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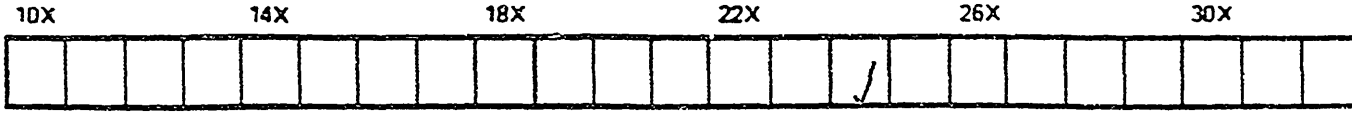
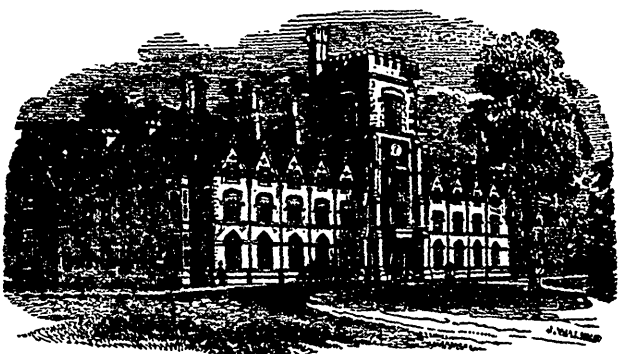


AGRICULTURAL REVIEW.

FEBRUARY.

EDITORIAL DEPARTMENT.



THE STATE AGRICULTURAL COLLEGE OF MICHIGAN.

The state Agricultural College proposes—1st. To impart a knowledge of science and its applications to agriculture; 2d. To impart a knowledge of agriculture as an art; 3d. To prosecute experiments in order to promote the science of agriculture, and improve upon the methods employed; 4th. To afford the means of general education to the farming class. The sciences which relate to agriculture and the kindred arts, especially Chemistry, Botany, Zoology, and Animal Physiology, receive a greater share of attention here than is given them in other institutions where the study of their practical applications is not pursued.

In order to secure the greatest benefit from the course of study, theoretical and practical instruction are combined, so that the student may apply the test of experience to elucidate and fix in his mind the principles taught in the lecture room. Farmers thus having gained both science and practice will avail themselves more successfully of those operations of nature which conduce to their advantage, and avoid or control those which tend to make labor unprofitable. Through their example the empirical routine too often pursued must give place to a more intelligent and rational practice, founded on the true principles of science.

The benefits arising from the increase and diffusion of scientific knowledge, and its application to the industrial pursuits, can hardly be estimated; and it is only by the systematic combination of principles with the details of practice and experiment that the greatest proficiency in the arts can be obtained. Agriculture is especially the creature of experiments. But it is well known that experiments general ly are too loosely performed to afford very satisfactory results, and that farmers do not usually possess facilities for deciding many questions that arise. It has therefore been determined, by the aid of an extensive laboratory in making analyses and prosecuting investigations, and with the other facilities for scientific researches accumulated at such an institution, to enter upon a systematic series of experiments for meeting the wants of the agricultural class.

Moreover, to accomplish the objects of the Institution, it is evident that those who receive in it the necessary scientific education, must not lose in acquiring it either the ability or the disposition to labor on the farm. It is well known that students who pursue a college course very seldom thereafter engage in any industrial pursuit. Four or six years of study without labor, and wholly removed from sympathy with the laboring world, at that period of life when habits and tastes are rapidly formed, will almost inevitably produce a disinclination to perform the work and duties of the farm. If the farmer then is to be educated, he must be educated on the farm itself; and it is due to this large class of our population that facilities for improvement, second to none other in the State, be afforded them.

It is believed that the three hours work which every student is required to perform on

the farm or in the garden, besides serving to render him familiar with the use of implements and the principles of agriculture, are sufficient also to preserve habits of manual labor, and to foster a taste for agricultural pursuits, It has been found in the past sufficient to keep the students interested in every department of farm and horticultural work; and the daily labor of each one being performed at one time, it does not occupy him longer than is requisite for preserving health and a robust constitution.

