrate the interstices of compact masses, and their remains form entire geological formations. Such is the calcarre grossier of the Paris basin. The Chalk formations of Europe, and even the silecious nodules called flint, are found, on examination, to be composed of the shields, or pericarps of invisible organisms. The cities of Berlin, in Germany, of Richmond, Petersburg in Virginia, are built upon such formations. The green sand formations that extend from New Jersey along our eastern littoral to the Gulf of Mexico, is a mass of organisms. The marsh that runs up above Charleston, Jefferson Co., Virginia, is another mass of working, living and decaying living beings; and it is to the existence of animal and vegetable organisms that river deposits, such as the Nile, the Rhine, the Mississippi, &c., owed their fertility. Some years ago the foundations of the houses in a quarter of the first-named city, (Berlin) were found to be tottering and insecure. On examination, the learned Ehrenberg discovered, that to a depth of from 20 to 30 feet there was an incessant action among a living mass of these invisible beings.

At times, under favorable circumstances, some of these insects appeared in such quantities as to create alarm. On one occasion, in Germany, great excitement was produced. It appeared as if blood was issuing from everything; and a woman seeing her child covered with what she presumed blood, supposed it had been assassinated. Ignorance, fanaticism and imagination had a wide field for speculation. What becomes of those supplies furnished by locusts, and the whole tribe

of grasshoppers that appear in such numbers, at times as to destroy the vegetation of a whole country; and when they die and ferment fill the air with noxious effluvia and pestilential odors? What a wise provision of nature, that these, instead of floating forever in the air, causing annoyance, disease and death, should be absorbed by other vitalities, and reappear in some other form of life to beautify and adorn creation.

It is not then surprising if phosphoric acid and ammonia should be found in the air, and earth and water. It would be more surprising if they were not. Being the result of the decomposition of all animal and vegetable matter, they will be found in all climes, from the Poles to the Equator; and here let me add, that because there are no visible traces of organic remains in the older crystaline rocks, it is not conclusive evi dence that they have not a similar origin. On the contrary, time and pressure or heat may have changed their structure and their minerological characters; and as phosphoric acid is now being found a constituent of all rocks, I think it would not require a sketch of the imagination to give them an identity of origin. The amount of organisms contained in some varieties of earth in some parts of the world is so great that they use them as articles of food. Vitality would appear to have been a preponderating influence in creation, and like matter it was created once and forever; changing, but not destroyed and progressive, and man, but an atom, a parasite, upon a vast universe of life. All organisms, whether vegetable or animal, are composed of solidified gases. Death and decay supervene, and they are again resolved into air. Life supports life, and it is to organisms, most probably, that we owe the origin of certain diseases.

This is as near as I can recollect the substance, if not the matter, of what I said, when an abrupt termination was put to my remarks by the pressure of business before the Society. I was going on to observe that it was impossible for me to separate the origin of many diseases from organisms. For it is well known, all over the world, that on mill-dams and in proximity to water-courses malarious diseases prevail, and the ratio of disease in union with the intensity of heat. As

the faunas vary from spring to fall, so does disease, becoming more violent, until frosts and winter puts an end to their existence, and that irritation which they cause.

It is customary, in South America, in sickly regions, for persons to veil their faces, to prevent disease or the inhalation of the cause of disease. I have seen this practised in the United States by eminent medical men, who did not pretend to explain why it should be a preventive. In the polders in Europe, where typhoid fever, intermittents, &c., prevail, I was informed by a practitioner that he was never so successful in the treatment of those diseases as when he gave boiled water to his patients to drink.

I am arrested here, in this fruitful subject, because this was all I said on the occasion ; but I was only on the threshold, or within the portals of that great temple of Nature, teeming with life and wonders, to which our eyes are literally but beginning to be opened.

WOOL AND WOOL GROWING.

BY PROFESSOR J. A. NASH, OF MASSACHUSETTS.

It is well known that the fleeces of some sheep make unshrinkable flannel ; that those of others work advantageously into fulled cloth ; and that those of others will make neither flannel nor fulled cloth of a good quality.

Starting with these well known facts, Peter A. Browne, Esq., of Philadelphia, some eight years ago, commenced a series of investigations on the integumentary covering of the sheep, designed, if possible, to ascertain the causes and supply a remedy.

After examining microscopically, and with the greatest care, thousands of samples from every part of the world and of every variety, Mr. Browne has arrived, with entire certainty, as he supposes, at the following among many other conclusions : —

There were originally two and but two species of sheep,

one hair-bearing and the other wool-bearing. Several varieties under each species may have come into being, as happens with other species. The crossing of these varieties was well, so long as the crosses were confined to the same species, for then the progeny, following the specific character of both parents, would produce either pure hair or pure wool unmixed.

But the crossings of varieties from the different species have produced a progeny, whose integumentary covering is neither pure hair nor pure wool but a mixture of both; and as it is the nature of hair not to shrink, and of wool to shrink, when scoured, the mixture is far less valuable than either of its ingredients, the hair injuring the fleece for fulled cloth, and the wool nearly spoiling it for flannel.

The characteristics of sheep's hair, Mr. Browne states to be: 1 — its filaments are oval in form; 2 — they are perforated by a central duct from end to end, in which the coloring matter flows; 3 — each filament is made up of a great number of fibres held together by an appendage, or bark, consisting of many small fragments, these fragments adhering closely to the filaments, or body of the hair, and having the ends so rounded and smooth as to offer little resistance to the hairs sliding freely over each other in any direction.

The characteristics of sheep's wool, on the other hand, are, that it is oval in a much higher degree than hair; it is destitute of a central duct passing through it; is made up, like hair, of a great number of fibres, and is covered by a fragmentary cortex, or bark, each fragment, or scale, terminating, unlike that of hair, in a sharp point, turned outward, so as to form a complete preventive of the filaments of wool sliding over each other.

Mr. Browne believes these and other characteristics of hair and wool to be permanent and unalterable, denoting a specific distinction in the parentage of our present varieties of sheep. According to his microscopic observations, hair is as distinguishable from wool as oats are from wheat, or rye from barley. If his views are correct, it follows that those, who say that hair will turn to wool when you carry a sheep far to the north, and wool to hair when the transportation is reversed,

are in error; and it is only true that either hair or wool may improve or deteriorate in quality by a change in circumstances, but never that one can be changed to the other, any more than you could obtain wheat from oats by sowing them in another climate, or rye from barley by sowing it in a rich soil.

Mr. Browne further states, as a result of long and careful observation with the microscope, that the hybrid sheep, that is, those springing from the two species, as he thinks many of our present flocks are, produce as perfect hair as the pure hair-bearing sheep, and as perfect wool as the pure wool-bearing sheep. The quality of neither is necessarily deteriorated by the mixture of blood, but the value is greatly diminished, because the two are so intimately mixed that no art can separate them, and because in the mixed state they are unfit for either the manufacture of flannel or fulled cloth; not but that they can be wrought into fabrics which we may possibly use as inner or as outer garments, but that a good article cannot be made from them.

Flannel made of wool shrinks; that made of hair and wool not only shrinks, but shrinks unevenly, leaving a rough, undulating surface; that only which is made of pure hair wears smoothly and retains its size till worn out. Fulled cloth made of hair is impossible, for hair will not felt; that made of hair and wool shrinks unevenly, and though forced into a smooth surface by the skill of the cloth-dresser, looses it and becomes rough the first time it is wet, after being made into garments; and only that made of pure wool can be relied upon to wear handsomely. You may buy a beautiful pair of pantaloons, but if you should wear them on a fishing excursion it would not be strange if the lower extremities should ever after refuse to resume the shape which the tailor intended for them.

If the intermingling of blood between the hair-bearing and the wool-bearing sheep is the cause of many failures, the remedy, Mr. Browne supposes, is obvious — to breed in the two distinct lines. He states further that his inquiries have led to the conclusion that the hair-bearing sheep thrive best in coast or insular situations; the wool-bearing best in hilly and inland

regions. Our Atlantic coast, as far inland as tide waters extend, reaching from Maine to Texas, including both, and occupied by a population of some thirteen millions, he believes to be well adapted to the former, while all the rest of our country is admirably adapted to the latter, and ought to produce wool in abundance and of the very best quality.

After detailing the foregoing views of Mr. Browne, Mr. Nash stated that he would be in nowise responsible for the microscopic facts in the case. All he could say was, that Mr. Browne had gathered from all quarters an immense collection of wools, had studied them long, experimented with them in every possible way, and came slowly to his conclusions. Mr. N. would give these conclusions to the public, as well as the alleged facts in which they are founded, more fully through the medium of the "Plough, Loom and Anvil," or "American Farmers' Magazine," published in New York, at an early day.

The subject, Mr. N. said, was important. The flesh of the sheep is wholesome, easy of digestion, to most persons palatable, and perhaps as cheaply produced as that of other animals. It would take a great deal of argument to convince him that it is for our interest to import instead of growing our wool, and more still to convince him that the government does not solemnly owe it to American Farmers, to protect by a reasonable duty both the *raw* and the manufactured article. Such a duty would not much increase the cost of woolens and flannels to the wearer, but it would gradually and surely turn their production from foreign to American soils.

LECTURE

ON THE GRASSES AND THE MANAGEMENT OF GRASS LANDS.

BY CHARLES L. FLINT,

Secretary of the Massachusetts Board of Agriculture.

THE annual value of the Grass crop to the country for pasturage and for hay together is not less than $300,000,000. This alone is sufficient to indicate its intrinsic importance, and to attract the attention and command the careful study of the intelligent farmer.

I need not therefore urge the necessity of a more extended knowledge of the subject. Too many instances of a want of this knowledge are already familiar to you, I doubt not, and they need scarcely an allusion from me. You are already familiar with the history of the introduction and propagation of many a plant which as richly deserved the name of "cheat," as that widely heralded under the name of Willard's Bromus, of which even the editors of some of our agricultural journals expressed the earnest hope that it might receive extended trials.

Monstrous prices were charged and paid by the unsuspecting farmer for its seed, in many cases four and five dollars a bushel, a pledge being exacted that it should not be allowed to go to seed. Committees of agricultural societies were invited to examine and report upon it, and in a letter published in a prominent journal, the disinterested propagator very kindly offered to put up ten barrels of Bromus seed for $100, saying, "Of course the earliest applicants will be sure of obtaining till all is gone, which scarcely would give a barrel to a State. Years must elapse before the country can be supplied as it now is with Herds grass and clover seed. My offer invites co-operation and participation in the profits and pleasures now available."

A quantity of Bromus seed was sent to the State Farm, under the charge of the Massachusetts Board of Agriculture, for the purpose of experiment, with a letter of directions to sow with clover, in the spring of 1855. The crop was cut while young, and before the grass had developed sufficiently to distinguish it with certainty. This past year (1856,) directions were given to let it stand later in the season. While engaged in the collection and study of specimens in the course of the past summer, I gathered samples of this grass when it was still immature, and when the spikelets had very much the appearance of a species of Bromus, once considered a valuable grass. Without giving it a very close examination at the time I pronounced it the *Bromus arvensis*, which at that stage of its growth it very much resembles. A few days after I was astonished to see it develope into chess, (*Bromus secalinus.*) This was the first specimen of the mature Willard's Bromus I had ever seen. I examined it with care with a strong magnifying glass, and to avoid the possibility of mistake, I submitted specimens of it to Prof. Gray, of Cambridge, and to Prof. Dewey, of Rochester, N. Y., both of whom, after examination, pronounced it genuine chess.

A striking illustration of the value of accurate knowledge of the subject is found in the fact that the great Linnæus, the father of modern botany, first recommended the culture of a grass commonly known in Massachusetts as *Beach grass*, and in England as *Mat grass*, for the prevention of the drifting of loose sands, a plant which since his day has come to be of immense value to Holland, in building up a soil along sandy river banks; and in England and Scotland where it is strictly protected by an Act of Parliament; and especially in Massachusetts, where more than forty thousand dollars have been spent under appropriations from Congress for the protection of Cape Cod Harbor and Provincetown.

The town of Provincetown, once called Cape Cod, where the Pilgrims first landed, and its harbor still called the harbor of Cape Cod, — one of the best and most important in the United States, — sufficient in depth for ships of the largest size, and in extent, to anchor three thousand vessels at once,

owe their preservation to this grass. For an inhabitant of an inland country, it is difficult to conceive the extent and the violence with which the sands at the extremity of Cape Cod are thrown up from the depths of the sea, and left on the beach in thousands of tons by every driving storm. These sand hills when dried by the sun are hurled by the winds into the harbor and upon the town. Before the culture of beach grass, when the sand drifted down upon the dwelling houses, — as it did whenever the beach was broken, — it was necessary in order to save them from burial, to wheel it off with barrows. Tons were thus removed every year from places that are now entirely safe from the drifting of sand. This statement would seem to be incredible were it not for the window glass in some of the older houses, against which the sand has been blown with such force as to make it appear perfectly ground.

It would be useless, in the time allotted to me here, to give even a brief account of the natural history or description of all the useful grasses found in our fields and pastures, however essential it might be to a complete understanding of the subject.* I can but briefly allude to a few of our most prominent species and then pass on to other topics. And among the most important of these is, unquestionably, the well known Timothy, (*Phleum pratense.*)

The name of Timothy, by which it is more generally known over the country and abroad, was obtained from Timothy Hanson, who cultivated it extensively, and according to some accounts, introduced it into England, from whence it is supposed to have been originally brought to this country. It forms a large proportion of what is called English hay. In point of nutritive matter the ripe crop is said to exceed the crop at the time of flowering, owing in part to the size and quantity of its mealy seeds.

As a crop to cut for hay it is probably unsurpassed by any other grass now cultivated. Though somewhat coarse and hard, — especially if allowed to ripen its seed, yet if cut in

* The natural history, comparative nutritive value, methods of cultivating, cutting and curing of the grasses, the management of grass lands, &c., will be found to be treated in detail in a work, recently published, entitled, "*A Practical Treatise on Grasses and Forage Plants, &c.*" pp. 240. By Charles L. Flint, Secretary Massachusetts Board of Agriculture. New York: G. P. Putnam & Co. 1857.

the blossom, or directly after, it is greatly relished by all kinds of stock, and especially so by horses, while it possesses a large per centage of nutritive matter in comparison with other agricultural grasses. It is often sown with clover, but the best practical farmers are beginning to discontinue this practice, on account of the different times of blossoming of the two crops. Timothy being invariably later than clover, the former must be cut too green, before blossoming, when the loss is great by shrinkage, and when the nutritive matter is considerably less than at a little later period, or the clover must stand too long, when there is an equally serious loss of nutritious matter in that. It thrives best on moist, peaty or loamy soils of medium tenacity, and is not suited to sandy or light gravelly lands; for though on such soils, by great care it can be made to grow and produce crops, some other grasses are better suited to them and more profitable. It grows very readily and yields very large crops on favorable soils. I have known instances where its yield was four tons to the acre of the best quality of hay, the Timothy constituting the bulk of the grass. It is cultivated with ease, and yields a large quantity of seed to the acre.

Fig. 2.

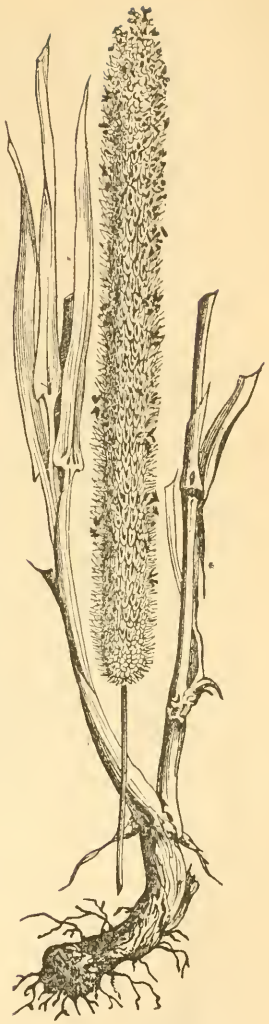


Fig. 1. Timothy Grass.

In one respect, perhaps, it must be admitted that this grass is inferior to meadow foxtail, and that is in the quantity of its aftermath; for while that of the latter is very great, the after-growth of Timothy is but slight, and if allowed to stand

too long and then mown in a dry time, it starts so slowly as to leave the ground exposed to the scorching rays of the sun, unless, indeed, there happens to be a rapid growth of clover to protect it. Fig. 1 represents this grass, and Fig. 2 its flower.

Another prominent and well known species, in New England, goes by the name of Red Top, (*Agrostis vulgaris.*)

Fig. 3. Red Top.

This valuable grass, so common in all our cultivated fields, has been an inhabitant of our soils for more than a century. It was called simply English grass by Eliot, Deane and other early writers, and by the English, Fine Bent. Indeed, the whole genus *Agrostis* is commonly known in England as "Bent Grass." This grass is often sown with Timothy and clover, in which case, the clover, of course, soon disappears, being biennial, when Timothy follows, after which red top usually takes its place, and with some wild grasses forms a close sward. In Pennsylvania and States further south, it is universally known as Herds-grass — a name applied in New England and New York to *Phleum pratense* alone. It is of somewhat slow growth, but of good or medium quality. It is suited to moist soils, though common to all. This grass is probably rather overrated by us. It makes a very profitable crop for spending, though not so large a yield is obtained as from

Fig. 4.

Timothy. It is a good permanent grass, and consequently well suited to our pastures, standing our climate as well as any other species. It should be fed close in pastures, for if allowed to grow up to seed the cattle refuse it; and this fact seems to show that it is not so much relished by stock as some of the other pasture grasses. The fact that cattle eat any grass greedily in the spring, is no proof of its excellence or nutritious qualities; since, then, all grasses are tender and full of juice, and many varieties of both grasses and shrubs are eaten, which at a more advanced stage are refused. It is seen in Fig. 2, and its blossom in Fig. 4.

This grass goes also by various other names, and is greatly modified by soil and cultivation. On a moist, rich soil it grows larger than on a poor, thin soil, and not only larger, but has a darker, purplish color, with a stem varying from eighteen inches to two feet or two and a half feet high; while on thin, poor, gravelly soils, it seldom grows over twelve inches, and often not over five or six inches high, while it has a lighter color. In the latter situations it goes by the name of Finetop, and is universally seen in old, dry pastures.

The Kentucky Blue Grass (*Poa pratensis*) is common all over the Northern United States, constituting no small portion of the turf of pastures and fields. It varies much in size and appearance according to the soil on which it grows. In Kentucky it is universally known as Blue grass, and elsewhere frequently called Kentucky blue grass, and still more frequently, June grass. It comes into the soil in some parts of the country when left to itself, and grows luxuriantly on soils best suited to it, and is relished by cattle. Wherever it is intended for hay it is cut at, or just after, the time for flowering, as, if the seed is allowed to ripen, more than a fourth part of the crop, in the opinion of some, is lost. In its earliness, it is equalled by some of the other grasses, and it is surpassed in its nutritive qualities, by many. After being cut in summer it starts up slowly. Low says, "It is inferior to the rough stalked meadow grass, and it may be questioned whether it deserves to be reckoned among the superior pasture grasses."

Fig. 5. June Grass.

Fig. 6.

It produces but one flowering stem in a year, while many of the other grasses continue to shoot up flower stalks, and run to seed thro' the season. On this account it is recommended highly for lawns, where uniformity is desired. The produce ordinarily is small, compared with other grasses, but the herbage is fine. It grows well in rather a dry soil, but will grow on a variety of soils, from the dryest knolls to a wet meadow. It does not withstand our severe droughts as well as some other grasses. Its reputation is far higher in this, than in its native country, where it is denied by most farmers even a place among the grasses to be recommended for cultivation. It endures the frosts of winter better, perhaps, than most other grasses, and in Kentucky, where it attains the highest perfection as a pasture grass, it sometimes continues palatable to stock through their mild winters. It requires at least two or three years to become well set, and it does not arrive at its perfection as a pasture grass till the sward is older than that, and hence it is not suited to alternate husbandry, or where the land is to remain in grass only two or three years and then be ploughed up. In Kentucky,

the best blue grass is found in partially shaded pastures. A well known farmer of that State, in a communication to the Ohio Farmer, says: "In our climate, and soil, it is not only the most beautiful of grasses, but the most valuable of crops. It is the first deciduous plant which puts forth its leaves here; ripens its seed about the tenth of June, and then remains green, if the summer is favorable in moisture, during the summer months, growing slowly till about the last of August, when it takes a second vigorous growth until the ground is frozen by winter's cold. If the summer is dry, it dries up utterly, and will burn if set on fire; but even then, if the spring growth has been left upon the ground, is very nutritious to all grazing stock, and especially to sheep and cattle, and all ruminating animals. When left to have all its fall growth, it makes fine winter pasture for all kinds of grazing animals. Cattle will not seek it through the snow, but sheep, mules and horses will paw off the snow and get plenty without any other food. When covered with snow, cattle require some other feeding; otherwise they do well all winter upon it.

"It makes also the best of hay. I have used it for that for twenty years. It should be cut just as the seeds *begin* to ripen, well spread, and protected from the dew at night by windrowing or cocking; the second evening stacked with salt, or sheltered with salt also. When properly cured, stock seem greatly to prefer it to all other hay. I would not recommend it for meadow especially, however, because the yield is hardly equal to Timothy and clover, and because it is more difficult to cut and cure."

The same writer says: "Any time in the winter, when the snow is on the ground, sow broadcast from three to four quarts of clean seed to the acre. With the spring the seeds germinate and are very fine in the sprouts, and delicate. No stock should be allowed for the first year, nor until the grass seeds in June, for the first time in the second year. The best plan is to turn on your stock when the seed ripens in June. Graze off the grass, then allow the fall growth and graze all winter, taking care never to feed the grass closely at any time."

Another eminent cattle breeder speaking of this grass,

says: "Perennial grasses are the true basis of agriculture, in the highest condition of that best employment for man. Grasses which are not perennial, are of immense value, especially as one of the shifts in the ordinary rotation of crops, suited to the agriculture of the great upper, or northerly portion of our continent, all of it above the *cotton* line. But it is the grasses which are perpetual, that I chiefly allude to, and among these, emphatically the blue grass, as it is called in the regions where it flourishes most. Whoever has limestone land, has blue grass; whoever has blue grass, has the basis of all agricultural prosperity; and that man, if he have not the finest horses, cattle and sheep, has no one to blame but himself. Others, in other circumstances, may do well; he can hardly avoid doing well, if he will try." It is seen in Fig. 5, and its flower in Fig. 6.

Another valuable species is commonly known by the name of Orchard Grass. (*Dactylis glomerata.*) This is one of the most valuable and widely known of all the pasture grasses. It is common to every country in Europe, to the north of Africa, and to Asia as well as to America. Its culture was introduced into England from Virginia, where it had been cultivated some years previously, in 1764. It forms one of the most common grasses of English natural pastures, on rich, deep, moist soils. It became, soon after its introduction into England, an object of special agricultural interest among cattle feeders, having been found to be exceedingly palatable to stock of all kinds. Its rapidity of growth, the luxuriance of its aftermath and its power of enduring the cropping of cattle, commend it highly to the farmer's care, especially as a pasture grass. As it blossoms earlier than Timothy, and about the time of red clover, it makes an admirable mixture with that plant, to cut in the blossom and cure for hay. As a pasture grass it should be fed close, both to prevent its forming thick tufts and to prevent its running to seed, when it loses a large proportion of its nutritive matter, and becomes hard and wiry. Stock eat it greedily when green.

Judge Buel, distinguished as a man of taste, said of this grass: "I should prefer it to almost every other grass, and

cows are very fond of it." Elsewhere he says: "The American Cocksfoot, or Orchard Grass, is one of the most abiding grasses we have. It is probably better adapted than any other grass to sow with clover and other seeds for permanent pasture or for hay, as it is fit to cut with red clover and grows remarkably quick when cropped by cattle. Five or six days' growth in summer suffices to give a good bite. Its good properties consist in its early and rapid growth and its resistance of drought; but all agree

Fig. 8.

Fig. 7. Orchard Grass.

that it should be closely cropped. Sheep will pass over every other grass to feed upon it.

If suffered to grow long without being cropped, it becomes coarse and harsh. Colonel Powell, (a late eminent farmer of Pennsylvania,) after growing it ten years, declares that it produces more pasturage than any other grass he has seen in America. On being fed very close, it has produced good

pasture after remaining five days at rest. It is suited to all arable soils. Two bushels of seed are requisite for an acre when sown alone, or half this quantity when sown with clover. The seed is very light, weighing not more than twelve or fourteen pounds to the bushel. It should be cut early for hay."

Mr. Sanders, a well known practical farmer and cattle breeder, of Kentucky, says of it, "My observation and experience have induced me to rely mainly on orchard grass and red clover; indeed, I now sow no other sort of grass seed. These grasses mixed, make the best hay of all the grasses for this climate (Kentucky;) it is nutritious, and well adapted as food for stock. Orchard grass is ready for grazing in the spring ten or twelve days sooner than any other that affords a full bite. When grazed down and the stock turned off, it will be ready for regrazing in less than half the time required for Kentucky blue grass. It stands a severe drought better than any other grass, keeping green and growing when other sorts are dried up; in summer it will grow more in a day than blue grass will in a week. Orchard grass is naturally disposed to form and grow in tussocks. The best preventive is a good preparation of the ground, and a sufficiency of seed uniformly sown. Judge Peters, of Pennsylvania, — who was at the head of agricultural improvement in that State for many years,— preferred it to all other grasses." It is shown in Fig. 7, and its flower in Fig. 8.

Other grasses deserve especial mention, and the careful study of the farmer both for their intrinsic value, and because they are generally distributed over the country. I have taken occasion in the work already alluded to,* to dwell upon their specific importance, and their comparative value.

It must be evident to the observation of the practical farmer, that the various species of grass differ very materially in nutritive value; that some contain the greatest quantity of nutritive matter when green or in the flower; others when the seed is ripe and the plant mature; that some yield a luxuriant aftermath, while others can scarcely be said to produce any at all; that some flourish in elevated situations and

* "Grasses and Forage Plants," &c.

are best suited to the grazing of sheep, while others grow most luxuriantly on the low lands and in the marshes, and sustain the richest dairies; and that no soil is so sterile, no plain so barren but that a grass can be found adapted to it. Some varieties, indeed, will not endure a soil even of medium fertility, nor the application of any stimulating manure, but cling with astonishing tenacity to the drifting sands, while others prefer the heaviest clays or revel in the hot beds of ammonia; some are gregarious in their habits, requiring to be sown with other species, and if sown alone will linger along till the wild grasses spring up to their support; others are solitary, and if mixed with different species will either extirpate them, usurping to themselves the entire soil, or die and disappear. Nearly every species is distinguished for some peculiar quality, and most are deficient in some, comparatively few combining all the qualities desired by us in alternate field crops, for pastures or permanent mowing, to such an extent as to justify a general cultivation.

It is important, therefore, to learn the comparative nutritive value of each species thought to be worth cultivating.

This study is naturally attended with great difficulties. It is but recently that accurate researches have been made with a view of arriving at such positive results as would be entitled to full confidence.

It is now very well established that the nutritive value of the food of an animal depends chiefly upon the proportion of nitrogenous substances contained in it. Without doubt, the sugar which is found to be an ingredient of most vegetable substances at some periods of their growth, in some degree contributes to it also. The nitrogenous constituents of any substance, as grass or hay, for instance, may be determined with little difficulty and with great exactness, since it has been found by abundant research, that, when present, they are of nearly the same constitution, and do not vary in their combinations. The determination of the sugar is somewhat more difficult.

The constituents of plants may be divided into two classes, one class embracing all those substances of which nitrogen or

azote forms a part, and the other consisting of non-nitrogenous bodies. Gluten, albumen, gelatine, casein, legumen and fibrin, belong to the former class, being nitrogenous substances, while starch, gum, sugar, woody fibre, mucilage, &c., are destitute of nitrogen, or non-nitrogenous.

Only a small quantity of nitrogen is found in vegetable substances, and it is derived, in part, at least, from the atmosphere in the form of ammonia. On the other hand, nitrogenous substances form a large proportion of the constituents of the blood of animals and appear in their whole system. As there is a constant waste in the animal and a continual formation of new tissues, — as the whole body is constantly renewed through the agency of the blood which is converted into flesh and muscle, — there must be a never-failing supply of nourishment, and this nourishment for the higher animals is found, as already intimated, in the nitrogenous elements of plants.

For every ounce of nitrogen which the animal requires to sustain life and health, he must take into the stomach, in the shape of food, such a quantity of vegetable substances as will furnish him with an ounce of nitrogen. If we suppose one kind of hay to contain one ounce of nitrogen to the pound, and another to have only half as much, or only an ounce in two pounds, the pound which contains the ounce of nitrogen would go as far to nourish the animal — other things being equal — as the two pounds which contain only the same quantity of nitrogen. The importance of woody fibre to act mechanically in giving bulk to the food, is not, of course, to be overlooked.

Nor is this a mere deduction of theory. The experiment has frequently been made, and it is now fully established both by science and experience, that the greater the proportion of nitrogen which any vegetable contains, the smaller will be the quantity of that vegetable required to nourish the animal body, and the less nitrogen any vegetable contains, the greater will be the quantity of it required. Muscle and flesh are composed of nitrogenous principles, while fat is made up of non-nitrogenous matter. Every keeper of stock knows that

to feed an animal on oil cake alone, for instance, which is but slightly nitrogenous, might fatten him, but it would not give him strength of muscle or size; while if the same animal be kept on the cereal grains, as wheat or Indian corn, alone, his size rapidly increases, his muscular system develops, and he gains flesh without increasing his fat in proportion. It was with reference to these facts that Boussingault formed his tables of nutritive equivalents, and they agree very closely with the results of practical observation.

The non-nitrogenous substances are necessary for the production of fat and to supply the animal body with heat, and thus they meet a want in the animal economy, although they do not contribute so directly to nourish and sustain the system. They are, therefore, important in the analyses of articles of food, though not so essential in determining merely their nutritive values.

Thus, taking the quantity of nitrogen which the plant contains, as the measure of its nutritive value, it is easy for the chemist to form a table of comparative nutritive values of any particular class of plants, and this has recently been done by Prof. Way in a series of investigations into the constituent elements of the grasses which form an exceedingly valuable contribution to the science of agriculture.

No crop is more susceptible to the influence of the seasons, than the grasses, and this has determined, to some extent, the time of sowing the seed, which, for the Northern States, is generally in the autumn. But as this practice is regulated entirely by locality, I shall not dwell upon it in this connection. No rule in regard to the time of seeding down land, which should be found to work best in one latitude, would necessarily apply in a different climate, and under different circumstances.

In general, too little attention is paid to the selection of seeds, not only of the grasses, but of other cultivated plants. The farmer cannot be sure that he has good seed unless he raises it for himself or uses that raised in his neighborhood. He too often takes that which has passed through several hands, and whose origin he cannot trace. Bad or old seed

may thus be bought, in the belief that it is good and new, and the seller himself may not know anything to the contrary. The buyer, in such cases, often introduces weeds which are very difficult to eradicate. The temptation to mix seeds left over from previous years with newer seed, is very great, and there can be no doubt that it is often done on a large scale. In such cases the buyer has no remedy. He cannot return the worthless article, and the repayment of the purchase money, even if he could enforce it, would be but poor compensation for the loss of a crop. The seeds of some plants retain their vitality much longer than others. Those of the turnip, for instance, will germinate as well, or nearly as well, at the age of four or five years, as when only one or two years old. But the seeds of most of the grasses are of very little value when they have been kept two or three years, and hence the importance of procuring new and fresh seeds, and guarding against any mixture of the old and worthless with the new, as carefully as possible.

It is easy to tell whether the germinative power of grass or any other seed still remains, by the following simple method; and if the buyer should be willing to try it, he might purchase only a small quantity at first, and afterwards obtain his full supply with more confidence if the trial showed it to be good. Take two pieces of thick cloth, moisten them with water and place them one upon the other in the bottom of a saucer. Place any number of seeds which it is desired to try, upon the cloth, spreading thin, so as not to allow them to cover or touch each other. Cover them over with a third piece of cloth similar to the others and moistened in the same manner. Then place the saucer in a moderately warm place. Sufficient water must be turned on from time to time to keep the three thicknesses of cloth moist, but great care must be taken not to use too much water, as this would destroy the seed. There should be only enough to moisten the cloths, and not enough to allow any to stand in the saucer. Danger from this source may be avoided in a great measure, however, by tipping up the saucer so as to permit any superfluous water in the saucer to drain off. The cloth

used for covering may be gently raised each day to watch the progress of the swelling or the moulding of the seeds. The good seed will be found to swell gradually, while the old or poor seed, which has lost its germinating power, will become mouldy in a very few days. In this way, also, any one can judge whether old seed is mixed with new. The latter will germinate much more quickly than the former. He can judge, besides, of the quantity which he must sow, since he can tell whether a half or three-fourths, or the whole will be likely to germinate, and can regulate his sowing accordingly. The seeds of the clovers, if they are new and fresh, will show their germs on the third or fourth day; other seeds will take a little longer, but till they become coated with mould there is hope of their germinating. As soon as the mould appears it is decisive, and the seed that moulds is worthless.

Our practice is most faulty, it seems to me, in the few species which we select for our mixtures. It is well known that some species are best adapted to one locality, and others to another, some reaching their fullest and most perfect development on clay soils and some on lighter loams and sands. We cannot but wonder that the practice of sowing only Timothy and red top on nearly all soils, clays, loams and sands indiscriminately, both on high and low land, should have become so prevalent. It is equally remarkable that, while but very few of our grasses, and these for the most part species peculiar to sterile soils, flourish alone, but nearly all do best with a mixture of several species, it should so constantly have been thought judicious to attempt to grow only two prominent species together with merely an occasional addition of an annual or a biennial clover, which soon dies out. When this course is pursued, unless the soil is rich and in good heart, the grass is likely to grow thin and far between, producing but half or two-thirds of a crop, whereas the addition in the mixture of a larger number of species, would have secured a heavier burden of a better quality. These considerations, it seems to me, indicate the true direction in which the farmer who wishes to "make two spires of grass grow where one grew before," without impoverishing the soil, should turn his attention.

I hold this proposition to be indisputable, that any soil will yield a larger and more nutritious crop if sown with several kinds of nutritious grasses, than when sown with only one or two species. Indeed, it is a fact well established by careful experiment, that a mixture of only two or three species of grasses and clover, will produce a less amount of hay than can be obtained by sowing a larger number of species together. There may be some exceptions to this rule, as in cases where the yield of Timothy and red top, owing to the peculiar fitness of the soil for these grasses, is as great as can stand on the ground covered by them.

But it is nevertheless true, that if we sow but one kind of grass, however abundantly the seed may be scattered, or on whatever soil it may be, or under however favorable influ ences, yet only a part of the plants will flourish; vacant spaces will occur throughout the piece which will be filled up, after a time, by grasses of an inferior quality, weeds or mosses. This is the case in some degree also, where only two, or a small number of species, are sown; while if a mixture made up of a larger number of kinds of seed is used, the plants will cover the entire surface and produce a far better quality of herbage.

In sowing such a mixture of several different species, we do but follow nature, who after all, will generally be found to be the best teacher, for wherever we cast our eyes over an old, rich, permanent pasture, we ordinarily see from fifteen to twenty species of grass or forage plants growing in social profusion. If the soil be very poor, as a cold, hard clay, or a barren sand, perhaps two or three varieties will suffice, but on good soils a larger number will be found to be far more profitable. Especially is this the case where the land is to be left in grass for some years and eventually be pastured, as is frequently done in New England, for it is then desirable to have grasses that reach their maturity at different times, as a constant succession of good feed throughout the season may thus more surely be obtained. It is well known that there is no month of spring or summer in which some one of the grasses does not attain to its perfection, if we except

the month of March. For good soils, eight or ten species of the grasses, or six or eight of the grasses proper, and one or more of other herbage plants, would probably be found to be profitable.

I am aware that the prevailing practice is decidedly against the use of any thing but Timothy, red top and clover, and that very large crops of these grasses are often raised, but it is nevertheless true that we obtain on an average less than a ton to the acre, while with the same culture and a larger number of species we ought to get double that quantity.

It is not generally considered how exceedingly light the seeds of some species of grass are, and hence one of the mistakes which we most frequently make. In an ounce of red-top seed, for instance, there are no less than 425,000 grains. In a pound there are 6,800,000 seeds; in a bushel, or twelve pounds, there are 81,600,000 seeds. Now suppose we take only one peck of Timothy seed to mix with it. In an ounce of Timothy grass seed there are 74,000 grains. In a pound there are 1,204,000 grains. In eleven pounds, or a peck, there are 13,244,000 seeds, and if we take but four pounds of clover, which is below the average quantity used, we shall find by the same process that we have 1,024,000 seeds. If now we add these sums together, we shall find that we have put upon the acre no less than 95,868,000 seeds! This gives over 15 seeds to the square inch, or about 2,200 seeds to the square foot!

There must be, evidently; an enormous waste of seed, or an extensive destruction of plants, for if we take nature for our guide, we shall not find anything like that amount of plants on an inch or a foot of our grass lands.

It is a well known fact that the sward of a rich old pasture is closely packed, filled up, or interwoven with plants and no vacant spaces occur. Yet, in a closely crowded turf of such a pasture, only one thousand distinctly rooted plants were found on a square foot, and these were made up of twenty different species. The soil should be supplied with a proper number of plants, else a loss of labor, time and space will be incurred; but however heavily seeded a piece may be with

one or two favorite grasses, small vacant spaces will occur, which, though they may not seem important in themselves, when taken in the aggregate, will be found to diminish very considerably the yield of an acre, even if they are so small as not to be perceived. And undoubtedly some allowance should be made for bad seed, and for young plants destroyed by insects, birds and various accidental causes; but even after all deductions for these, we see that there is no deficiency in the quantities of seed used, and the imperfectly covered ground cannot be explained in this way.

Sinclair, too, who had observed carefully and extensively, writes on this point in regard to the practice of overseeding, as follows: "When an excess of grass seed is sown, the seeds, in general, all vegetate, but the plants make little, if any progress, until from the want of nourishment to the roots, and the confined space for the growth of the foliage, a certain number decay, and give the requisite room to the proper number of plants; and that will be according as there are a greater or less variety of different species of grasses combined in the sward."

Time will not permit me to dwell upon this point, but it is worthy the earnest and careful attention of the practical farmer. In the work on Grasses and Forage Plants, already referred to, many mixtures are given for different varieties of soil and location, and this whole subject is more fully developed.

The time of cutting grass is a point on which even judicious farmers differ, but the weight of authority seems to fix upon the period of blossoming, as, on the whole, the best, and our practice in New England is generally conformed to it so far as practicable.

This practice is unquestionably founded on a correct principle, the object of the farmer being to secure his hay so as to make it most like grass in its perfect condition. From principles stated in another place, it has been seen that the nutritive substances of grass are those, which are, for the most part, soluble in water, such as sugar, gluten, and other compounds. Now it is evident that if this is so, the grass should be cut at the time when it contains the largest amount of

these principles. In its early stages of growth it contains a very large per centage of water. From its earliest growth the sugar and other soluble substances gradually increase till they reach their maximum per centage in the blossom, or when the seed is fully formed in the cell. From this period the saccharine matter constantly diminishes, and the woody fibre, perfectly insoluble in water, and innutritious, increases till after the seeds have matured, when the plant begins to decay. Of course, if the plant is not cut in the flower, a great part of the nutriment of its stems and leaves is wasted.

There is another equally instructive suggestion in these transforming processes, and it is this: If grass is cut in a condition ever so succulent, and before the transition of sugar, &c., into woody fibre has commenced, there will even then be some loss of sugar and starch from the action of heat and moisture, especially if the grass is exposed to the rain in the process of curing, and lignification, or change to woody fibre takes place to considerable extent, dependent, of course, on the length of time it is exposed to air and light; so that grass cured with the least exposure to the searching, sifting winds, and the scorching sunshine, is, other things being equal, more nutritious than grass cured slower and longer exposed, however fine the weather may be. In other words, grass overcured in the process of hay making, contains more useless, woody fibre and less nutritive qualities, than grass cured more hastily and housed before being dried to a crisp. There can be no doubt which of the two would be most palatable to the animal. Some loss of nutritive elements must, therefore, take place in the process of curing, however perfect it may be, and the true art of hay-making consists in curing the grass just up to the point at which it will do to put into the barn, and no more, in order to arrest the loss at the earliest possible moment. And this fact of the loss of sugar and starch, or of their transformation into woody fibre by too long exposure to the sun and wind, I think equally well established as that any transformation at all takes place, and as equally suggestive.

Without dwelling upon the new and improved implements employed in securing the hay crop, the mowing machine, the

horse-rake and other valuable additions to the old facilities for haying, I can but briefly allude to the general treatment of grass lands and draw my remarks to a close.

If one thing more than another may be said to lie at the foundation of all real improvement of grass lands, or lands under a course of rotation, it is a proper system of drainage. Especially is this important for low, wet lands, since it not only frees them from superfluous water, thus making them more susceptible of tillage in early spring, but actually increases their temperature several degrees, in some cases as much as from eight to ten, and rarely less than from two to four, and admits the air to circulate more freely around the roots of the plants. The aquatic grasses require large and constant supplies of moisture, and when the soil is changed by drainage, the more valuable species of grass may be introduced and cultivated in it. But one of the most important questions which the farmer of New England has to meet, is the proper treatment of his pasture lands. Many of our old pastures have been stocked hard time out of mind, and the grasses in them have been literally starved out and grow thin of necessity, while, as the finer and nutritious grasses disappear, nature very kindly covers up the nakedness of the soil with moss, as an evidence of the effect, and not the cause of poverty. They are said to be "worn," or "run out." Many of them are grown over with bushes and briars and other equally worthless pests, till they carry but one animal to four or five acres, and often require twice that amount to keep an animal on foot, to say nothing of fattening him. It is a well known saying that "Poor pastures make breachy cattle."