The History of the College has fully exploded the common fallacy that labor and study are incompatible. The work performed by the student does not diminish his enthusiasm for study. It has been clearly shown that the advancement in the studies of the course is not less rapid when a limited portion of the time is devoted to manual labor. And if, aside from its proper office of contributing its share towards the mental culture of the young men of the State, the College succeeds to any extent in breaking down the wall that has been reared between the educated and laboring classes of community, so that those who labor shall be better educated, and those who are educated shall not despise labor, it will amply repay all the efforts that have been put forth in its behalf.

Location.

The State Agricultural College occupies a pleasant and healthy location about three miles east from Lansing, the capital of the State. The buildings stand upon a slight eminence, among forest trees which have been purposely retained. The grounds have been skilfully laid out, and are being tastefully adorned by art. It is designed to make this one of the most attractive places in the west, that it may exert an influence in educating the taste of the student, while it provides the material for illustrating the principles of science.

Admission.

Candidates for admission into the Preparatory Class must not be less than fourteen years of age, and must sustain a satisfactory examination in Arithmetic, Geography, Grammar, Reading, Spelling, and Penmanship. Candidates for admission into the Freshman Class, or for any advanced standing, must sustain an examination in all the previous studies of the course. Students are admitted at any time on passing the required examinations; but it is greatly preferred that all candidates present themselves for examination on the first day of the term, or at the semi-yearly examination near the middle of the term.

Preparatory course of instruction.

Higher Arithmetic, Mathematical and Descriptive Geography, English Grammar, Algebra, Natural Philosophy, Rhetoric.

College course first year.

Geometry, English Literature, Algebra, Trigonometry and Surveying, Geology, History and Book-keeping.

Second year.

Physics, Meteorology and Vegetable Physiology, Elementary Chemistry, Agricultural Chemistry, Botany and Horticulture, Rhetoric.

Third year.

Civil Engineering, Analytical Chemistry, Animal Physiology, Drawing and Rural Engineering, Inductive Logic, Zoology.

Fourth year.

Astronomy, Mental Philosophy; Entomology, Veterinary Medicine and Economy of Domestic Animals, Moral philosophy, Political Economy, Connection of Physical Sciences, Declamations and Compositions during the course, Lectures in Practical Agriculture.

Select course.

Persons of suitable age and acquirements who desire to pursue one or more of the branches of study more closely related to Agriculture, (such as Chemistry, Botany, Animal Physiology, &c.,) may be received for a less time than is requisite for the full course. They will also be allowed to change from the regular to a select course if it be done before commencing the studies of a term. They will all be required to go into one or more of the college classes; to perform three hours, labor in one of the regular work divisions; and to be in all respects subject to the rules and discipline of the College. On leaving, they may, if they have *completed* one or more branches of study, receive a certificate of their attainments in the branches pursued.

Labor.

Students are required to labor on the farm, or in the garden, three hours a day. The number of hours may be increased to four, or diminished to two and a half. The labor is considered an essential part of the educational system of the College; and none are exempt from it, except from physical disability. For the compensation allowed, see *Means of defraying expenses.*

Lectures on Chemistry.

Chemical forces, Laws of combinations, Properties of bodies, General discussion of the facts and phenomena belonging to Inorganic and Organic Chemistry. General Analysis, Analysis of Soils, Analysis of Minerals, Analysis of Manures, Analysis of Plants, Preparation of Artificial Manures, Formation and composition of soils, Composition of plants as determining the Chemical condition of the soil, Composition of the air, and its relations to vegetable growth, Connection of heat, light, and electricity with the growth of plants, Nature and sources of the food of plants, Chemical changes attending vegetable growth, Chemistry of the various processes of the farm, as plowing, draining, &c., Exhaustion of soils, Methods of Chemically improving soils—by 1st. Mineral manures, 2d. Vegetable manures, 3d. Animal Manures, 4th. By indirect methods. Rotation of crops, Chemical composition of the various crops, and the as efood; Feeding, housing, and care of food Preparation of food for animals and man. The instruction in Agricultural Chemistry is imparted principally by lectures.

Lectures on Botany.

From the length of time devoted to this study, and the facilities afforded for illustration, it is believed a fuller course is given in it here than at any other institution in the country. The student is first thoroughly grounded in Structural and Physiological Botany, and

then takes up Systematic Botany; his studies are illustrated by living and dried specimens, Diagrams and the Miscroscope. Three excellent instruments are used in the examination of minute structure. The indigenous plants as well as those of the grounds, afford ample material for the study of Systematic Botany. In this part of the course the student dissects and examines a sufficient number of plants to make him acquainted with the more important natural families. The botanical relations of cultivated plants and troublesome weeds receive special attention.