Undoubtedly thousands of acres of pasturage would be far more profitably covered with pines than with cattle, and many an observing farmer is now convinced of this fact. The cultivation of pines will be found to be perfectly practicable on light lands, and a rapid growth of wood, intermixed, as it should always be, with some deciduous growth like the white birch, will be found to be more profitable than the use to which they are now put.

I know many pastures of good strong soil, never ploughed

within the memory of the living, some of which are known not to have been ploughed for a hundred and fifty years, which require from eight to ten acres to a cow, so entirely buried are they in moss and bushes. Such lands can be planted with pines at a small cost, and would soon be covered with a growth which would pay a large per centage on the outlay. I have, during the past season, examined over five hundred acres of cultivated pines in different parts of Massachusetts, varying in age from three months to twenty years, and can testify to the surprising rapidity with which such a plantation will cover the ground, concealing the fact of their being planted by the hand of man, and assuming the appearance of a dense forest. In one instance, the owner informed me, that his plantation had averaged him a cord to the acre every year for twenty years during which it had been planted, while the land, a light barren sand, had apparently been improved, and a thick undergrowth of hard wood was apparently ready to succeed the pine when the opportunity offered. I have seen a growth of pitch pine, made this year, of over two feet six inches in length by measurement, and a growth of white pine, made in the same time, of two feet nine inches.

The idea was formerly entertained that pasture lands were sufficiently enriched by the animals which fed them. Practical men begin to think otherwise, for it is found that a profitable return is made for the little outlay which they require. Particularly is this the case with pastures fed by milch cows. They do not return the essential elements of the plant to the ground in so large a proportion to what they take from it, as some other animals. These elements are required in great quantities to form their milk, while in other animals they are required only to form bone and muscle. The ordure of cows is, therefore, less valuable and fertilizing than that of other animals. The consequence is, that lands fed wholly by cows are exhausted sooner than those fed by other animals. For it is evident that where more is taken from the soil than is returned, exhaustion must follow.

We furnish animal and vegetable matters to the earth, to supply it with substances which the growth of plants has

taken from it. It will be obvious, on a moment's reflection, that the constituent parts of the plant are taken up from the earth and the air, in much the same manner as our food and drink become our bone and flesh. The analogy is still more distinct when we reflect that all our applications for the improvement of the soil, are nothing more than the supply of food for plants. For the food of plants is found in all manures, and the value of these depends upon the quantity they contain.

No doubt it is better to plough and cultivate where this can be done on strong, good soils, which are not too stubborn and rocky. This applies to many lands which have been used as pastures time out of mind, the soils of which are naturally good, but have run out from neglect. Put soil into a good state of culture, and rich and nutritive grasses will flourish as naturally as weeds. The former are nearly as spontaneous on good soils, as the latter are on poor ones. The success will depend chiefly on good culture if this mode is adopted.

Or we may scarify the surface thoroughly with a sharp tooth harrow, sowing on a suitable mixture of grass seeds, and then harrow and brush over again, the work to be done in September or very early in spring, if the surface is hard enough to go over with cattle without too much poaching. This applies to old pastures covered with moss, where the sweet grasses are run out, but which, from their particular location, may not be desirable for woodland, nor pay for a more complete and careful improvement.

Or we may mix the grass seeds as evenly as possible with a finely divided compost and use it as a top-dressing, first harrowing the surface to loosen it, and after spreading the compost, brushing it over with a brush harrow to break up the lumps. This will cost a little more than the preceding method, but the grass seed will start sooner, make a larger and finer growth the first season, and give greater satisfaction. This applies to very much the same class of lands as the preceding. In both cases, if the pasture, or any part of it is covered with bushes, they should of course be cut or grubbed up; if it is wet or covered with stagnant waters,

they should of course be drained off so as at least to leave a dry and healthy surface. It is unnecessary to say that the top-dressing should be free from weed seed, and be in a finely divided state. This method of improvement is perfectly practicable on thousands of acres which are now in a state both discreditable and unprofitable to their owners.

Other methods of improving pasture and mowing lands may be equally available, and the enterprising farmer will not fail to adopt them wherever they are found to be most practicable. Even the farmer of limited means may do something each year towards improving his pasture lands. He may lessen the area of the bushes, he may plough up a small piece, at least, and seed down at once with grass seed and winter rye, either in the spring or in the fall, and in either case his stock will fare enough better to pay for it, and the next year he may take another piece in the same pasture, till the whole is finished, when it will carry more stock, and more stock will give him more manure, and more manure will increase the fertility of other lands, and increased fertility will add to his means of further improvement. The difficulty with most small farmers is to begin. Well begun is half well done, for the moment any real improvement is begun in earnest, the interest is excited, the mental activity is increased, the desire for improvement partakes the nature of a passion, and hence, though the beginning may be small, the ending may be the renovation of the owner as well as the land.

In conclusion, I have another suggestion to make as to the propriety of encouraging the collection of grasses for exhibition at the anniversary festivals of our Agricultural Societies. It would be an easy thing, I think, to engage many in this fascinating pursuit. Some, undoubtedly, would be interested by the simple suggestion, but the offer of small premiums for the largest and best arranged collection would induce others to attempt it who now want something to stimulate them to the work. The premium, however small, might afford the necessary stimulus, and if the interest were once excited, the subject would be still farther pursued, till many others

were interested, while the collections, if properly named would do much to disseminate a higher knowledge of the exhaustless riches of this class of plants.

"The royal rose — the tulip's glow —
The jasmine's gold are fair to see;
But while the graceful grasses grow,
O, gather them for me!

The pansy's gold and purple wing,
The snowdrop's smile may light the lea;
But while the fragrant grasses spring,
My wreath of them shall be!"

FIELD TRIAL

OF

Reapers, Mowers, and Implements,

AT

SYRACUSE, N. Y.

FIELD TRIAL

OF

REAPERS, MOWERS, AND HARVEST IMPLEMENTS.

PRELIMINARY ARRANGEMENTS.

The National Trial of Reapers, Mowers, and other Harvest Implements, was held in accordance with the decision of the United States Agricultural Society, (at its annual session for 1857,) that its awards on Agricultural Implements or Machinery should be based upon a "*Practical Working Trial* of the same in the field." As there could be no opportunity for testing Reapers, Mowers, and other Harvest Implements at the Annual Exhibition of the Society, which was to take place during the first week of September, the Executive Committee sanctioned a proposition from the Implement Committee to have a separate trial of this important class of agricultural machinery at a time when they could be thoroughly tested. The central portion of the State of New York was fixed upon as a desirable locality, and after considering the liberal offers of facilities and co-operation made by various towns and cities, Syracuse was selected. Its position is central, and accessible by direct railroad communication with all of the great grain-growing regions — its hotel accommodations are ample — large grain fields in close proximity to the city were liberally proffered for the trial — and the citizens generously offered to charge themselves with any excess of expenditure over the receipts from entrance fees, should any occur. The preliminary arrangements were made, and an extensive correspondence with implement manufacturers was carried on (under the supervision of President Wilder,) by Henry

S. Olcott, Esq., of the Westchester Farm School, who had been delegated by the Implement Committee.

At a meeting of the Executive Committee held at Albany, on the 30th of May, a Board of Judges was selected from the States most directly interested in the use of Harvest Machines. A large majority of these gentlemen accepted the appointment and attended — others were substituted for those who could not do so — and the list, as corrected, was as follows:—

BOARD OF JUDGES.

John Stanton Gould, Hudson, New York, *Chairman;* Seth Scammon, Saco, Maine; Brooks Shattuck, Manchester, N H.; Sanford Howard, Boston, Mass.; Elisha R. Potter, Kingston, R. I.; T. S. Gold, West Cornwall, Conn.; John J. Thomas, Union Springs, N. Y.; George Hartshorne, Rahway, N. J.; Frederick Watts, Carlisle, and J. L. Darlington, Westchester, Pennsylvania; John Jones, Middleton, Del.; Francis P. Blair, Silver Spring, Md.; H. K. Burgwyn, Halifax, N. C.; William A. Gill, Columbus, and J. T. Worthington, Chillicothe, Ohio; Horace Capron, Alden, Ill.; Lewis Wooster, Mackford, Wisconsin; and William Duane Wilson, Mount Pleasant, Iowa.

J. E. Holmes, of Newark, Ohio, a practical mechanic, experienced in conducting Implement Trials, and versed in the science of machinery, was chosen Superintendent, and a member *ex-officio* of the Board of Judges.

The citizens of Syracuse, at preliminary meetings, appointed the following

LOCAL OFFICERS.

Committee of Arrangements. — John B. Burnett, Elijah Clark, James M. Ellis, B. F. Colvin, J. C. Woodruff, John Hayden, and A. Benedict.

Committee of Reception. — His Honor Mayor Williston, Hon. Harvey Baldwin, M. D. Burnett, George Geddes, Hiram Putnam, Seth Hutchinson, J. R. Lawrence, Hon. A. P. Granger, Hon. E. W. Leavenworth, Major J. E. Heron, James Crouse, John Crouse, J. F. Sabine, P. Lynch, Harvey Loomis, William J. Hough, A. C. Powell, James Noxon, B. Davis Noxon, Thomas G. Alvord, James Lynch, D. McCarthy, R. Furman, T. B. Fitch, Hamilton White,

H. W. Chittenden, R. Hebbard, D. Pratt, George Stevens, D. D. Hillis, Dr L. Clary, H. W. Van Buren, William C. Clark, W. H. Shankland, Charles B. Sedgwick, Daniel Dana, and Charles Pope, Esquires.

Chief Marshal. — Major James M. Taylor. *Aids.* — Gen. R. M. Richardson, Major E. T. Wright, and Capt. Silas Titus. *Assistants.* — D. P. Wood, Dr. William H. Hoyt, James Geddes, Col. J. D. Hawley, George Hosmer, O. E. Bussey, P. H. Hinsdale, Major B. Davis Noxon, Jr., Thomas Earl, Capt. H. D. Hatch, William Luther, Major R. W. Pease, George D. Cowles, Walter M. Dallman, Col. R. F. Stevens, Legrand Sherwood, Agustus Avery, Alfred Colvin, O. D. Clark, Dr. L. F. Warner, Lyman J. Midler, Col. N. Chase, Silas J. Chasbro, M. S. Price, Edward Pierson, and C. C. Bradley.

The New York State Agricultural Society, in response to a special invitation from the Executive Committee, appointed a Committee to attend the Trial. Other Visiting Committees were present, from State and County Societies.

The Onondaga County Agricultural Society placed its spacious Fair Grounds, situated near Syracuse, at the disposition of the United States Society.

THE OPENING CEREMONIES.

At an early hour on the beautiful morning of the 14th July, the Onondaga County Fair Grounds were thronged with Farmers and Mechanics, critically examining the various machines, calculated to relieve the burthensome toil of the husbandman. The exhibitors of the machines were preparing for the contest, or explaining to the groups of spectators the peculiar mechanical principles by which they hoped to triumph over their competitors.

President Wilder arrived on the grounds at eleven o'clock, A. M., escorted by the Chief Marshal and his Assistants, whose neat uniform dress, good horses, and efficient services were a subject of general commendation throughout the Trial.

His Excellency Governor King, of New York, (a member of the Executive Committee,) was escorted to the grounds by the Syracuse Dragoons and Light Artillery. He was accom-

panied by His Excellency, Governor MOREHEAD, of Kentucky, and by ex-Governor CLARK, of New York. Many other distinguished gentlemen were present, including the entire Executive Committee and Delegation of the New York State Agricultural Society, Delegations from Agricultural Boards and Societies, the Judges, Officers, and Members of the United States Agricultural Society, Editors of Agricultural and News papers, and others interested in the great cause of Agriculture.

At noon President WILDER, accompanied by the invited guests, repaired to the speaker's stand, erected on one side of the track. Opposite, on the other side of the track, were elevated tiers of seats, crowded with spectators. The machines then moved around the course in procession, headed by the Marshals, under direction of Mr. Superintendent HOLMES. It was literally an industrial army, ready for a strife which, although peaceful, would decide important questions, and win high honors for the victors. After having passed twice around the track, the procession was halted before the speaker's stand, and Mr. Superintendent HOLMES announced that the preliminary arrangements had all been completed.

President WILDER then advanced to the front of the stand, and (after the cheering with which he was greeted had subsided,) delivered, in a clear tone, and with his usual dignified earnestness of manner,

THE INAUGURAL ADDRESS.

Farmers, Mechanics, Friends and Fellow-Citizens:

We have assembled for a most interesting purpose, for an object commensurate with the vast extent of our national domain and corresponding in its character with the great progressive and practical elements of our age, activity, enterprise and improvement.

In illustration of this sentiment it was resolved at the last annual meeting of the United States Agricultural Society in Washington, that its awards on agricultural implements should hereafter be based on a working trial. In conformity with this resolution, the Executive Committee ordered two Exhi-

bitions in this department the present year, one at the North, the other at the South; the first in the State of New York, on account of her facilities for communication with all parts of the country, and the encouragement afforded to this enterprise by her intelligent citizens; — the second in Kentucky, from the great interest which she has manifested in the welfare of this Society, and the liberal provision which the citizens of Louisville have made for its next Annual Exhibition.

We are here, therefore, gentlemen, not for amusement, but for work, to make a trial of Agricultural Implements in the field; to satisfy ourselves, and to demonstrate to the world how our immense grass and grain crops can be gathered with the least labor and expense, and also to encourage genius by rewarding superior merit and skill. [Applause.]

The fact is now established beyond all reasonable doubt, that the use of machinery in agriculture as in every other department of labor, is a great blessing to society. It developes the skill and gives employment to the inventor and manufacturer, it saves labor and expense to the producer, and reduces the price of commodities to the consumer. It is, therefore, beneficial to all, injurious to none.

Mowing and Reaping Machines may seem to some to be a modern invention, but they are only an illustration that there is "nothing new under the sun." Many a classical scholar has read the description which Pliny the elder gives of such machines working upon the plains of Gaul in the middle of the first century of the Christian dispensation. The records of the Old Colony of Massachusetts Bay, in New England, contain the following account of a patent granted to Joseph Jencks, in 1655, for a "machine for the more speedy cutting of grasse, for seven years, &c., &c.:"

"In answer to the motion of Joseph Jencks, Sen., it is ordered, that Joseph Jencks, Sen., and his assignees only shall have liberty granted to them to make that engine the said Jencks hath proposed to this Court, for the more speedy cutting of grass, for seven years, and that no inhabitant or other person within this jurisdiction during that time shall make or use any of that kind of engine without license first obtained

from the said Joseph Jencks, on the penalty of five pounds for every such engine so made or used, to be recovered at any Court in this jurisdiction by the said Joseph Jencks, Sen., or his assignees."

Reaping machines were in use in England towards the close of the last century. Several patents had been secured, but no very marked progress had taken place until towards the middle of the present century. A new era then commenced, and the entry of our American machines in the London Fair, awoke and directed to improvement in this department the inventive genius of America and Europe.

Much time, experience, and large expenditure have been involved in the production of improved implements of husbandry. Consider for how many centuries, capital, science and practice have been at work to produce our present model ploughs. But the dispatch of our time requires a more rapid march towards the culminating point of excellence in this department of human industry.

The worthy iniatory steps which have been taken in this direction by the New York State Agricultural Society, by the Massachusetts Society for the Promotion of Agriculture, and other kindred associations, have prepared the way and created a demand for this great National Trial, a trial which is to subject every machine to the most careful and candid examination, and to the rigid scrutiny of competent judges, and thus to inspire the confidence of our farmers in the application of machinery to their labors, to place at their disposal the best implements now in existence, and also to give a fresh impulse and a wise direction to that inventive genius, which shall hereafter produce, if possible, those of a still higher excellence.

The importance of these labor-saving machines to the cause of American agriculture, it is scarcely possible to overrate, and the degree of excellence which we have already attained is a distinguished national honor. What American does not feel a generous pride in the success of these implements at the great Industrial Fairs of Europe, especially in our Ploughs Reapers and Mowers, distancing all competition and exciting the astonishment and admiration of the world?

For these honors we would not forget our special obligations to you, Gentlemen, the inventors and manufacturers of these implements. We welcome you as the authors and almoners of these blessings, as the benefactors of mankind. You have promptly and generously responded to our call, and have come up here as "Greek met Greek," in the ancient Olympic games. It was not the simple sprig or wreath of myrtle which fired their ambition, but the love of approbation, the desire to inscribe their names upon the roll of fame. But you are here for higher and nobler purposes, to relieve the fatigue of labor, to aid the conquest of mind over matter, to ameliorate the condition of your fellow-men, to make valuable contributions to the cause of civilization and improvement. Those who shall be crowned with success in this exhibition, we trust will bear in mind that it is not the intrinsic, but the relative value of these national prizes which gives them pre eminent importance. Those who obtain no other prize will certainly enjoy the high satisfaction of increasing an honorable competition, multiplying facilities for improvement, and brightening the prospect of victory, on the return of our next annual contest.

From the competitors I turn to you, gentlemen, who are to decide between their rival claims. Your responsibilities are indeed numerous and weighty, calling into service your scientific acquisitions and practical tact, and demand patient and thorough investigations. I shall not attempt to instruct you minutely in reference to your duties. There are a few points, however, to which I deem it important that your special attention should be directed.

1. Simplicity of construction.
2. Durability.
3. Cost of machine.
4. Effective power—or power required for a given amount of work, including the necessary attendance.
5. The rate of motion, or what a machine will accomplish under an ordinary rate of speed for daily work.
6. Quality of work, or the manner of leaving the grass and grain.

7. Facility of management.

8. Any machine possessing special points of excellence, although as a whole it may be inferior, such special advantages should be noted, and a diploma awarded therefor.

Under these general heads, it will be obvious that there are many subordinate qualities to be considered, but with these brief instructions, I commit to you the issue of this trial. The soundness of your judgment and the integrity of your character are a sufficient guarantee that you will discharge the delicate and difficult trust confided to you in a manner honorable to yourselves, to the Association for which you act, and so as to command the confidence and respect of all.

Friends and Fellow Citizens: I congratulate you on the presence of so many distinguished agriculturists, citizens of other States, and representatives of kindred associations, who have come up here to engage and to co-operate with us in our laudable enterprise. But our special acknowledgments are due to the Chief Magistrate of this Commonwealth, a faithful and zealous supporter of our own institution from its beginning, whose hand helped rock the cradle of its infancy, whose wise counsels have aided in nurturing it into an auspicious manhood, and who, in the Council Chamber and in the field, at home and abroad, is honored and loved as the tried and faithful friend of the farmer. [Applause.]

Most heartily do we rejoice in the presence of His Excellency the Governor of Kentucky, that once "dark and bloody ground," now one of the most beautiful, fertile and prosperous States of the Union. [Applause.]

Our thanks are also due to the New York State Agricultural Society, (an institution second to no other in the country for valuable contributions to the cause of American Agriculture,)for the presence of its able Secretary and Executive Board on this occasion. We also tender our sincere thanks to the Onondaga County Society for the use of these, their grounds. And last, though not least, we render our most grateful acknowledgments to the good people of Syracuse for their guarantee fund, and for the ample provi-

sion which its local committees and citizens have made for our reception and accommodation. [Three cheers for Syracuse.]

Gentlemen, much as I value this interchange of opinion and experience among our farmers, an ample opportunity for which will be afforded in the evenings of the days of our sessions, yet let me not be unmindful of my own proclamation that we have met for work rather than for speech-making or amusement. We are here to decide questions of vital practical importance, to illustrate the advantages of the application of machinery to the arts of cultivation, and among the numerous inventions to designate that which is best suited to a particular purpose.

When we consider the great extent of our fields of grass and grain, the vast agricultural resources of our rapidly increasing national farm, the labor, capital and intelligence requisite for the development of these, the diversion of human energy to other departments of industry, the question comes home with augmented force, how are our bountiful harvests to be gathered, with a suitable regard to the economy of labor, and to the preservation of the crops? There is but one satisfactory reply — *by the improved implements of husbandry — by a substitution of the labor of domestic animals for that of mankind, and ere long by the application of "steam wrought and steam impelled machinery."*

The commendatory announcement by the press of this exhibition throughout the land, and the gathering of this concourse of our intelligent yeomanry, together with inventors and manufacturers from this and other countries, the lightning and the press ready to convey the report of the progress and result of this experiment to millions of readers anxiously in waiting for it, bear concurrent testimony to the universal interest, general utility and paramount importance of this trial.

Gentlemen, the time has arrived when this experiment should commence. Let us therefore leave the forum for the field of action. Let our presence and approbation encourage the enterprise of competitors — the skill of the mechanic and the genius of the inventor — and thus let us continue to perfect the industrial arts and promote the welfare of the farmer,

the true interest of the American people. [Continued Applause.]

REMARKS OF GOV. KING.

Governor KING having been loudly called for, came forward, and was greeted with hearty cheers. He had attended, he said, not in his official character as Chief Magistrate of the State, but as a farmer, deeply interested in the trials about to take place, and as a member of the United States Agricultural Society, ever ready to co-operate with, and to support, to the extent of his abilities, the indefatigable President. It was only those who endeavored to lighten the labors of the distinguished gentleman who so ably presides over this, (as he does over every festival which he projects,) that could appreciate the extent or the value of his self-sacrificing exertions — exertions which merit the gratitude of every true friend of agriculture. Long may he fill his present honorable position. [Continued applause.]

After speaking of the progress of agriculture in the State of New York, Gov. King complimented the farmers of Onondaga county for their enterprise and industry. It was evident, from what was visible on every hand, that farmers were learning the science of agriculture as well as the art — the principles of it as thoroughly as the practices.

In conclusion, Gov. King heartiily endorsed the objects for which the audience had assembled, coming from many States and from all sections of the United States, and he called upon every one — as his countrymen — to join in the good work, emulating each other in the peaceful struggle in which they were engaged. [Applause.]

REMARKS OF GOV. MOREHEAD.

Governor MOREHEAD, of Kentucky, was then loudly called for, and on coming forward was greeted with three rounds of cheers. He had no anticipation, (he said,) of being called upon to say a word. He had come to see and not to talk. But he must thank the distinguished President of the United States Agricultural Society, (Col. Wilder,) for the very com-

plimentary manner in which he has alluded to himself, and the State which he represented here. The State of Kentucky is an agricultural State, and her people look with pleasure upon exhibitions of this character wherever they take place, for they believe that whatever promotes the agricultural interest of any one State or section, advances the agricultural interest of the whole confederacy of States. [Applause.] In agriculture, as in many other respects, there is an unmistakeable identity between the States of New York and of Kentucky, and the people of the latter State will ever cordially second the efforts of the people of New York in their onward march of prosperity. [Applause.] He hoped to see and to aid in welcoming many citizens of the State of New York at the Annual Exhibition of this Society, which was to be held at Louisville in September. [Cries of "We'll come."]

The people of Kentucky, Sir, have also an interest in the welfare and the continuance of the American Union. [Applause.] You have eloquently referred to our State, sir, as having once been "the dark and bloody ground." Now, in their stead, she presents smiling fields, and is inhabited by patriotic citizens, who love and who cherish our common country, but should the time ever come when fratrical blood is to be shed — when men from different sections meet in an unholy civil war — Kentucky will again be "bloody ground," for her sons will stand true and steadfast in defence of the Union of these States. Yes, Mr. President, there is not a drop of blood in the hearts of my fellow citizens at home — not a drop of water that trickles down the hill-sides of Kentucky, nor a breath of air that stirs around them, that is not redolent with feelings of devotion to the Union of the United States. [Applause.]

THE COLLATION.

After the conclusion of the opening ceremonies, the invited guests, Board of Judges, and officers of the Society retired to the President's marquee, where Col. Wilder welcomed them to a bountiful collation. When it had been duly discussed, a procession was formed, in which the mow,

ing machines were placed, and all moved off to commence

THE TRIALS IN THE FIELD.

[The trials, and the arrangements therefor have been so ably and accurately described in the Report of the Board of Judges, that it would be a work of superrogation to allude to them here.—*Secretary.*]

THE IMPLEMENT COMMITTEE.

The "Implement Committee," under whose immediate direction the "Practical Working Trials in the Field" were made, consisted of

GEN. TENCH TILGHMAN, OXFORD, Md., *Chairman.*
JOHN D. LANG, VASSALBORO', Maine.
HON. HENRY WAGER, ROME, New-York.
JOSEPH A. MOORE, Esq., LOUISVILLE, Kentucky.
GEORGE E. WARING, JR., Esq., NEW-YORK, N. Y.
A. G. MUNN, Esq., LOUISVILLE, Kentucky.
H. S. OLCOTT, Esq., MOUNT-VERNON, N. Y., *Secretary.*

The Committee (with the exception of Gen. Tilghman, who was unavoidably absent,) were at Syracuse during the Trial of Harvest Implements, and rendered important service by their active co-operation in the Field. They also matured their arrangements for the trial of other implements at Louisville, Kentucky, and made some important suggestions on the Field Trials of Harvest Implements, which will be found in their Report.

EVENING AGRICULTURAL DISCUSSIONS.

Meetings were held in the large hall of the Voorhees House every evening during the continuance of the trial, for the discussion of agricultural topics. On Tuesday evening, gentlemen from twenty-two different States gave interesting off hand reports of the growing crops in these States, and on Wednesday evening, the subject being "Grasses," a valuable paper was read by Sanford Howard, Esq., of Boston. Much useful and novel information was elicited and diffused at their meetings.

MACHINES REGULARLY ENTERED.

(Taken from the Secretary's Entry Book.)

MOWING MACHINES.

Inventors.	*Owners.*	*Residences.*
Pells Manny,	Pells Manny,	Freeport, Ill.
J. E. Heath,	A. H. Caryl,	Boston, Mass.
William F. Ketchum,	William F. Ketchum,	Buffalo, N. Y.
E. Ball,	Ball, Aultman & Co.	Canton, Ohio.
Aultman & Miller,	Ball, Aultman & Co.	Canton, Ohio,
J. H. Manny, with Wood's improvement,	Walter A. Wood,	Hoosick Falls, N. Y.
J. H. Manny, with Wood's improvement,	Walter A. Wood,	Hoosick Falls, N. Y.
Thomas D. Burrall,	Thomas D. Burrall,	Geneva, N. Y.
Martin Hallenbeck,	Martin Hallenbeck,	Albany, N. Y.
William A. Kirby,	Buffalo Agricultural Machine Works,	Buffalo, N. Y.
William H. Hovey,	William H. Hovey,	Springfield, Mass.
R. L. Allen,	R. L. Allen,	New York City.
J. E. Newcomb,	Pruyn & Lansing,	Albany, N. Y.
Moore & Patch,	Miller, Wingate & Co.,	Louisville Ky.
*C. H. McCormick,	C. H. McCormick,	Chicago, Ill.

MOWING AND REAPING MACHINES, COMBINED.

Pells Manny,	Pells Manny,	Freeport, Ill.
A. H. Caryl,	A. H. Caryl,	Boston, Mass.
William F. Ketchum,	William F. Ketchum,	Buffalo, N. Y.
J. H. Manny, with Wood's improvement,	Walter A. Wood,	Hoosick Falls, N. Y.
Seymour & Morgan,	Seymour, Morgan & Allen,	Brockport, N. Y.
Thomas D. Burrall,	Thomas D. Burrall,	Geneva, N. Y.

* Mr. McCormick's machine arrived too late for trial.

Inventors.	*Owners.*	*Residences*
William A. Kirby,	Buffalo Agricultural Machine Works,	Buffalo, N. Y.
Warder, Brokaw & Child,	Warder, Brokaw & Child,	Springfield, Ohio.
Obed Hussey,	T. R. Hussey & Co.,	Auburn, N. Y.
Ketchum & Hull,	Hull & Sanford,	Poughkeepsie, N. Y.
Moore & Patch,	Miller, Wingate & Co.,	Louisville, Ky.
John S. Wright,	Rufus Dutton,	Dayton, Ohio.
R. L. Allen,	R. L. Allen,	New York City.
Dietz & Dunham,	Fred'k J. Frelinghausen,	Raritan, N. J.

REAPING MACHINES.

Pells Manny,	Pells Manny,	Freeport, Ill.
Jonathan Haines,	Jonathan Haines,	Pekin, Ill.
J. H. Manny, with Wood's improvement,	Walter A. Wood,	Hoosick Falls, N. Y.
Seymour & Morgan,	Seymour, Morgan & Allen,	Brockport, N. Y.
Thomas D. Burrall,	Thomas D. Burrall,	Geneva, N. Y.
Warder, Brokaw & Child,	Warder, Brokaw & Child,	Springfield, Ohio.
Jerome Atkins,	Rufus Dutton,	Dayton, Ohio.
Moore & Patch,	Miller, Wingate & Co.,	Louisville, Ky.
C. H. McCormick,	C. H. McCormick,	Chicago, Ill.

REPORT.

To Hon. Marshall P. Wilder, President of the United States Agricultural Society:

The Board of Judges appointed by the Society to conduct the trial of Mowers and Reapers, at Syracuse, assembled at that place on the 13th day of July, 1857, and, in obedience to your instructions, proceeded to test and compare the various Machines presented for that purpose, until Monday, the 20th instant, when we finished our examination of them. Of the results obtained by us, and the methods by which they were ascertained, we beg leave to offer the following

REPORT:

Since immense pecuniary interests are involved in trials of this character, and with a hope to aid other Societies in conducting their trials with more thoroughness and accuracy, than has hitherto characterized them, (except the trial at Geneva, by the New York State Society, in 1852,) we propose to speak of our arrangements with more minuteness of detail than would otherwise be necessary.

The General Superintendent, the Chairman of the Committee of Judges, and Mr. Sandford Howard, were on the ground during the preceding week, engaged in laying off the grounds into lots, testing the dynamometers, and side draft guage, and preparing, so far as they could do beforehand, the tests to be employed in the trials.

We strongly recommend that in future trials, this preliminary labor may receive the strictest attention. While the trials are in actual progress, the faculties of all concerned

are wholly absorbed in watching their performance, and in recording the facts as they disclose themselves. Every thing that calls off the attention of the Judges from the working of the machines, is very certain to cause the omission of some material fact in their note books, and the continuity of the whole chain of observation is broken by the absence of a single link.

It should be adopted as an inflexible rule, by all Societies that institute trials of agricultural implements, that no machine should be entered later than one week preceding the trial, and that none be admitted to entry without the payment of the amount fixed upon as an entrance fee. Very many machines were entered for the trial at Syracuse, and ample preparations made for them by the Society, whose proprietors found their courage oozing out at their fingers ends before the hour of trial came. Had the money been paid on entry, this disposition to shrink would have been greatly counteracted and much extra labor and confusion of plans would have been avoided.

Lots of equal size should be accurately surveyed, corresponding in number with the entries; they should be plainly distinguished by stakes three and a half feet long, two and a half inches wide, and three-fourths of an inch in thickness; a strip of white cloth, three inches wide and a foot long, should be fastened to the top; and the number distinguishing the lot, distinctly painted in black on the upper part of each stake. A strip of land six feet wide, ought to intervene between each lot, which should be cut out by a scythe or cradle, before the trial begins. The want of this latter precaution was severely felt by us, — disputes were constantly arising between exhibitors, respecting narrow strips of grass lying on the boundaries of their respective lots, the swath of one exhibitor retarded the operations of another, while some of the exhibitors, mistaking their terminal stakes, ran diagonally, instead of directly, across their lots, which compelled them to cut over their own swaths, thus increasing their liability to clog. The interests of the owner of the

lot, of the exhibitors, and the judges, alike demand the precaution above spoken of.

When the field is so situated that one end of the trial lot cannot be seen from the other, straight bean-poles, with white flags, ought to be provided and placed on the line on the ridges of the intervening hills. Indeed, it is desirable in all cases to have an adequate supply of these poles on hand, as cases are continually arising where they are required.

Blank books and pencils must be provided for the judges, otherwise the minutes will be kept on loose papers, subject to obliteration by rubbing, and to loss. Small as this item of precaution may appear, the whole of the objects of the trial may be frustrated from the neglect of it.

Badges are required, that the persons of the judges may be readily distinguished on the field. That used by us, was a blue rosette with a button attached to the back, by which it was easily fastened to a button-hole on the lappel of the coat — this is far more convenient than the usual fastening with pins.

Dynamometers, (an instrument for measuring side-draft,) a speedometer, a measuring tape one hundred feet long, and two of five feet long, two two-feet rules, a pair of compasses, and a sector, a large platform scale, and a pair of smaller scales, are necessary for applying the desired tests; and it is desirable to have a carpenter on the ground with his tools, during the pendency of the trials, especially those with the dynamometer. It is also very desirable that the judges familiarize themselves with the use of the instruments, so that there will be no hesitation or uncertainty during the progress of the trial.

No pains should be spared in perfecting the preliminary arrangements, as, on their completeness, the accuracy of the trials will very materially depend.

Interests of great magnitude, both to the manufacturer and to the farmer, are put at hazard, and all concerned are morally bound to take every precaution against error, and every security for the discovery of truth. As an illustration of the magnitude of the interest of inventors, in these trials,

nothing can be more convincing than the result of the Geneva trial of the New York State Agricultural Society, in 1852.

The taker of the first prize there, was at that time a poor man. Last year a single manufacturer informed us that he had paid to the legal representatives of the inventor (now deceased) of that machine, one hundred and seventeen thousand dollars for the use of the patent right for machines manufactured and sold by him within the year. Another manufacturer informed us that he had paid twelve thousand dollars last year to the same parties, for patent rights on machines sold by him. Probably not less than one hundred and fifty thousand dollars were paid during the last year for the use of that patent; and a much larger one will be paid during the present one.

It is obvious that the greatest care should be taken, on the one hand, to give every opportunity to develop the good points of each machine; and on the other, to expose every thing that is wrong, for the protection of the farmer.

The interest of farmers, and most emphatically of farmers' wives and daughters, in these machines, is, in the aggregate, still greater than the manufacturers. An estimate by a committee of the New York State Agricultural Society, of the cost of cutting and curing a ton of hay with a scythe, or with a machine, shows a saving of *seventy-five* cents a ton in favor of the latter. A more careful comparison would show a still greater saving. The diminution of the number of hands employed in harvesting, lightens the labors of the females of a farmer's family very greatly, at a period when their energies are already taxed to the utmost. The food consumed by extra hands, is also saved. The grass being evenly spread by the machine, dries, and is ready to put into cock much sooner than when cut by a scythe; and is therefore less subject to injury from dews and rains. Chemical philosophy and practical trial, alike concur in proving that the greatest amount of nutritive matter is secured in hay when the grass is cut while in blossom. Since this period is a very brief one, farmers having large meadows to cut, are unable to secure a great proportion of their crop while it is in the best condition, if it is done by hand; but the more

rapid action of the machine enables them to cut the whole while in the most perfect state. It is now well settled, that good machines will cut more grass from an acre than a scythe can possibly do, — probably the best machines will average one twenty-fifth more to an acre than the best scythe-cutting; or, a machine will cut twenty-six tons of hay from ground where a scythe could only obtain twenty-five tons.

These advantages were not taken into the calculation which measures the superior economy of mowing machines by seventy-five cents a ton. If they are admitted, they will largely increase the pecuniary difference between the two modes of cutting.

Without insisting on these latter advantages, and assuming seventy-five cents as the true measure of the difference, we find that the substitution of these machines for scythes will effect a saving of ten millions, three hundred and seventy-eight thousand, nine hundred and eighty-one dollars to the United States; two millions, seven hundred and ninety-six thousand five hundred and ninety-seven dollars to the State of New York; one million, three hundred and eighty-two thousand, one hundred and twenty-six dollars to the State of Pennsylvania; and one million and eighty-two thousand, three hundred and fifty-six dollars to the State of Ohio.

Suppose a machine to be invented which will effect a farther saving of twenty per cent. over the best of those now in use, the annual saving effected by such machines in the United States would be, two millions, seventy-five thousand, seven hundred and ninety-six dollars; in the State of New York, five hundred and fifty-nine thousand, three hundred and eighteen dollars; and in the State of Pennsylvania, of two hundred and seventy-six thousand, four hundred and twenty-four dollars. Should the farmers of the United States use a machine twenty per cent. worse than the best of those now in existence, they would sustain a corresponding *loss*. There was much *more* than twenty per cent. difference between the machines exhibited at Syracuse; and this fact conclusively shows how deeply the farmers of our country need a reliable guide in purchasing mowing and reaping

machines, and how necessary it is that bodies, charged with the responsibilities of affording them such a guide, should spare no effort to ascertain the truth, the whole truth, and nothing but the truth, respecting their operations.

[A List of Entries, taken from the Secretary's Book, is on page 135 and 136.]

At two o'clock on Monday, July 13th, all the Judges assembled, who had arrived at Syracuse. They agreed to divide themselves into nine Sub-Committees, viz: —

1st, on Grain and Grasses. 2nd, on Description. 3rd, on Mechanical arrangements. 4th, on the Quality of the Work performed. 5th, on Stubble. 6th, on Time. 7th, on Dimensions. 8th, on the Weight and Price of Machines. 9th, on the Dynamometer and Side Draft Guage.

The Sub-Committees were appointed as follows: —

Sandford Howard and John Jones, on Grain and Grasses.

John F. Thomas, on Description.

J. E. Holmes, Wm. A. Gill and B. Shattuck, on Mechanical arrangement.

H. Capron, J. L. Darlington and S. Scammon, on Quality of Work.

J. T. Worthington and Wm. Duane Wilson, on Stubble.

E. R. Potter, F. P. Blair and H. K. Burgwyn, on Time.

J. T. Worthington and Wm. Duane Wilson, on Dimensions.

J. T. Worthington and Wm. Duane Wilson, on Weight and Price.

John Stanton Gould, on the Dynamometer and Side Draft Guage.

It was agreed that stubble could not be cut closer than three inches, without injury to the meadow, and that no credit be allowed for a shorter cut.

Eight o'clock A. M. was agreed on as the hour for beginning; from half-past twelve to one o'clock, for lunch; and six o'clock P. M. for leaving off. Blank books, containing the instructions to each Sub-Committee, were then distributed, and the Judges proceeded to the show grounds of the Onondaga County Agricultural Society, where the machines were collected, to make such preliminary observations and com-

parisons as could best be made when the machines were at rest, and contiguous to each other.

Subjoined is a copy of the instructions to the Sub-Committees: —

The Committee on Grains and Grasses will describe, —

1st. The kinds of Grain and Grass in each field.

2nd. If there is a mixture of Grains, or different kinds of Grass, the Committee [illegible] of the several kinds, and the proportion which each kind bears to the total amount.*

3rd. State the average length of each kind of Grass and Grain.

4th. State the kinds of Weeds growing among the Grain, their proportions, and average length.

5th. Estimate the total amount of Grass or Grain per acre by measuring a small area of which an acre is an exact multiple, weigh the Grass or Grain on such area, from which weight the amount on an acre may be calculated.

The Committee on Description,

1st. Will give a general description of each machine.

2nd. They will take care to describe such portions of each machine as constitute its individuality, and on which it founds its claim to a preference.

3rd. If there are any departures from established mechanical principles they will point them out, and give their reasons for their opinions in full.

4th. They will especially take notice of all contrivances for throwing in and out of gear, for facilitating the grinding of the knives, for making repairs in the field, for adjusting the driver's seat, for raising the cutter over obstacles, for diminishing the space occupied by the machine when out of use, for simplifying the parts, and for the avoidance of fracture.

The Committee on Mechanical Arrangements will ascertain and record, —

1st. The number of horses required to work the machine.

2nd. The number of men: in what capacity they are employed.

3rd. The kind of materials employed in the construction of each machine, and your opinion of their durability.

* It is recommended that the relative amounts of each kind of Grass be ascertained as follows: — Select a handful of Grass from various parts of the field so as to secure as near an average distribution as possible. Weigh each handful separately; separate the different Grasses in each, and weigh each kind. The ratio of the weight of each kind of Grass to the total weight of all the handsful, will represent the proportion of each kind in the whole field.

4th. Carefully examine the workmanship of each machine, and state minutely the nature, locality and probable consequence of each defect.

5th. State what metals are used in the journal bearings. When compound metals are used, state the proportions of each.

6th. After the machine has been used, observe what parts have been heated, and to what extent.

7th. Examine them carefully after they have been used to see if any part has been unduly rubbed or worn.

8th. Observe the facilities for oiling each part of the machine, and for easiness of access to each bolt, screw, and nut.

9th. What provision is made for cutting stubble at different lengths.

10th. In what manner are the gavels delivered, behind or at the side.

11th. Describe the arrangements for moving machines from place to place. Give your opinion of their relative portability and compactness.

12th. What contrivances are adapted to secure the safety and convenience of the driver.

13th. Observe the bearing of each machine on the necks of the horses while it is in operation.

14th. Give your opinions respecting the ability of each machine to work under a load of grass in passing over soft ground.

The Committee on Quality of Work, —

1st. Will assume the number 40 as the best work that can be done; 30 as the best that can be done with the scythe; 20 as inferior to any work that would be tolerated by a respectable farmer. The gradations of work will be expressed by numbers intermediate to these.

2nd. They will pay particular attention to the speed of the machine at the time of clogging. For this purpose they will be furnished with a speedometer, which, in connexion with the time occupied, will enable them to ascertain the minimum speed at which each will operate usefully.

3rd. They will observe the evenness of the cut — whether it is higher at one end than the other, and whether it is scalloped.

4th. The condition of the grass after it is cut: whether it is evenly spread, or in ridges. The machine which leaves the grass in the best condition for drying, is the most perfect.

5th. Observe the closeness with which the machine cuts up to obstacles, such as stones, trees, stumps and fences.

6th. State the condition in which the machine leaves the gavels; whether in the best condition for the binder, or not.

7th. Is the grain beaten out of the head by the action of the machine.

The Committee on Stubble will carefully observe, measure, and record the following items: —

1st. The length of stubble left by each machine.*

2nd. Observe any spears of grass drawn out by the roots, and if any are thus drawn out, state as nearly as may be, the pro portion.

3rd. State the condition of the grass, with respect to wetness or dryness.

4th. Notice whether the stubble is drawn forward by the action of the machine, or whether it is left as the plant originally developed itself.

5th. What is the appearance of the cut on the end of the stubble. Is it clean, or torn off.

The Committee on Time, —

1st. Will note the exact time of starting of each machine.

2nd. They will observe the time of each stoppage, and state its cause, specifying those which were occasioned by fault of the machine, by care of the machine, and those which were not connected with the machine.

3rd. The time of final stoppage of each machine.

4th. In the dynamometer trials, they will note the exact length of time the instrument is applied to the machine while in motion.

5th. In the trials of minimum speed in cutting, they wil note the exact time during which the machine is passing over a given space.

The Committee on Dimensions will make the following measurements: —

1st. The length of cut. This measurement will be in all cases the length of the knife, and not the grass gathered by the divider.

* Numerous measurements should be taken in at least ten different portions of the lot, and the average taken.

2nd. The diameter of the driving wheel.

3rd. Breadth of driving wheel. State if the wheel is smooth on its external surface, if not, state the length of the projections, and their distance from each other.

4th. The number of vibrations of the knife to each revolution of the driving wheel.

5th. Length of each vibration.

6th. The advance of the machine while making one vibration.

7th. The length of the base of each tooth of the cutter; this measurement to be taken from the extreme point of one cutting edge to the other.

8th. The distance from the apex perpendicularly to the base-the base being taken as in No. 7, — both measurements to be taken with great accuracy.

9th. In reapers, give the diameter of the reel, and the number of its revolutions in relation to the driving wheel.

10th. Give the distance between the fingers or guards.

11th. Is the knife sickle-edged, or smooth.

The Committee on Weight and Price, —

1st. Will weigh each machine.

2nd. They will ascertain the price of each machine at the shop of the maker.

3rd. If any extras accompany the machine, they will state them.

4th. If there is a difference in the price when the extras go with them, they will state it.

The Dynamometer Committee, —

1st. Will ascertain the total power required to operate each machine while cutting

2nd. The power required to draw the machine over a smooth surface, with knife in motion, but not cutting.

3rd. The power required to draw the machine over a smooth surface, the knife being in repose.

4th. Each machine will move through twenty-three and a half rods of space in all the trials. The trial will take place twice *in grass.*

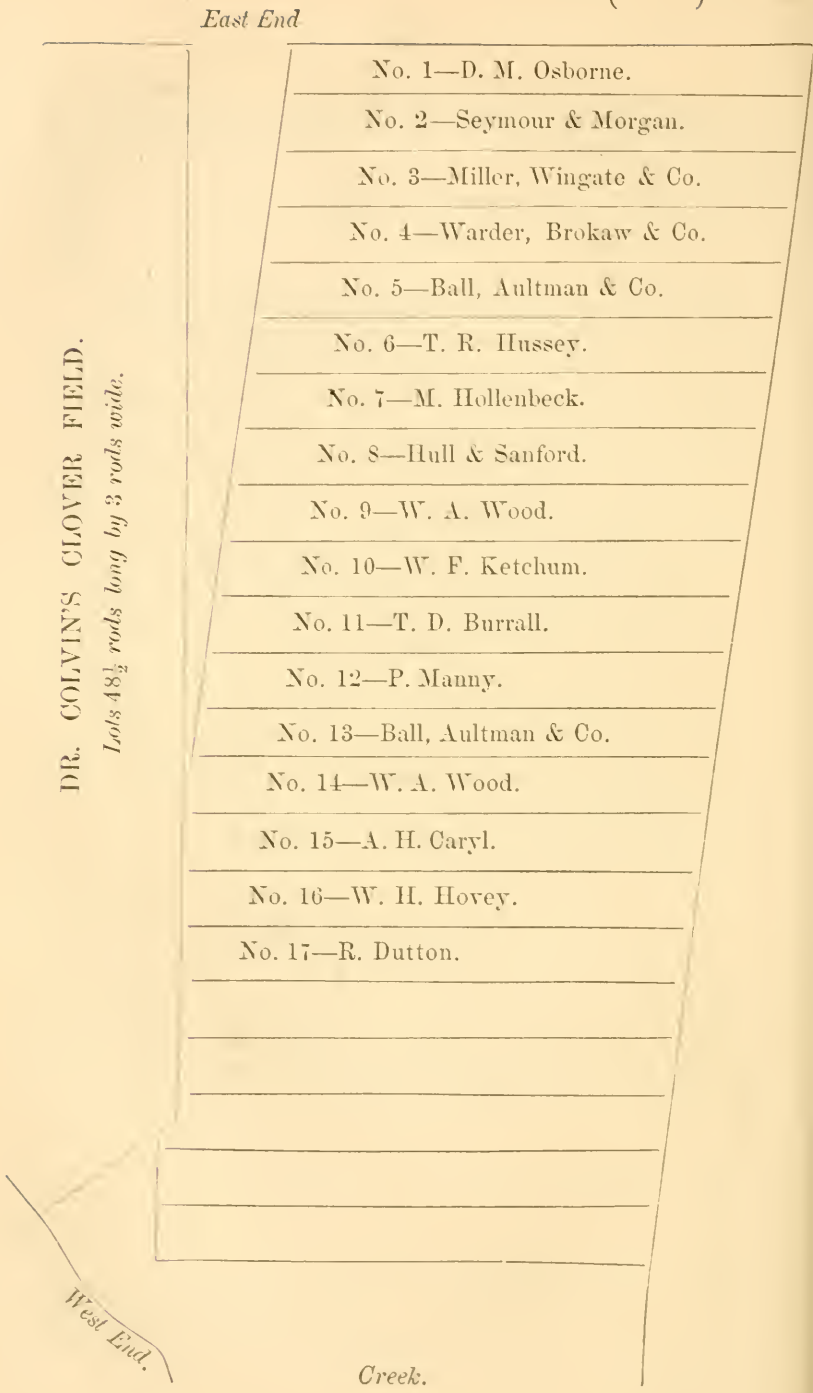
5th. The time, in all cases, will be carefully noted, and the length of piston drawn out will be carefully measured.

6th. Measure the side draft.

It was agreed that the number 100 should represent perfection. The value of the several points of excellence was fixed as follows, for Mowers: —

	Value.
1st. Cost or cheapness of the machine,	6
2d. Simplicity of construction,	12
3d. Durability,	12
4th. Effective power, least power required for a given amount of work, including the necessary attendance, ease of draft, and freedom from side draft,	15
5th. Rapidity of action, or amount of work which may be performed in a given time,	5
6th Quality of work, manner of leaving the grass and condition of stubble, &c.,	20
7th. Facility of management,	
(*a*) Portability or convenience of moving the machine when in operation, or otherwise, 5	
(*b*) Putting in or out of gear, 2	
(*c*) Accessibility of the different parts, for the purpose of oiling, &c., 2	
(*d*) Convenience and safety of the driver, 3	
(*e*) Readiness with which the machine may be brought into perfect operation from a dead stand, and quality of work with a slow motion, 4	
(*f*) Time and room occupied in turning and avoiding abrasion of the turf, 2	
Total value, —	18
8th. Adaptation to uneven surfaces, cutting at different heights, and to cutting different kinds of grass,	12

On Tuesday the 14th, after an address from the President of the Society, the Judges and competitors proceeded to Dr. Colvin's Field, a plan of which is hereto annexed.


East End
DR. COLVIN'S CLOVER FIELD.
Lots 48½ rods long by 3 rods wide.
No. 1—D. M. Osborne.
No. 2—Seymour & Morgan.
No. 3—Miller, Wingate & Co.
No. 4—Warder, Brokaw & Co.
No. 5—Ball, Aultman & Co.
No. 6—T. R. Hussey.
No. 7—M. Hollenbeck.
No. 8—Hull & Sanford.
No. 9—W. A. Wood.
No. 10—W. F. Ketchum.
No. 11—T. D. Burrall.
No. 12—P. Manny.
No. 13—Ball, Aultman & Co.
No. 14—W. A. Wood.
No. 15—A. H. Caryl.
No. 16—W. H. Hovey.
No. 17—R. Dutton.
West End.
Creek.

The surface was somewhat stony, tolerably level, and would "average about one ton of hay to the acre, and was very badly lodged, except on the west part of the field where it was thin, and stood generally upright. A few docks and thistles were the principal weeds among the clover. On the south side of the lot there was a swale, in some portions of which were mud-holes, which severely tried the machines; those of Ball, Aultman & Co., and Warder & Brokaw, broke down in them. On some parts of this swale there was Red-top, (*Agrostis vulgaris;*) Fowl meadow, (*Poa serotena;*) Herds-grass, or Timothy, (*Phleum pratense;*) and some semi-aquatic species of vegetation." The reports of the Time Committee were looked to as affording a very reliable guide to the practical working of the machines; but unfortunately they failed to report on the trials of this field, the number and duration of the stoppages, and the causes of them are therefore unknown. The character of the work performed will be found in the Table marked A, embodying the report of the Committee on Quality of Work, and in that marked B showing the observations of the Committee on Stubble.

There was a large number of spectators on the field: it was the commencement of the trial, and the competitors were nervous and excited; a large number were at work at the same time, and in close proximity to each other, which extended the excitement to the horses. The trial, therefore, partook rather of the character of a race, than a sober demonstration of the capacities of the machines to perform the work assigned them. Scarcely one of them did justice to themselves on the occasion. It is but bare justice to Mr. Osborn to say, that his lot was by far the worst in the whole field. It was more uneven, had more trees and stumps, and was more trampled by the spectators, before and after cutting, than any other in the field: hence, the numbers annexed to his work in Tables A and B, really indicate a greater degree of merit than some that are marked higher by the Committees.

On Wednesday, July 14th, the experiments in the Hayden Field were commenced. The lots were 55 feet wide and 60 rods long, containing one and a quarter acres each. There

were many loose stones on the lot, and its surface was quite uneven in all directions, the natural diversities of the surface being increased in many places by deep water-furrows. The map on the opposite page will show its divisions for the purposes of the trial.

The elevation from west to east was estimated at eighty feet; and it was generally conceded, by spectators and Judges, that there were few fields presenting a greater combination of difficulties, or one better calculated to bring into view the bad qualities of machines, than this. The crop was made up as follows: — "Two-thirds Herds-grass or Timothy, (*Phleum pratense;*) one-sixth June-grass, (*Poa pratensis;*) one-sixth Red Clover, (*Trifolium pratensis.*) The length of the Timothy was from two to three feet. The amount varied in different parts of the field from one and a half to two tons per acre — the latter only on (perhaps) a fourth part of the field."

Three machines were tried on the same day on another field belonging to Mr. Hayden, the first meadow not yielding lots enough for all. The surface of the latter field was smoother and presented fewer obstacles than the former; but on the other hand, the grass was heavier and more lodged. The crop consisted of the same species, in about the same proportions as the first field, and was fully equal to two tons of hay to the acre. Its length was from two and a half to three and a half feet. There were no weeds in either field deserving particular notice, except a few Canada thistles. The tough, soft undergrowth of the *poa pratensis*, which was uncommonly luxuriant, offered considerable difficulties to the knife, and brought out all the clogging propensities of the machines. The Timothy was in full flower; about one-sixth of the Clover blossoms had turned, the remainder being in full flower. The grass was quite dry, the slight dew of the preceding night having been thoroughly dried by the sun before the commencement of the trials.

HAYDEN'S FIELD,

NEAR PINE GROVE.

PLANK ROAD.

59 ft.—4½ a.

No. 17.—Seymour & Morgan.

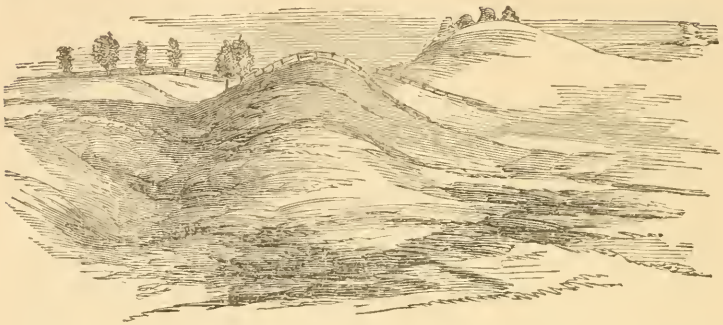
No. 16.—Hull & Sanford.

No. 1.—Wardar, Brokaw & Co.	One tree on the lot, and one corner has some stumps.
No. 2.—W. A. Wood.	One tree.
No. 3.—T. R. Hussey.	Four trees.
No. 4.—W. F. Ketchum.	Five trees.
No. 5.—W. A. Wood.	Five trees.
No. 6.—Miller, Wingate & Co.	
No. 7.—D. M. Osborn.	
No. 8.—A. H. Caryl.	
No. 9.—R. Dutton.	
No. 10.—T. D. Burrall.	
No. 11.—M. Hollenback.	
No. 12.—W. H. Hovey.	
No. 13.—Ball, Aultman & Co.	
No. 14.—P. Manny.	
No. 15.—Ball, Aultman & Co.	

Lots fifty-five feet wide, sixty rods long.

NORTH.

The following sketch will give a very clear idea of the first field, as viewed from the plank road: —



The exhibitors showed in this field, as the day previous, too nervous an anxiety to work rapidly; and the work would, without doubt, have been much better done if uninterested farmers, accustomed to their management, had controlled them. The work, however, in most instances, was much better done than in the Clover field. We regret that the report of the Time Committee is incomplete for some of the lots. Those which were accurately taken will be found in Table C, and are very instructive. Tables A and B show the quality of work and the character of the stubble. Several of the Judges who were not on the Quality of Work Committee, made notes of their own, and it was very satisfactory to find that their marks agreed very closely with those of the Committee; in most cases they were identically the same: some of them marked the work of Allen's machine as perfect, and some of them marked Wood's (No. 5) at 38.40. With these exceptions, we believe there was a perfect agreement amongst all the Judges, with respect to the character of the machines in this important particular.

Mr. Osborn had a very bad lot in this, as in the Clover field, and worked in both without any assistance. While all the Judges agreed on the correctness of the numbers as representing his actual work, several were of opinion, that, in view of the disadvantages he labored under, and his conscientious abstinence from employing assistance, higher numbers should be assigned to him.

On Thursday the 15th the Dynamometer trials began. It had been intended to use the newly-invented dynamometer of W. B. Leonard. The Committee had tested it during the preceding week with great care, by attaching to it various weights during different times, and finding in all cases a perfect accordance between the facts and the indications of the internal dial-plate. They had the utmost confidence that this instrument would guide them to more precise results, with much less labor, than had been previously attained.

When the instrument was actually applied to the machines in the field, the results obtained were so widely discordant with those previously given by other instruments less perfect in theory than this, that our confidence was much shaken. The experiments were repeated, and it was then found that the indications of the instrument did not correspond with each other. It was then discovered that the vibration and twisting to which it was subjected in the field, had destroyed the parallelism of the slides which advanced the wheel on the circular revolving disk, and that this wheel admitted of so much motion vertically that it was thrown from the surface of the disk by the vibrations, and hence the force expended was not registered. Gibbs' dynamometer was tried; but as the vibrations of the instrument was so wide and rapid, it was concluded to postpone farther trials until the next day, and in the meantime to test the oil dynamometer of Mr. Horace L. Emery, which he kindly offered for the purpose. These tests proving satisfactory, we proceeded, on Friday the 16th, to apply it to the machines with the results as indicated in Tables D and E.

A weight of 200 lbs. was first hung on the instrument, and the length of piston drawn out in two minutes was ascertained. Successive additions of 50 lbs. were tried up to 500 lbs., as exhibited in the following table. The experiments would have been more satisfactory if they had been made with the oil at different temperatures.

200	lbs.	drew	out	the	piston	$2\frac{2}{32}$	inches in two minutes.
250	"	"	"		$2\frac{7}{32}$	"	" "
300	"	"	"		3	"	" "
350	"	"	"		$3\frac{5}{32}$	"	" "
400	"	"	"		$3\frac{9}{32}$	"	" "
450	"	"	"		$4\frac{3}{32}$	"	" "
500	"	"	"		$4\frac{8}{32}$	"	" "

The mode of calculating the results found in the Table, was as follows: — Divide the number of seconds employed by the number of sixteenths of an inch of piston drawn out.

$$\left.\begin{array}{l} 60 \times 2 = 120 \\ 16 \times 3 = 48 \end{array}\right\} = 2.500 \quad \left\{\begin{array}{l} \text{seconds to draw out 1-16 inch by} \\ \text{the weight of 300 lbs.} \end{array}\right.$$

Divide the number of seconds occupied by the machine, by the number of sixteenths of an inch of piston which it draws out. Thus, Burrall's machine draws out $2\frac{1}{2}$ inches in 1 minute 25 seconds: —

$$\left.\begin{array}{r} 60 + 25 = 85 \\ 16 \times 2 + 8 = 40 \end{array}\right\} = 2.125 \quad \left\{\begin{array}{l} \text{seconds to draw out 1-16 inch} \\ \text{by the machine.} \end{array}\right.$$

seconds.	seconds.	lbs.	lbs.	
2.125	2.500	300	352.9	The constant draft of Burrall's machine.

Another formula used by Mr. Emery, is as follows, taking W. Wood's machine as an illustration, by which $2\frac{7}{16}$ inches is drawn out in 1 minute 13 seconds: —

$$60 + 13 = \overset{\text{sec.}}{73} \quad \overset{\text{sec.}}{60} \quad 16 \times 2 + 7 = 39 \quad \left\{\begin{array}{l} \text{32 sixteenths speed} \\ \text{per min. of piston.} \end{array}\right.$$

Then,

24 = speed of 300 lbs.: 32 300 lbs. to 400 = Wood's draft.

Other methods will readily suggest themselves.

The column headed "actual draft in lbs. per inch," is obtained by deducting the figures in the column headed "deduction for short cut" from those in the column headed "length of cut of machine." The total draft is then divided by the remainder, and the quotient gives us the number of lbs. draft for each cutting inch of the machine. Thus, for Burrall's machine we have

$$58 \text{ inches} - 3 \text{ inches} = 55 \text{ inches} \quad \frac{352.9 \text{ lbs.}}{55 \text{ inches}} = 6.416 \text{ lbs.}$$

Since the machines vary materially in the breadth of their cut, and as some did not enter the grass to the full length of their knives, these reductions are absolutely necessary for a direct comparison of the power of the machines.

There are various ways in which a skilful driver may vary the indications of the dynamometer. Those of us who have served as judges at other trials, have seen such things; and our attention was repeatedly drawn to the matter at this time by the exhibitors. In two or three instances the table indicates discrepancies which are not accounted for by the peculiarities of the mechanism, and are probably due to these tricks of the trade; but as our attention was fully directed to the lines and foot-board, without being able to detect any thing of the kind, we have not felt justified in altering the numbers. If there are errors, they must be charged to our want of sagacity.

It will be observed that the seventh column in Table E is headed, "length of stubble." This represents the length of stubble left by each machine at the time of being tried with the dynamometer. Of course the higher the stubble is cut from the ground, the easier is the draft, and we desired to find some uniform rule by which we could apportion a deduction from each machine proportionably to its stubble; but we could not satisfy ourselves in this particular. Sometimes half an inch made a great difference in the draft, and other times it was so trivial as to be of no consequence. To arrive at any reliable rule, would require far more extended and varied trials than it was in our power to make. We have therefore given the column, leaving each one to make such corrections of the column showing the actual draft, as his judgment may indicate as correct.

Another question, connected with the amount of draft, seems to call for remark in this connection. We allude to the weights of machines. This difference on level ground is trifling, but when ascending hills it becomes of great importance; and as most farms are more or less hilly, it becomes a matter of serious consequence to the farmer to select the lightest machine — other things being equal. The ascent in the Hayden meadow was estimated at 80 feet from the plank road to the eastern end of the lot. Its length was 60 rods, and the horses averaged four minutes in walking the distance. It follows, therefore, that the power expended in overcoming

simply the gravity of each machine, is expressed by the weight of the machine raised, perpendicularly, 80 feet high in four minutes.

Table E shows the weight of Ball, Aultman & Co.'s machine to be 995 lbs., and Walter Wood's to be 719 lbs., making the difference of power from this single source, equal to that required to raise 276 lbs. 80 feet high in four minutes, which is rather more than one-sixth of one horse power. The difference is still more striking in Allen's machine, where the difference is 313 lbs. 80 feet high in four minutes, or about one-fifth of one horse power.

It now remains to describe the Oil or Hydro-dynamometer of Mr. Emery. It was invented and made by him in 1850, and so far as we know, is the only one in the country. It has been awarded a silver medal by the New York State Agricultural Society, a gold medal by the American Institute, and also by the Worcester Mechanics' Association. It has also received the approbation and commendation of some of the best mechanics in the country. The figures and references will give a very clear idea of its construction.

Fig. 1.

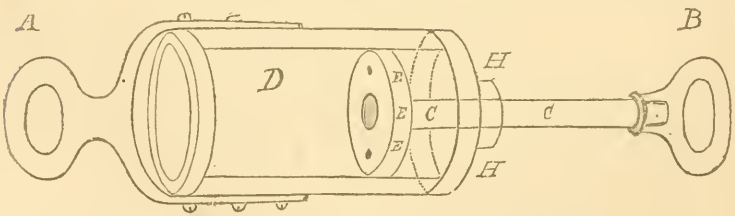


Fig. 3.

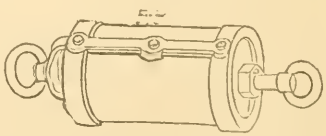


Fig. 2.

Fig. 1 represents a strong iron cylinder, about eight inches long, and two and a half in diameter. *A* is the ring and bail attached to one end of this cylinder. *B* is the ring and piston-rod. *E E E*, the piston, which is ground, steam tight,

to fit the inside of the cylinder. *C C*, the piston-rod, passing through *H H*, a stuffed packing-box in the cylinder head. *D*, the chamber of the cylinder.

Fig. 2.—*E* represents the top-side of the piston towards *B*. *C*, the centre of the piston where it connects with piston-rod *C*. *x x x*, a thin, flat brass spring, held at one end to piston by screw—the other end resting on a "puppet" valve, to close it when the instrument is at rest, and to yield when the ring *B* is drawn in, and the oil changes side of piston through puppet-valve, *K* shows the adjustible brass plate, which has a ground joint to the upper side of piston. This is made firm and tight to piston. The orifice in its centre is for the passage of oil, and is about the size of a hog's bristle, while the hole in the piston beneath the plate *K* is $\frac{1}{8}$ of an inch in diameter. The plate *K* is $\frac{1}{8}$ of an inch thick.

Fig. 3.—External view.

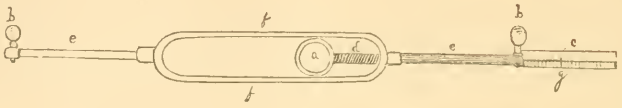
When this machine is used the cylinder being filled with oil, or other non-elastic fluid—care being taken that it is perfectly homogeneous—that fluid passes through a capillary orifice in the piston with a velocity proportional to the force applied. All that is then necessary is to apply the power to the machine through the "hydro-dynamometer." When the power ceases to act, note the time during which it has been applied, and the exact length of piston drawn out, as in columns four and five of Table D. This gives an exact measure of the force applied to the machine.

The meadow in which the dynamometer trials were made, was quite level, "the grass, mostly Timothy, from $2\frac{1}{2}$ to 3 feet long, and would yield about $2\frac{1}{4}$ tons to the acre."

A very valuable instrument for measuring side draft which exists in many machines for mowing and reaping, was used for the first time at this trial, and was found to answer the purpose perfectly. Hitherto the side draft of machines has been guessed at, and much difference of opinion has arisen respecting the pressure of different machines in this direction.

We think a correct and reliable method of determining this matter will be hailed by both mechanics and agriculturists as most valuable contribution to both departments of industry, and will lead very shortly to great improvements

in this direction. The instrument used by us was invented and manufactured by J. E. Holmes, Esq,, of the Newark (Ohio) Machine Works.

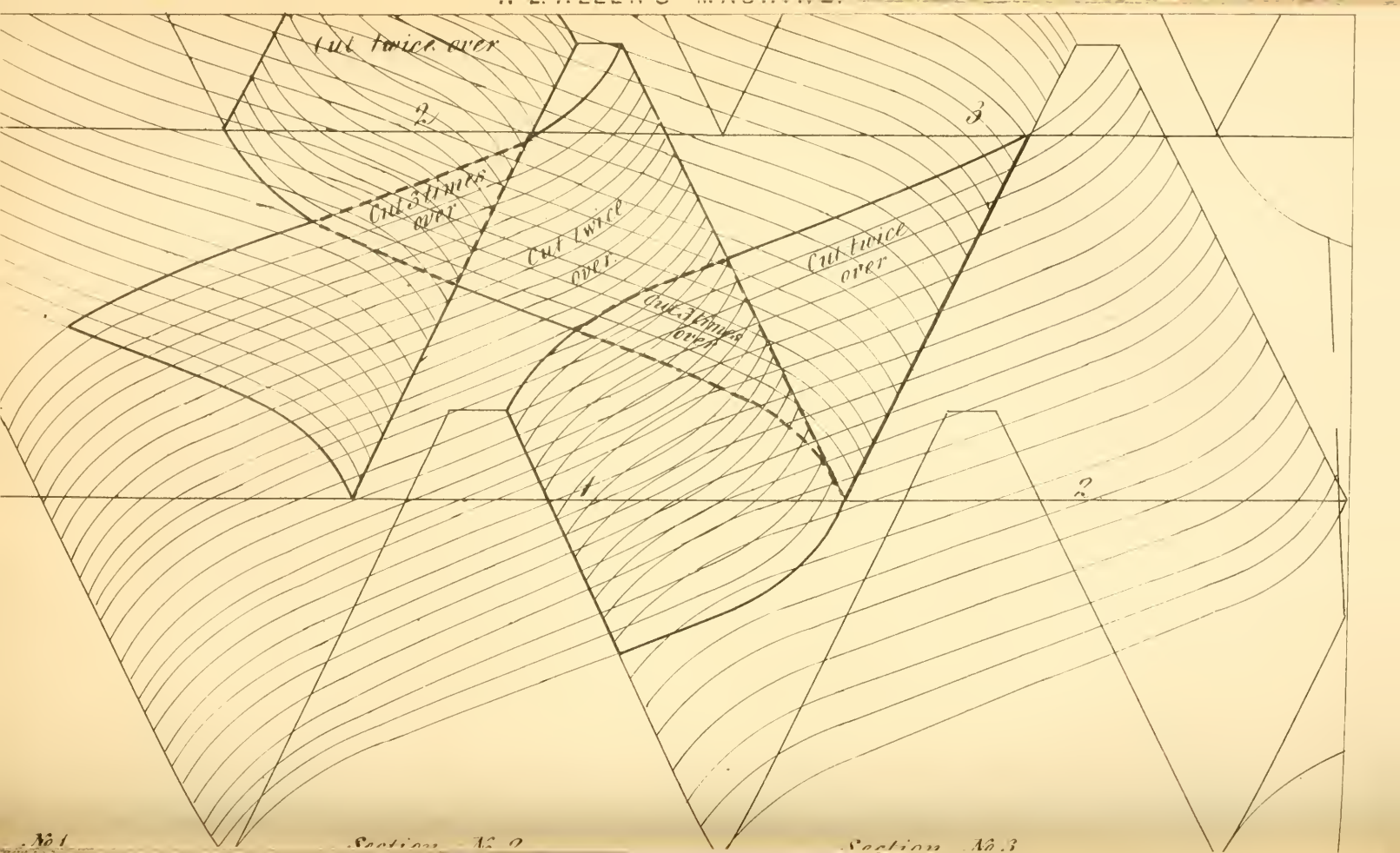


An inspection of the cut will convey a very correct idea of the instrument. It is simply an iron neck yoke. (*bb*) are rings through which the collar straps are passed. The tongue of the machine is inserted into the ring (*a*); pins are inserted in the upper and under part of it, which move freely in slats in the parallel bars (*ff*). The shaft (*e*) is hollow and contains a spiral spring (*d*). A scale (*c*) is attached to one end, and the pressure on the spring caused by the side draft is shown by the index (*g*) in pounds. It can be easily read by a person walking by the side of the horses.

We now proceed to pass in review the leading characteristics of the several machines, other than those contained in the tables.

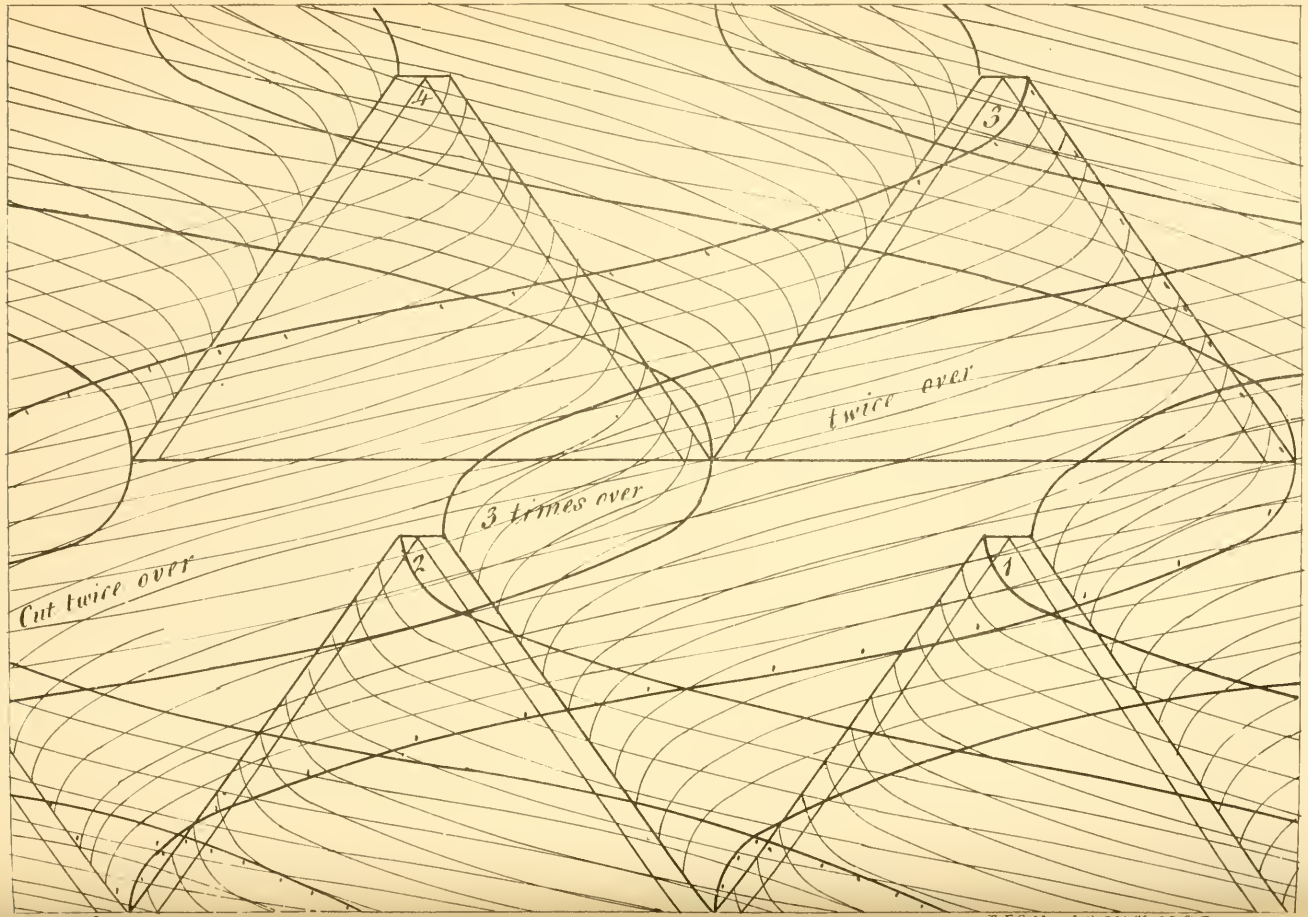
Burrall's is distinguished for its single gearing and general simplicity, in which particular it excels all other geared machines. As each motion of the knife passes two fingers, it gives a cutting power to compensate for its less multiplied motion. As his cutting motion is peculiar, we give the annexed diagram, illustrative of the curve traced by any point of his knife during its progression. It will be seen that a large space is cut twice over, and a portion three times over, which seems an unnecessary waste of momentum.

The gearing consists of one large crown wheel and one pinion, being placed on the left side of the frame and the knife on the right. There is a balance-wheel, the diameter, weight and speed of which, seem more scientifically adjusted to overcome the momentum of the knife than any other. It seems to us, however, that it would be much improved by bringing it forward on the shaft and nearer to the pitman. The pitman boxes are of brass, the rest of iron. It is not



No 1 Section No 2 Section No 3

BURRALL'S MACHINE.



F. F. Oakley's Lith. 204 Wash.n St. Boston

excelled for durability. The frame and cutter-bar being of iron; and the workmanship is excellent. The other facts in relation to this machine, may be learned from the tables.

Pruyn & Lansing's; invented by J. E. Newcomb. While we cannot recommend the cam principle in the present state of our knowledge and experience, we cannot withhold the tribute of our admiration to the ingenuity displayed in the construction of this machine. Simplicity can be carried no farther. The frame is in one piece, so that the wheel, cutter-bar, tongue and regulating roller can be attached without intermediate additional pieces, or bolts. The cam is on the interior of the driving-wheel, and is thus protected from dirt and stubble, to which others are liable. The friction-rollers are on both sides of the cams, which diminishes the wear on it by one-half. These points give it, in our opinion, a great superiority over other cam machines.

The same cap which holds the journal of the driving-shaft, is the centre of oscillation of the lever, and brings it to a level with the cutting-bar, without any additional pieces or bolts, requiring only four bolts to hold the whole frame and driving-power together. The boxes are of Babbet metal. A small friction-roller on each side of the cam, imparts a reciprocating motion to a lever, the long end of which connects with the knife, and imparts to it its vibration. By this arrangement, a motion on the cam of three-quarters of an inch, causes a vibration of the knife to the extent of two inches. The points of the wedge-form guards are four inches apart, the spaces at the points of the blades but two inches; hence, a stone larger than two inches in diameter cannot reach them. The reciprocating-bar seems needlessly heavy, causing an unnecessary expenditure of power at every vibration. If cam machines are ever made available, we think this is the basis on which they must be constructed. The extreme cheapness of this machine, renders it desirable that it should prove successful. Its work, as shown in the tables, was excellent. It cut perfectly, as slow as the horses could walk; stops in the grass; starts, and cuts with perfect ease without backing, and there is no difference in the length of the stub-

ble at the point where the stopping and starting took place, from what it is in parts where it was continuously in motion.

R. L. Allen's machine is one of excellent character — much better than appears from Table II, as will be seen from a comparison with other tables, in which it appears that it falls very slightly behind the maximum marks which alone make their appearance in Table H. It is very strongly built, the strength of material judiciously distributed, the workmanship is of the very best character, and the materials of the first quality. The seat of the driver is more convenient and comfortable than any other, and would have been so marked in the Table, but that in the judgment of the mechanical committee it was less safe, from the fact that it was placed *before* the knife, and therefore, in case of being thrown off, the driver would be more likely to be injured by it than if it were behind. The journal-boxes are of composition metal, and it runs with very little noise. While cutting at a speed of three feet per second, it cuts smoothly, leaving a stubble of two and three-fourth inches; but when stopping, and starting in the grass without backing, the stubble was five inches at the place of stopping, and there was a slight pulling when the machine started. All the machines, except Allen's and Wood's, were tried in dry grass. Theirs was tried in grass wetted by a recent rain, which made the test more difficult; and it is no more than justice to say that their regular driver was absent, and his place supplied in the slow trials by a boy who had never managed the machine before. On the whole, we consider this machine to be one of a very high character: light of direct draft, and totally free from side draft. The necessity of more minute description is obviated by the annexed cuts, which will be readily understood. The peculiarities of his cut will be seen on the accompanying diagram.

Walter Wood's machine, as appears from the thirteenth column of Table D, headed "power expended solely in cutting grass," to be very remarkable for the small amount of power expended in the single act of cutting. We should have suspected some error of observation, had not the same

thing been manifest in *both* machines, which were tried at separate intervals. When this peculiarity was developed by computation and tabulation, (before which it was wholly unsuspected by us,) we were unable to account for the fact from the structure of the machine, and therefore requested the inventor (by letter) to give us his theory of the fact. He referred us to the following passage in his printed circular, which he deemed a sufficient solution to the mystery:— "The use of the wide guard which divides and presses the grass to the cutters, and holds it in a position to be cut easier, or with less power than when driven to a narrow guard by the cutter itself. Experience has fully proved, that the nearer we approach to a continuous cut, and have enough of space left for a clip, the less the power required to cut grass or grain." The circular containing this passage was handed to us at Syracuse, but its force escaped our notice.

On carefully comparing the guard used in this machine, with others, we are inclined to concur with Mr. Wood in the main, with respect to his arrangement. We are, however, of opinion that the ease of cutting depends not so much on the width of guard, as it does on the angle between the guards and knife-edges.

In KETCHUM'S machine, which is the pattern from which most of the other machines are copied, in this particular, the distance between the fingers, from centre to centre, is the same as Wood's; but the fingers are equal in width throughout, viz., three-fourths of an inch, which makes the space to be passed over by the grass before it is cut, nearly twice as great as Wood's. It is, consequently, chopped off in a leaning position with one tooth of the bevel-wheel. But in Wood's, the angular guard with its broad base, parts, and holds the grass out half way to the knife-edge in a proper position to be cut easily, and is sheared off with the knife-edge by three cogs, instead of one. In a word, the cut of Wood's knife resembles the *drawing saw* cut, while the others approximate more to the square chisel cut.

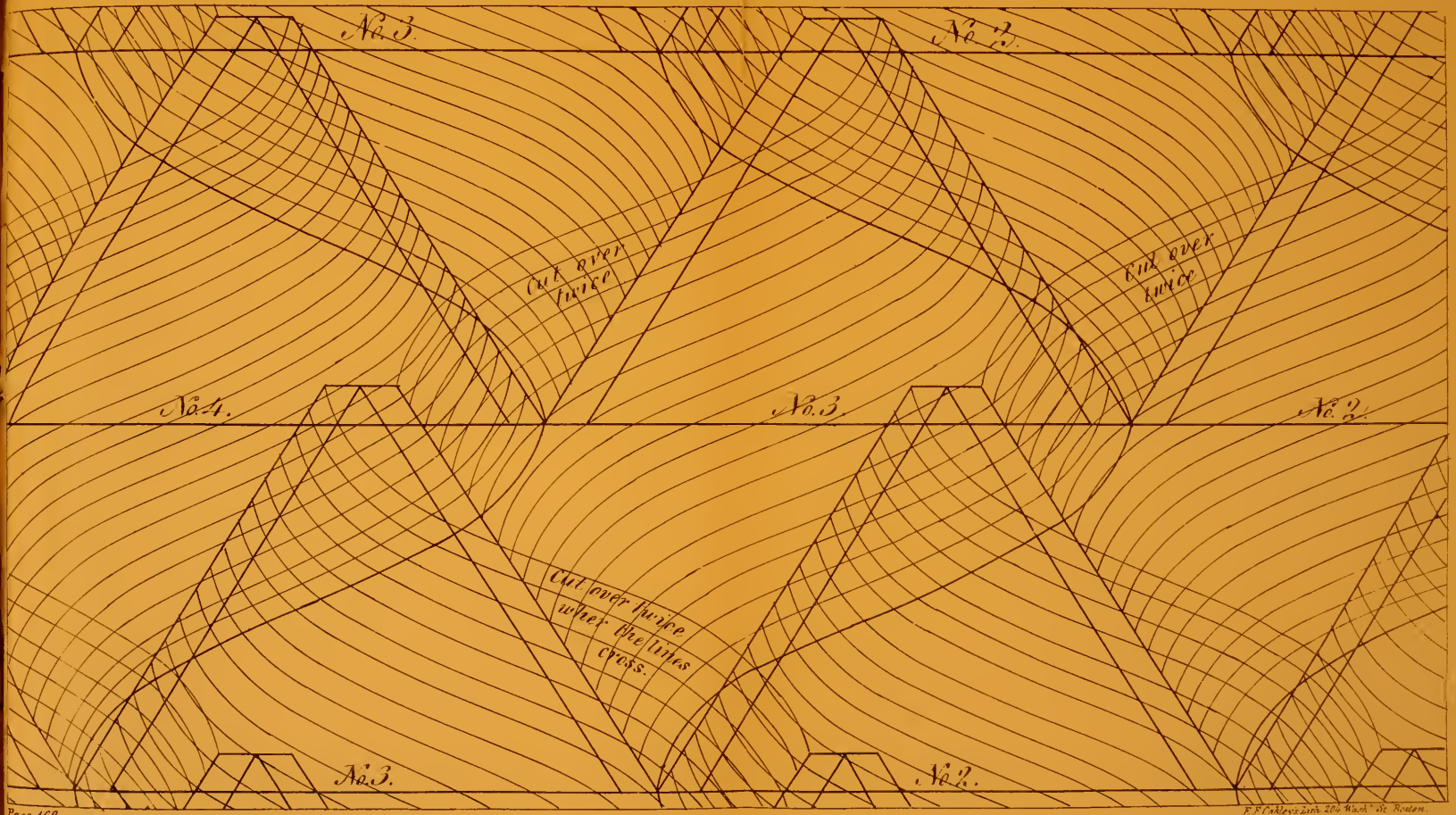
We are more fully confirmed in our opinion, by finding in Table D that Pruyn & Lansing's machine is next to Wood's

in the power expended in cutting, and it also resembles Wood's more clearly in the shape of its finger, or guard, than any other.