Lectures on Horticulture.

In the course on Botany, the relations of that Science to the operations of Horticulture are pointed out, and the student is well prepared to understand the principles concerned in Horticultural operations. The Class in Botany and Horticulture is employed in the garden and College grounds, and opportunities occur daily for the application of the instruction received in the class-room. It is intended that every student in this class shall have practice in all the methods of propagating plants from the seeds, or by budding, grafting, layering, &c., as well as in all the other operations of Horticulture.

Lectures on Zoology and Animal Physiology.

The instruction in this department consists of daily recitations and lectures extending through a year and a half of the College course. The course is fully illustrated by a collection of native and foreign animals, anatomical preparations, diagrams, and models representing the peculiarities and comparative structure of each branch of the animal kingdom. Dissections of animals are made, to render the student familiar with the appearance, situation, and relations of the organs of the animal system in a state of health, and the changes produced by the action of diseases. Opportunities will be given for the study of the minute structure of the various tissues by means of the microscope. Anatomy and Physiology of the organs of locomotion, digestion, circulation, respiration, and reproduction. Principles of the classification of animals as founded on their structure and embryonic development. Descriptive Zoology, comprising the systematic arrangement of animals in accordance with their natural affinities, in classes, orders, families, &c.; habits and geographical distribution of animals. Natural History of domestic animals, including the characteristics and peculiarities of different breeds and their value for particular purposes. Insects injurious to vegetation. Economy of domestic animals, including the principles of breeding, rearing, management, and hygiene. Diseases of animals, their nature and treatment. Medicines in use, their action and mode of administration.

Lectures on Mathematics and Civil Engineering.

The Preparatory Class spend some time in a review of Arithmetic. The following branches of the Mathematics and their applications follow: Algebra, Geometry, Trigonometry, Conic Sections, Surveying, Levelling, Topographical Surveying, Plotting, Mechanics, Strength of Materials, Arches, Framing, Bridge and Road Building, Industrial Drawing. Students have the use of Chain, Compass, Level, and other instruments for practice: and receive instruction in the field as well as in the lecture-room.

Lectures on Geology and Mineralogy.

A course of daily recitations in Geology and Mineralogy, during the second half of the freshman year, is fully illustrated by maps, diagrams, specimens, &c., and accompanied by familiar lectures on the relations of the science to Agriculture.

Lectures on English Literature.

Instruction in this department is given by means of Text Books and Lectures. Rhetoric—Style. History of English Literature. Rhetoric—Arguments, Conviction, Persuasion, Fallacies in reasoning. Declamations and compositions throughout the course. Select portions of English Classics receive critical examination in a course of reading prescribed for each class. This course may vary somewhat from year to year. With a late class it was as follows: Freshman Class—Selections in prose and verse. Sophomore Class—Portions of Chaucer committed to memory; Milton's Lycidas in a course of six lectures; two books of Paradise Lost. Junior Class—Shakspeare's Julius Cœsar; Shakespeare's Merchant of Venice. Senior Class—Webster's reply to Hayne.

FACILITIES FOR INSTRUCTION.

The Farm.

The College Farm contains 676 acres, about 250 of which are now under cultivation, and can soon be made available for the legitimate purposes of the Institution. The Farm is not only an important, but an indispensable element in the educational facilities of an Agricultural College. It is a means of illustrating, in the most satisfactory manner, the principles of science taught in the lecture-room; and of giving the student a practical knowledge of their applications. By the union of science and experiment, the practical results will distinctly determine the economical value of these principles, and aid him in arriving at a knowledge of the best and most profitable methods of cultivation and farm management.

By the system of manual labor here adopted, the student becomes practically familiar with the use of the various agricultural implements, the differents modes of cultivation, and the general principles of farm economy. The science and the operations of agriculture must be united, and in their common results many of the difficulties of the practical farmer will find a ready solution. In addition to the practical farm, where the largest profits consistent with the continued productiveness of the soil are the test of the correctness of the practice, special experiments will be instituted for the purpose of adding to our stock of positive knowledge, by testing disputed methods of culture, determining the value of farm and garden products, the adaptation of our climate and of certain soils to desirable plants, the fertilizing properties of various manures, and other questions of practical importance, requiring for their determination accurate and methodical investigation.