The wide guard has a tendency to exclude small stones from between them, thus protecting the point of the knife. If the height of the knife above ground is greater than half the diameter of the stones which could pass between the guards, they would always clear the knives below. If larger, (and loose,) so that the guards strike below the centre of the stones, they would be thrown above. These views will account for the closeness with which this machine was enabled to cut in the clover lot, notwithstanding the stones. Another signal advantage in this machine, is the arrangement by which the driver is enabled to raise or depress the cutter-bar while in motion, and its flexibility on the ground in consequence of the joint by which the tongue is attached to the frame. It is exceedingly portable and compact, and the workmanship is excellent throughout. We think it could be improved by putting in composition or Babbet metal boxes, and by making the angle of the cutting-edge of the knife smaller in relation to the base. The annexed diagram illustrates the cut of this machine, and also Ketchum's and many others. This machine and Hallenbeck's, were the only machines which *never* clogged in any degree or under any circumstances. It cut perfectly well in heavy wet grass, (same as in Allen's trial,) travelling three and a half feet per second, leaving a stubble of two and a half inches long; when stopped, and started without backing, the stubble was only half an inch longer than when cutting continuously. Nothing could be finer than its action in slow cutting. The apparatus for throwing in and out of gear by a cam wedge, we consider better than any other.

F. J. Frelinghausen's (Dietz & Dunham) machine. This is a cam machine, having the cam on one side of the driving-wheel, and unprotected from dirt — differing from Pruyn & Lansing's, which has the cam on *both* sides and protected from dirt. The vibratory motion of the knife is produced by two small rollers, or wheels, attached to opposite ends of a reciprocating bar,

WALTER WOOD'S MACHINE.



F. F. Cables's Lith. 26 Wash.n st. Boston.

working alternately into the cavities of the cam. The seat for the driver is furnished with springs and is very convenient.

William H. Hovey's machine. The peculiarity of this machine consists in the separation of each knife, and they are fastened without being riveted. A pin with a large head is fastened to the lower bar, a hole in each knife is slipped over the head, a slot at the side of the hole permits it to be slid laterally along the shank of the pin, which fastens it, the large hole is then accurately fitted by a projection on a steel button working on the upper bar. The object aimed at is very important, — the knives are only imperfectly ground when fastened to the bar, and it is often very desirable to replace a broken knife without leaving the field. By this contrivance the knives can be easily ground or replaced; but we have some doubts about the permanence of the fastening, which can only be settled by a longer trial.

There is a spur-wheel on the main or driving-wheel, the gearing not very well made. There is a small balance-wheel; but with the imperfect gearing does not prevent some rattling. We think it is too complicated for general use. It cuts well when moving at the rate of two feet per second; but drags more than some others, when starting in the grass from a dead stand. It has iron journal-bearings, and brass boxes, in the connecting bar.

M. Hallenbeck's machine. The Mechanical Committee say, "We look upon this as one of the best in mechanical construction—combining the greatest strength, with the smallest amount of material, of any at this Exhibition." The journal bearings are of a mixture of copper and tin, their seats are planed, and a strap over the frame confines them tightly in their places, keeping them always in line. The distinguishing peculiarity is in the construction of the fingers or guards: the groove in which the knife-bar works is sloped from the centre, both ways, thus leaving but a small bearing for the bar; the double wedge-formed cavities thus left across each finger immediately under the base of the blades, permits the loose grass, which would otherwise clog the machine, to work easily through them—the under part, at the shoulder,

being formed in a quadrant and the top guard being elevated from the point of the knife, adds to the security against clogging. All the gearing is well made, which, together with the well proportioned and counter-poised balance-wheel, causes it to work beautifully without rattling. The loose joint by which the frame is connected with the tongue, permits the cutter to follow the inequalities of the ground without bearing on the necks of the horses. It works well with a very slow motion, and starts easily from a dead stand. It did not clog at all under the most trying circumstances.

Ball, Aultman & Co., (E. Ball's machine.) This is a very superior machine — the only drawback to its excellence being its weight, price and complexity. It has two driving-wheels, instead of one, placed side by side like the wheels of a cart, giving great firmness and steadiness in running. The cutter adapts itself with very great perfection to all the inequalities of the ground, so that either end, and the front or rear of the knife, is adjusted to the uneven surface by means of a double hinge joint. Either driving-wheel acts independently of the other, or both may act in conjunction. When the machine is moved in a curve, either to the right or left, the knives are kept in a proper motion. A rachet-wheel suspends all motion when backing, this motion can therefore be as easily effected as in an empty cart. The cutter-bar can be very speedily removed, when the machine will answer very well for a buggy. It cuts well at a very slow motion, though the stubble is about an inch longer than when cutting faster. It starts easily in the grass from a dead stand: no machine exceeds it in this respect. The gearing is very good, — the large wheel has the cogs on the interior face, which is the best form from its bringing a greater number of cogs in contact with the cogs of the pinions, lessening the pressure on each, and of course diminishing the liability to break and wear. It has a well counterpoised balance-wheel, which conspires, with the well made gearing, to give a quiet motion without rattling. The journals run into iron boxes, Babbeted.

Ball, Aultman & Co., (Aultman & Miller's machine.) It is very similar to the other — the gearing is less compactly

arranged, though not more complex. The large cog-wheel is a crown-wheel, and therefore (as explained above) is inferior to internal gearing. The peculiarity of its construction consists in an apparatus by which the cutter-bar is folded over on to the frame almost as easily as a bird folds its wing — giving great portability to the machine.

By means of a lever, easily operated by the foot of the driver, the cutter-bar is raised over stones and other obstacles. If we do not misremember, this last peculiarity is possessed by the preceding machine — although our notes do not state the fact. Another valuable feature, though a small one, is the security given to the journal boxes of the pitman by a rachet spring-key, which cannot possibly be shaken out, though it may easily be removed by a delicate pen-knife. Its cutting qualities are very similar to Ball's machine.

A. H. Caryl. This is a cam machine, the cam being formed by a zig-zag space between the portions of the rim of the driving-wheel — a small friction-wheel connected with the cutter playing in this space. The Description Committee say of this, "There is a great loss of momentum in this machine, from two causes, viz: the whole distance travelled by the blades, backwards and forwards, (an inch and a half,) has to be travelled by the wheel between the cams, there being no increase of the vibratory strokes by means of a lever, as in Pruyn & Lansing's. Also, from there being no guards, (the lower knives being immovable,) it requires great thickness of blade to prevent them from bending up when dull; and the increased weight consequently augments the momentum and wastes force, hence the great thumping noise and waste of force. The open space between the cams, are liable to become covered and filled with earth, and to wear the rollers. The same objection exists to all cams on the side of the wheel, but not to Pruyn & Lansing's." The cutting principle is peculiar: what in other machines is simply a finger, in this is a stationary cutter, so that the operation of cutting resembles the action of a pair of shears. This machine (probably from some mechanical maladjustment) worked badly from the beginning, and was withdrawn; but we can readily under-

stand, that at first, when in perfect order, it will do beautiful work; but as soon as the knives are dull, or a joint or rivet loosens, it must necessarily clog and work badly. It was not tried in slow motion.

William F. Ketchum. We were much interested in this machine as the matured production of a man who was the pioneer in successful mowing by machinery. The distinguishing feature of this machine, is placing the cutter-bar in a line with the axis of the driving-wheel, which obviously gives it a great advantage in passing over water-furrows, since the finger-bar must follow exactly the motion of the wheel. The perforated knife is claimed by the inventor as a perfect antidote against clogging; but the following extract from the report of the Committee on Quality of Work, shows that it cannot be relied upon in all cases: — "The grass was heavy and much lodged. The horses labored hard, and one man was assisting to clear the machine, which clogged badly. While some good work was done in spots, the general performance was far below the reputation this mower has justly earned upon other occasions." The Description Committee say, "The form and size of the cogs, and the gearing generally, render the working of this machine more imperfect than some others, running with more noise and rattling; the surface of the cogs not being in all cases wholly in contact, wear unequally. The large cog-wheel is a crown-wheel, which does not secure quite so perfect motion as interior cogs." The whole machine is made of cast iron, and the cutter-bar is flexible to the extent of four inches, which has a tendency to diminish the severe side draft, when a stiff bar rises over a stone or knoll. There is no balance-wheel, which, together with the somewhat imperfect gearing, produces a good deal of rattling.

Buffalo Agricultural Machine Works. (The Kirby machine.) The chief peculiarity of this machine, consists in the independent action of the finger-bar, which is secured by the peculiar mode of attaching the driving-wheel to the frame, so that the wheel in passing over uneven ground does not carry the finger-bar up and down with

it, but each acting independently, the fingers follow the ground. This independent action and flexibility of the finger-bar, lessens the liability to breakage when in contact with obstructions. It also permits the finger-bar to be set at any desired height, and to facilitate its motion in soft ground. This contrivance for securing the rise and fall of the cutter-bar, is very ingenious, and is worthy of commendation. The gearing is good, but not as well adjusted as some others — the balance-wheel being small and without counterpoise, causes some rattling, while in motion. This machine had the misfortune to draw the worst lots in both fields, which made its performance seem worse than it really was. We consider it a good and useful machine, destined, when improved by the suggestions of time and experience, to take a high rank.

T. R. Hussey. This machine is so well known that description is unnecessary. The interior gearing is commendable; the balance-wheel seems not well adjusted — it is small, with a large counter-balance, and rattles very badly. The tables show that it is not the best machine for mowing.

Warder, Brokaw & Child, (Ohio harvester.) The gearing is internal and generally well made. The boxes are of iron, except those for the connecting-rod, which are of brass. The frame is of wood, the cutter-bar of iron. The plan of raising and depressing the cutter-bar to change from mower to reaper, and *vice versa*, by means of an iron brace with slot and notched fall, appears less convenient than some others. The very acute angle formed by the brace with the tongue makes it liable to hard strain. In motion, as slow as the horses could walk, this machine performed well, and started very well from a dead stand. It is a new machine, and not fully perfected for mowing.

Hull & Sandford, — a modification of Ketchum's. The gearing interior, and tolerably well made. The boxes are of Babbet metal. The Descriptive Committee say, — "The facility in raising and depressing the cutter-bar, and the manner by which this is effected by two distinct centres to the driving-wheel and to the other gearing, is ingenious and

convenient." The mowing was not of the best character, the stubble seemed rather torn than cut off. The imperfect work may have been due to the bad temper of the knife, rather than to inherent defects in the machinery.

Miller, Wingate & Co. The most noticeable feature of this machine is its cutter-bar, made of boiler-plate iron doubled over so as to leave an open space between the top and bottom plates. The shanks of the guard-fingers are secured by rivets within this space, which gives it great strength in proportion to its weight. Its journal-boxes are of iron; boxes of connecting-rod, brass. It has a balance-wheel, but no counterpoise, and rattles some, though less than some others. It cuts the grass tolerably well, and leaves it evenly disposed on the ground. It works well in slow cutting.

Pells Manny. This machine, used as a mower, resembles the machine of J. H. Manning in its main features, though somewhat more complex. The gearing was not well made; the bevel gear did not coincide, in consequence of the points of the cones not meeting together, and hence, only a portion of the face of the cogs touched each other, leaving one-half their length out of contact. This, it is true, is an error in the manufacture only; but many machines, good in principle, are cast aside and condemned for just such imperfection in the manufacture. The journal-boxes are of cast iron. The work of this machine was fair; but it clogged occasionally. His smooth mowing-knife was broken in the cars, and he was therefore compelled to use his sickle-edged reaping-knife.

Seymour & Morgan have a very good machine; but it is evidently more fully calculated for reaping than mowing. It did its work, however, respectably in the meadow. Clogged occasionally. They did not finish their work in the clover field. They arrived late, and found that the reel-divider would not work in the tangled clover — erroneously supposing that they would be compelled to finish just as they began. They abandoned the field.

Rufus Dutton. (Atkins' Automaton Reaper.) The gearing of this machine is admirable, and surpasses in accuracy and finish any on the ground. Where the cogs brightened by wear, the polish was equal throughout the whole length of it. The workmanship throughout was thorough and conscientious, affording a marked contrast to many others. It is rather complicated, as a mower.

We now proceed to offer a few general remarks on topics suggested or illustrated in the course of this Trial.

1st. We believe there has never before been any systematic attempts to analyze the total amount of power consumed, and to distribute it amongst the various parts. We think this has been as satisfactorily established as could be expected on a first attempt. Table D shows that the average of all the machines for total power is 418.6 lbs.; while Burrall's (the minimum) is 352.9 lbs.; and Caryl's (the maximum) is 493.1 lbs. This very wide difference is calculated to awaken the attention of the mechanics to the variations of detail on which this difference depends — many of which are disclosed in Tables F and G. The power expended solely in cutting, differs from the general average, and among different machines, far more widely than the apparent similarity in the cutting-apparatus would lead a casual observer to suspect. The general average of power thus expended, is 131.7 lbs.; the maximum is F. J Frelinghausen's, 181.6 lbs.; the minimum is Walter Wood's, 66.8 lbs. (Explained on pp. 160, 161) The power expended in giving vibration to the knife, averages 60 lbs.; the minimum being 26 lbs. in Burrall's, and the maximum, 90 lbs. in Pruyn. These facts offer interesting problems for the study of mechanics; and we cannot doubt that their solution will lead to vast improvements in the construction of these machines.

2nd. Sufficient attention has not been paid to lightness, in the construction of machines. This point has probably been overlooked because dynamometer trials almost invariably take place on level ground, where the waste of force is masked. We would invite the attention of mechanics to the remarks on this topic, on pp. 153 and 154, believing that

attention to them on their part will lead to great economy of power.

3rd. We believe this trial has shown that grass is cut more easily when the angle at the apex of the knife is obtuse, or the angle between the cutting-edge and the base of the knife is acute — since it then approximates more nearly to a saw cut, and less to a chisel cut. If we are correct in this, very many of the machines may be improved, as may be seen from Table F.

4th. It seems clearly settled by this trial, that a broad, wedge-form guard is superior to a straight one, for the reasons assigned on page 162. It is obvious that when the grass is drawn over at an angle of forty-five degrees, as it is in some machines, the area of the cut section is much greater than when cut standing perpendicularly, and must therefore absorb more power. The cut in the latter case is much more analogous to the saw, and it affords a much better protection against stones. We think it a great error in Pruyn & Lansing's machine, that the lower part of the guard is smaller (narrower) than the upper part. The effect of this arrangement is, that the force of the cut is expended on the root of the grass, which tends to draw it out and break the fibres, which will either kill it, or retard its starting in the fall. This effect is less apparent when the knife is sharp, but will become very serious when it is dull. The *tendency* however, exists at all times.

5th. It has long been understood by mechanics, that internal is better than external gearing, where it can be applied, because the larger wheel more nearly coincides with the smaller in form, and therefore brings a greater number of cogs in contact. We were therefore surprised to see so many machines geared externally, and would recommend a change in this respect.

6th. Nothing has been more clearly demonstrated, in our judgment, than the value of balance-wheels in promoting the smoothness of working of the machines, where they were properly adjusted and judiciously located. Some were too small to act well at the velocity with which they worked; in

others the weight was not sufficiently distributed to the rim, and in others the counterpoise was so placed as to increase, rather than overcome, the momentum of the knife. We recommend to all builders of these machines a careful series of experiments with a view to ascertain the exact size of balance-wheel which will best overcome the momentum of the knife at their respective velocities. We also advise that the wheel shall be located near to the pitman, as a remote location gives rise to a twisting and irregular action on the journals.

7th. Most inventors seem aware of the value of a light knife in diminishing the momentum, although we think there is much room, by the use of an improved quality of materials, to reduce its weight still farther: but some seem to forget that the weight of the connecting-rod, as well as the weight of the knife, is an element of momentum. Some of these were very unnecessarily long and heavy. A reduction of these dimensions will therefore be followed by a material reduction of power expended.

8th. It is often overlooked, that time, as well as force, is an element in the consideration of power. A variation of ten pounds in the draft of two machines is looked upon by many as a mere bagatelle. It is not considered that this force is extended throughout every second of time of working. If, then, the two machines work for ten hours, the difference of force is not represented by 10 lbs., but by that number multiplied into the number of seconds in 10 hours, viz: 10 h. $\times$ 60 m. $\times$ 60 sec. $\times$ 10 lbs. $=$ 360.000 lbs. Our excuse for an allusion to a principle so entirely elementary, must be found in the fact that it is so strangely overlooked by many farmers and mechanics; and we hope that the remark may stimulate inventors to attempt every possible reduction of force, even if it be apparently very small — being assured that in the long run, it will be very considerable.

9th. It seems fully settled, that the most desirable position of the knife is in a line with the centre of the driving-wheel, as in Ketchum's machine.

10th. It is also very clear, from this trial, that the cutter-

bar should be flexible, as connected with the frame of the machine. The grass is cut more evenly, and side draft is prevented; for when the knife on a stiff machine rises over a knoll, or other obstruction, the pressure on the surface of the ground increases the resistance and causes side draft. For this reason, those machines which have flexible fastenings of the cutter-bar to the frame, have the least side draft, provided the draft is properly attached. Hence, such machines as Ball & Aultman's, Kirby's, and the last made mower of Ketchum's, &c., are to be preferred in this respect.

11th. Much difference of opinion exists among the builders, with regard to the comparative merits of cast and wrought iron fingers or guards. We do not suppose that our judgment will settle conflicting opinions on this point; yet we deem it proper to say, that we believe the cast iron finger to be the best, on the whole. We think it is better that a guard should break, than bend. In the latter case, the friction will be very greatly increased, consuming an increase of power, which is expended in wearing out and deranging other parts of the machinery. Many country blacksmiths are not qualified for such a job, and make it worse by their attempts to repair it; while any farmer can take off a broken guard and replace it by a new one in a few minutes. It is probable, however, that considerable improvement may be made by a proper mixture of metals in casting them. The guards in Allen's machine seemed of a very excellent quality, and we were informed that they were produced in this way. We think, too, that Allen's concave knife is a step in the right direction for reducing friction, and for diminishing the weight of the knife without lessening its strength.

12th. We noticed with pleasure, on some machines, contrivances for increasing the comfort and security of the driver. Ball, Aultman & Co., R. L. Allen, Seymour & Morgan, and some others, have comfortable springs to the seats, which make the work of the driver much less laborious. We think when the cutter-bar is not in a line with the shaft of the driving-wheel, it should be in *advance* of it. There have been many instances, where the driver has been shock-

ingly mangled by the knife by being thrown from his seat. This would not have occurred if the knife had been before the driver's seat.

13th. We would invite the especial attention of builder's to the wedge-form cavity in the guard under the knife, as described on page 163 in connection with Hallenbeck's mower.

14th. We speak of the cam principle with diffidence. The simplicity of structure which it admits is a strong temptation to use it; yet it will be seen from Table D that the ease of draft which ought to follow simplicity of structure, has not been attained in practice. Pruyn & Lansing required 446 lbs.; F. J. Frelinghausen's, 492 lbs.; and Caryl's, 493 lbs. Or, according to the more accurate statement on Table E, Pruyn & Lansing required 8.494 lbs.; Frelinghausen, 8.946 lbs.; and Caryl, 8.502 lbs., per inch of cut to drive them.

Notwithstanding this result, we are not quite incredulous with respect to the application of the cam principle to the propulsion of mowers and reapers, and we would invite the attention of inventors to the utilities which may lie latent in the cam. There was much in the mechanical arrangement of all these machines which may account for their tendency to expend their power in hammering themselves to pieces, without charging it to the fundamental principle of the cam. Accuracy of adjustment, the avoidance of loose play between the respective parts, and smoothness of surface where the parts rub or roll on each other, are indispensable to perfect cam action; yet, all these points were neglected in all three of them.

Pruyn & Lansing's machine complied more nearly with these conditions than the other two, and the result is seen in its reduced draft. We think if this machine were altered from a straight to a curved zig-zag* — if there were increased precautions against the intrusion of dust and dirt — if larger friction-wheels, made of composition metal, were employed, and more accurately adjusted to roll on the face of the cam, without any play — if the length of vibration of the knife could be shortened without injury to the cutting power — and if

* I have not had time to investigate the ordinates of the proper curve, but presume, from analogy, that it would be a cycloid.

the momentum of the knife could be arrested just before changing its direction, by an elastic spring placed at either end of the machine, we might hope for a decided improvement over every thing now in existence.

15th. A difference of opinion also exists with respect to the advantages of wooden and iron finger-bars. In our opinion, iron finger-bars, (which can be made much narrower than wooden ones,) are better adapted to the cutting of *fine*, *short* grass than wooden ones, on which, from their greater breadth, the grass piles up and tends to clog the knife; but in ordinary grass, we prefer the wooden finger-bar, as in case of accident farmers would be able to repair or renew it without recourse to the mechanic's shop.

16th. When grass is long, and the wind is blowing in the same direction that the machine travels, it is very difficult, if not (in some cases) impossible, to cut without a reel. In other cases, it is much better to cut without one, as the grass after cutting, is in a much better condition for drying. We therefore consider it desirable that mowers should be furnished with reels which can be quickly and easily removed and replaced. They would then be enabled to cut under all circumstances.

17th. Most machines are now made portable by a small removable wheel, which may be attached to the outer end of the cutter-bar at pleasure. We very much prefer those, which, like Wood's, Ball, Aultman & Co., Pells Manny's, &c., are *permanently* portable. In lodged clover, or grass of any kind, it is often desirable (in farmers' phrase) to fetch the swaths. In such cases it is very inconvenient, and with spirited horses, dangerous, for the driver to get off and upon the end wheel.

18th. The driving-wheel should in all cases be covered, as in Allen's machine, and should be furnished with a convenient box to hold the necessary wrenches and other tools, with a compartment for an oil can, where it can be carried without risk of spilling.

19th. The oil holes should be covered with tin covers and supplied gradually to the journals by candle wicks, or some similar contrivance.

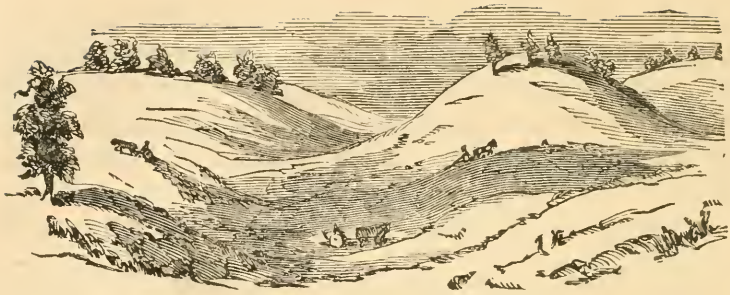
20th. A knife is much wanted which shall be easily detached from the bar, for grinding, &c., and which is not liable to become loose from the rapid motion of the bar. If Mr. Hovey's contrivance does not answer the purpose, we think the attention of inventors should be directed to the making of one.

REAPING TRIALS.

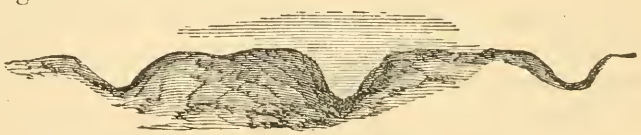
The following scale of points of excellence in Reaping, was agreed on by the Judges : —

1st. Cheapness,	5
2d. Simplicity of construction,	9
3d. Durability,	9
4th. Effective power, or power required for a given amount of work, including the necessary attendance, ease of draft, &c.,	20
5th. Rapidity of action, or amount of work performed in a given time,	5
6th. Quality of work, manner of leaving the grain, saving or loss from imperfect operation, or the difficulty of securing the entire crop,	30
7th. Facility of management,	
(*a*) Portability, or convenience of moving from place to place, while in operation or otherwise,	3
(*b*) Putting in or out of gear,	2
(*c*) Accessibility of parts for the purpose of repairing, oiling, &c.,	3
(*d*) Convenience and safety of the operators,	3
(*e*) Convenience in turning,	2
8th. Adaptation to uneven surfaces, cutting at different heights, and to cutting different kinds of grain,	9

The Reaping trials commenced on the 17th of July, on the Rye lot of Mr. Hayden, near the farm house. It is believed there are few fields in the country better calculated to try the powers of reaping machines, than this. It was hilly, stony, and crossed by deep water furrows. The annexed cut will give some idea of the inequalities of the surface.



The lot reaped by Mr. McCormick seemed to us quite beyond the scope of machine reaping, so steep were its undulations. The lot cut by the Kirby machine was crossed by a water-furrow two feet deep by actual measurement; and if a field had been made on purpose to interpose all imaginable obstacles to reaping by horse-power, it could scarcely have been more difficult. The profile below, shows a section of the field crossed by the machines at right angles, severely testing their strength.



The Committee on Grains and Grasses report, "That the crop was estimated at from 25 to 30 bushels to the acre. The straw averaged five feet high, stood thick on the ground, rather leaned to the eastward, in some places considerably lodged."

The cut below shows the average leaning of the straw towards the east.

On the same day, part of the machines were tried on another of Mr. Hayden's rye fields. "The crop was esti-

mated at 20 bushels to the acre, the straw was from four to five feet long, generally leaning, and in some places lodged down."

No report was made by the Time Committee on Reaping: the results of the trial in other respects, will be found in the Tables I, J and K.

No report was received of the experiments made to determine the length of time required by combined machines to convert a mower into a reaper, and vice versa.

July 18th. The reaping machines worked on the rye field belonging to Mr. Corning. "The crop was quite variable — in some places being equal to 30 bushels on an acre, in others not exceeding 10. The heaviest spots leaned somewhat, but generally stood fairly. The length of the straw was from three to five feet. On the same day the machines cut a small piece of wheat on the same farm, of the Mediteranean variety; the yield estimated at 18 bushels to the acre; standing up well; length of straw two and a half feet. A few Canada thistles on the two latter fields, were the only weeds particularly noticed."

Most of the machines were prepared for cutting wheat, and not for rye, which made their work worse than it would have appeared, if it had been confined to wheat.

We offer the following observations on the various machines, in their character of Reapers, referring to what has been said of them, as Mowers, in the preceding pages for many important particulars respecting them: —

Wm. F. Ketchum. This machine is changed from a mower to a reaper by enlarging the main wheel by means of circular sections bolted to the rim, and adding a changeable platform for *rear* or *side* delivery of the grain. The strengthing bar of the platform is arranged to give great firmness while reaping.

Miller, Wingate & Co. Side delivery. The frame of the machine is arranged to raise and lower, so as to cut any desired height, and always be level, or nearly so. The journals are well protected from dirt, and the boxes are all made with large oil cups.

Hull & Sanford. Side delivery. This machine cut off a large proportion of the heads of the grain, occasioning a great loss to the farmer.

T. R. Hussey. Back delivery. This is a great objection to this machine, as the gavels must be bound before it takes a second swath. Some farmers, however, like this feature, as they think it stimulates the binders and causes them to do more work. The gavels were laid very unevenly, and the performance marked by the Committee on Quality of Work, below medium.

Seymour & Morgan. This machine appears much better as a reaper than as a mower. It is in all respects well made. It has a side delivery. One point characterises it, which we deem of much importance. The size of the bundles are entirely under the control of the driver — a simple pressure of his foot, stops the rake at any point without interfering with the cutting. We observed that the motion of the knife was increased or diminished from mowing to reaping, and vice versa, by a very simple and speedy method; but the precise arrangement for accomplishing it does not appear on our minutes: we think, however, it was by a change of pinions. The Committee on Quality of Work say, "The performance of the automaton rake was very good."

T. D. Burrall. Delivery on side or rear, as desired. A castor-wheel in front takes the weight off the necks of the horses. The change of speed from reaping to mowing, is effected by bolting circular sections of plank to the rim of the driving-wheel, like Ketchum's. It has no reel, and the distance which the raker has to reach over makes it very fatigueing work. The simplicity and strength of the machine is admirable.

C. H. McCormick. This reaper is well known throughout the country. It worked on the worst ground we ever saw, and did its work *perfectly*. This is high praise, but it must be qualified by its enormous side draft and its tendency to rack, which we think impairs its durability. Side delivery.

D. M. Osborn. This machine is made entirely of iron, except the seat and pole. The gavels were not as well laid

as some others, though from the structure of the machine we could not see why they should not be.

Walter Wood. This excellent machine made very superior work.

Rufus Dutton. The well known and admirable machine of Atkins has won for itself a high reputation, which has not been diminished on this trial. We have already borne our testimony to the accuracy and perfection of its gearing. It requires more power than any other self-raker, and it cannot be regulated, with respect to the size of the gavels, by the driver.

F. J. Frelinghausen. The outer end of the cutter is raised for reaping by a castor, and the other end is raised by a screw and bolt in a sliding bar, with a slot. Side delivery.

Warder & Brokaw. The peculiarity of this machine is a supplementary platform, which holds the bundles after being made, and about to be thrown off, until properly formed and the loose and scattering stalks are collected, thus making better bundles and saving grain. The relative difference between the speed of the knife in reaping and mowing, is as the numbers 34 and 43. The change is effected by a change of pinions. Another peculiarity is the long section at the outer end of the knife, which, from the gather of the divider, is compelled to cut twice as much as any other. The peculiar arrangement of this section is designed to remedy this difficulty. Delivery either at the side or behind.

Pells Manny. Worked part of the time with a hand-rake, and a part as a self-raker. The automaton rake is very ingenious, though difficult to describe without a drawing. The great objection to its working is, that some of the straws which fall at the instant the rake is over the knife, scatter while it is making a backward sweep. This machine made much better work in the wheat than in the rye. It is not well calculated for the latter grain.

In concluding our review of the reaping trials, we desire to express our opinion of the necessity which exists for an improvement of reaping machines by the addition of an automaton rake which shall be wholly under the control of

the driver. In the present state of mechanical science in this country, it seems to us only necessary to state the want, in order to have it satisfactorily supplied before another harvest. If a good automaton rake is added to machines, we think the saving over cutting by cradles, would amount to one dollar per acre.

We have alluded to the want of provision for regulating the size of the gavels in Atkins' machine. The arrangements of Seymour & Morgan, and Pells Manny, are ingenious, and in wheat, lay their gavels as well as they are usually laid by hand rakers; yet we believe a binder can *rake* and bind after a cradle nearly as fast as he can *bind* after a machine. The heads falling straight on the platform, and afterwards swept round on a circle, deranges the straws, the butts are not even, and the straws are not parallel. It is the rectification of these which causes so much trouble to the binder. In addition to this, the working of a long rake from one end, must cause twisting and springing unfavorable to the permanence of the machine.

It gives us pain to undervalue the ingenious and meritorious labors of these gentlemen, but we should be unfaithful to our convictions if we did express a fear that they have not adopted the right principle. We think that farmers must look to something like the Texas self-raker for what they want, and we commend it to the attention of inventors as most likely to be successful. We are of opinion that the endless apron will require less power, will preserve the parallelism of the straws, cause less waste, and be less liable to get out of order, than the contrivances now in vogue. One of the most obvious deficiences in the Texas self-raker, is the want of some provision for squaring the butts; yet we think it would be easy to remedy it.

Some of the reapers still allow much of the weight of the machine to fall on the necks of the horses. This should be universally avoided by using a castor wheel, or some equivalent contrivance.

Some machines use too small wheels in running over the ground. Large ones, like those of Seymour & Morgan, are greatly to be preferred.

Most of the platforms were too small for rye straw: those designed for general use, should increase their size.

It will be seen that the second premium is awarded to Walter A. Wood, although his total amount of merit, as developed in Table L, is equal to F. J. Frelinghausen. On recurring to Table I, it will be seen that Walter A. Wood, in the first day's work in rye, marks 38 on cut and 40 on gavel, against nothing for Frelinghausen; and in the second day in rye, Wood makes 37 on cut and 36 on gavel, against Frelinghausen's 30 on cut and 38 in gavel. As between them, Wood should receive 30 in the merit roll for "quality of work," which is decisive of the question, without considering the suspicion of want of durability which hangs around Frelinghausen's machine.

In awarding a diploma to J. Haines, for his Illinois Harvester, we disclaim all expression of opinion respecting the safety of the grain when harvested on his method.

The Committee, on Monday, July 20th, proceeded to examine the Illinois Harvester, made by Jonathan Haines, at Mr. Sabin's farm, in Onondaga hollow. It cuts a swath ten feet wide, from eight to thirty-six inches from the ground, at the pleasure of the operator. It is drawn by four horses, and two horses or more are employed in conveying the heads to the stack or barn, according to the distance. The horses travel behind the machine, and it is guided with great accuracy and rapidity by a steering wheel in the rear. One man is employed in driving the horses, steering, and regulating the height of the cutter. One man drives the wagon, and one man loads, — the minimum force being six horses and three men. The knife is four inches at base, and the perpendicular distance from the apex to the base is two inches. The fingers, or guards, are three inches apart. The vibration is eighteen inches. The reel is five feet in diameter and consists of eight slats set on spirally, the left hand being one-eighth of the circumference behind the right hand. This spiral arrangement gives an upward direction of the heads of the grain on the endless apron. The journal-bearings are made in two pieces, and as they wear they are brought together by

a follower and wooden wedges. The machine is capable of harvesting 20 acres per day; its weight is 1600 lbs.; its price at the shop of the maker, $240.

The knife is attached to an adjustable lever, by means of which the heads are taken off with any desired length of adhering straw: in practice, from fourteen inches to two feet (according to ripeness), is considered the most desirable length. The heads, after being cut, fall on to an endless apron, which runs level to the edge of the machine, when it comes to an inclined plane working on a hinge, and is elevated, according to circumstances, from 15° to 45°. The edge of this inclined plane overhangs a wagon, furnished on the opposite side, and ends with a cloth screen, into which the apron deposits the cut heads. Every portion of the field passed over by the machine was left perfectly clean; no scattering straws or waste of grain could be detected in any part — all the grain knocked out by the reel, was thrown on to the endless apron and safely delivered in the attending wagon. Our dynamometer had been taken to Albany before this trial was had, and we were therefore unable to test its draft accurately; but the four horses appeared to work no harder than two horses in other machines.

There is no side draft, nor any weight on the necks of the horses. The momentum acquired by the knife, which is very considerable, is gradually arrested by long wooden springs. The gearing from the driver is internal, and is transmitted from the pinion by one pair of bevel wheels. On the whole, the working of the machine was admirable, doing its work thoroughly, speedily, and handsomely. The ground on which it worked was tolerably level, though very stony. On level land, and large fields, we consider this machine to be of great value. On uneven lands or small fields, we should not consider it desirable.

The grain, after being cut, is deposited in cribs or ricks, made to stand north and south: rails are first laid down, from ten to fifteen inches apart, long stakes are then thrust into the ground at short intervals, the heads of grain are then thrown on as high as the stakes, other rails are then

laid across the rick and the stakes drawn up. This process is repeated until the rick is carried as high as is desired. Mr. Haines claims that the air circulating through the holes left by the stakes, and through the spaces between the rails, is sufficient to prevent heating or moulding. He produced for our inspection certificates, from several very respectable gentlemen, to prove that grain treated in this way was as safe as any other, and that a great saving was effected by it. We see no cause to doubt this testimony; but as we did not personally superintend the experiments, we cannot vouch for their accuracy.

We much regret that we were unable to test this novel and interesting machine more thoroughly. Our neglect to do so was through no fault of Mr. Haines. Early in the trial he applied to us to cause a large field of grain to be cut, one-half by his header, the other, by any reaper we might select, and thus test the comparative economy and safety of the two methods; but the anxiety of the proprietors of reapers to depart, and the severe pressure of our other duties, prevented us from accepting the proposal. We have, however, seen enough of it to commend it cordially to our large prairie farmers, for whom it seems exactly adapted.

At the beginning of the trial, Granger & Wilson, of Texas, entered a transferable automaton rake. They exhibited to us a small model; but their rake was not attached to any machine capable of working in the field. One of the best shops in Syracuse agreed to attach one early in the week, but failed to have it ready before our departure. Deeply impressed with the ingenuity of the contrivance, as indicated in the small model, we desired that a practical trial should be given to it; and at the request of the Chairman, Mr. George Geddes, of Syracuse, consented to give it a trial on his own farm. The following is the report of Mr. Geddes, whose well known scientific skill as an engineer and a farmer, stamps his conclusions with great value.

Fairmount, N. Y., July, 25th, 1857.

Hon. John Stanton Gould:

Dear Sir, — As you requested, I have attended to the trial of the "Texas Self-Raker," and have to report as follows: — The machine was made from a working model during the grand trial of Reapers and Mowers, at Syracuse, and came on the ground yesterday with all the disadvantages incident to so hasty a construction, with the addition of having to encounter the difficulties of cutting and handling very unripe wheat, made still heavier by rain. Many points of detail, such as insufficient motion of the reel that lays the grain on the endless apron — the apron being placed too high, as regards the cutting-bar, to fairly receive the grain, and other minor matters were found not quite right; but each of them easily remedied.

The object aimed at by the inventor, is a very important one: it is to receive the cut grain in the arms of a revolving cradle, and hold it until a proper sized bundle is obtained, and then instantaneously drop it in the best form to receive the band.

From the working of this imperfect machine, I have high expectations in regard to the ultimate success of the principle involved, and I think perseverance is only necessary to secure the object aimed at.

In all the reapers I have seen operating, there is one constant difficulty — whether the bundles, or gavels, are thrown off by hand, or by the action of the rake or fingers operated by the power that moves the machine, the same trouble arises in so laying the grain that it can readily be bound into square, compact bundles. This is just now the real point of difficulty. It costs too much to bind the scraggling bundles, and the mechanic that will give us our grain ready to receive the band, with the butts square and even, will be entitled to the vast pecuniary reward, as well as the fame that surely awaits him. It would seem that this can only be done by some device that will drop the bundle by an instantaneous motion, and that, too, of the whole bundle. The "Texas self-raker" is an attempt to do this, and, so far as I can judge, the inventor is on the road that will lead him to success.

Yours truly,

George Geddes.

We fully concur in the views of Mr. Geddes, so clearly expressed in the above report. In all the machines we have

seen, save Atkins' automaton, the motion for raking off disarranges the parallelism of the straws, and their arrangement by the binder, absorbs too much of his time, and by so much, detracts from the saving which machinery can and ought to effect. Atkins' automaton, though not liable to this objection, cannot regulate the size of the bundles; in thin grain they are too small, and in stout grain they are too large. We are of opinion that when all the mechanical details are properly adjusted, the Texas self-raker will obviate both of these difficulties, giving a parallel gavel with square butts, of a size easily regulated at the pleasure of the driver.

Frost, Burk & Co. offered some very superior scythe snaiths; the workmanship of them is very superior, their mechanical peculiarities consist in their shape, and in the manner in which the scythe is fastened to the snaith. The snaiths have a bend backward and downward from the centre beween the nebs to the upper end, the effect of which is to bring the hands into a more natural and easy position in mowing, than when the snaith bends forwards, or from the user, at the left hand neb. The heel-bend does not turn forward so much as other snaiths, but is of such a shape as balances the scythe exactly level when hung to the snaiths.

The nature of this invention consists — First, in the peculiar construction of the set-ring, which has a groove for the passage of the claw of the scythe, and an opening or mortise for the admission of the loop-bolt.

Second, the peculiar construction of the loop-bolt, consisting of a loop for the admission of the shank or arm of the scythe; the groove, for the passage of the claw, together with the hook or lip, which fills the opening in the set ring on the side of the snaith. The inside of the hook or lip bent firmly against the wood, the opposite end of the loop bearing against the set-ring.

It will be readily seen that the devices constituting this mode of fastening, are constructed to suit the different sizes of shanks. The advantages gained by the use of the grooves are, first, to admit the arm and claw of the scythe to pass through the loop without making it so large as to be incon-

venient, and unnecessarily heavy. Second, they lessen the labor in fastening the scythe to and unfastening it from the snaith, it being unnecessary to turn the nut as far as would otherwise be required.

Another advantage of this method of fastening, is, the draught by the screw being towards the spotting, the scythe will be held more firmly than if it were sidewise or lengthwise.

Two Hay Presses were presented for examination. (See pages 222 and 223. One made by William Deering & Co., on Dederick's patent, is of great value, and may be used either as a portable or stationary press.

			lbs.	lbs.		lbs.		
No. 0.	Pressing bales from		450	to 500,	weigh	3000;	sold for	$175.
No. 2.	"	"	275	to 325,	"	2880;	"	140.
No. 4.	"	"	200	to 225,	"	1500;	"	115.
No. 5.	"	"	150	to 175,	"	1000;	"	100.