Up to the present time insuperable difficulties have prevented the prosecution of any extensive series of experiments. A portion of the farm has now been brought into a condition which warrants us in commencing experimental operations with assurance of success; and it is hoped ere long to make this one of the most attractive features of the College. An accurate and detailed account of the results of the experiments, modes of culture, and practical operations of the farm will be kept and published from time to time, so that the farmers of the State may derive benefit from the results of investigations conducted at the Institution.

Kitchen garden.

Several acres are devoted to the raising of vegetables for the table of the Boarding Hall. Not only the necessary articles are cultivated, but the rare culinary plants are represented. All the processes of this branch of horticulture are amply illustrated here, and it is intended that this shall be one of the prominent features of the Institution.

Philosophical and Mathematical apparatus.

The College possesses a set of apparatus for illustrating the principles of Mechanics, Heat, Electricity, Galvanism, &c.; also a Leveling Instrument, Surveyor's Compass, Chain, and other instruments for Mensuration, Topographical Surveying and Drawing.

Museum.

The Museum contains a valuable collection of the *Mammals, Birds, Reptiles, Fishes, Mollusks, Insects,* and *Crustaceans* of Michigan, together with numerous specimens of foreign species, serving to illustrate very fully each branch of the animal kingdom. A suit of *anatomical* preparations for the purpose of illustrating the comparative structure of domestic animals, has been secured, to which additions will be made, so as fully to elucidate this department of study and lay the foundation for the successful prosecution of the study of Veterinary Medicine. The Cabinet of Minerals, though not large, contains many rare specimens, and is sufficient for the purposes of illustration. Frequent additions are made to it, and it will doubtless become one of the most valuable in the State. The College is entitled to a complete suit of speciments from the Geological Survey of the State.

Herbarium.

The Herbarium is one of the largest in the West. It contains about 20,000 specimens, from all parts of the world. It is especially rich in the rare American plants. The specimens collected on the various government expeditions are numerous, and it is believed that in the Grasses, the family so important to the agriculturist, it is not exceeded by any collection in the country. Connected with the Herbarium is a collection of woods, fruits, vegetable products, and morphological specimens, which, it is hoped, will be the nucleus of a valuable cabinet.

Library and Reading Room.

The Library contains about twelve hundred volumes. The College receives regularly a large proportion of the Agricultural and Horticultural papers and periodicals, as well as many of the other daily and weekly papers of the country. The Library and Reading Room are open to students daily.

Literary Societies.

The Students have organized two Literary Societies in the Institution: the Cincinnatus Lyceum, and the Sons of Demeter. The exercises in the Societies consist principally of discussions, essays and lectures.

TERMS AND VACATIONS.

The College term opens on the last Wednesday of February, and continues until the last Wednesday of November, of each year. The examinations and other exercises of the College are so arranged as to allow students, who desire to teach for four months during the winter, the privilege of being absent the first and the last two weeks of the term. Students who teach only three months will not be allowed to be absent during the progress of the term.

Commencement.

Commencement exercises of the graduating class take place on Wednesday, two weeks previous to the last Wednesday of November, in each year. There is a public examination of all the classes every half year.

Degrees.

The Degree of Bachelor of Science is conferred upon Students who complete the Full College Course and sustain all the half yearly examinations in the same.

The Degree of Master of Science is conferred upon Graduates of three years standing, who give evidence of having been engaged during that period in scientific studies.

Discipline.

Students are required to board in the College boarding Hall, and to observe strictly all the rules and regulations in force in the same. They are not allowed to absent themselves from the College grounds without permission. They are expected to abstain from all immoral practices, and from every thing which is inconsistent with their relations to the Institution. Strict decorum, earnest fidelity in their studies, prompt attendance upon all chapel exercises, recitations, lectures and field operations are uniformly required. None are excused from the daily manual labor, nor from other duties, except from physical disability. Students who fail in punctual attendance upon these exercises, and those whose influence upon others is considered deleterious, will be reprimanded, suspended, or expelled, at the discretion of the Faculty.

Attendance.