Six or seven tons of hay can be put into bales, by a man and a boy, in a day by No. 2.

Those who have used the old Dederick press are aware that the follower, by treading the hay in the box, was liable to be changed from a truly horizontal position. When this occurred, the enormous power of the toggle-joint was expended, not on the hay, but on the sides and doors of the press, when a fracture of some of the parts was pretty sure to follow. This difficulty is entirely obviated by this press, which works with parallel levers, the ends of which are separated on the follower and thus prevent the possibility of tilting. Again, in the old angular press of Dederick, it was found impossible to make a chain or rope which would not elongate unequally; hence the levers never acted simultaneously. By the parallel arrangement of the levers, they must of necessity act precisely alike, producing a great saving of power and diminishing almost to zero the liability to fracture.

When the bale is to be removed from the press, the opening of the doors at the sides and ends has hitherto been a work of some difficulty and danger. The doors of *this* press may be easily opened by a boy with one hand, without the least danger to himself or to any one else.

The workmanship of these presses is uncommonly good, and the materials are of the best quality. The strength of the materials seem very scientifically adjusted to the amount of strain it is required to bear, and we can hardly suppose any press can be made more rapid, or durable, or convenient, than this is. Their power is amply sufficient for all practical purposes, and the action and arrangement of them will be easily understood by a reference to the engravings of them appended to this Report.

In one of these presses adapted to bailing 400 lbs., the power of a horse applied through a capstan of 10 inches diameter, operated by a sweep eight feet in length, is at the point indicated in Figure A, multiplied 15 times; when they are at a point indicated in Figure B the power is multiplied 36 times; half way between Figures B and C 75 times; and when at the point indicated in Figure C, the power of the horse is multiplied just 150 times; and from this point it goes on increasing to 316 times.

The head *U* is slid over to either side at pleasure; the door is closed and fastened by the latch *F*. The hay is then thrown in and well tramped down round the edges; the head *U* is drawn over the top of the press. The power is now applied to the follower through the parallel levers *J*, *K*, by the tackle *N*, *R*, *R*. When the levers become perpendicular, as in Figure C of the preceding cut, the maximum pressure is obtained, the door *C* with its companion on the opposite side are opened, the hoops nailed, and the ends of the bale relieved by opening the door *B*. This completes the process. We have no hesitation in awarding to this machine our unqualified commendation.

A very beautifully finished grain cradle was presented by H. Robinson, which proved a most excellent implement.

AWARDS OF THE JUDGES,

AT THE NATIONAL FIELD TRIAL OF HARVEST IMPLEMENTS BY THE UNITED STATES AGRICULTURAL SOCIETY.

REAPERS.

First Premium — To C. H. McCormick, a Gold Medal and Diploma for the best Reaper.

Second Premium — To Walter A. Wood, a Silver Medal for the second best Reaper.

Third Premium — To Warder, Brokaw & Child, a Bronze Medal for the third best Reaper.

To Jonathan Haines — A Diploma, for Illinois Harvester.

COMBINED MACHINES.

First Premium — To Walter A. Wood, a Gold Medal and Diploma, for the best Combined Machine.

Second Premium — To Buffalo Agricultural Machine Works, Kirby's Improvement, a Silver Medal, for the second best combined machine.

Third Premium — To Warder, Brokaw & Child, a Bronze Medal, for the third best combined machine.

MOWERS.

To T. D. Burrall — A Diploma, for simplicity of construction and solidity of workmanship.

To R. L. Allen — A Diploma, for his concave knife blade, and general excellence of material and superior workmanship.

To Buffalo Agricultural Machine Works — A Diploma, for cheapness, and ingenious adaptation of cutter to uneven surfaces.

For other awards on Mowers, see end of this report.

TRANSFERABLE AUTOMATON RAKES.

First Premium — To Seymour & Morgan, a Silver Medal, for the best Transferable Automaton Rake.

STATIONARY HAY OR COTTON PRESS.

First Premium — To William Deering & Co., a Silver Medal and Diploma, for the best Stationary Hay or Cotton Press.

PORTABLE HAY OR COTTON PRESSES.

First Premium—To WILLIAM DEERING & Co., a Silver Medal and Diploma for the best Portable Hay or Cotton Press.

GRAIN CRADLES.

First Premium—To H. ROBINSON, a Bronze Medal, for three superior Grain Cradles.

SCYTHE SNAITHS.

First Premium—To FROST, BURK & Co., a Bronze Medal, for superior Scythe Snaiths,

CONCLUDING REMARKS.

It has been our object from the beginning, to conduct the trials that they might be self-determining, so that the announcement of the results of our weights and measures might determine the question of the relative merits of the different machines without the intervention of our own judgments or opinions. We have steadily adhered to that determination throughout the trials. We have had no partialities for individuals or localities to gratify, and our single aim has been to award the palm to merit alone. How far we have succeeded in our endeavors, is now for you and the public to determime. We have laid before you, in the preceding report, all the facts and circumstances on which our awards are based. If we have erred, our judgments can be corrected by the facts recorded in these pages.

We have already returned our thanks to the local committee, the marshals, and the citizens of Syracuse, for the valuable aid they afforded us; yet we cannot refrain from renewing them on this occasion, and bearing our testimony afresh to the intelligent and willing assistance which they extended to us during the whole period of our labors.

We have also great pleasure in expressing, publicly, as we have already done privately, our thanks to you for your uniform kindness, and for your ability and zeal in promoting the various plans which we have formed, for securing success for our labors.

We also desire to express our thanks to the other officers of the Society, whose counsels and assistance have been exceedingly servicable to us.

Finally, we submit these results of our labors to your judgment in the hope that you will find in them some facts and conclusions which are not altogether without value in promoting the interests of our common humanity.

JOHN STANTON GOULD, *Chairman.*

TABLE A.

Shewing quality of work in Timothy and Clover Fields. MOWERS.

Number of Entry.	Name of Exhibiter.	Clover Field.				Timothy Field.			
		Number of Lot drawn.	Quality of Mowing—40 being Perfect Work.	Quality of Swath left—40 being Perfect Work.	Remarks.	Number of Lot drawn.	Quality of Mowing—40 being Perfect Work.	Quality of Swath left—40 being Perfect Work.	Remarks.
27	T. D. Burrall,	11	23	31	Clogged to some extent.	10	38	40	
47	Pruyn & Lansing,	19	30	30	Clogged to some extent.	19	40	36	Clogged some.
45	R. L Allen,	18	30	36		18	40	36	
22	Walter A. Wood,	14	28	31	No clogging, cut well round trees.	5	38	35	
57	T. J. Frelinghausen,	20				20	40	38	
34	Wm. H. Hovey,	16				12	37	31	Clogged some.
39	M. Hallenbeck,	7	35	36	No clogging.	11	40	40	
18	{ E. Ball's invention. { Ball, Aultman, & Co.	5				15	40	40	
19	{ Miller & Aultman's. { Ball, Aultman & Co.	13			Broke in bad ground.	13	38	38	
14	A. H. Caryl,	15	23	23		8			
17	Wm. F. Ketchum,	10	23	25	Clogged.	4	27	25	Clogged badly, cut badly round stump.
30	D. M. Osborn,	1	32	30	Clogged some, had worst lot in field.	7	33	35	
37	T. R. Hussey,	6	32	38	Clogged some.	3	30	35	Clogged badly.
58	C. H. McCormick,								
23	Walter A. Wood,	9	35	36	Cut badly round trees	2	36	34	
33	Warder, Brokaw & Co.	4			Clogged and stopped	1	30	35	Clogged, had a bad lot.
38	Hull & Sandford,	8	28	36		16	30	33	
40	Miller, Wingate & Co.,	3	30	38	Cut badly round trees	6	35	40	
10	Pells Manny,	12	23	31	Clogged badly.	14	30	30	Clogged badly.
25	Seymour & Morgan,	2			Clogged badly and stopped.	17	30	35	Clogged badly.
44	Rufus Dutton,	17	33	33	Clogged some.	9	35	38	Clogged badly.

TABLE B.

Shewing the length of Stubble left by each Mower in the Clover and Timothy Fields. MOWERS.

Number of Entry.	Name of Exhibiter.	Clover Field.				Timothy Field.			
		Number of Lot drawn.	Length Stubble. Inches and Decimals.	Merit Marks. 40 being perfect, 30 equal to Scythe.	Remarks.	Number of Lot drawn.	Length Stubble. Inches and Decimals.	Merit Marks. 40 being perfect, 30 equal to Scythe.	Remarks.
			Ins.				Ins.		
27	T. D. Burrall,	11	4.5	24	Uneven; cut clean; very little dragged.	10	3.6	28	Cuts clean and even; the stubble in hollows 1-4 inch higher than ridges; no dragging.
47	Pruyn & Lansing,	19	3.8	24	Tolerably even.	19	3.6	28	
45	R. L. Allen,	18	4.0	28	Cut pretty close and even.	18	3.5	24	
22	Walter A. Wood,	14	3.8	27	Cut clean, but uneven; not dragged.	5	3.6	30	Cuts very evenly; no dragging; the cut is very clean on both ridges and hollows.
57	T. J. Frelinghausen,	*				8	3.0	32	
34	Wm. H. Hovey,	16	3.4	32	Even; not dragged; cut well.	12	3.3	33	Cuts well; no dragging.
29	M. Hallenbeck,	7	4.2	25	Tolerably clean; a little uneven.	11	3.7	21	Cut very well; drags slightly.
18	E. Ball's. / Ball, Aultman & Co.	5	3.7	10	Uneven; not much dragged.	15	3.8	28	No dragging; cuts extremely clean and even.
19	Miller & Aultman. / Ball, Aultman & Co.	13			Not cut; machine broke.	13	3.4	38	No dragging; cut beautifully even, remarkably so over hills and hollows.

14	A. H. Caryl,	15	4.0	16	Uneven; not dragged.	8‡			See foot notes.
17	Wm. F. Ketchum,	10	4.1	10	Dragged some; uneven.	4	3.4	24	Cuts clean; no dragging; cuts cleanest on ridges.
30	D. M. Osborn,	1	3.7	10	Drags; uneven patches left. The worst lot in the field to mow.	7	3.7	29	Cuts evenly except in hollows; does not drag.
23		23	4.0	30					
37	T. R. Hussey,	6	4.2	10	A little dragged; unevenly cut.	3	4.2	10	Drags badly; cuts uneven; stubble longest in hollows by one-half.
25	Seymour & Morgan,	2	4.1	10	Drags; uneven; some left uncut.	17	3.9	21	Drags some; cuts even; difference of 1-3 of an inch between hills and hollows.
58	C. H. McCormick,	†							
23	Walter A. Wood,	9				2	3.5	28	Cut very clean; no dragging; cuts cleanest in hollows.
33	Warder, Brokaw & Co.	4	3.7	21	Tolerably cut; drags some. Lot unfinished.	1	4.6		Very uneven, many patches wholly missed; drags badly.
38	Hull & Sandford,	8	4.4	22	Pretty clean; a little uneven; not much dragged.	16	4.4	23§	The ends of the stubble appear torn, rather than cut; drags some; tolerably even.
40	Miller, Wingate & Co.,	3	4.0	10	Drags; uneven.	6	4.1	27	Cuts even; 1-4 of an inch shorter in hollows than on level ground.
10	Pells Manny,	12	6.0	10	Not clean; a little dragged; uneven.	14	4.2	22	Tolerably even; drags some; 1-4 inch longer in hollows than on ridges.
44	Rufus Dutton,	17	4.5		Drags; uneven.	9	3.7	24	Drags the stubble; cuts it higher in hollows than on ridges.

* Did not enter until after the conclusion of the Clover Trial, and only finished No. 8 in the Timothy Field, after it had been abandoned by Mr. Caryl.

† Did not enter in time to mow.

‡ The reel worked ill and the machine clogged. Mr. Caryl therefore abandoned the lot and notified the Chairman that he was no longer a competitor. The lot was finished by T. J. Frelinghausen, who did excellent work; the marks affixed to his name are placed there on the sole authority of the Chairman, who alone examined the work.

§ Committee on Stubble omitted this lot in their report. The figures given are taken from the private notes of the Chairman.

TABLE C.

Time of Cutting each Lot on the Hayden Meadow.

No. of Entry.	Exhibiters Names.	No. of Lot.	Whole Time.	Time, deducting stops.	Causes of Stoppages. From fault of Machine.	Causes of Stoppages. From care of Machine.	Causes of Stoppages. From causes not the fault of the Machine.	Character of Lot.	Remarks.
			h m	h m					
27	T. D. Burrall,	10	1.00	.56¾	2 1-4 min. clogging.	.....	2 minutes.		
47	Pruyn & Lansing,	19	1.11		.....	.....	.....	.....	No report on stoppages.
45	R. L. Allen,	18	1.06		No stoppage.				
22	Walter A. Wood,	5	1.07	.55½	None.	1-2 minute oiling.	1 m. reins broke, 7 m. hitting stone, 1 m. passing machine, 2 m. cut dead furrow.	2 stumps hit one of them twice	
57	T. J. Frelinghausen,	8			Time not noted	—came late—mowed	part of a lot.		
34	Wm. H. Hovey,	12	1.13		....	.....	....	.....	Stops not noted.
29	M. Hallenbeck,	11	1.04	1.04	No stops.				
18	E. Ball. / Ball, Aultman & Co.	13			Time not noted.				
19	Miller & Aultman, / Ball, Aultman & Co.	15	1.10	1.01	3 1-2 min. 6 times.	.....	4½ min. lost pin, 1½ min. loading from another swath.	Tree on lot.	
14	A. H. Caryl,	8			.....	.....	.....	.....	Withdrawn before finishing, from failure of reel.
17	Wm F. Ketchum,	4	1.09		Stops not noted.				
30	D. M. Osborn,	7	1.24	1.01	13 minutes.	5 min. taking off reel, changing track clearer	5 min. from clogging, by starting out of geer.	Very bad.	
37	T. R. Hussey,	3	1.51	.47	54 minutes; clogging	.....	10 min. removing grass from other swath.	.....	Driver sick.
58	C. H. McCormick,								
23	Walter A. Wood,	2	.55		Several stoppages from 1-2 to 1 min.	Causes of stoppages not noted.			
33	Warder, Brokaw & Co.	1	2.10		.....	.....	.....	.....	Stops not noted.
38	Hull & Sandford,	16			Time not noted.	Stops not noted.			
40	Miller, Wingate & Co.,	6			Time not noted.	Stops not noted.			
10	Pells Manny,	14	1.21	1.07	8 min., 9 times.	.....	6 min. belt of reel broke.		
25	Seymour & Morgan,	17	1.40		Stops not noted.				
44	Rufus Dutton,	9	2.03	1.01	63 min., 35 times.				

TABLE D.

Shewing direct draft, side draft, surface draft, and power required for vibration of knife. MOWERS.

No. of Entry.....	Name of Exhibiter.	Character of Mower.	In Grass.		Out of Grass.		Surface Draft.		Total power expended in cutting grass.....	Power expended in vibrating knife & surface draft....	Surface draft.....	Power expended solely in cutting.	Power expended solely in vibrating knife.....	Side draft.....
			Length of Piston drawn out	Time of drawing out.....	Length of Piston drawn out	Time of drawing out.....	Length of Piston drawn out	Time of drawing out....						
			Inches.	m. s.	Inches.	m. s.	Inches	m. s.	lbs.	lbs.	lbs.	lbs.	lbs.	
27	T. D. Burrall.....	Combined.	$2\frac{1}{2}$	1.25	$1\frac{3}{8}$	1.19	$1\frac{1}{4}$	1.22	352.9	209.1	183.1	143.8	26.0	12
47	Pruyn & Lansing.....	Mower.	$2\frac{3}{4}$	1.14	$2\frac{5}{8}$	1.27	$1\frac{11}{16}$	1.15	446.0	362.0	272.0	84.0	90.0	$11\frac{1}{2}$
45	R. L. Allen.....	Do.	$2\frac{15}{16}$	1.33	$1\frac{15}{16}$	1.27	$1\frac{15}{16}$	1.15	378.9	267.2	210.0	111.7	57.2	
22	Walter A. Wood*.....	Do.	$2\frac{7}{16}$	1.13	$2\frac{1}{16}$	1.14	$1\frac{5}{8}$	1.15	400.8	334.0	260.0	66.8	74.0	03
57	T. J. Frelinghausen.....	Combined.	$2\frac{1}{8}$	1.10	$1\frac{15}{16}$	1.15	$1\frac{9}{16}$	1.15	492.0	310.4	250.3	181.6	60.1	08
34	Wm. H. Hovey.....	Mower.	$3\frac{3}{16}$	1.25	$1\frac{7}{8}$	1.15	$1\frac{3}{8}$	1.10	450.8	300.0	236.1	150.8	63.9	04
29	M. Hallenbeck,.....	Do.	$2\frac{9}{16}$	1.17	$1\frac{3}{4}$	1.12	$1\frac{1}{4}$	1.13	399.9	292.1	205.8	107.8	86.3	08
18	E. Ball..... Ball, Aultman & Co.....	Do.	$2\frac{3}{4}$	1.19	$1\frac{3}{16}$	1.20	$1\frac{7}{16}$	1.16	418.3	272.3	227.3	146.0	45.0	
19	Miller & Aultman..... Ball. Aultman & Co.....	Do.	$2\frac{7}{8}$	1.18	$1\frac{3}{16}$	1.15	$1\frac{7}{16}$	1.17	442.8	290.4	224.6	152.4	65.8	10
14	A. H. Caryl.....	Do.	$2\frac{7}{8}$	1.10	$2\frac{7}{16}$	1.15	†	†	493.1	390.0	†	103.1	†	30
17	Wm. F. Ketchum.....	Combined.	$3\frac{1}{8}$	1.31	$1\frac{7}{8}$	1.28	$1\frac{1}{4}$	1.15	412.1	255.7	200.0	156.4	55.7	04
30	D. M. Osborn.....	Mower.	3	1 34	$1\frac{3}{8}$	1.05	$1\frac{1}{16}$	1.11	383.0	253.8	179.5	129.2	74.3	20
37	T. R. Hussey‡.....	Combined.	$2\frac{9}{16}$	1.28	$1\frac{7}{16}$	1.33	$1\frac{15}{16}$	1.22	349.4	185.5	137.2	163.9	48.3	5
28	C. H. McCormick.....	Do.	$2\frac{9}{16}$	1.10	$1\frac{3}{8}$	1.07	$1\frac{3}{8}$	‡1.01	439.3	291.0	270.4	148 3	‡20.6	40
23	Walter A. Wood.....	Do.	$2\frac{7}{16}$	1.14	$1\frac{3}{4}$	1.05	$1\frac{3}{8}$	1.06	395.2	323.1	250.0	72.1	73.1	03
33	Warder, Brokaw & Co.....	Do.	$2\frac{7}{8}$	1.14	$1\frac{7}{8}$	1.04	$1\frac{1}{2}$	1.07	466.1	351.1	268.5	115.0	82.6	33
38	Hull & Sandford.....	Do.	$2\frac{5}{8}$	1.24	$1\frac{9}{16}$	1.14	$1\frac{1}{16}$	1.07	375 0	253.4	190.4	121.6	63.0	04
40	Miller, Wingate & Co.....	Do.	3	1.24	$1\frac{11}{16}$	1.11	$1\frac{3}{8}$	1.13	428.0	285.2	226.0	142.8	59.2	
10	Pells Manny.....	Do.	$2\frac{11}{16}$	1.15	‡$1\frac{3}{8}$	1.13	‡$1\frac{3}{16}$	1.15	430.0	226.0	190.0	‡ 04.0	‡36.0	
									418.6	286.9	221.2	131.7	66 0	

* Cut in the field with a reel, but without it in the dynamometer trial.

† No arrangement for throwing out of gear, hence the surface draft could not be obtained.

‡ Original notes rubbed and their meaning doubtful. In the cases of McCormick and Manny the doubt is confined to the marked columns.

The figures in the table annexed to the names of E. Ball and Miller & Aultman are correct transcripts of the judge's minutes; but Messrs. Ball, Aultman & Co. state that the credits are transposed, that the figures attached to E. Ball's machine really belong to Miller & Aultman, and

TABLE E.

Shewing corrected Draft, Weight, and Price of Mowers.

Number of Entry.	Name of Exhibiter.	Total draft while cutting grass.	Deduct for short cut.	Length of cut of Machine.	Corrected for two preceding columns, actual draft in pounds per inch.	Length of Stubble.	Weight.	Price.
			Ins.	Ins.		Ins.		
27	T. D. Burrall,	352.9 lbs.	3	58	6.416	$3\frac{3}{4}$	$884\frac{1}{2}$ lbs.	$115
47	Pruyn&Lansing	446.0 "	$1\frac{1}{2}$	54	8.494	3.0‡	711 "	$100
45	R. L. Allen,	378.9 "	2	60	6.517	$2\frac{3}{4}$	682 "	$120
22	Walter Wood,*	400.0 "	0	64	6.262	$2\frac{5}{8}$	719 "	$105
57	T. J. Frelinghausen,	492.0 "	$3\frac{1}{4}$	59	8.946	$2\frac{7}{8}$	705 "	
34	Wm. H. Hovey,	450.8 "	0	53	8.505	$2\frac{3}{4}$	859 "	$120
29	M. Hallenbeck,	399.9 "	$1\frac{1}{2}$	55	7.474	$2\frac{5}{8}$	672 "	$115
18	E. Ball, Ball, Aultman & Co.,	418.3 "	0	51	8.202	$2\frac{1}{2}$	930 "	$125
19	Miller & Aultman, Ball, Aultman & Co.,	442.8 "	$\frac{1}{2}$	52	8.578	3.0	995 "	$125
14	A. H Caryl,	493.1 "	0	58	8.502	$2\frac{3}{4}$	995 "	$125
17	W. F. Ketchum	412.1 "	$3\frac{7}{8}$	60	7.342	$2\frac{3}{4}$	753 "	$110
30	D. M. Osborn,	383.0 "	0	54	7.092	$2\frac{3}{4}$	658 "	$100
37	T. R. Hussey,	349.4 "	0	58	6.024	$3\frac{1}{2}$	800 "	
58	C. H. McCormick	439.3 "	0	68	6.578	$2\frac{1}{4}$	905 "	
23	Walter A. Wood,	395.2 "	$1\frac{1}{2}$	64	6.323	$2\frac{1}{2}$	874 "	$125
33	Warder, Brokaw & Co.,	466.1 "	3	59.3	8.278	$2\frac{3}{4}$	1015 "	
38	Hull & Sandford	375.0 "	0	55	6.818	3		
40	Miller, Wingate & Co.,	428.0 "	0	62	6.903	3	949 "	$150†
10	Pells Manny	430.0 "	$3\frac{1}{2}$	58	7.414	$3\frac{1}{4}$	912 "	$120
25	Seymour & Morgan,						956 "	$100
44	Rufus Dutton,						1008 "	$120

*The above applies to wooden cutter bar; with a steel cutter bar the weight is 708 lbs. Price $115.

†This is the price of the combined Machine. The single Mower not stated.

‡Original figures doubtful.

TABLE F.

Showing the dimensions of various parts of the Machines. MOWERS.

No. of Entry.	Name of Exhibiter.	Length of cut.	Diam. of Driving Wheel....	Breadth of Driving Wheel.	Height proj. on Driving Wheel.	Distance from each other	Vib'n. to each rev. Dri Wheel.	Length of each vibration.....	Distance betw'n fingers.....	Length of base of each tooth of knife.....	Perpend'r dist. fm base to apex	Diam. of Roel.	Rev. of Reel to one rev. of Driving Wheel.	Kind of edge.	Advance of machine in making one vibration.	Position of Knife.
27	T. D. Burrall.....	58	36	5.5	.7	5.5	47	6.0	3.	3.	2.0	none		Smooth	2.4	24 in. before shaft.
47	Pruyn & Lansing....	54	30	7.5	1.5	6.0	32	2.0	4.	4.	3.0	do.		do.	3.0	43 in. before shaft.
45	R. L. Allen.....	60	32½	6.	.5	6.3	45	3.5	2.4	3.	2.5	do.		do.	2.3	30 in. behind shaft.
22	Walter A. Wood....	64	29	6.0	1.0	6.0	37	3.5	4.	4.	2.7	49	1.5	do.	2.5	Shaft before.
57	T. J. Frelinghausen..	59	32	5.5	0.7	4.3	32	3.0	3.	3.	3.1	none		do.	3.	18 in. behind shaft.
34	Wm. H. Hovey.....	53	40	5.0	.9	6.4	46	3.7	3.7	3.3	3.0	do.		do.	2.6	24 in. behind shaft.
29	M. Hallenbeck.....	55	38	5.2	.7	6.0	44	4.0	4.0	4.0	3.1	do.		do.	2.0	25 in. behind shaft.
18	E. Ball..... / Ball, Aultman & Co.	51	30	5.0	.7	6.6	34	4.0	4.0	4.0	3.4	do.		do.	3.0	18 in. behind shaft.
19	Miller & Aultman.. / Ball, Aultman & Co.	52	30	5.0	.7	6.6	34	4.0	4.0	4.0	3.4	do.		do.	3.0	22 in. before shaft.
14	A. H. Caryl.....	58	34	10.0	none	none	36	1.7	3.0	3.0	2.8	54		do.	3.0	22 in. before shaft.
17	Wm. F. Ketchum....	60	36	5.4	1.0	6.5	36	4.0	4.0	4.	3.0	none		do.	6.0	In line with shaft.
30	D. M. Osborn.....	54	30	6.0	.7	6.0	32	4.0	4.0	3.5	2.5	54		do.	3.1	8 in. behind shaft.
37	T. R. Hussey.....	58	36	6.0	.6	8.0	48	3.6	3.5	3.5	3.2	none		do.	2.3	20 in. before shaft.
58	CHl. McCormick.....	60	28	7.0	.6	6.5	32	4.5	4.0	4.0	1.7	78	1.0	Sickle	2.0	19 in. behind shaft.
23	Water A. Wood....*															
33	Warder, Brokaw & Co.	59.3	36	5.5	.7	6.0	43	4.5	4.0	4.0	1.3	60	3.3	Sickle	2.5	22 in. before shaft.
38	Hull & Sandford.....	55	36	5.5	.6	5.0	42	4.0	4.0	4.0	3.5	50	1.0	Smooth	2.6	On line with shaft.
40	Miller, Wingate & Co.	62	36	6.5	.5	8.0	44	3.5	3.5	3.5	1.8	58	1.0	Sickle	2.5	27 in. before shaft.
10	Pells Manny.....	58	30	7.0	.7	6.0	36	3.5	4.0	4.0	1.2	52	2.0	do.	3.0	32 in. before shaft.

All the dimensions on this Table are stated in inches and decimals of an inch.

*See No. 22.

TABLE G.

Containing Report of Mechanical Committee. MOWERS.

Number of Entry.	Name of Exhibiter.	Number of Horses.	Number of Men.	Question Three.	Question Four.	Question Five.	Question Six	Question Seven.	Question Eight.	Question Nine.	Question Eleven.	Question Twelve.	Question Thirteen.	Question Fourteen.	Total Merits.	Total merit excluding 14th Question.¶
27	T. D. Burrall	2	1	36	36	40	36	36	36	28	28	36	40		352	352
47	Pruyn & Lansing....	2	1	28	36	36	28	28	36	20	20	28	28	28	316	288
45	R. L. Allen†.....	2	1	36	40	36	36	36	36	28	20	36	40	36	380	344
22	Walter A. Wood....	2	1	40	28*	40	36	36	36	36	40	36	36	28	388	360
57	T. J. Frelinghausen.	2	1	28	28	28	36	36	28	28	28§	28	36		304	304
34	Wm. H. Hovey.....	2	1	28	28	28	36	36	20	28	36	28	36	20	324	304
29	M. Hallenback**....	2	1	36	40	36	36	36	36	28	28	28	28		332	332
18	E. Ball's invention Ball, Aultman & Co.	2	1	36	36	40	36	36	36	36	40	40	36		372	372
19	Miller & Aultman.. Ball, Aultman & Co.	2	1	40	36	36	36	36	36	36	40	40	36		372	372
14	A. H. Caryl	2	1	36	36	28	36	36	28	36	40	36	28		340	340
17	Wm. F. Ketchum....	2	1	36	40	40	36	36	36	28	28	36	28		344	344
30	D. M. Osborn.....	2	1	36	36	36	36	36	36	28	28	28	28		328	328
37	T. R. Hussey.....	2	1	28	36	36	36	20	28	20	20	28	20	28	300	272
58	C. H. McCormick....	2	1	36	36	36	36	36	36	28	28	28	28	28	356	328
23	Walter A. Wood (*a*).															
33	Warder, Brokaw & Co.	2	1	28	36	36	36	36	36	36	28	28	28	36	364	328
38	Hull & Sandford.....	2	1	36	36	36	36	36	36	36	20	28	20		320	320
40	Miller, Wingate & Co	2	1	36	36	36	36	36	28	28	28	36	20		320	320
10	Pells Manny.....	2	1	28	28	28	28	28	36	36	36	36	36	28	348	320
25	Seymour & Morgan..	2	1	36	36	28	36	36	28	28	28	36	28		320	320
44	Rufus Dutton‡‡.....	2	1	28	36‡	28	36	36	28	40	28	36	36	28	360	332

* This number expresses the opinion of the Committee, but my own opinion is, that it is entttled to 36.

** Although the number expressing the aggregate merits of this Machine is comparatively small (332), yet the mechanical Committee say in a note, "We look upon this Machine as one of the best in mechanical construction, combining the greatest strength with the smallest amount of material, of any at the exhibition," and in this opinion I fully concur.

† Mechanical Committee say in a note, "This Machine runs with very little noise, shewing that the gearing is well made, and the momentum very equally distributed throughout the Machine. In most respects a first class Mower, very compact."

‡ This is the Committee's number—in my opinion the workmanship was superi or to that of any other at the trial.

‡‡ The Mechanical Committee say in a note, "One of the best Machines on trial. But rather complex for general use."

§ So in the Report of the Mechanical Committee; but I think the drivers' seat safer than several Machines marked 36.

¶ The Mechanical Committee having omitted the answer of the 14th question, for some of the machines, the column headed "total merit," gives an unfair comparison of the Machines. I have therefore given another column shewing the totality of merit exclusive of the 14th question.

(*a*) Same as 22.

TABLE H.

Exhibiting the Merit Marks of Mowers as made up by the Chairman of the Judges.

	Pruyn & Lansing.	D. M. Osborn.	T. D. Burral.	Walter A. Wood.	Ball & Aultman. E. Ball.	M. Hallenbeck.	R. L. Allen.	A. H. Caryl.	W. F. Ketchum.	C. H. McCormick.	Warder & Brokaw.	Hull & Sandford.	Pells Manny.	Ball & Aultman, Miller & Aultman,
1st.—Cheapness	6	6												
2d.—Simplicity	12		12											12
3d.—Durability				12	12	12								
4th.—Effective Power				15										
5th.—Rapidity of Action				5	5	5	5		5					
6th.—Quality of Work				20	20	20								
7th.—Facility of Management														
(*a*)—Portability				5	5	0	0	5	0				5	5
(*b*)—Putting in and out of gear				2										
(*c*)—Accessibility of parts	2	2	2	2	2	2	2		2	2	2	2	2	2
(*d*)—Accommodation of Driver					3									3
(*e*)—Slow motion	4		4	4							4			
(*f*)—Facility of turning				2	2									2
8th.—Adaptation to uneven surfaces		12		12	12				12				12	12
	24	20	18	79	61	39	7	5	19	2	6	2	19	36

TABLE I.

Quality of Work. REAPERS.

Number of Entry.	Name of Exhibiter.	First Day's Work.				Second Day.			Remarks.
		Number of Lot.	Character of Machine.	Quality of Cut.	Quality of Gavel.	Number of Lot.	Quality of Cut.	Quality of Gavel.	
16	Wm. F. Ketchum.....	3	Combined.	37	30	13	35	30	Medium performance.
40	Miller, Wingate & Co.	4	do	36	28	6	28	32	Medium performance.
38	Hull & Sandford.....	10	do	35	34	10	35	36	Great waste of Heads, both days of cutting.
37	T. R. Hussey.....	6	do	34	30	5	32	32	Below medium performance.
25	Seymour & Morgan...	5	Self Raker.	34	36	11	32	35	A good performance by the Self-Raker.
28	T. D. Burrall.....	2	Combined.	36	32	4	32	30	Ground unfavorable. Grain partly lodged. Performance medium.
58	C. H. McCormick.....		do						
31	D. M. Osborn.....	8	do	35	30	3	30	28	Medium work.
22	Walter A. Wood.....	14	do	38	40	9	37	36	Cut well round stumps. A very good piece of work.
44	Rufus Dutton.....	12	Self Raker.	37	37	16	35	32	Cut well round stumps. Performance good.
57	T. J. Frelinghausen...		Combined.			2	30	38	
33	Warder & Brokaw....	7	do	39	37	7	0	0	Very good work.
11	Pells Manny.....	1	Self Raker.	28	31	14	24	28	Automaton failed to act first day. Automaton worked second day. Performance below mediocrity.
58	C. H. McCormick.....	17	Reaper.	40	40	12	40	39	Whole performance very fine.

TABLE J.

Draft and Corrected Draft of Reapers, and Weight and Price of Reapers.

Number of Entry.	Name of Exhibiter.		Length of Piston drawn out.	Time of drawing out		Draft.	Width of Cut.	Deduction for Short cut.	Corrected Draft, Draft for each inch of cut.	Price.		Weight.
			ins.	min.	sec.		ins.	ins.	lbs.			
16	William F. Ketchum	Combined.	$4\frac{8}{16}$	1	58	457.6	60	6	8.4		$130	1080 lbs.
40	Miller, Wingate & Co.	do	$4\frac{12}{16}$	2	10	438.6	62	0	7.1		$150	1016 lbs.
38	Hull & Sandford	do	$4\frac{3}{16}$	1	57	429.5	55	0	7.8	*		*
37	T. R. Hussey	do	$4\frac{2}{16}$	1	52	442.2	58	6	7.6	*		950 lbs.
25	Seymour & Morgan	do	$4\frac{6}{16}$	1	40	525.2	60	2	9.0		$150	1217 lbs.
28	T. D. Burrall	do	$4\frac{4}{16}$	1	48	472.2	58	7	9.2		$135	1220 lbs.
58	C. H. McCormick	do	$4\frac{2}{16}$	1	44	476.2	60	0	7.9	*		905 lbs.
31	D. M. Osborn	do	$4\frac{5}{16}$	1	52	468.7	54	4	9.3		$120	815 lbs.
22	Walter A. Wood	do	$4\frac{12}{16}$	1	56	491.4	64	0	7.7		$125	874 lbs.
		do								Reaper	$165	
46	Rufus Dutton	do	$4\frac{8}{16}$	1	39	543.5	60	$3\frac{1}{2}$	9.6	Combined	$185	1443 lbs.
57	T. J. Frelinghausen	do	$4\frac{8}{16}$	2	07	425.5	60	0	7.1	*		822 lbs.
33	Warder & Brokaw	do	$4\frac{4}{16}$	2	00	424.9	60	0	7.1	*		1130 lbs.
11	Pells Manny	do	$5\frac{4}{16}$	1	58	534.0	60	0	8.9		$135	1018 lbs.
58	C. H. McCormick	Reaper.	$4\frac{4}{16}$	1	40	510.2	72	0	7.1	*		*
	Average					474.2			8.1			

*No Report.

TABLE K.

Stubble Committee's Report. REAPERS.

Number of Entry.	Name of Exhibiter.	Hayden Rye Field.			Corning Rye Field.			Corning Wheat.		
		Number of Lot.	Length of Stubble, decimals of a foot.	Merit.	Number of Lot.	Length of Stubble, decimals of a foot.	Merit.	Number of Lot.	Length of Stubble, decimals of a foot.	Merit.
16	William F. Ketchum	3	0.71	30	13	0.78	26			
40	Miller, Wingate & Co	4	0.88	24	6	0.83	28			
38	Hull & Sandford	10		35	10	0.72	00	3	0.75	24
37	T. R. Hussey	6	0.77	31	5	0.83	28	4	0.68	31
25	Seymour & Morgan	5	0.88	24	11	0.82	24		0.66	
28	T. D. Burrall	2	0.85	29	4	0.88	31			
58	C. H. McCormick									
31	D. M. Osborn	8	0.79	29	3	0.77	27	8	0.66	30
22	Walter A. Wood	14	0.84		9	0 83	12		0.74	36
44	Rufus Dutton	12	0.74		16	1.17	00		0.66	38
57	T. J. Frelinghausen				2	0.79	24		1.50	00
33	Warder & Brokaw	7			7				0.68	33
11	Pells Manny	1	0.79	25	14	0.84	00		0.66	36
58	C. H. McCormick	17			12	0.74	30	7	0.66	38

TABLE L.

Exhibiting the Merit Marks of Reapers, according to the Scale of Points adopted by the Judges.

	Wm. F. Ketchum.....	Miller & Wingate.....	Hull & Sandford.....	Seymour & Morgan...	T. D. Burrall.....	C. H. McCormick.....	D. M. Osborn.....	Walter A. Wood.....	T. J. Frelinghausen...	Warder & Brokaw....	Pells Manny.....
1.—Cheapness.....							5				
2.—Simplicity.....					9				9		
3.—Durability		9						9		9	
4.—Draft.....		20				20			20	20	
5.—Rapidity*											
6.—Quality of work.....						30					
7—(*a*) Portability.....				3				3		3	3
(*b*) Putting in and out of Gear,								2			
(*c*) Accessibility of parts.....	2		2	2	2		2	2			2
(*d*) Convenience of Driver....				4				4	4		
(*e*) Facility of turning.....				4				4			4
8—Adaptation to uneven surfaces,							9	9			9
	2	29	2	13	11	50	16	33	33	32	18

*The Reports of the Time Committee are not sufficiently complete to determine the question of Rapidity.

Explanatory Note. — The following Circulars furnish an explanation of the delay which has occurred in the Awards on Mowers. It will be seen that a majority of the Judges non-concurred with the Chairman in regard to the arrangement of Table H, exhibiting the Merit Marks of the different Machines: —

To the Board of Judges of the United States Agricultural Society, at the Trial at Syracuse of Reapers and Mowers:

Gents, — Herewith you will receive a copy of the results of our labors, condensed into a series of Tables lettered from A to L, and a report of our proceedings during the trial.

You will perceive that Table H gives the number 20 to Walter A. Wood, for quality of work, which the hastily formed Table I presented to you at Syracuse did not.

That Table was formed from the results of the Hayden lot alone.

On a more careful review, I find the Table A gives to Walter A. Wood, for his work in the Clover field, to one machine, 28 for cut and 31 for swath; and to the other, 35 for cut and 36 for swath — which are the *highest* marks given to any machine in that field, except Hallenbeck's — while Ball & Aultman had *nothing*. So far then as the Clover field is concerned, Walter A. Wood and Hallenbeck stand at the top of the list for "quality of work."

In the Timothy field, Walter A. Wood had 38 for his cut and 35 for his swath. Ball & Aultman had 40 for cut and 40 for swath. It will be seen that Wood's work falls very *slightly* behind Ball & Aultman's in that field.

The question is, whether the trials in the Clover field are to be wholly overlooked and the ability to do the best work in lodged Clover is to be left out of the account as of no value?

Whether the superiority of Wood in the Clover field is not sufficient to counter-balance the *slight* inferiority in the Timothy field?

On carefully considering the matter, it seems just and right to me to take merit in the Clover into account as well as in Timothy; and I have accordingly made Wood equal to Ball & Aultman in the Merit Table H, which gives Wood the first premium.

And carefully examining the Tables, you will please convey to me your opinions in writing, on this point. If a majority of you agree that I have construed the scale of points correctly — viz.: that merit in "Quality of Work" depends on merit in *all* kinds of work, and not on *one* kind of work alone — the awards will stand as in the report. If a majority disagree with me in opinion as to the proper construction of the scale of points, I shall then understand the decision as, 1st premium to Ball & Aultman; the 2d to Wood; and the 3d to Hallenbeck — unless you expressly indicate otherwise.

I think there can be no doubt that the first premium for Reapers must be given according to Table L, to McCormick.

I refer you to page 41 for the reasons for giving Walter Wood the second premium on Reapers. Should you disapprove these reasons, and deem the award improper, I will re-write those paragraphs in conformity to your decision.

I believe there can be no question with respect to the other awards.

You will please bear in mind that the report must be ready for publication by the first of September, and that your replies must be received, and such alterations and corrections as you may decide to make must be written and printed before that time. Hence it is desirable that your replies should be sent to me as *early* as possible, in order that the report may be ready to be distributed at the Louisville Fair.

Yours, Very Truly,

JOHN STANTON GOULD.

Hudson, New York,

Boston, Aug. 20, 1857.

Dear Sir: — As Mr. Gould has expressed his views in regard to the award of premiums on *Mowers*, it is not improper that I should offer some remarks on the same subject.

1. Mr. G., in Table H, gives Wood more credit for "quality of work," than the returns of the sub-committees show he is entitled to — that is, the returns (Table A) show that Ball, Aultman & Co. (entry No. 18) had credit for "perfect work" in regard to "quality of mowing" and "quality of work" — 40 being recorded for each; whereas Wood's highest credits in these points (or for ontry No. 22) are 38 and 36. But Mr. Gould *raises these credits to the same standard as Ball, Aultman & Co.,*

because it does not appear that their machine (entry No. 18) *worked in the Clover.*

Now the question is, was Ball, Aultman & Co.'s machine eligible or ineligible, as a competitor for premium, whether it did or did not work in the Clover? If it was *ineligible*, it is not entitled to *any* premium, but must be thrown out altogether. It is evident, however, that it was considered *eligible*, because it was allowed to go on in all the other trials without any objection being made. It follows, then, obviously, that *we must estimate its merits according to the comparison we were able to make with other machines tried under the same circumstances.* This is fair ground, and no other ground can be fair.

Tried on this basis, Ball, Aultman & Co. are entitled to 20 in the scale of ultimate points or "merit marks" — his quality of work being reported at 40 for both cut and swath — that is, *perfection* in each. Wood, on the other hand, not being reported perfect in these points (he standing at 38 and 35), is not entitled to this credit of 20 in the ultimate scale — that is, the footing in his column, in Table II, should be 20 *less* than it is, on account of his less perfect work than Ball, Aultman & Co. This, of course, would carry the first premium to Ball, Aultman & Co.

2. Again, Mr. Gould places Wood equal with Ball, Aultman & Co. in respect to "adaptation to uneven surfaces" — assigning 12 to each. I consider Ball, Aultman & Co.'s machine superior to Wood's in this point, on account of its flexible bar which enables it to fit to the elevations or depressions of the ground. The advantage of this was strikingly shown in the greater perfection of the work of the machine on the Hayden meadow.

Yours truly,

SANFORD HOWARD.

AWARDS ON MOWERS.

First Premium — Gold Medal and Diploma — To Ball, Aultman & Co., Miller & Aultman's patent, (see note page 195.)

Second Premium — Silver Medal — To Walter A. Wood.

Third Premium — Bronze Medal — To Martin Hallenbeck.

[It will be seen by the decision of the Judges on Mowers, that the number 20 for perfection of work by Wood's Machine, should be deducted from Table H, (see page 199,) and made to conform to the following Table.]

TABLE

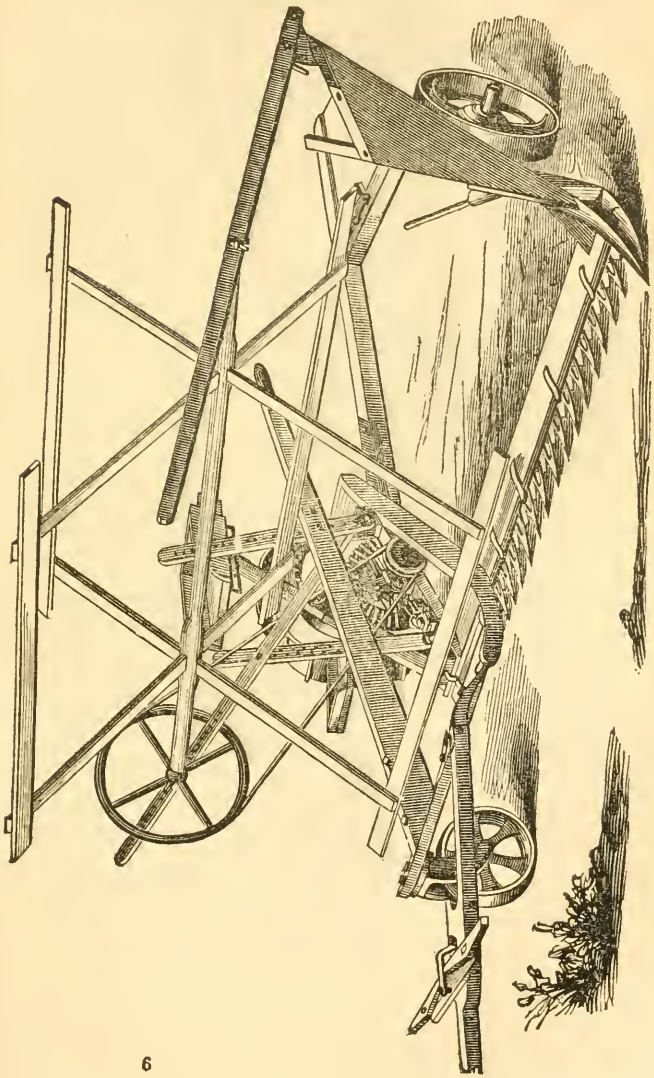
Exhibiting the Merit Marks of Mowers according to the decision of a majority of the Judges.

	Pruyn & Lansing.	D. M. Osborn.	T. D. Burral.	Walter A. Wood.	Ball & Aultman. E. Ball.	M. Hallenbeck.	R. L. Allen.	A. H. Cayl.	W. F. Ketchum.	C. H. McCormick.	Warder & Brokaw.	Hull & Sandford.	Pells Manny.	Ball & Aultman, Miller & Aultman,
1st.—Cheapness	6	6												
2d.—Simplicity	12		12											12
3d.—Durability				12	12	12								
4th.—Effective Power				15										
5th.—Rapidity of Action				5	5	5	5		5					
6th.—Quality of Work					20	20								
7th.—Facility of Management														
(*a*)—Portability				5	5	0	0	5	0				5	5
(*b*)—Putting in and out of gear				2										
(*c*)—Accessibility of parts	2	2	2	2	2	2	2		2	2	2	2	2	2
(*d*)—Accommodation of Driver					3									3
(*e*)—Slow motion	4		4	4							4			
(*f*)—Facility of turning				2	2									2
8th.—Adaptation to uneven surfaces		12		12	12				12				12	12
	24	20	18	59	61	39	7	5	19	2	6	2	19	36

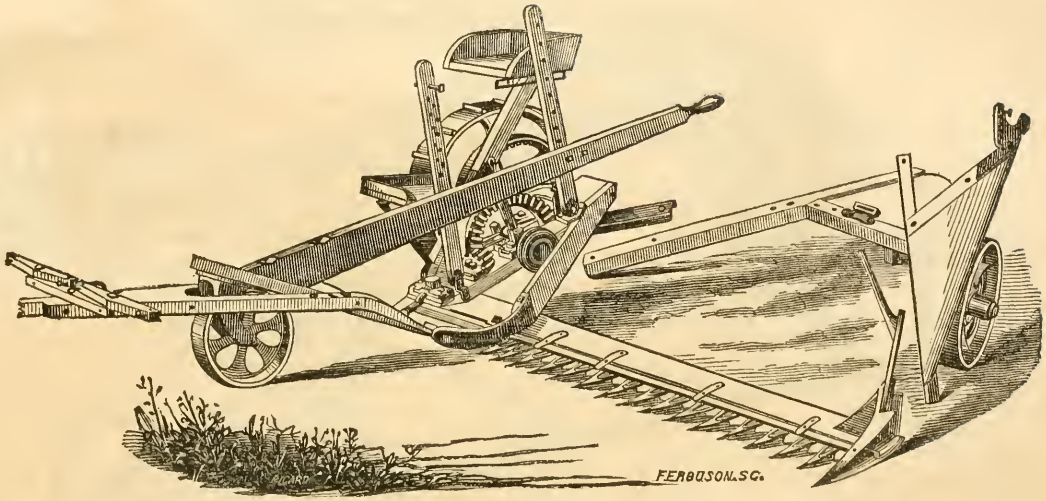
The following are engravings of the several Machines on which the awards were made.

COMBINED MACHINES.

FIRST PREMIUM TO WALTER A. WOOD.

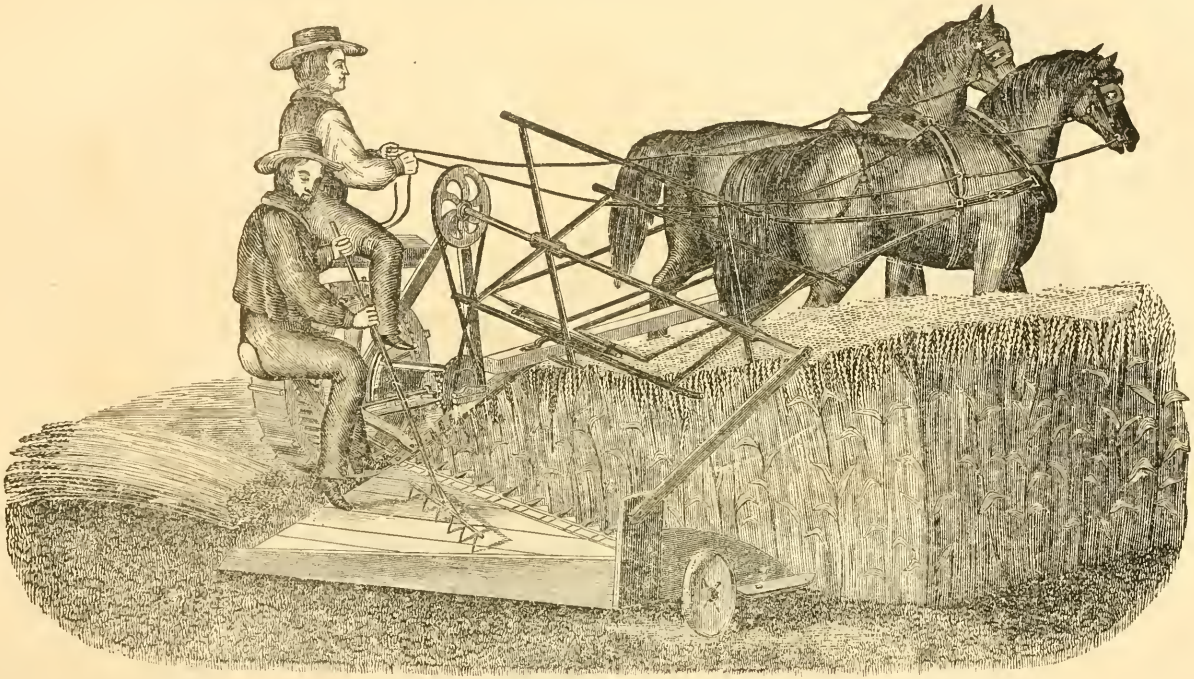


No. 1.—COMBINED MACHINE, as used in Mowing, with Reel and Framework complete. This is the same as used in Reaping except the Platform and Raker's Stand.

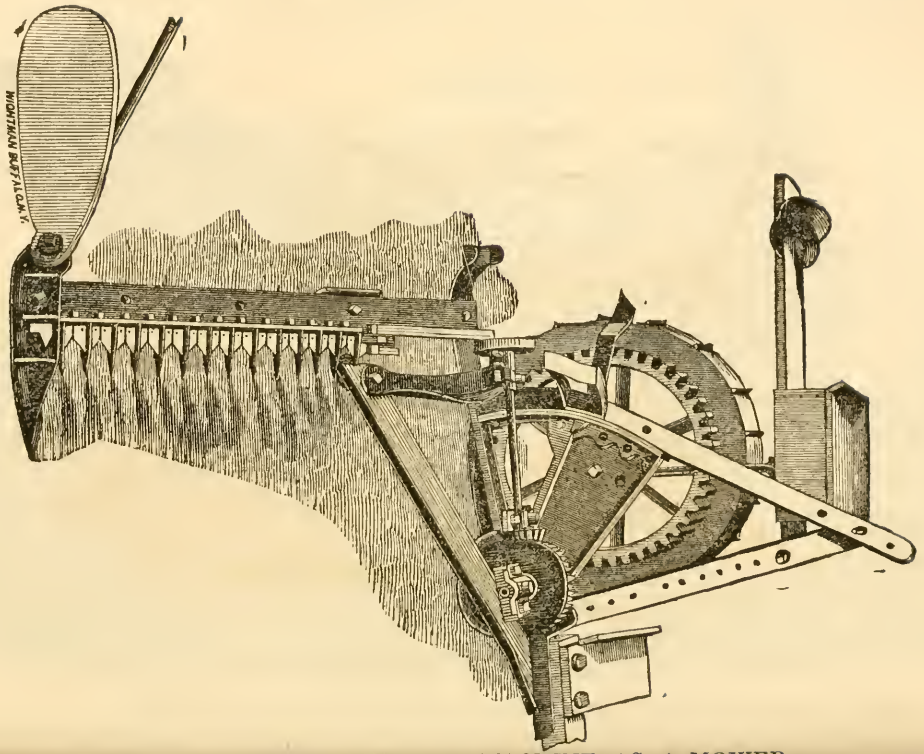


No. 2.—Wood's Combined Machine, as used in Mowing Lodged Clover, with the rear part of the Frame detached.

KIRBY'S COMBINED MACHINE---As a Reaper.

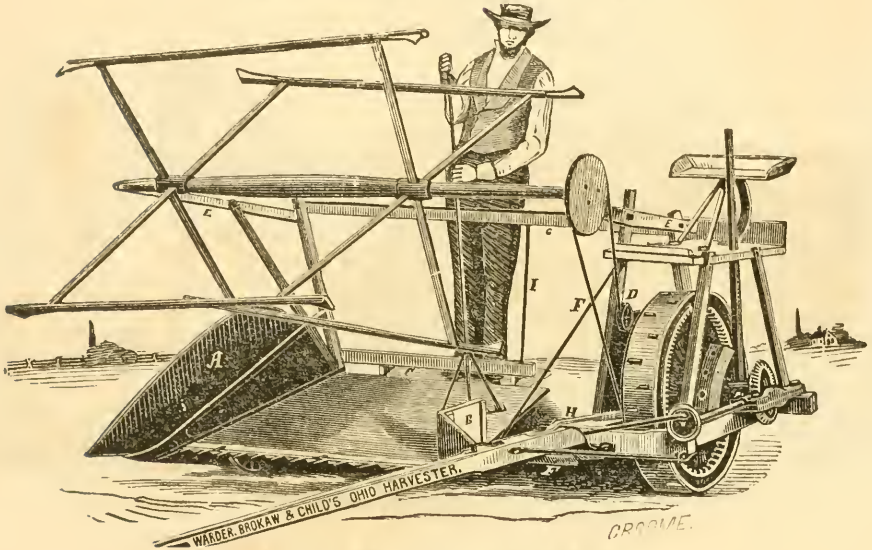


Manufactured by Buffalo Agricultural Machine Works.



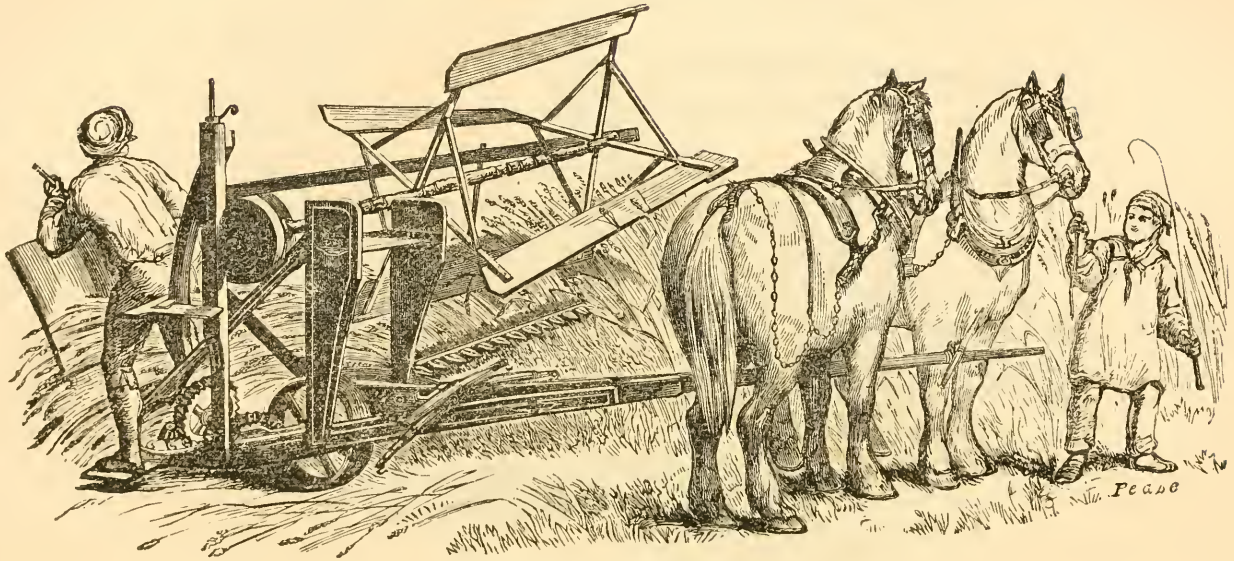
No. 2.— KIRBY'S COMBINED MACHINE AS A MOWER.

THIRD PREMIUM TO WARDER, BROKAW & CHILD.



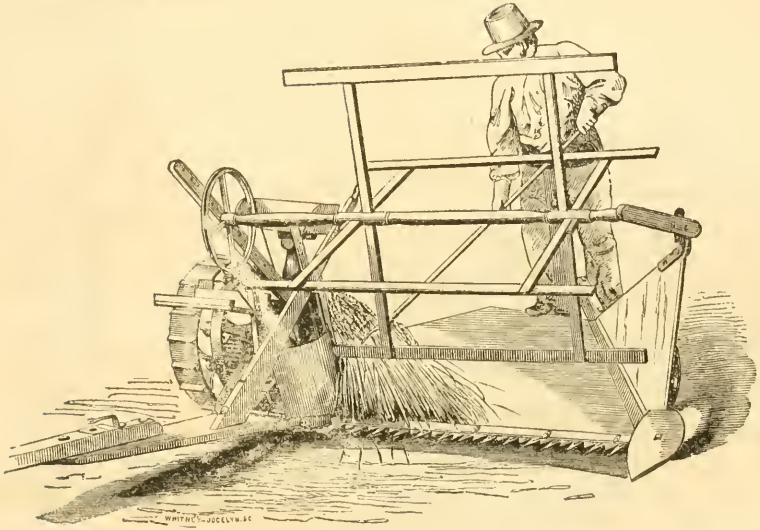
COMBINED MACHINE AS A MOWER.

FIRST PREMIUM TO C. H. McCORMICK.

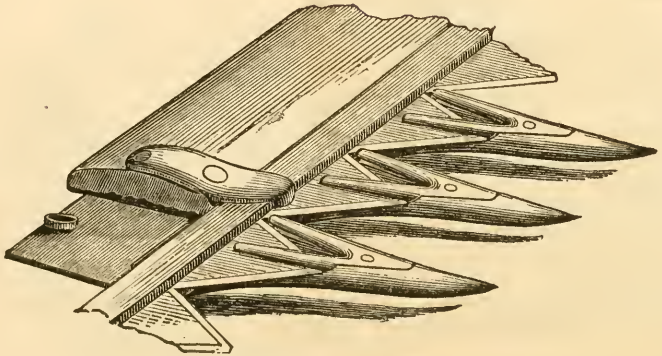


McCORMICK'S REAPER.

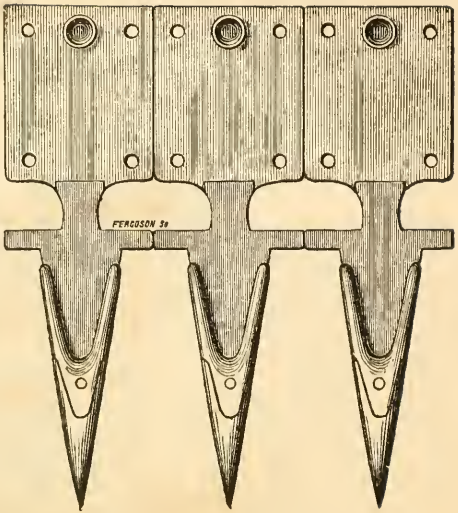
SECOND PREMIUM TO WALTER A. WOOD.



WOOD'S MACHINE AS A REAPER.

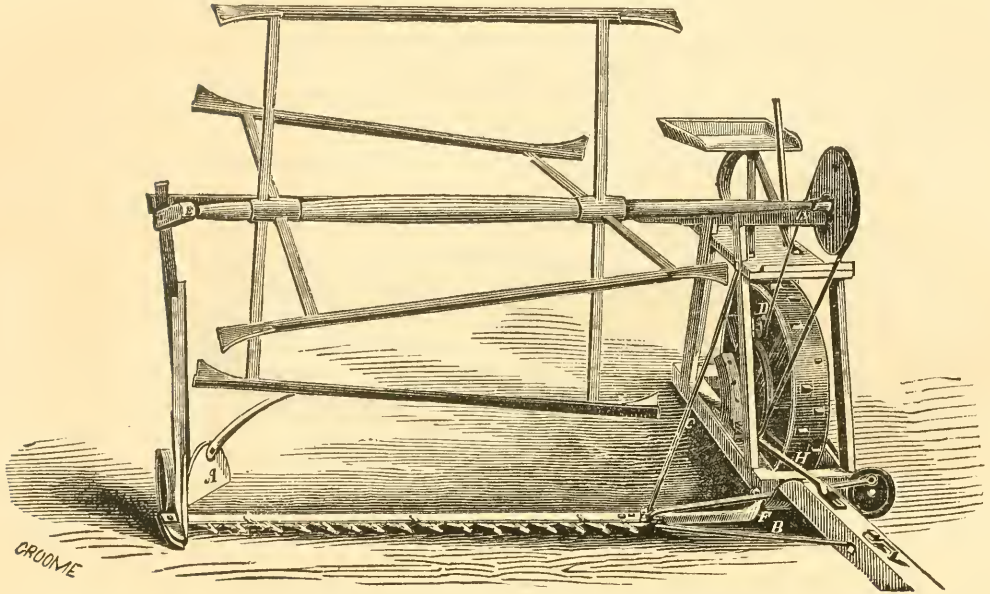


A SECTION OF CUTTER-BAR,
With Guards attached, as used on WOOD's Machines.



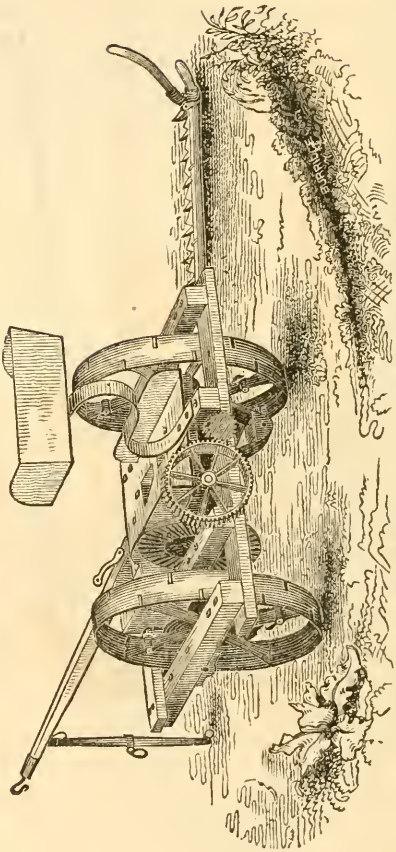
DETACHED GUARDS,
Such as are used on WOOD's Machines.

THIRD PREMIUM TO WARDER, BROKAW & CHILD.



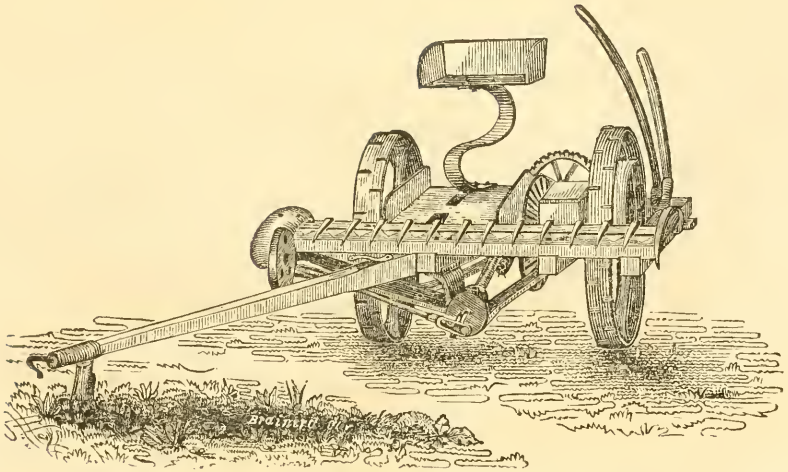
WARDER, BROKAW & CHILD'S REAPER.

MOWERS.

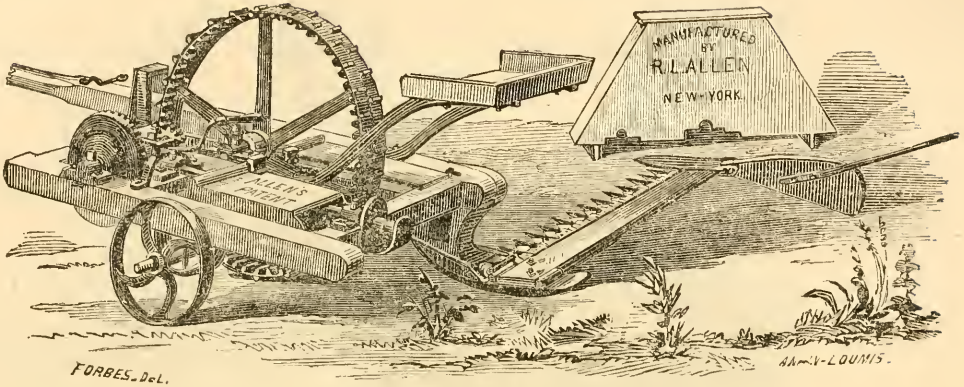


FIRST PREMIUM TO BALL, AULTMAN & CO.

SHOWING MACHINE IN WORKING ORDER.



BALL, AULTMAN & CO.'S MACHINE, FOLDED FOR MOWING OR TRANSPORTATION.



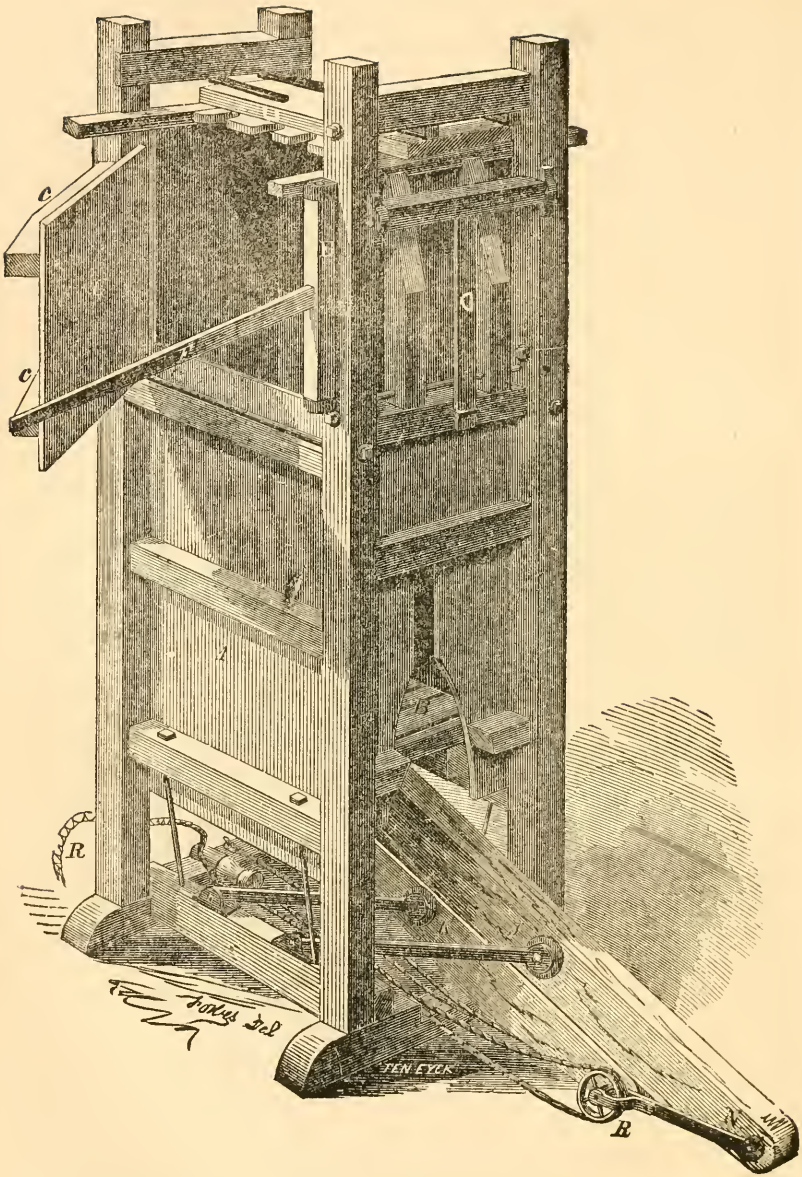
R. L. ALLEN'S MACHINE,

For which a Diploma was awarded for concave knife blade, and general excellence of material, and superior workmanship.

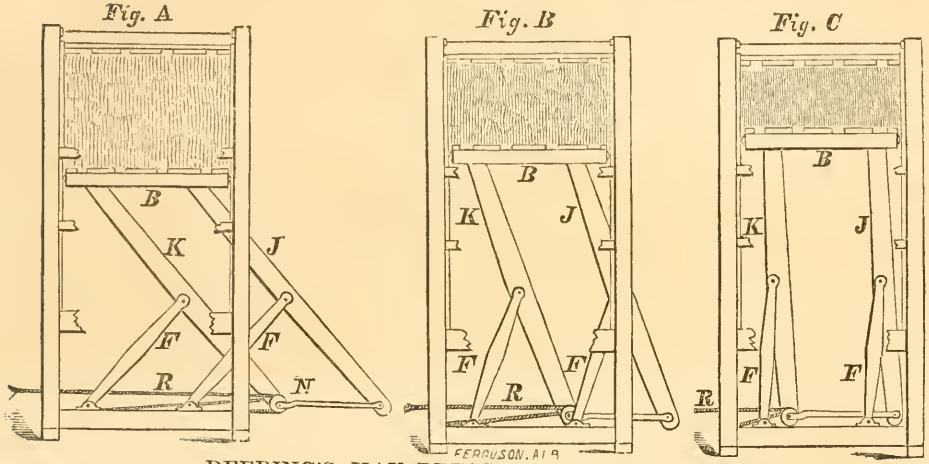
NOTE. — For Wood's Machine, which received the second premium as a Mower, see page 89.

The plate of Hallenbeck's Mower, to which the third premium was awarded, has necessarily been omitted, on account of its large size.

We regret that we have not received an engraving of T. D. Burrall's Machine, for which a Diploma was awarded for simplicity of construction and solidity of workmanship.



W. DEERING & CO.'S NEW PARALLEL LEVER HAY PRESS.



DEERING'S HAY PRESS — SECTIONAL VIEW.

ERRATA.

On page 161, 1st line, for both machines, read " both of his machines."

On page 162, 16th line from bottom, read " Wood's machine and Hallenbeck's," instead of this Machine and Hallenbeck's.

On page 166, 12th line from bottom, read "wrought and cast iron," instead of " cast-iron ;" and on same page 14th line from bottom, read " bevel," instead of " crown."

On page 168, for Manning, read " Manny."

Wherever W. Wood occurs, read W. A. Wood.

FIFTH ANNUAL EXHIBITION.

FIFTH ANNUAL EXHIBITION

OF THE

UNITED STATES AGRICULTURAL SOCIETY.

THE Fifth Annual Exhibition of the United States Agricultural Society was held near Louisville, Kentucky, on Monday, August 31, and on Tuesday, Wednesday, Thursday, Friday and Saturday, September 1st, 2d, 3d, 4th and 5th, 1857. A guarantee fund of thirty thousand dollars, as an indemnity against expenses over receipts, had been subscribed by the public-spirited citizens of Louisville, and efficient local officers and committees had made all the arrangements, which were upon the most liberal scale. Premiums, amounting in the aggregate to upwards of twelve thousand dollars, were offered for various classes of Domestic Animals, Farm Products, Fruits, Flowers, Native Wines, Agricultural Implements and Machinery. Invitations were afterwards extended to the artists, artisans and the manufacturers of the vicinage, to bring the products of their genius and of their industry to the Exhibition.

THE GROUNDS.

The grounds liberally placed at the disposition of the United States Agricultural Society, were those of the SOUTHWESTERN AGRICULTURAL AND MECHANICAL ASSOCIATION, which are pleasantly located about three miles from Louisville.

They comprise nearly fifty acres, bounded on one side by the Frankfort Railroad, and by a turnpike: while on the opposite side is another turnpike which also furnishes direct communication with the city of Louisville. The surface is undulating, covered with a thick growth of luxuriant "blue-grass," and studded with clumps of noble forest-trees, interspersed here and there with spacious edifices for the purposes of the Society to which they belong. These grounds and edifices had been put in thorough repair and order for the occasion, under the efficient direction of Hon. Gibson Mallory, Chairman of the Local Executive Committee. Commodious buildings, spacious marquees, commodious tents, and comfortable stalls for cattle had been erected, and above them waved the standard of the United States Agricutural Society, with the pennons of its officers, and a profusion of national flags.

The "Entrance Hall," into which visitors stepped directly from the railroad platform, is a picturesque structure, containing large waiting-rooms for ladies and gentlemen. Passing through its noble vestibule into the grounds, a broad avenue leads through the centre of the grounds to a large house, used as parlors and dressing-rooms for ladies. On the right of this avenue is "Floral Hall," a large octagonal building; — "Implement and Machine Hall," a commodious structure, with conveniences for steam-power; — a mammoth tent had been erected on this occasion as a "Manufacturer's Hall;" — and there were "Refreshment Saloons," a "Telegraph Office," and a variety of "Private Stables." On the other side of the avenue, stands the colossal "Amphitheatre," encircled by a track for trials of horses; — and in a grove near by were the "President's Marquee," the "Press Tent," and the "Marshals' Tent." Beyond these is another cottage, also devoted to the use of the ladies; — and another building for refreshments. In the rear, arranged in long rows, were eight hundred substantial "box-stalls" for horses and for cattle, with pens for sheep and for hogs. Granaries containing an abundant supply of feed for the stock exhibited; — platform scales were erected for weighing stock,

and an abundant supply of water was furnished from wells and springs.

SUPERINTENDENTS AND MARSHALS.

The Executive Committee, while retaining the general supervision of the Exhibition, entrusted each Department to the charge of a Superintendent, who received his daily instructions from President WILDER. The superintendence of the grounds was confided to JOHN HENRY THOMAS, Esq., Field Marshal, who was assisted in his arduous duties by an efficient corps of Assistant Marshals, — all uniformly attired. This volunteer corps of gentlemen were mounted on spirited steeds, and whenever seen on the ground in the exercise of their authority, they elicited admiration and commanded respect.

FIRST DAY.—Monday, August 31.

It had been originally announced that the Exhibition would be opened to the public on Tuesday, the first of September, but it afterwards became apparent that in order to do justice to the various departments, it would be necessary to occupy the entire week, commencing on Monday morning. Every arrangement had been completed, and a large proportion of the stock had arrived on the Saturday previous, so that the Exhibition was open at the appointed time on Monday. It was a beautiful morning, the atmosphere was clear and invigorating, the sky was cloudless, and the picturesque "encampment of a great agricultural army" was lit up by the mellow rays of an autumnal sun.

THE AMPHITHEATRE.

This structure, where the Exhibition was inaugurated, is admirably calculated for the display of horses and of cattle. It is an ornamental, circular wooden edifice, two hundred and ten feet in its exterior diameter, and is modelled after

the Coliseum of ancient Rome. From the interior arena, tiers of seats rise one behind the other to a broad promenade platform, around the other edge of which is still another seat, running the entire circumference. Over these seats is an ornamental roof, supported by fluted columns at the inner and at the outer edge, while from without eleven broad staircases lead to the promenade platform. Beneath a portion of the seats appropriated for invited guests, are commodious offices for the Secretary, the Treasurer, and the Judges. In the centre of the arena is a pagoda shaped structure, surmounted by a flag-staff. The upper story of this is occupied by the band in attendance, and the lower story by the President of the Exhibition, his private Secretary, and the Judges on duty, who are summoned by a crier.

EXHIBITING IN "THE RING."

Horses or cattle of a designated class, having been brought from their stables under direction of the Superintendent in whose Department they are, are led into the arena or "ring," when the gates are opened at the signal-tap of the bell. The Judges then examine them, and having sent away the unsuccessful ones, the victors are decorated with the badges of superiority. The animal to which the first premium is awarded, is designated by a blue ribbon; the one receiving the second premium by a pink ribbon, and the one receiving the third premium by a white ribbon. The decorated animals are then led around the arena for inspection by the multitude, and then retire through gates opposite to those by which they entered, to be succeeded in a like manner by the next class.

This method of exhibition was highly approved of by gentlemen from the Atlantic States, who witnessed it at Louisville for the first time. It was their opinion that while it greatly increases the isolation of judges from the intruders, and allows of the more complete display of the points of the animals, at the same time enables thousands to *inspect the examination*, and by their united verdict to ratify or to annul

the decisions of the Judges. By introducing class after class of animals, and by making one breed succeed the other, the interest is unflaggingly maintained throughout the day, and a large number of spectators are made familiar with the appearance and points of good cattle, horses and other domestic animals.

THE INAUGURATION CEREMONIES.

Long before the appointed hour, the spacious amphitheatre was crowded with a brilliant assemblage, and precisely at ten o'clock the sound of martial music announced that President WILDER had entered the grounds. He had been escorted from the city by the "Louisville Association of Butchers," a fine-looking body of mounted men, marshalled by Messrs. GEORGE KICE and LOUIS REHM. They had two bands, each in a decorated vehicle, their horses were gaily caparisoned, and the riders were uniformed in white linen frocks, blue silk sashes, and black hats.

President WILDER, on entering his marquee, received the invited guests, and extended to them the hospitalities of the Exhibition. A procession was immediately formed, by the Field Marshal and his Aids, of the Officers of the United States Agricultural Society, Local Officers, Invited Guests, Members of the Press, Judges, Visiting Delegations, and Members of the Society, escorted by the Association of Butchers, which opened to the right and left as it entered the arena, the procession moved into the amphitheatre. President WILDER was then introduced to the vast audience by Hon. GIBSON MALLORY, President of the "Southwestern Agricultural and Mechanical Association," and was received with enthusiastic applause. When it had subsided, President WILDER, delivered, — in a distinct voice heard by the thousands of spectators — the following: —

INAUGURAL ADDRESS.

Ladies and Gentlemen: — We have met in this thriving, populous, and patriotic city — in this gate-way of the West — to celebrate by appropriate ceremonies the Fifth Annual Exhibition of our National Association.

In behalf of the United States Agricultural Society, in behalf of the Southwestern Agricultural and Mechanical Association, at whose invitation we are here assembled, and in behalf of the generous citizens of Louisville, whose guaranty fund secures the success of this enterprise, and whose liberality has made such ample provision for our accommodation, I bid you welcome to the privileges and enjoyments of this occasion.

We have come up with our flocks and herds — with the products of the field, the work-shop, the orchard, and garden — to excite a spirit of invention, emulation, and improvement, not in agriculture alone, but in all the useful and ornamental arts of which she is the common parent, and to bestow on genius and on merit their appropriate reward.

We come from different and distant sections of this great Republic. We meet as citizens, representing our various districts, but with no other rivalry than a laudable ambition to advance the progress of science and art, so wonderfully displayed in our age, and to promote those great industrial pursuits which redound equally to the honor, benefit, and welfare of all. Most sincerely do I congratulate you upon the cheering prospects which attend the opening of this Exhibition, and upon the salutary influences which it is calculated to exert upon the prosperity, union and happiness of our common country!

We rejoice to meet on this occasion the many distinguished guests, officers, and delegates of other associations, this splendid array of the butchers of Louisville, and especially the fair daughters of our land who have assembled to honor us and our cause with their presence. Ladies, we greet you with a welcome fresh from our hearts. Nothing could be more appropriate than your presence. We rejoice, therefore, to meet you here in this amphitheatre, where your beauty encircles us with garlands of female loveliness, and, like a constellation of bright stars sparkling in the horizon, adorns and lends enchantment to the scene.

Farmers, Friends, and Fellow-Citizens: — Happy am I to meet you on the return of our national jubilee, and to

extend to each of you the right hand of fellowship. Whether you come from the great vallies and fertile fields of the West, the broad plains of the genial and sunny South, or from the manufacturing districts of the North — from whatever profession or art of life, from whatever position in society you come — I bid you welcome to a participation with us in the labors, the rewards, and the triumphs of industry. In view of our present privileges and the glorious prospects for the future, let us act in a manner worthy of the deep responsibilities which rest upon us as American citizens. Let our past history and success excite us to attain to further and greater excellence in all the arts and in all the relations of life, and thus let us go on developing in richer abundance the exhaustless resources of our national domain — rising higher and higher in the scale of human perfection, grandeur, and glory, and rejoicing as one great family, forever and forever, in the blessings of a prosperous and united people.

In discharge of my official duty, I now proclaim this Fifth Annual Exhibition of the United States Agricultural Society to be duly opened, and that it will remain so during the present week. The order of exercises will proceed in accordance with the printed programme of each day.

After the delivery of this pertinent address, which was received with frequent demonstrations of approbation, the band in attendance played "Hail Columbia," and the cavalcade left the amphitheatre. The "Marshal of the Arena" then introduced the

GRAND CAVALCADE OF HORSES.

This comprised all the horses entered for premium, some of them magnificent animals. "Wagner," the famous conqueror of "Grey Eagle," led the van, active as a colt, although more than twenty years of age. Then came other horses, of undoubted pedigree, among them three full-bred Arabians, recently brought from the Desert of Arabia, by A. Keene Richards, Esq., of Georgetown, Kentucky. Thorough-

bred Mares and Colts, Trotting Horses of the famous Black Hawk and Morgan stock, Matched Horses, and animals for heavy draft, each came in their turn, and many won the plaudits of the spectators.

TRIALS OF SPEED.

While the long cavalcade was passing through the amphitheatre, the "trials of speed" were commenced, under direction of a Board of Judges appointed by President WILDER, on the track. This track was half a mile in length, but it is but justice to the owners of horses tried on it to state, that it was in bad order, and that two of the turns were so "sharp" as to render it necessary for drivers to check their speed in passing around them. Each horse trotted alone, strictly "against time."

PREMIUMS AWARDED.

Trotting Stallions over Five Years Old. I. "Green Mountain Blackhawk," seven years old, by "Blackhawk Morgan," raised at Bridgeport, Vermont, owned by J. B. Crippen, Coldwater, Michigan, — time, 2:58. II. "Young Hamiltonian," seven years old, no special breed, raised in Vermont, and owned by J. L. Doty, — time, 3:08.

Trotting Stallions Four Years Old and under Five. I. "Bird Blackhawk," owned by E. G. Thomas,— time, 3:58

Trotting Stallions under Four Years Old. I. "Clifton," by "Pilot, jr.," raised in Fayette Co., Kentucky, owned by W. J. Bradley, — time, 3:12. II. "Henry Clay," by Cassius, owned by Dr. Spalding, Greenup Co., Kentucky, — time, 3:19.

THE DINNER HOUR.

At one o'clock, on every day of the Exhibition, a recess was taken, for the purpose of allowing opportunity for the refreshment of the inner-selves of the thousands assembled. President WILDER, with the officers, guests and members of the United States Agricultural Society, marched each day in procession to a dinner especially provided for them, in one of the cottages on the ground. Others dined at the public tables of the caterer, or at the private entertainments in the rooms beneath the amphitheatre, fitted up for the purpose. But the most agreeable spectacle of all was the pick-nicking

upon the beautiful green lawns, beneath the shade of noble forest-trees, where knots of people were to be seen gathered around ample baskets of provisions. Enjoyment reigned supreme, and the shouts of merriment and the ring of joyous laughter, enlivened by the popping corks from bottles of native wine, was heard all over the grounds, adding zest and life to the scene. The unbounded hospitality exercised at these impromptu festivals, where one or two hundred guests were often entertained, but added to the reputation of "Old Kentucky."

AFTERNOON TRIALS OF SPEED.

The afternoon was devoted to trials of speed on the track, and to an examination of the noble cattle, fine sheep, and excellent swine in the stalls and the pens.

PREMIUMS AWARDED.

Trotting Mares, over Five Years Old. I. "Kate," owned by A. H. Brand, Fayette, Co., Kentucky, — time, 3:05. II. "Kate," owned by P. Satterwhite, Louisville, Kentucky, — time, 3:21.

Trotting Mares, Four Years Old and under Five. I. Bay roan, by "Pilot, jr.," owned by George E. Heinsohn, jr., Jefferson Co., Kentucky, — time, 3:21. II. "Highland Mary," by "Messenger," raised in Oneida Co., New York, and owned by Lawrence Daviess, — time, 3:32.

Trotting Mares, under Four Years Old. I. "Mary Porter," by "Vermont," raised at Lexington, Kentucky, owned by Joseph L. Duncan, — time, 3:50.

Trotting Geldings. I. "George," owned by W. B. Conant, Coldwater, Michigan, — time, 3:03½. II. Dapple gray, owned by J. F. Caldwell, Boyle Co., Kentucky, — time, 3:08.

THE INVITED GUESTS.

Prominent among the many distinguished gentlemen present as invited guests on the opening day, were, — Hon. John C. Breckinridge, Vice President of the United States; Governor Morehead, of Kentucky; Hon. James B. Clay, M. C.; Col. Sidney Johnson, U. S. A.; the Honorables Linn Boyd, Cassius M. Clay, Archibald Dixon, L. W. Powell, J. W. Frink, Jacob Tolbert, Brutus J. Clay, Charles T. Garrard, and others, who omitted to record their names.

DELEGATES FROM AGRICULTURAL SOCIETIES.

Hon. Thomas M. Clay, President, R. W. Scott., Esq., Secretary, and W. S. Elam, H. E. Lewis, W. T. Barrett, L. J. Bradford and J. J. Towles, Esqs., Directors of the Kentucky State Agricultural Society. J. R. Barrett, President, and a delegation from the St. Louis Agricultural and Mechanical Association. C. W. Webster, President, and a delegation from the Illinois State Agricultural Society. L. G. Morris, Thomas Richardson, and Samuel Thorne, Esqs., delegates from the New York State Agricultural Society. Gen. Tench Tilghman, James N. Goldsborough, Esq., and other delegates from the Maryland State Agricultural Society. John Pope, John Bond, Rice Bond, George L. Holmes, William Person, and Henry Lake, Esqs., delegates from the State Agricultural Bureau of Tennessee. Judge Boudinot and John McGowan, from Philadelphia Society for promoting Agriculture. Secretary Dyer, of the Connecticut State Agricultural Society; Secretary Flint, of the Massachusetts State Agricultural Society; Treasurer Smyth, of the New Hampshire State Agricultural Society; and a large number of officers and delegates, representing forty-eight County Agricultural and Horticultural Societies. The number of States thus represented was twenty-seven.

REPRESENTATIVES OF THE PRESS.

A feature of the Exhibition was the large number of Editors and Reporters in attendance, representing "the press" in almost every section of the country. They were cordially welcomed and hospitably entertained by "the press of Louisville, who were represented by an efficient committee. Among them were: S. N. Stockwell, of the *Boston Daily Journal;* Thomas Affleck, *New Orleans Picayune;* William Holmes, *St. Louis Republican;* Henry S. Olcott, *New York Daily Times;* William Duane Wilson, *Iowa Farmer;* James E. Worsham, *Memphis Evening News;* C. E. Drapier, *Indiana Forum;* John H. McHenry, jr., *Owensboro, (Ky.) Forum;* William W. Fosdick, *New York Spirit of the Times;* Chas. R. Deming, *Indianapolis Sentinel;* G. F. Gray, *Albany (N. Y.)*

Evening Journal; A. S. Mitchell, *St. Louis Intelligencer;* John Foster, *Georgetown (Ky.) Journal;* W. M. French, *Jeffersonville Republican:* Wm. L. Avery, *St. Louis Leader;* Thomas Haller, *Frederick (Md.) Examiner;* Barton D. Jones and James L. Brown, *Indianapolis Journal;* George E. Greene, *Vincennes Sun;* M. and O. Gregg, *New Albany Tribune;* L. A. Wood, *Somerset American;* N. J. Coleman, *St. Louis Valley Farmer;* Thomas M. Green, *Frankfort Commonwealth;* John O. Bullock, *Paducah Herald;* S. I. M. Major, *Frankfort Yeoman;* D. J. Powers, *Madison Western Farmer;* T. E. Massic, *Chillicothe Democrat;* W. B. Lynch, *Virginia Washingtonian;* J. S. Hogan, *Lexington Reporter;* J. G. Craddock, *Paris Flagg*; I. N. Morrison, *Worthington Times;* R. H. King, *Frankfort Commonwealth;* W. T. Dennis, *Richmond (Ind.) Farmer:* Howard Cox, *Bloomington Republican;* S. Davis, *Covington Journal;* H. Madison, *Southern Advocate;* R. Johnson, *Michigan Farmer;* H. Watson, *Alabama Times*; C. S. Jones and R. Hicks, *Rockport (Ind.) Democrat*, and Geo. S. Phelps, *Mississippi Enquirer.* Other gentlemen of "the press" only registered their names on the book at the tent set apart for the "fraternity," which was probably carried off by some collector of autographs of distinguished individuals, as it never reached the business office of the Society.

THE EVENING.

The evening was devoted to meetings of the various Committees, in order to perfect every arrangement. The vacancies in the different Boards of Judges were generally filled, and at nine o'clock the printed programme for the next day's Exhibition was distributed at the business office and at the hotels throughout the city. This was done every evening during the week.

A large number of eminent practical and theoretical agriculturalists called on President Wilder, at his rooms, among them Col. Lewis Sanders, of Grass Hills, the originator of

THE FIRST CATTLE SHOW IN THE WEST.

This was held, as Col. SANDERS informed the gentlemen present, on his own farm near Lexington, Kentucky, in July, 1816. The judges, selected by him, were: Judge Harry Innis, of Franklin Co.; Nathaniel Hart, of Woodford Co.; Capt. Fowler, of Lexington, and Capt. John Jewett, of Bath. A fine collection of cattle, sheep and hogs were brought together, and the judges, after careful examination, awarded nearly twenty silver cups, costing twelve dollars each, as premiums. The citizens of Louisville had, at the request of Col. Sanders, contributed the funds to pay for these cups — all other expenses were defrayed, and all the arrangements were made by him personally. Among other distinguished guests at this pioneer-show, was Henry Clay, who addressed the assembled crowd. The whole affair passed off to the satisfaction of all present, and was repeated the next year, 1817, when a larger concourse of people assembled, and more stock was exhibited. In 1818, a "Kentucky State Agricultural Society" was organized at Lexington, of which Governor Isaac Shelby was President, and Thomas T. Barr, Secretary.

SECOND DAY.—Tuesday, September 1.

The weather continued delightful, the heavens smiling in the same kindly manner that gave glory and pleasure to the inaugurating occasion. The first of the autumnal months extended his greeting with mature beauty, and there was a brilliancy of sky and a purity of atmosphere that is not seen through the summer. During the afternoon, however, clouds occasionally overcast the heavens, but only to afford by contrast a more correct idea of the excessive brightness of the opening of autumn. At an early hour the whole population of the city seemed to be on its way to the Exhibition, crowding the frequent trains on the railroad, or occupying the continuous lines of vehicles on the turnpike roads.

The Local Committee had energetically made some necessary alterations in the stables, &c., and the Superintendents of different Departments had nearly all concluded their preliminary duties of arrangement. At the appointed hour the programme for the day was commenced, and every detail was punctually carried out.

THE JUDGES.

The Judges had been selected with great care, from among the gentlemen best qualified in various sections of the Union. A large majority of these were punctually in attendance, and the vacancies were so filled on the ground, that each Board contained representatives from five, seven, or nine different States, giving a national stamp to its verdict, in addition to the high personal reputation of individual members.

Each Board of Judges was furnished with a book, in which was copied all entries in the class upon which the merits of which they were to decide. The owner's name, the weight, age, breed, birth-place, pedigree and other information concerning animals, and the place of manufacture, date of patent, cost, and owner's name of machines and implements, were thus in the hands of the Judges. When they had made their decisions they entered them in these same books, which were then returned to the Secretary.

DISPLAYS IN THE AMPHITHEATRE.

The leading feature of the second day was the Exhibition of Durham, Devon, and Fat Cattle, affording the most magnificent display of these noble animals ever witnessed on the American continent, and rarely equalled in England. The number exhibited, in some of the classes, was not large, as the well known fame of cattle which it was known would be there, kept away many. But in point of excellence, the show was declared by many good judges present superior to any ever witnessed.

In the afternoon the scene was enlivened with an exhibition of heavy horses and of saddle-geldings. The draft-

horses were of a superior character, and they performed wonders when attached to heavy loads. The saddle-horses were fine looking, easy moving, and so thoroughly trained as to excite general admiration. Many of them had been taught to gallop, canter, trot, pace and walk, and when at full speed would shift their gait from a pace to a canter, or from a gallop to a trot, at a signal given by a peculiar pull at the bit by the rider. The rider of the horse to which the premium was awarded was master Railey, (a son of the owner,) aged about thirteen, who also received a complimentary premium for the superiority of his horsemanship.

PREMIUMS AWARDED.

DURHAM BULLS, *three years old and over:* I. "Sirius," R. A. Alexander, Woodford Co., Ky.; II. "Crusader," R. G. Corwin, Wayne Co., Ohio; — *Two years old and under three*: I. "Dalma," Charles T. Garrard, Bourbon Co., Ky.; II. "Yora," Nelson T. Lee, Boyle Co., Ky.; — *One year old and under two:* I. "Turk," R. A. Alexander, Woodford Co., Ky.; II. "Saladin," Craig & Johnson, Scott Co., Ky.

DURHAM COWS AND HEIFERS, *three years old and over:* I. "Forget-me-not," R. A. Alexander, Woodford Co., Ky.; II. "Dutchess of Athol," R. A. Alexander, Woodford Co., Ky.;— *Two years old and under three:* I. "Iranna," George M. Bedford, Bouhon Co., Ky.; II. "Maid of Oak Lane," Col. S. Meredith, Wayne Co., Indiana; — *One year old and under two:* I. "Mazurka 4th," R. A. Alexander, Woodford Co., Ky.; II. "Mazurka 2d," R. A. Alexander, Woodford Co., Ky.; — *under one year old:* I. Col. S. Meredith, Wayne Co., Indiana; II. "Dolly Madison," S. Meredith, Wayne Co., Indiana.

DURHAM HERDS, *of Bull and five Cows.* I. R. A. Alexander, Woodford Co., Ky.; II. R. A. Alexander, Woodford Co., Ky.

DEVON BULLS. *Three years old and over:* I. "Duke of Devon," Charles A. Ely, Elyria, Loraine Co., Ohio; II. "Bryan," Paul Wing, Montgomery Co., Ohio; — *one year old and under two:* I. "Victory," Charles A. Ely, Elyria, Loraine Co., Ohio; — *under one year old:* I. Charles A. Ely, Elyria, Loraine Co., Ohio; II. "Archer," Paul Wing, Montgomery Co., Ohio.

DEVON COWS AND HEIFERS. *Three years old and over:* I. "Jenny Lind," Charles A. Ely, Elyria, Loraine Co., Ohio; II. "Victoria," Charles A. Ely, Elyria, Loraine Co., Ohio; — *two years old and under three:* I. "Ida," Charles A. Ely, Elyria, Loraine Co., Ohio; II. "Ida 2d," Charles A. Ely, Elyria, Loraine Co., Ohio; — *under one year:* I. "Lady Jane," Paul Wing, Montgomery Co., Ind.; II. "Ida 3d," Charles A. Ely, Elyria, Loraine Co., Ohio.

DEVON HERDS, *of Bull and five Cows:* I. Charles A. Ely, Elyria, Loraine Co., Ohio; II. Paul Wing, Montgomery Co., Indiana.

FAT BULLOCKS. *Five years old and upwards:* I. Isaac Shelby, Fayette Co., Ky.; II. George Davidson, Wayne Co., Ind.; —*four years old and under five:* James Calloway, Henry Co., Ky.; II. Isaac Shelby, Fayette Co., Ky.; *three years old and under four:* I. Isaac Shelby, Fayette Co.; II. J. M. Calloway, Henry Co., Ky.

FREE MARTINS AND FAT HEIFERS.. *Five years old and over:* I. Geo. Davidson, Wayne Co., Ky.; II. W. L. Waddy, Shelby Co., Ky.; —*four years old and under five:* I. William R. Estille, Fayette Co., Ky.; II. Isaac Shelby, Fayette Co., Ky.; —*three years old and under four:* I. Isaac Shelby, Fayette Co., Ky.

DRAFT STALLIONS. *Three years old and upwards:* I. Hoggins & Bradford, Boone Co., Ky.; II. Ewing & Hikes, Louisville, Ky.; —*two years old and under three:* I. James Henderson, Fayette Co., Ky.; II. Albert Ford, Oldham Co., Ky.; —*one year old and under two:* I. J. S. Todhunter, Fayette Co., Ky.; —*under one year old:* I. Z. Belle, Shelby Co., Ky.

DRAFT MARES. *Over one year and under two:* I. M. Miles, Henry Co., Ky.

SADDLE GELDINGS: I. Logan Railey, Woodford Co., Ky.

MEETING OF THE STATE SOCIETY.

In the evening the Kentucky State Agricultural Society held a special meeting at the Merchants' Exchange, to which all friends of agriculture were cordially invited. Hon. Brutus J. Clay, (the President of the Society,) presided, and Hon. Robert W. Scott, (Corresponding Secretary of the Society,) acted as Secretary.

After the meeting had been called to order, a resolution was unanimously adopted, expressive of the sense of the obligation felt by the Kentucky State Society to the United States Society, for holding their Fifth Annual Exhibition at Louisville, and inviting the officers and members of the last named Association to visit, before they left the State, the farms of the members of the Kentucky Society.

A committee having been appointed to carry this resolution to President WILDER, returned with that gentleman, who was greeted with applause. He had come, he said, to briefly acknowledge in person the compliment paid to the Society over which he presided, and also to express his thanks for the many civilities extended to himself and to others connected

with the United States Agricultural Society, in Kentucky. After acknowledging these courtesies, he briefly passed in review the excellent features of the Exhibition, expressing his regret that while the best imported specimens from the best English herds were present, their reputation had kept away owners of that fine stock to be found throughout Kentucky and the adjacent States.

Gentlemen from different States were then called upon for an interchange of sentiments, opinions and information on Agricultural topics, and the meeting was prolonged until a late hour, when it was adjourned until the next evening. As it was held by the State Society, a detailed report of the proceedings would be out of place here; but the value and interest of the remarks offered were encouraging to the friends of Agriculture. There were no angry recriminations or selfish intrigues, but perfect harmony of purpose and unity of action marked the whole proceedings. Men from all sections of the Republic met in friendly and familiar intercourse, to socially exchange such information and opinions as would "speed the Plough!"

THIRD DAY.—Wednesday, September 3.

Another beautiful day, a slight shower the evening previous having laid the dust, and tempered the atmosphere to a delightful degree of coolness. Every arrangement had been perfected, and the order of the programme was punctually followed, enabling visitors to witness the exhibition of any particular class of stock, without taking time which might be more profitably occupied in visiting other departments. The large amount of machinery driven by the steam engines was in full operation, mowing and reaping machines were moving over the field, clattering horse-powers propelled the threshing-machines, and animation everywhere prevailed.

DISPLAYS IN THE AMPHITHEATRE.

The fine United States Band, kindly detailed from the Newport Barracks by Col. Buchanan, enlived the exhibitions in the amphitheatre, which were witnessed by a large audience. Different classes of Ayrshire and Herefords were first shown — superior animals, of pure blood and possessing fine points. The herds of Fat Cattle closed the morning's exhibition, and never in America were such monstrous specimens of the bovine race seen.

After the usual dispersion for dinner, (which was as usual supplied with genuine Kentucky hospitality,) the bell gave the signal for re-opening the displays in the amphitheatre, and the spacious tiers of seats were soon crowded to their utmost capacity. Horses were to be exhibited, and it is an undeniable fact that a large audience always congregates to witness any display of the qualities of these noble animals. Stallions for general utility were first on the programme, and the greatest enthusiasm pervaded the vast assemblage, when the gates were thrown open, and sixteen magnificent horses came prancing in, led by grooms or driven under harness. They were all offshoots of thorough-bred or of noted trotting-stock, and seemed as proud in their carriage as if they wished to win the plaudits of the ten thousand people who were looking at them. After they had passed around the ring several times, amid the cheers of the assemblage, the inexorable Judges ordered one after another away until only four remained — viz: a bay of the "Halcom" and "Whip" stock; a full blooded "Morgan;" a beautiful "Black Hawk;" and another bay of the "Diomed" and "Sir William" stock. The sympathies of the crowd were with the Black Hawk, and as he trotted evenly around the ring, over-excited spectators shouted: "Give the Black the blue ribbon — give it to the Black!" But the Judges decided that the two bays were entitled to the ribbons, and their judgment was endorsed by those best versed in horse-flesh. Combining muscular strength with symmetry of form, elegance of action, and qualifications for speed, they were

undoubtedly best fitted for "general utility"—light harness, the saddle, the plough and the team. Succeeding classes of younger stallions, mares and fillies were also composed of very superior animals, and their movements in the arena provoked loud and frequent outbursts of applause from the delighted spectators.

It is a favorite boast with the Kentuckians that they are decidedly Arabic in their sentiments with reference to their horses, and, (in a figurative point of view,) their stables are their Meccas, towards which they worship with a feeling next to idolatry. On this occasion, these Kentucky Meccas seemed to have yielded up their choicest treasures, which, with the numerous contributions from other States, formed probably one of the finest displays of horses of all classes "for general utility" ever witnessed.

FLORAL HALL.

It had been impossible to get the contributions of fruit, flowers and the fine arts in order at an earlier period, and it was not until Wednesday noon that Floral Hall was formally opened to the public. This beautiful octagonal temple, dedicated to Flora and Pomona, was erected expressly for the Exhibition, at a heavy expense. It was about one hundred feet in diameter, and the same in height in the centre. A wide gallery encircles its interior, and it was decorated throughout with evergreens, gracefully arranged and festooned.

Wide tables around and in the centre of the lower floor, were loaded with the choicest productions of the garden, the green-house, the orchard and the field. Massachusetts and Louisiana, Oregon and Georgia, Wisconsin and Pennsylvania, with many intermediate States—vied with each other in contributing vegetables of an almost miraculous size, fruits and grapes of the most tempting appearance, substantial staples of life, and flowers such as might have bloomed in Eden, and have lent their fragrance to that Paradise ere the fall. Among the fruit (although not entered for premium) was a collection of one hundred different varieties of pears,

from the grounds of President WILDER, at Dorchester, near Boston, Mass.

In the gallery there was a fine display of manufactured articles, and works of art, including a series of portraits of valuable horses, painted by Mr. E. Troye, which attracted general admiration. These miscellaneous articles were examined by sub-committees, whose reports were received, amended and consolidated in the reports of the General Committee on Manufactured Articles, Implements, and Machinery.

THE POULTRY DEPARTMENT.

Liberal premiums were offered for poultry. Comparatively few "fancy fowl" were offered, especially of the monstrous Asiatic varieties; but the ordinary varieties of domestic poultry were well represented.

THE MACHINE HALL.

This large edifice, erected for the occasion, was furnished with "power" by a fine steam-engine from the Newark (Ohio) Machine Works. The great variety and novelty of the machines in operation, showed that the highest mechanical skill of our country is taxed to supply the place of hand-labor by machinery. Well have these labor-saving machines been called types of the progressive spirit of the age, which thus presses the giant forces of nature into the service of the yeoman.

The "Machine Hall," with the "Implement Tent," and the test-trials in the field, were under the superintendence of that noted machinist, Joseph E. Holmes, of Ohio, who had conducted the Grand Trial of Reapers and Mowers at Syracuse.

PREMIUMS AWARDED.

HEREFORD BULLS, *Three Years Old and over:* I. "Prince of Wales," John Humphreys, Loraine Co., Ohio; II. "Charles," W. H. Sotham, Owego Co., New York; — *Two Years Old and under Three:* I. "Fair Boy," Thomas Aston, Loraine Co., Ohio; — *One Year Old and under Two:* I. "Ranger," W. Sotham. Owego Co., New York.

Hereford Cows and Heifers, *Three Years Old and over:* I. "Duchess," Thomas Aston, Loraine Co., Ohio; II. "Mayflower," W. H. Sotham, Owego Co., New York; — *Two Years Old and under Three:* I. "Princess Royal," John Humphreys, Loraine Co., Ohio; II. "Wood Lass," W. H. Sotham, Owego Co., New York; — *One Year Old and under Two:* I. "Beauty," Thomas Aston, Loraine Co., Ohio: — *Under One Year Old:* I. "Prudence," W. H. Sotham, Owego Co., New York; II. "Woodlark," W. H. Sotham, Owego Co., New York.

Hereford Herds, *of Bull and Five Cows:* I., W. H. Sotham, Owego Co., New York.

Ayrshire Bulls, *Three Years Old and over:* I. "Home," J. W. Goslee, Jefferson Co., Ky.; II., R. A. Alexander, Woodford Co., Ky.; — *One Year Old and under Two:* I., S. Berryman, Boston, Ky.

Ayrshire Cows, *Three Years Old and over:* I. "Queen," R. A. Alexander, Woodford Co., Ky.; II. "Arvelve Lass," R. A. Alexander, Woodford Co., Ky.;—*Two Years Old and under Three:* I. "——," R. A. Alexander, Woodford Co., Ky. — II. "——," R. A. Alexander, Woodford Co., Ky.; — *Under One Year Old:* I. "Tunie," R. A. Alexander, Woodford Co., Ky.; II. "Lilie," R. A. Alexander, Woodford Co., Ky.

Ayrshire Herds, *of Bull and Five Cows:* I., R. A. Alexander, Woodford Co., Ky.

Herds of Fat Cattle. I., Isaac Shelby, Fayette Co., Ky.

Stallions for General Utility, *over Four Years Old:* I. "Murdock," James Minor, Nelson Co., Ky.; II. "Sir William," J. D. Smith, Clark Co., Ky.; — *Three Years Old and under Four:* I. "Rob Roy," J. F. Payne, Scott Co., Ky.; II. "Belshazzar," John T. Ewing, Beechland, Ky.; — *Two Years Old and under Three:* I. "Black William," Robert Garnett, Woodford, Co., Ky.; II. "Lord Wellington," Thomas Henderson, Fayette Co., Ky.; — *One Year Old and under Two:* I. "Daniel Boone," James L. Crim, Fayette Co., Ky.; II. "——," Jas. Minor, Nelson Co., Ky.; — *Under One Year Old:* I. "——," J. C. Montague, Lexington, Ky.; II. "Romulus," N. F. Lee, Danville, Ky.

Mares and Fillies for General Utility, *over Four Years old:* I. "——," R. T. Downing, Fayette Co., Ky.; II. "Kate Brown," Nelson T. Lee, Danville, Ky.; — *Three Years Old and under Four:* I. "Julia Morgan," W. H. Frederick, Jefferson Co., Ky.; II. "——," William Abbott, Scott Co., Ky.; — *Two Years Old and under Three:* I. "——," Joseph McClasky, Nelson Co., Ky.; II. "——," H. Thompson, Clark Co., Ky.

Poultry. *Shanghais:* Andrew Buchanan, Louisville, Ky.;—*Bramah Pootras*, W. L. Oldham, Jefferson Co., Ky.; — *Bantams*, J. K. Taylor, Lexington, Ky.; — *Turkies*, W. L. Oldham, Jefferson Co., Ky.; — *Wild Geese*, W. L. Oldham, Jefferson Co., Ky.

Fruits. *Best collections of Apples:* I. Lawrence Young, Jefferson Co., Ky.; II. John Sigerson & Brother, St. Louis, Missouri;—*Best Thirty*

varieties of Apples: I. Hobbs, Walker & Co., Jefferson Co., Ky.; II. O. Hite, Jefferson Co., Ky.; — *Best Twelve varieties of Apples:* I. Jacob Johnson, Jefferson Co., Ky.; II. George E. Hancock, Jefferson Co., Ky.;— *Best Dish of Apples:* I. George E. Heinsohn, Jefferson Co., Ky.; II. J. M. Robinson, Ky.; — *Best collection of Pears:* [Mr. Wilder not entering for premium.] I. William Heaver, Ohio; II. John Sigerson & Brother, St. Louis, Missouri;— *Best Thirty varieties of Pears:* I. William Heaver, Ohio; — *Best Twelve varieties of Pears:* I. John A. Warder, Ohio;— *Best Dish of Pears:* I. Jacob Johnson, Ky.; II. S. L. Gaar, Jefferson Co., Ky.; — *Best collection of Peaches:* I. John E. Willey, Ind.; II. John W. Wright, Ind.; — *Best Dish of White-flesh Cling Peaches:* I. John F. Willey, Ind.; II. Jacob Clore, Ky.;—*Watermelons:* I. William Hinton, Ky.,— *Mush Melons:* I. George E. Heinsohn, Ky.; — *Plums:* I. P. S. Burke, Ky.; II. John Thatcher, Ky.; — *Catawissa Raspberries:* I. John A. Warder, Ohio.

Grapes. *Foreign varieties:* I. N. Durfee, Massachusetts; II. Wm. Heaver, Ohio; — *Native or Seedling:* I. Miss E. J. Todd, Ind.;—*Isabella:* I. Harry Nantz, Ky.; II. Jacob Johnson, Ky.; — *Catawba:* I. Jacob Johnson, Ky.; O. Hite, Ky.

Garden Products. *Best collection:* John Thatcher, Jefferson Co., Kentucky.

Flowers. *Roses:* I. W. Heaver, Cincinnati; II. E. Wilson, Louisville; — *Dahlias:* I. E. Fergurson, Milwaukie, Wis.; II. E. Wilson, Louisville; — *Exotics:* I. E. Wilson, Louisville; — II. J. P. Morton Louisville; — *Annuals:* I. J. P. Morton, Louisville; — *Herbaceous Plants:* I. Moore & Serp, Louisville; II. W. Heaver, Cincinnati; — *Best Floral Designs:* I. E. Wilson, Louisville; II. Dr. Ross, Jefferson Co., Ky.

FOURTH DAY.—Thursday, September 3d.

As had been hopefully predicted, Thursday eclipsed even the two preceding days in interest, and in the number of visitors, many of them strangers of distinction. The weather was such as always seems to favor exhibitions over which Col. Wilder presides, and the scene upon the grounds was of the most exciting and interesting character, "from early morn till dewy eve." From the Amphitheatre came the shouts of the people and the clear, soft tones of music; cheer after cheer greeted some favorite horse as he swept around the track; in the Floral Hall all was gayety and bustle; the

stirring sounds of industry were heard around and within the Manufacturer's Tent and Implement Hall; the Marquee of the President was filled with eminent guests; there was a mystic meeting in the "Press-Tent;" mounted marshals galloped to and fro, while swarming everywhere was the populace, pouring hitherward and thitherward as is recorded in Scripture — men parting from their wives, wives separated from their husbands, and children mourning the temporary loss of parents. Yet the "work" moved on like "clock-work!"

DISPLAYS IN THE AMPHITHEATRE.

Classes of Jersey cattle and milch cows were exhibited in the morning, while in the afternoon classes of horses attracted the universal and apparently unalloyed satisfaction of the mass of spectators who filled every seat, and occupied every standing-place. Ladies waved their handkerchiefs, and gentlemen cheered lustily as class after class of the equine race was in turn brought before them. Every taste was gratified! There were horses that could run — horses that could pace — horses that could trot — saddle-horses and harness-horses — with draft-horses that could apparently draw any reasonable load over any reasonable road. The drivers of some of the "teams" would have put to the blush any of the charioteers who figured in the Olympian races, and there were men, (aye, and mere boys,) astride of well-trained horses, who appeared to have been born in their saddles—perfect centuars.

TRIALS OF SPEED.

While the exhibitions were going on in the amphitheatre, there was a constant successions of "trials of speed against time" on the track, around the barriers of which a sea of humanity pressed like an ocean-wave against a break-water. Everything passed off in the most orderly manner, and no accident occurred to mar the harmony of the exciting scene.

EXHIBITION OF SHEEP.

There was an unusually choice exhibition of sheep, which attracted crowds during the whole exhibition to the pens where they were kept. There were the fine-wooled Saxons—the luxuriant Cotswolds — the delicious Southdowns — the prized Merinos — and the famed Improved Kentucky breed, perfected by the Hon. Robert W. Scott.

These "Improved Kentucky Sheep," are the result of a twenty years endeavor to combine in the same animal the hardiness and prolific quality of the native sheep, the size and thrift of the Cotswold, the symmetry of form and delicacy of mutton of the Southdown, and a fleece which unites to the weight and length of the Cotswold the thickness and softness of the Saxony. Clothed to the neck and to the ears in a thick, long and impenetrable fleece, they face the bleakest winters, and the hotest, wettest summers, thriving on the commonest feed.

DISPLAY OF SWINE.

There was a long row of pens, filled with contented porkers of every description, from the huge paternal head of the family and his mammoth partner down to the tiniest of pigs—nice, clean, intelligent little grunters, fit to grace a lady's boudoir.

TRIALS OF IMPLEMENTS.

Acting in accordance with a resolution of the Society, that all Implements exhibited should be *tried in the field*, sub-committees were busily engaged in testing ploughs, cultivators, harrows, horse-powers, corn-planters, seed-sowers, threshing-mills, a hoop-splitting machine, Ayer's self-acting pump, portable steam-engines, and other valuable labor-saving inventions.

PREMIUMS AWARDED.

JERSEY COWS. *Three years old and over:* I. "——," R. A. Alexander, Woodford Co., Ky.;— *one year old and under two:* "Quality," Thomas Aston, Loraine Co., Ohio.

MILCH COWS. I. R. A. Alexander, Woodford Co., Ky.; II. Paul Wing, Montgomery Co., Ohio.

Matched Geldings, *sixteen hands high and over:* I. Dr. John R. Desha, Lexington, Ky.; II. Sandford Davis, Scott Co., Ohio; — *under sixteen hands high:* I. J. L. Downing & Son, Fayette Co.. Ky.; II. Farewell F. Marr, Scott Co., Ky.

Matched Mares, *sixteen hands high and over:* I. A. H. Brand, Lexington, Ky.; II. William E. Milton, Louisville, Ky.; — *under sixteen hands high:* I. Elias Dorsey, Jefferson Co., Ky.; II. Thomas H. Hunt, Louisville.

Extra Ring, *composed of all the Stallions, Mares and Geldings, of all ages, that had received premiums during the Exhibition;* I. "Black William," Robert Garnett, Woodford Co., Ky.; II. "——," W. C. Trabue, Jefferson Co., Ky.

Trials of Speed — Mares *five years old and over:* I. "Kate," A. H. Brown, Fayette Co., Ky., time 3:5; II. "Kate," P. Satterwhite, Louisville, Ky., time 3:21; — *four years old and under five:* I. Bay Roan, Geo. E. Heinsohn, Jefferson Co., Ky., time 3:21; II. "Highland Mary," Barnes Davis, Oneida Co., N. Y., time 3:32; — *under four years old:* I. "Mary Porter," J. L. Downing.

Cotswold Sheep. *Bucks over three years old:* I. "Monarch," J. W. Goshee, Jefferson Co., Ky.; II. "Success," Smith Hopkins, Henry Co., Ky.; — *Bucks two years old and under three:* I., R. A. Alexander, Woodford Co., Ky.; II. David Ellis, Henry Co., Ky.; — *Ewes two years old and over:* I. Luke Hopkins, Henry Co., Ky.; II. Thomas Aston. Loraine Co., Ohio; — *Ewes under two years old:* I., J. M. Calloway, Smithfield. Ky.; II. J. B. O'Bannon, Jefferson Co., Ky.

Southdown Sheep. *Bucks over three years old:* I., R. A. Alexander, Woodford Co., Ky.; II. Cassius M. Clay, Madison Co., Ky.; — *Bucke two years old and under three:* I., R. A. Alexander, Woodford Co., Ky.; II. Towns & Worthen, Loraine Co., Ohio; — *Ewes two years old and over:* I., R. A. Alexander, Woodford Co., Ky.; II. Towns & Worthen, Loraine Co., Ohio; — *Ewes, under two years old:* I., R. A. Alexander, Woodford Co., Ky.; II. Towns & Worthen, Loraine Co., Ohio.

Saxony Sheep. *Bucks, two years old and over:* I. Alexander Black, Greencastle, Ind.; *Bucks, under two years old:* I. Alexander Black, Greencastle, Ind.; *Ewes, two years old and over:* I. John Herr, Jefferson Co., Ky.

Merino Sheep. *French Bucks, two years old and over:* I., J. D. Olcott, Michigan; — *French Bucks, under two years old:* J. D. Olcott, Michigan; — *French Ewes, two years old and over:* I., J. D. Olcott, Michigan; II. John Herr, Jefferson Co., Ky.; — *French Ewes, under two years old:* I., J. D. Olcott, Michigan; — *Spanish Bucks:* I., J. D. Olcott, Michigan.

Improved Kentucky Sheep. I., R. W. Scott, Locust Hill, near Frankfort, Ky.

Longwool Lambs. I. Luke Hopkins, Henry Co., Ky.; II. J. M. Calloway, Smithfield, Ky.

Fat Wethers. I., J. M. Calloway, Smithfield, Ky.

Large Breeds Swine. *Boars, two years old and over*, I. "Suffolk,' E. & B. Bassett, Milan, Erie Co., Ohio ; — *Sows, two years old and over*, I. "Lizzie," J. M. McFerrin, Boyle Co., Ky.; II. "Virginia," John S. Seaton, Jefferson Co., Ky.; — *Sows, one year old and under two*, "Princess," Richard Allen, Fayette Co., Ky.; — *Sows and their pigs*, I. "Virginia" and pigs, John S. Seaton, Jefferson Co., Ky.

Small Breeds Swine. *Boars, two years old and over*, I. Richard Allen, Fayette Co., Ky.; — II. W. W. Young, Jefferson Co., Ky.; — *Sows, two years old and over*, I. Richard Allen, Fayette Co., Ky.; II. Zeb. Ward, Frankfort, Ky.; — *Sows, one year old and under two*, I. Richard Allen, Fayette Co., Ky.; II. Zeb. Ward, Frankfort, Ky.; — *best pair of Pigs*, E. & B. Bassett, Erie Co., Ohio.

EVENING MEETING.

The meetings of the Kentucky State Agricultural Society were continued through the evenings of the week, and were well attended by the members, as well as by gentlemen interested in the advancement of scientific and practical agriculture from many States of the Union.

On Thursday evening, the question of "Legislative Aid" being before the meeting, J. R. Barrett, Esq., gave an interesting account of the St. Louis Agricultural Association, in which he dwelt on the fact that agricultural societies which depended for their prosperity on individual enterprise, and individual liberality, and the individual exertions of their managers, were sure of success. State aid, in his opinion, might be acceptable, but the true basis of prosperity was the individual exertions of officers, — such officers as were willing to carry out the labor which they had undertaken.

FIFTH DAY.—Friday, September 4th.

Everything was propitious and gratifying — the weather, the attendance of the people, and the display of stock. The amphitheatre was densely filled, the various halls were continually thronged, the beautiful groves were alive with gay parties, and everywhere on the grounds intelligent and well-dressed people were to be seen in crowds.

DISPLAYS IN THE AMPHITHEATRE.

Classes of mules, jacks and jennies were first on the programme of the morning, and there was a fine show, especially of "matched mules." One class of four spans attracted especial attention, and was valued at three thousand dollars. The Spanish jacks and jennies, mostly fine imported stock, were unusually large and fine.

Next was a grand cavalcade of all the premium cattle, headed by the superintendent of the cattle department. First came the Durham stock, then the Herefords, then the Devons, then the Jerseys, and then the mammoth fat cattle; making upwards of fifty head of magnificent animals, all in the arena at once! Such a herd was never before brought together at once.

The morning exhibition was closed with a fine display of ponies, mounted by young lads, who ran several races which excited the audience intensely, eliciting hearty cheering. The first premium was won by the smallest boy in the ring, who rode a handsome roan pony with great daring and skill.

ANNOUNCEMENT OF THE SYRACUSE AWARDS.

Before the vast audience retired from the amphitheatre to dine, President WILDER announced the result of the labors of the Board of Judges at the National Trial of Harvesters, at Syracuse, in July. The arena was filled with the exhibitors there and their friends, all deeply interested in the announcement about to be made. These awards have already been given in this volume, but it is proper to place on record the

REMARKS OF PRESIDENT WILDER.

Ladies and Gentlemen: Many of you are aware that, at the meeting of the United States Agricultural Society in Washington last winter, it was decided that hereafter all awards for agricultural implements should be made after a practical trial of the machines in the field. In accordance with that decision, a trial of reapers, mowers, and other implements was had at Syracuse, in New York, on the 13th of

July last. There were more than forty machines exhibited and tried, and it was then promised that the awards should be made known at this annual exhibition. I now have the pleasure to submit the report of the jury at that trial. [Applause.]

I regret to state that the committee on mowers have not yet agreed upon the verdict. When they do so, the result will be made known through the public press.

And now, ladies and gentlemen, allow me to propose a sentiment:

Honor and renown to the inventors of labor-saving implements, which have made the name of America glorious throughout the world. Praise and glory to him who shall teach them to work by steam. [Applause.]

AFTERNOON DISPLAYS IN THE AMPHITHEATRE.

After dinner a rare treat was afforded all true lovers of the horse by the exhibition in the ring of the fine Arabians, recently imported by A. Keene Richards, Esq., of Georgetown, Ky. There were three stallions — Mokhladi, Massoud, and Sacklowie — and two mares. Mokhladi is a light gray, fourteen hands and one inch high, and was bred by the Tarobine tribe of Bedouins, in Arabia Petra. Sacklowie is a mahogany-bay, fifteen hands high, with a superb head, and was bred by the Anayza Bedouins. But the gem of the stud was Massoud, a dark sorrel, fifteen hands high, with a perfect head and neck, fine clean limbs, and every mark of great muscular power. Mr. Richards stated that he has run his mile on a Kentucky track, without any training and carrying two hundred pounds weight, in 2:18. In his native desert, he has been galloped ninety miles by daylight, without stopping — proof of his action and of his endurance.

After the Arabians, a ring of thorough-bred stallions, embracing several horses of note, was exhibited. There was "Wagner," twenty-six years of age, whose contest with "Gray Eagle," some years since, is one of the most prominent events in the history of the American course. "Sovereign," that famous sire of racers, was also there, as was "Scythian," said to have been the first horse in England when purchased

to send to Kentucky about a year since. The excitment of the audience when these, with half a dozen other noted horses, were in the ring, was intense.

Thorough-bred mares and fillies were next exhibited, class by class. In the ring of "three year old fillies," Hon. Gibson Mallory, of Louisville, exhibited a very fine animal, which deservedly received the blue ribbon. As she had not been named, the owner handsomely called her "Grace Wilder," in honor of a charming young daughter of President WILDER, and the christening was ratified by the enthusiastic applause and approbation of the multitude.

TRIAL OF WORKING OXEN.

The working oxen, of which there was a large and fine display, were tested on the grounds. Great interest was manifested in this part of the exhibition, and there was ample evidence given that most of the cattle were as well-broken, as docile and as powerful, as they were finely formed.

TRIALS IN THE FIELD.

Large crowds were attracted to various parts of the grounds, to witness the practical tests of ploughs, seed-sowers, portable steam engines, horse powers, pumps, and other descriptions of farm implements and machinery — each class undergoing a thorough examination by the sub-committee to which it had been assigned.

PREMIUMS AWARDED.

MULES. *Horse Mules, Two years old and over:* I. Thompson, Heironimous & Co., Clarke Co., Ky.; — *Mare Mules, Two years old and over:* I., W. R. Estell, Fayette Co., Ky.; II. E. L. Davidson, Washington Co., Ky.; — *Best Five Mules:* I. Thompson, Heironimous & Co., Clarke Co., Ky.; — *Matched Mules:* I., E. L. Davidson, Washington Co., Ky.; II. Thompson, Heironimous & Co., Clarke Co., Ky.

JACKS. *Four years old and over:* I. John Larrimore, Madison Co., Ky.; II. G. Mallory, Jefferson Co., Ky.; — *Three years old and under Four:* I. Sol. Steele, Shelby Co., Ky.; — *Two years old and under Three:* I., J. H. Rochester, Boyle Co., Ky.; II. R. W. Souvy, Washington Co., Ky.

JENNETS. *Four years old and over:* I. Harrison Thompson, Clarke Co., Ky.; — *Two years old and under Three,* I. Dudley Tribble, Madison

Co., Ky.; II. J. B. Field, Jessamine Co., Ky.; — *One year old and under Two*, I., G. Proctor, Boyle Co., Ky.

Ponies. I., C. T. Tucker, Louisville, Ky.; II. I. C. Ferguson, Louisville, Ky.

Saddle Stallions. I. John L. Payne, Scott Co., Ky.; II. D. L. Gregory, Jefferson Co., Ky.

Thorough-bred Stallions. *Four years old and over*, I. "Sovereign," A. Burford, Woodford Co., Ky.; II. R. A. Alexander, Woodford Co., Ky.; — *Three years old and under Four*, I. "Harry Hudson," J. L. Brown, Jefferson Co., Ky.; II. "Yorkshire," Newton Craig, Scott Co., Ky.; — *Two years old and under Three*, I. "American," Thomas H. Clay, Lexington, Ky.; II. "Lannas," E. M. Blackburn, Woodford Co., Ky.; — *One year old and under Two*, I. "Tiberius," Samuel Bergman, Jefferson Co., Ky.; — *Under One year old*, I., E. M. Blackburn, Woodford, Co., Ky.

Thorough-bred Mares and Fillies. *Four years old and over*, I. "Victory," Thomas H. Clay, Lexington, Ky.; II. R. A. Alexander, Woodford Co., Ky.; — *Three years old and under Four*, I. "Grace Wilder," Gibson Mallory, Jefferson Co., Ky.; — *Two years old and under Three*, "Lunie," R. A. Alexander, Woodford Co., Ky.; II. "Lillie," R. A. Alexander, Woodford Co., Ky.; — *One year old and under Two*, I., R. A. Alexander, Woodford Co., Ky.; II. R. A. Alexander, Woodford Co., Ky.; — *Under One year old*, I. "Vandalia," Thomas H. Clay, Fayette Co., Ky.; II. R. A. Alexander, Woodford Co., Ky.

Working Oxen. *Four years old and over*, I., W. R. Duncan, Clarke Co., Ky.; II. Albert Allen, Fayette, Co., Ky.; — *Two years old and over Four*, I., N. Fergurson, Fayette Co., Ky.; II. W. R. Duncan, Clarke Co., Ky.

TRIBUTE TO "THE PRESS" OF LOUISVILLE.

At a meeting of the members of "the Press" from abroad, W. W. Fosdick, of New York, in the chair, and Wm. Holmes, of St. Louis, secretary, resolutions were passed, thanking the members of the press of Louisville for "manifold pleasing attentions and gratifying hospitalities." [This deserved compliment the Secretary of the United States Agricultural Society desires to publicly endorse, and at the same time to acknowledge having made free use of the daily reports in the *Journal*, the *Democrat* and the *Courier* in compiling this record of the Exhibition.]

EVENING MEETING.

Before adjourning on Friday evening, *sine die*, the State Agricultural Society of Kentucky, by a unanimous vote, appointed a committee to memorialize Congress, petitioning for a grant of 500,000 acres of land to each State in the Union, for the promotion of the interests of agriculture, to aid in establishing agricultural schools and to furnish means for the support of experimental farms. The proceeds of the lands, it was stated, would constitute a fund from which each State would reap most important benefits to the cause of improved agriculture. The committee was also instructed to memorialize Congress on the subject of establishing an Agricultural Department.

SIXTH DAY.—Saturday, September 5th.

The sixth and last day of the Exhibition was — like its predecessors — in every respect auspicious. Again was the weather such as even a confirmed invalid would welcome as bland and delightful, and again did thousands throng to the grounds which throughout the week had been the scene of useful display and rational enjoyment; — where the products of the field, the workshop, the garden, the pasture range and the stable, has presented such attractions. It was a curiosity to stand at the main gateway and witness the flood of human beings that poured in after the arrival of the rapidly succeeding trains, while the turnpike roads were crowded with vehicles of every description, from the costly equipage to the humble farm wagon.

DISPLAY IN THE AMPHITHEATRE.

Again was the amphitheatre crowded, as the programme announced the very "cream" of the weeks' show. Rockaway horses, of which there was an imposing and varied display, occupied the ring during a good portion of the morning, after which came a "sweep stakes" for the thorough-bred stallions.

"Sovereign" and "Scythian" again competed, and the decision of the day previous was reversed, "Scythian" bearing off the blue ribbon amid the plaudits of the excited audience.

In the afternoon, there was a "ring" of thirteen buggy horses in harness — a collection of animals that would have won the commendation of horse-fanciers anywhere. Then came an equally numerous and fine class of buggy mares, in harness; and at six o'clock, P. M., as the beams of the setting sun gilded the eastern side of the interior of the amphitheatre, President WILDER gave the signal for

THE GRAND CLOSING CAVALCADE.

The bell was sounded for the last time — the band struck up the National Anthem — the gates were thrown open — and the cavalcade of premium horses entered the arena, decked with their ribbons of victory. Matched horses in harness, rockaway and buggy horses, stallions, mares, geldings, fillies, ponies, trotters and pacers, followed in regular succession, passing around and around the arena to the inspiring notes of the band, cheered by the waving of ladies' handkerchiefs, and by the continued shouts of the gentlemen. There were seventy-eight magnificent animals together, moving around like the ever-varying hues of the kaleidescope, and forming a fitting *finale* to the displays in the amphitheatre. The great heart of the assembled multitude beat with pride and satisfaction, and all seemed to go from the amphitheatre at last with reluctance, as if unwilling to quit the scene of so much unalloyed satisfaction.

TEST OF DRAFT-HORSES.

A trial of the classes of Draft-Horses, comprising some of the noblest animals that ever tightened a trace, was carried on during the most of Saturday, in the rear of the amphitheatre, and attracted a large crowd of spectators. Each pair of horses or single horse was in turn hitched to a heavily loaded drag, and visible evidence was given of strength and of docility.

EXAMINATIONS OF FARM PRODUCTS AND NATIVE WINES.

The Committees on Native Wines had a cellar, in which the productions of the vineyard sent were kept until tested, or rather *tasted*. The farm products exhibited were not numerous, but most of the specimens exhibited were unusually excellent in quality.

HOTEL PREMIUMS.

These premiums, which were very large, were contributed by the liberal proprietors of the hotels of Louisville, who received in part return the articles exhibited.

MANUFACTURED ARTICLES, FARM IMPLEMENTS AND MACHINERY.

The mammoth tent and the large building devoted to farm implements and agricultural machinery, were constantly crowded with spectators, and the duties of the examining sub-Committees, which were discharged with an intelligent fidelity, were laborious indeed. Each sub-Committee made a thorough comparative examination of the machines or implements in the class or classes assigned to it, and reported to the General Committee. These reports were then critically examined by the General Committee, and revised before receiving its approval.

REPORTS OF COMMITTEES.

The larger portion of the Committees merely handed in their awards, and the Executive Committee decided not to publish the few Reports submitted, but to file them for reference in the Archives of the Society. The awards of the Committee on "Manufactured Articles, Farm Implements and Machinery," will be found appended to this account of the transactions at Louisville.

AWARDS OF PREMIUMS.

ROCKAWAY HORSES. I., F. E. Ware, Charleston, S. C.; II. J. F. Caldwell, Boyle Co. Ky.

SWEEPSTAKE, *for Blooded Stallions:* I. "Scythian," R. A. Alexander, Woodford Co.. Ky; II. "Sovereign," Abraham Buford, Woodford Co., Ky.; — *Blood Mares:* I. "Sunie," R. A. Alexander, Woodford Co., Ky.; II. "Lilie," R. A. Alexander, Woodford Co., Ky.

BUGGY HORSES, *single, in harness:* I., Z. Ward, Frankfort, Ky.; II. J. F. Caldwell, Danville, Ky.; — *Buggy Mares:* I., G. D. Hunt, Lexington, Ky.; II. J. M. Calaway, Lexington, Ky.

SWEEPSTAKE *for Stallions for General Utility:* I., J. B. Bailey, New Jersey: II. F. Fulton, Vermont; — *Mares for General Utility:* I., N. T. Lee Boyle, Co., Ky.; II. R. P. Pepper, Woodford Co., Ky.

DRAFT HORSES. *Pair:* I. Peter Merkle, Louisville, Ky.; II. Jackson Cline, Louisville, Ky.; — *Single:* I. Craig & Kennedy, Louisville, Ky.

HOTEL PREMIUMS. *Flour;* I. Edward Allen, Fayette Co., Ky.; II. N. O. Wilson, Fisherville, Jefferson Co., Ky.; — *Irish Potatoes:* I. Jas. Foley, Lexington, Ky.; II. Geo E. Heinsohn, Jefferson Co., Ky.; — *Sweet Potatoes:* I. George E. Heinsohn, Jefferson Co., Ky.; II. John Thatcher, Jefferson Co., Ky.; — *Hams:* I. Mrs. Gibson Mallory, Oldham Co., Ky.; II. T. L. Jefferson, Louisville, Ky.; — *Butter:* I. Miss Carrie Downing, Lexington, Ky.; — II. R. A. Alexander, Woodford Co., Ky.; — *Corn Meal:* I. Robert Young, Henry Co., Ky.; II. H. C. Bowman, Fayette Co. Ky.

FARM PRODUCTS. *Winter Wheat:* I. Squire J. Roberts, Shelby Co., Ky.; II. B. F. Cawthon, Louisville, Ky.; — *Rye:* I., L. S. P. Vaughn, Jefferson Co. Ky.; II. Lawrence Brown, Jefferson Co., Ky.; — *Spring Barley:* I., L. L. Dorsey, Louisville, Ky.; — *Winter Barley:* I., L. L. Dorsey, Louisville, Ky.; — *Oats:* I. Oscar Burbridge, Bourbon Co., Ky.; — *White Corn:* I., N. Miles, Henry Co., Ky.; II. Thomas Trigg, Ky.; — *Yellow Corn:* I., N. Miles, Henry Co., Ky.; II. John L. Seaton, Ky.; — *Suyar Beets:* I. George E. Heinsohn; — *Carrots:* I. John Thatcher, Jefferson Co., Ky.; — *Undressed dew-rotted Hemp:* I. Edward Allen, Fayette Co., Ky.; — *Poland Oats:* I. Oscar Burbridge, Bourbon Co., Ky.

NATIVE WINES. *Catawba, older than the vintage of* 1856, I. John R. Eakin, Wartrace, Tennessee; — *Wine from the Herbemont Grape,* I. Nicholas Longworth, Cincinnati, Ohio; — *Wine from the Isabella Grape,* I. Nicholas Longworth, Cincinnati, Ohio.

THE GRAND AGRICULTURAL BANQUET.

The Grand Banquet given at the Galt House, after the conclusion of the Exhibition, was a pleasing *finale* to the labors and the pleasures of the week. The tables were appropriately decorated for the occasion, and in addition to the boun-

tiful repast there was a profusion of fresh, bright flowers, tastefully arranged. Eloquent music was discoursed during the banquet after the announcement of each toast, by the United States Band, from the Newport Barracks.

The guests were from every section of the Union, comprising gentlemen who have adorned the councils of the Nation, with others distinguished in agriculture, science and literature, and the representatives of great commercial and manufacturing interests. Eloquence, wit, and sentiment were generously contributed, and the company remained at the table until the midnight chimes warned them away.

REMARKS OF PRESIDENT WILDER.

After the cloth had been removed from the tables, President WILDER rose amid hearty cheering, and prefaced the regular toasts with the following eloquent and appropriate introduction: —

Gentlemen: The moment has arrived when it is my duty as well as my high privilege to present you with the congratulations of the Association which I have the honor to represent on the happy consummation of our National Exhibition.

In behalf of the United States Agricultural Society and of the Southwestern Agricultural and Mechanical Association, I bid you welcome to the social and intellectual entertainment of the present hour. It affords me great pleasure to recognize in this assembly so many illustrious personages — gentlemen distinguished by official position, worthy deeds, and fair fames. While we regret the absence of many invited guests, we rejoice that we are honored with the company of the Governor and ex-Governors of this State, the officers and delegates of kindred societies, and other friends of Agriculture who have met to participate with us in the enjoyments of this occasion.

This is the Fifth Annual Exhibition of our Association. Its object is to improve that great art which gives independence and strength to our nation, to create additional facilities for the acquisition and diffusion of knowledge, and to promote a more extended intercourse throughout our happy land.

My heart is no stranger to that interest which has brought this immense concourse together — to the inspiration of that

sentiment which I trust will ever animate the hearts of the American people — to those patriotic emotions which merge all sectional jealousies and party distinctions in a general desire for the public weal. [Applause.]

We come from different and distant portions of our country. I am from the home of the Puritans, but I am most happy to meet you here in this land of cavaliers and chivalry — and here upon the broad platform of good citizenship, to unite my influence with yours in furtherance of our common cause, and in cementing the bonds of union — to join hands with you, sir, the Governor of the Commonwealth of Kentucky, and through you with this assembly in exemplification of the glorious inscription on the seal of your State: "United we Stand, Divided we Fall." [Here President Wilder and Governor Morehead shook hands amidst the shouts of the audience.]

One of the most hopeful and delightful features of these national jubilees, relates to the genial influences which they exert on all classes of society, associating them together with friendly greetings and making them one in interest and one in affection.

"The principle of association," said the Farmer of Marshfield [cheers], "the practice of bringing men together bent on the same general object, uniting their physical and intellectual efforts to that purpose, is a great improvement in our age. It is, therefore, essential to the best interests of our farmers that these associations should be established and universally attended." Equally harmonious with this expression was the sentiment of your immortal Clay, the farmer of Ashland. [Cheers.] "Give me," said he, "some object to transmit my name to posterity, emblematical of those great interests which I have sought to promote in the national councils — a plough, a loom, a shuttle, an anvil, or some article connected with agriculture, commerce, or manufactures." [Applause.]

Our present Exhibition has been distinguished by ample preparations and by great perfection. Some of the departments have possessed unsurpassed excellence. But, after such a display of the beneficial results of agriculture, you need no further testimony in its favor from me. For the success which has attended it we are greatly indebted to the officers and members of the Southwestern Agricultural and Mechanical Association for the use of their beautiful and commodious grounds, and to the local officers, committees, and marshals for the important aid which they have rendered us.

Our thanks are also due to the Judges for the satisfactory manner with which they have discharged their delicate trust — to the Butchers' Association for their splendid parade at the opening ceremonies — to the press for their indefatigable labors and able reports, and especially to the good people of Louisville for their personal urbanity and generous hospitality. [Applause.]

But Gentlemen, I must not stand longer between you and the eloquent orators who are to address you. My purpose was only to remind you of the importance of our cause and to welcome you to this festive board. And who does not feel an interest in this occasion, and look forward with bright anticipations to the glorious future of our country?

Who can estimate the millions of her population or the amount of her agricultural products when our railroads, now laid half-way from the Atlantic to the Pacific, shall have reached those golden shores — when science shall have improved to its utmost extent the implements of husbandry and the arts of cultivation, and when the progress of civilization shall have filled our valleys and crowned our hill-tops with all that can minister to the advancement of our intelligent, industrious, and virtuous people! [Prolonged applause.]

When the cheering had subsided, President WILDER remarked that he would proceed to announce the Regular Toasts, viz: —

I. *Kentucky* — The battle-field of pioneer civilization in the West contests with her sister States for the palm of excellence in agriculture. A bloodless strife, but more momentous than many wars.

REMARKS OF GOVERNOR MOREHEAD.

His Excellency Governor Morehead was called upon to respond, and was greeted with applause. When it had subsided, he said:

I am well aware, Mr. President, that the call which has just been made upon me to respond to the sentiment which has just been announced proceeded more from the position I occupy than any qualifications I possessed to discharge the duty imposed upon me. I am rejoiced, however, that I am permitted to express the high gratification which is felt by the people of Kentucky in the assemblage of the large and highly respectable body of practical agriculturists at this great national exhibition. I know that I speak the sentiment of the

public heart when I say that their presence has been most welcome. If unused to the forms and ceremonies which are but the outward manifestations of this welcome, it has not been the less warm-hearted, sincere, and cordial.

You have been pleased to speak of our State as contending for the palm of excellence in agriculture. I need scarcely say that it is a trait in the character of every Kentuckian to be proud of his State, and in the fulness of the heart I confess that we are sometimes too prone to indulge in encomiums, which might by some be considered as extravagant if not boastful. But when we gaze upon the luxuriant beauty of our land — its exuberant fertility — its high cultivation — its comfortable dwellings and its woodlands carpeted with velvet of living green, may we not be allowed to indulge an honest pride in the feeling that this is our own, our beloved and cherished State? It is true that she was the battle-field of pioneer civilization in the West. But a little more than half a century ago it was a comparative wilderness. Legendary tales of Indian massacre and a marauding savage warfare are familiar to us all. Human industry and enterprise and heroism have never achieved a prouder triumph than that which has given the privilege of assembling around this festive board, to celebrate the close of this national exhibition in our midst. Our fathers not only subdued the wilderness, but a vindictive and subtle savage foe, and we are now surrounded by blessings which, like the air we breathe, we scarcely take heed of. The elements of wealth and enduring prosperity are scattered in profusion around us, and the basis and substratum of all is agriculture. It is the greatest department of human employment. It is the most independent and noble employment of man. But, independent as it undoubtedly is, as to all the means of necessary subsistence, it should not be forgotton that there is a mutual dependence of almost every conceivable form of human industry. All the sister arts, including agriculture, impart vitality and vigor to each other. They all must unite to attain the highest degree of perfection. I need scarcely advert to the vast improvement in all kinds of agricultural implements, the knowledge of which is spread by this annual exhibition, to show the dependence of agriculture upon the mechanic arts. Agriculture, manufactures, and commerce are all dependent on each other and constitute the golden circle of human industry. Providence has ordained not only that there should be individual dependence, but that nations should in a greater or less degree be dependent on each other. The different climates of the earth, with all their vast varieties of soils and ca-

pabilities, clearly enough indicate that the inhabitants of each are to labor for each other, and that the surplus of each ought to be distributed by a liberal and enlightened commerce.

The cotton planter of the United States feels as much interest in a good or bad harvest in England as the English farmer himself, and on the other hand England is quite as sensitive as to the prospects of a cotton crop in this country.

In our own country we have almost every variety of climate and soil. By a provision of the Constitution, the commerce between the thirty-one States of which this great nation as composed must forever remain free and unfettered, subject alone to be regulated by the general government. The different States constitute part and parcel of one common government. They are not barricaded by custom-houses, with bayonets bristling around the boundaries of each, but the citizen of each State is entitled to all the privileges of a citizen of every other. Each State is interested directly or indirectly in the wealth and prosperity of every other. How far the manufacturing and grain-growing and stock-producing States have been directly benefitted by extending the cultivation of sugar, cotton, and rice, may be seen by adverting to a single fact. Cotton and tobacco constitute the great bulk of our agricultural exports. Taking the census of 1850 and the report on the commerce and navigation of the United States immediately after, it appears that the value of the cotton crop amounted to $128,000,000 in round numbers, of which we exported $109,500,000, and that the tobacco crop amounted, in round numbers, to $20,000,000, of which we exported $11,250,000, while all other agricultural products amounted to $1,551,000,000, and a fraction, of which we exported $33,809,126, less than one 46th part.

Of the cotton exported it is not practicable to ascertain with precision the portion which should be credited to the country lying north of the cotton line. The mules and horses, the pork and bacon, coarse cottons, linseys and jeans, bagging and rope, farming implements, boots, shoes, hats, gins, and all other machinery constitute no small portion of this large export. The interest of one section is sustained by the industry of another, and they act as reciprocal elements of expansion. If the industry of one section is paralyzed, the shock is felt in every other. I rejoice that there is this reciprocal dependence of one section upon another. There is no ground for jealousy or strife where this is understood and properly appreciated. While we remember that we are one people, one country, and one General Government, bound together in one common bond of union, we

ought to feel that there is no real diversity of interests between different sections.

You have spoken, Mr. President, of the motto engraved on our coat of arms — "United we stand, divided we fall." Let me tell you, sir, that it is still more indelibly engraved on the heart of every Kentuckian. We do not allow ourselves to argue upon this subject. We never yet realized the possibility of dividing. Devotion to the Union is not the result of reason alone, but with us it is a holy sentiment of the heart. I have an abiding conviction that God will preserve us for a nobler end than this. But if he should punish us by the infliction of such a calamity, the work would be done in a paroxysm of frenzy when reason was dethroned and madness ruled the hour. May God avert from us the desolation and ruin which such an event would scatter over a smiling land. May the time never arrive when the motto — "United we stand, divided we fall," shall grow dim in our hearts.

Ex-Governors Wickliffe, Powell, and Helm, of Kentucky, were also called upon, and each responded.

II. *The great Valley of the West* — The granary of Uncle Sam's farm, of whose inexhaustible supply all partake and leave enough for the nations who *(knead)* need. The sovereignties comprised within its limits may truly be said to be the *flour* of the family, the representatives of which we hope to see *rise* on this occasion.

Responded to by J. D. Barrett, Esq., President of the St. Louis Agricultural Society.

III. *Our Republican Institutions* — Under the operation of which the ruler of to-day may become the citizen of to-morrow, lending his aid in conferring dignities lately held by himself. May those institutions be kept sacred in their sublime simplicity, the cherished good of every patriotic heart.

Responded to by Hon. James Guthrie, Ex-Secretary of the Treasury.

IV. *Indiana* — The bountiful fruitage of good seed cast upon good soil, yielding a many fold crop of virtues. We greet her at this festive board, rejoicing in the prosperity and welfare of her sons.

Responded to by Judge Huntington, of the Supreme Court of Indiana.

V. *The Army of the United States* — Its valor has been proved on every battle-field where it has been tested. Its prowess is acknowledged at home and abroad. American agriculture will ever honor the protectors of American soil.

Responded to by Col. Buchanan, U. S. A., the senior officer present.

VI. *The Empire State*— Though no more the "far West," owing to the strides of progress, she still bases her claim to sovereignty upon impregnable grounds — the strength, virtue, intelligence, industry, and wealth, which ever command the scepter of influence.

Hon. Henry Wager, of Oneida County, New York, Vice-President of the United States Agricultural Society, was called upon, but as he had been obliged to leave the hall, Hon. Thomas L. Davis, of Syracuse, N. Y., responded.

VII. *Maryland* — The first State in which the "American Farmer." was heard through the press. Her voice still sounds clear and harmonious amidst the gallant band of advocates by which she is now surrounded.

Responded to by Gen. Tench Tilghman, of Maryland, Chairman of the Committee of Farm Implements and Agricultural Machinery.

VIII. *The South-Western Agricultural and Mechanical Association* — Prosperity to her association; long life, health and happiness to its members.

Responded to by Hon. Gibson Mallory, President of the South-Western Agricultural and Mechanical Association.

IX. *The City of Louisville* — The fertility of her soil and the wealth of her citizens are only equalled by the urbanity, intelligence, and patriotism of her citizens.

Responded to by His Honor, Mayor Pilcher.

X. *South Carolina* — Her influence upon the looms of England are far more powerful than that of their own government.

Responded to by Col. Benj. Allston, of South Carolina, a life-member of the United States Agricultural Society, and son of the Vice-President from that State.

XI. *New Hampshire* — May the Union of the States be as lasting as her granite hills.

Responded to by Hon. Frederick Smyth, of Manchester, New Hampshire, member of the Executive Committee of the United States Agricultural Society.

XII. *Iowa* — A young sister in the family of the Union, already she presses on into the front rank of the Union.

Responded to by Gen. William Duane Wilson, of Iowa.

XIII. *Our neighbors, the Canadas* — We extend to them the right hand of friendship, and wish them prosperity and political happiness.

Responded to by Mr. Askew, of Canada.

XIV. *The Press*—An engine of infinite power in a Republic; may its powers ever be exerted in the cause of truth and virtue.

Responded to by W. W. Fosdick, Esq., of New York.

XV. *Woman*—The farmers heart knows how to love her—his hand to defend her—but his tongue knows not how well enough to speak her praise. Hers are the only hoops the farmer will ever consent shall compass his country.

It was exceedingly fitting that a gentleman of the noble bearing and true chivalry of Col. William Preston, of Louisville, should be called upon to respond to the sentiment relative to women. He spoke eloquently and forcibly, and was listened to with the utmost attention, the cadences of his musical voice falling sweetly on the multitude of hearers.

Volunteer toasts were given in profusion, but the limits prescribed for this report have already been exceeded, and there is no place left for them here.

BUSINESS MEETINGS.—Monday, September 7th.

The Executive Committee held a business meeting on Monday, September 7th, and passed resolutions, thanking the Local Officers, the Southwestern Agricultural and Mechanical Association, the citizens of Louisville, and the members of "the Press," at Louisville, and from a distance, for their efficient co-operation, their bounteous hospitality and their kind services in behalf of the Society.

The General Committee on Agricultural Implements, Motive Powers, Machinery, Manufactured Articles, and Works of Art and Skill held a Business Meeting, and finally revised their award of premiums, which is appended.

The Premiums were promptly paid, at the business office of the Society, by Arthur Peter, Esq., the efficient Local Treasurer. Notice was also given that Medals and Diplomas awarded would be delivered at the next Annual Meeting of the Society, on the 13th of January, 1858, at Washington City.

AWARD OF PREMIUMS

FOR

AGRICULTURAL IMPLEMENTS, MOTIVE POWERS, MACHINERY, MANUFACTURED ARTICLES, AND WORKS OF ART AND SKILL.

AGRICULTURAL IMPLEMENTS.

Fallow Ploughs. Damron, Waren & Co., Jeffersonville, Indiana, Silver Medal and Diploma. Brinley & Davis, Simpsonville, Ky., Bronze Medal.

Stiff-Sod Ploughs. Brinley & Davis, Simpsonville, Ky., Silver Medal and Diploma. Damron, Warren & Co., Jeffersonville, Indiana, Bronze Medal.

Light-Sod Ploughs. Brinley & Davis, Simpsonville Ky., Silver Medal and Diploma.

Sod and Sub-Soil Ploughs. Brinley & Davis, Simpsonville, Ky., Bronze Medal.

Sub-Soil Ploughs. G. W. Cooper, Ogechee, Georgia, Silver Medal and Diploma, for sub-soil plough with "universal plough stock."

Gang Ploughs. Hildreth & Charles, Lockport, New York, Silver Medal and Diploma. [With this plough were equipments for sowing or drilling, and thoroughly covering grain.]

Combination Ploughs. Pitkin Bros., Louisville, Ky., "Wiards," Bronze Medal.

Double Ploughs. N. & A. L. Whitehall, Rob Roy, Indiana, Diploma of commendation. [This plough was not entered for the field test.]

Potato Ploughs. Pitkin Bros, Louisville, Ky., Diploma. [This plough was not entered for test in the field.]

Cultivators. Baker, Onondaga County, N. Y., "Rough and Ready Cultivator," Silver Medal. Brinley & Davis, Simpsonville, Ky., Bronze Medal.

Cultivator Teeth. Sayre & Remington, Utica, N. Y., Diploma.

Harrows. S. S. Hogle, Bedford Co., Ohio, Diploma, for new principle of rotary harrow.

Broadcast Sowers — Horse. J. C. Alden, Boston, Massachusetts, "Haines Broadcast Sower," Silver Medal. H. J. Hale, Indianapolis, Ind., Bronze Medal.

Broadcast Sower — Hand. J. C. Gaston, Oxford, Ohio, Silver Medal.

Grain Drills — Horse. Brinchley, Jones & Co., Dublin, Wayne Co., Ind., "Moore's Patent Drill," Silver Medal. Bitzell & Forhner, Centreville, Wayne Co., Ind., Bronze Medal.

Corn Planters — Horse. George M. Evans, Pittsburg, Pa., Silver Medal. W. M. T. Hardisty, Crawfordsville, Ind., Bronze Medal.

Corn Planters — Hand. D. W. Hughes, Palmyra, Missouri, Silver Medal, J. K. Jones & Co., Rockton, Winnebago Co., Ill., Bronze Medal.

Threshing Machine. Richard H. Pease, Albany N. Y., (machine and separator with double changeable railroad horse-power,) Silver Medal. Munn & Co., Louisville, Ky., (machine, separator and cleaner, with eight-horse sweep power,) Silver Medal. Miller, Wingate & Co., Louisville Ky., (machine without separator, with four-horse sweep power,) Silver Medal. Munn & Co., Louisville, Ky., (machine without separator, with two horse sweep power,) Silver Medal. Pitkin Bros., Louisville, Ky., (Wheeler, Melick & Co.'s machine and winnower,) Diploma.

Corn and Cob Mills. James E. Mooney, Edinburg Ind., "Young America Mill," Silver Medal. J. O. Joyce & Co., Cincinnati, Ohio, "Star Mill," Bronze Medal.

Wheat Fans. J. McKim & Co., Portland, Ky., "Bamborough's Fan," Diploma.

Sorgho Mill. Hedges, Free & Co., Cincinnati, Ohio, Silver Medal and Diploma.

Apparatus for making Sugar. Hedges, Free & Co., Cincinnati, Ohio, Silver Medal and Diploma.

Agricultural Boiler. Hedges, Free & Co., Cincinnati, Ohio, Silver Medal and Diploma.

Kettles for Agricultural uses. Wallace, Lithgow & Co., Louisville, Ky., Diploma.

Grain Separators. Smith & Holbrook, Louisville, Kentucky, "Child's Separator," Diploma. G. Heberling & Campbell, Quincy, Ill., Bronze Medal.

Flour Separators. Stephen Hughes, Hamilton, Ohio, Bronze Medal.

Grain Cleaners or Smut Machines. L. B. Ball & Co., Putnam, Muskingum Co., Ohio, Silver Medal.

Hay and Straw Cutters. Griffin & Haynes, Harrisburg, Pa , "Cumming's Cutter," Silver Medal. H. Trumbull, Central College, Ohio, Bronze Medal.

Husking Machines. Thomas Palmer, Cincinnati, Ohio, "Boy Power Corn Husker," Silver Medal and Diploma.

Corn Shellers — Power. Wilder, Hyde & Robinson, Cincinnati, Ohio, "Reeding's Patent," Silver Medal. John Van Horn, Magnolia, Putnam Co., Ohio, Bronze Medal.

Corn Shellers — Hand. Miller, Wingate & Co., Louisville, Ky., Diploma.

Corn Stalk Cutters. H. Trumbull, Central College, Ohio, Diploma.

Oil Cake Crushers. Hedges, Free & Co., Cincinnati, Ohio, Diploma.

Root Slicers. Samuel Males, Cincinnati, Ohio, Diploma.

File Machines. John Daines, Birmingham, Oakland Co., Michigan, Silver Medal.

Churns. Peter D. Morse, Jefferson Co., Ky., Diploma,

Washing Machines. E. P. Ferris, Versailles, Indiana, Bronze Medal. J. F. & C. L. Pond, Cleveland, Ohio, Diploma.

Contrivances for Watering Stock. J. A. Dyer, Hartford. Conn., "Ayres' patent self-acting farm well." Silver Medal and Diploma.

Farm Pumps. Winchel & Bros., Cincinnati, Ohio, Silver Medal and Diploma.

Grindstones. John B. McIlvaine & Son, Louisville, Ky., "Lake Huron Stone," Diploma.

Hoes. J. B. Johnson, for Tuttle & Co., Nautatuck, Conn., Silver Medal.

Platform Scales. W. B. Belknapp & Co., Louisville, Ky., "Fairbanks' Scales," different sizes and patterns, Silver Medal and Diploma.

Platform Stock Scales. Nelson & Davis, Louisville, Ky., Bronze Medal.

Self-opening Gates. D. E. Fenn, Tallmadge, Ohio, Diploma.

Portable Fences. James Rowe, Centralia, Illinois, [model,] Diploma.

A Hay Press and a Hemp or Cotton Press, were exhibited by Munn & Co., Louisville, Ky. Each was thoroughly tested, and proved itself an excellent machine, but as the premiums for presses had been awarded at Syracuse, the Committee can only give Diplomas of Commendation.

Hay Rake and Grain Gleaner. Damron, Warren & Co., Jeffersonville, Indiana. For the above mentioned reason, the committee can only give Diplomas of Commendation.

Dynamometers. Emery Bros., Albany, N. Y., Silver Medal and Diploma. John Skerry, Sag Harbor, N. Y., "Leonard's patent," Bronze Medal. [The Dynamometer of W. B. Leonard deserves a special commendation, and for engineers is the most ingenious and perfect contrivance yet devised for weighing power, force, or resistance. Its bulk and weight, as it is at present constructed, gives the preference to Emery's instrument for trials of agricultural implements in the field.]

MOTIVE POWERS.

Double Railway Horse Powers. Richard H. Pease, Albany, N. Y., special Diploma of Commendation. Emery Bros., Albany, N. Y., Diploma of Commendation. After the most careful examination, the Committee were with difficulty able to discover that either of the above machines possessed any advantage over the other.

Portable Steam Engines for Farm use. Newark Machine Works, Newark, Ohio, special Diploma of Commendation. Barbaroux, Snowdon & Co., Louisville, Ky., Diploma of Commendation; it is a good engine for the purpose for which it is intended to be used.

Stationary Steam Engines. Newark Machine Works, Newark, Ohio, a piece of plate worth $50, for the admirably finished, powerful, and smoothly working engine which furnished the motive power for the Exhibition.

Oscillating Steam Engines. Gridge, Wadsworth & Co., Pittsburg, Pa., Diploma.

MACHINERY.

Hoop Splitting and Shaving Machines. Ivers Phillips, Fitchburg, Mass., Silver Medal and Diploma.

Water Pipe Boring Machine. Nye & Wychoff, Elmira, N. Y., Silver Medal and Diploma.

Hand Looms. S. C. Wendelhall, Richmond, Indiana, Silver Medal and Diploma.

Circular Saw Mill. Munn & Co., Louisville, Ky. [Not ready for examination when the committee were upon the ground. Those who afterwards saw it were of opinion that it was an excellent machine.]

Improved Mill Saws. N. T. Coffin, Indianapolis, Indiana, Bronze Medal.

Improved mode of hanging Mill Saws. O. S. Woodcock, Indianapolis, Indiana, [model,] Diploma.

Apparatus for feeding fuel into furnaces. James Hennington, Richmond, Wayne Co., Indiana, Silver Medal.

Rubber Belting, Packing, and Hose. George Blanchard, Louisville, Ky., Bronze Medal and Diploma.

Lubricator for Machinery. Clayton Brown, Sr., Richmond, Wayne Co., Indiana, Diploma.

Screw Cutting Machine. J. R. Elliot, Cincinnati, Ohio, Silver Medal and Diploma.

Machine for Repairing T Rails. Mason & Davis, Washington City, Indiana, [model,] Diploma.

Harness for Shoeing Refractory Horses and Mules. William P. Thomas, Wayne Co., Indiana, Bronze Medal.

Horning Machine. O. F. Mayhew, Indianapolis, Indiana, Diploma.

Brick Making Machine. O. W. Seeley, Albany, N. Y., [model,] Diploma.

MANUFACTURED ARTICLES.

Best Collection Manufactured Articles. Wallace, Lithgow & Co., Louisville, Ky., Diploma.

Extension Top Buggy. Huggins & Co., Louisville, Ky., Bronze Medal.

Two Horse Family Carriage. M. Ketlinger, Louisville, Ky., Diploma.

Rockaways. Thomas J. Vail, Louisville, Ky., Diploma. Severson & Cooling, Louisville, Ky., Diploma.

Carriage Wheels. Blanchard & Brown, Dayton, Ohio, Diploma.

Saddle and Harness. R. E. Miles, Louisville, Ky., Silver Medal.

Hemp Rope. Thomas D. Hunt & Co., Louisville, Ky , Diploma. Brady & Davis, (for L. C. Randall & Co.,) Louisville, Ky., Diploma.

Ornamental Fountain. William R. Dunlap & Co., Cincinnati, Ohio, Diploma.

Combination Bank-Lock. A. C. Harig, Louisville, Ky., Silver Medal.

Metallic Roof: J. M. Gaston, Oxford, Ohio, Diploma.

Weather-strip lock for doors and windows. A. Speers, New York City, Diploma.

Tubs and Pails. H. Crary, Columbus, Ohio, Silver Medal.

Egg-beater. H. Miller, Cincinnati, Ohio, Diploma.

Cured Hams. C. Duffield, Louisville, Ky., Diploma.

Solidified Milk. Thomas Bruton, New York City, Diploma.

Soap and Candles. Russell & Co., Louisville, Ky., Diploma.

Lard Oil. William Shene & Co., Louisville, Ky., Diploma.

Kerosene Oil. Thomas Bruton, New York City, Diploma.

Case of Boots. Joseph Buckel, Louisville, Ky., Bronze Medal.

Rubber and Gutta Percha Clothing. George Blanchard, Louisville, Ky., Diploma.

Sole-leather Trunk. D. O'Hara, Louisville, Ky., Bronze Medal.

Eliptic Spring Bed. Gray & Co., Cleveland, Ohio, (Howe's Patent,) Bronze Medal.

Eliptic Spring Bed for Invalids. Gray & Co., Cleveland, Ohio, (Howe's Patent,) Diploma.

Patent Dressed Moss. Peter & Buchanan, Agents for Campbell & Bondreaux, New Orleans, Diploma.

Refrigerators. E. W. McDonald, Louisville, Ky., Diploma.

Fruit Preservers. John C. Schooley & Co., Cincinnati Ohio, Diploma.

Rain and River Water Filters. J. E. Cheney & Co., Rochester, N. Y., Diploma.

Portable Soda Fountains and Water Cooler, combined. A. Frankenberry, Columbus, Ohio, Diploma.

Marbleized Iron Mantle Pieces. Wallace, Lithgow & Co., Louisville, Kentucky, Silver Medal.

Hollow Ware. Wallace, Lithgow & Co., Louisville, Ky., Diploma.

Mustard, Spices and Blacking. Hawkins & Thornton, Louisville, Ky., Diploma.

Iron Doors. Henry J. Meade, Louisville, Ky., Diploma.

Lightning Rods. David Munson, Indianapolis, (manufactured at Corrigton, Ky.,) Bronze Medal.

Still, Cap and Worm. John Metcalf & Bros., Louisville, Ky., Diploma.

Life Boat and Boat for Military purposes. Col. Buchanan, U. S. A., Newport Barracks, Ky., Diploma.

WORKS OF ART AND SKILL.

Portraits of Animals. E. Troye, Kentucky, Diploma, with special commendation.

Colored Photographs. J. C. Ehrod, Kentucky, Diploma.

Photographs and Ambrotypes. Webster, Louisville, Kentucky, Diploma.

Specimens of Mechanical Dentistry. Fitz & Wilson, Louisville, Ky., Silver Medal and Diploma.

Case of Jewelry. Voght & Klink, Louisville, Ky., Silver Medal and Diploma.

Eighteen-Day Vibrating Clock. A. Guillemet, Ind., Silver Medal and Diploma.

Clock. J. J. Hirschbuhl, Louisville, Ky., Silver Medal.

Chronometer Watch. J. J. Hirschbuhl, Louisville, Ky., Silver Medal.

Seven Octave Piano. G. F. Jackson, Louisville, Ky., Silver Medal and Diploma

Penmanship and Card Writing. S. J. McCoy, Ind., Diploma.

Practical and Ornamental Penmanship. A. Browley, Pittsburg, Pa., Diploma

Case of Regalia. George Blanchard, Louisville, Ky., Bronze Medal.

Piano Cover, richly embroidered. Miss Sally Dorsey, Ky., Silver Medal.

Specimens of Needlework. Miss Mary Jane McCreary, Ind., Diploma.