Students are required to be present on the first day of the term, unless excused to be absent on account of sickness, or for actual service as teachers. They are also expected to remain during the entire College year, and none are excused from attendance except from urgent necessity. Students who wish to terminate their connection with the College, or who desire leave of absence for a definite period of time, will receive such dismissal or leave of absence if application be made for the same before the opening of the College year. The closing of the term does not close their relations with the Institution. If, however, such

application be made during the progress of the term, it will be granted only for good and sufficient reasons.

Routine of duties.

The time of the students is divided between labor, study and recitations. They are arranged in two work divisions, one section laboring in the forenoon, the other in the afternoon. If, then, they are not laboring on the farm or in the garden, in conformity with the regulations of the College, they are employed either at their studies, or in recitation.

Expenses.

Tuition is free to all students from this State.

Students from other States are charged twenty dollars a year for tuition, Board at cost, for the present probably about two dollars per week. Washing, forty-two cents per dozen.

Settlement for board and washing must be made quarterly. Room-rent for each student, four dollars a year, paid quarterly in advance. Rooms are furnished with bedsteads and stoves. Matriculation fee, five dollars, which entitles to the privileges of the whole course. At the opening of the term each student is required to pay into the treasury ten dollars, as an advance on board, which is allowed in the settlement of accounts at the end of the term. All bills must be settled promptly when due.

Means of defraying expenses.

Students work on the farm or in the garden three hours a day, for which they receive adequate remuneration; the amount paid depending on their ability and fidelity. The highest rates of wages range from seven to eight cents per hour. The lowest rates may not exceed three or four cents, if the student fails to render more valuable services The wages for labor are allowed on their board, in the quarterly settlement of accounts. The winter months are devoted to vacation, affording the student an opportunity for teaching. His earnings through the winter, when added to the wages received during the term, if he is industrious and economical, will generally enable him to defray all his college expenses. The question is often asked whether a young man can support himself at the Institution? He can usually support himself in the manner pointed out above, provided he can command means sufficient to meet his bills the first year.

PRACTICAL OBSERVATIONS.

When we plan our business, we had better undertake no more than we have means to accomplish.

When we undertake a job, it is generally better to finish it up in good style than to leave it unfinished, or do it poorly. We have plenty of competitors in the agricultural business, and the profits on any crop are not, ordinarily, of surprising magnitude. If the thing is managed with energy and economy it will just about "pay"—but if the stalks are mouldy or frost-bitten, the corn will cost more than it will sell for. If the carrots get very weedy, through neglect in their early culture, you had better have omitted them altogether. If your wheat is sown upon foul land in October, the chances are you had better have taken the seed to mill and made sure of so much. If your fruits trees are planted on poor land, and left unpruned, and uncultivated, to the mercy of the cattle, you had better left them in charge of the nurseryman, who knows how to appreciate his own wares. If your hay is uncut in September, verges from ripe to rotten, better had you taken in cows to pasture at two shillings a week. In every and all cases it is better *not* to do a thing, than do it at a loss—for what is done out of season, or half done, is pretty certainly done at a loss.

Of course, when we begin, we expect to finish We expect "something will turn up" to bring everything through all right. But are we not a little too sanguine? Have we any right to expect every day will be fair, every September and October free from frost, every man ready to help us at our own price? Are casualties and contingencies new in human affairs, and we for the first time victims? Have we had no experience of human capabilities? Might we not by this time calculate a little closer?

After all, the radical defect is in our dread of the cost and trouble of doing a thing, and our *criminal indifference to the cost of* NOT *doing it*. A grape grower once said that if he had laid down his vines in the fall it would have paid him $50 a day for the time of doing it. I affirm that there is scarce a farmer but might have done many things in the course of the year that would have paid him from *five* to *fifty* dollars a day. Nailing on a board—putting plaster over the manure or muck in it—running the cultivator once more through the corn, potatoes, and beans—going a little further for a better breed—planting a few apple trees to give your family a better assortment—putting those tools under cover, and fixing things in time! Let us cut our garments according to our cloth, and be sure and make them up.—H. T. B. in *Rural New Yorker*.

THE GENESEE FARMER.

The January number of the *Farmer* is promptly on our table. It is a capital number. All our agricultural and horticultural friends should take the *Farmer*, if they not do already do so. It costs only sixty cents a year, and for this small sum you get *three hundred and eighty-four* pages of matter, well illustrated, and abounding with information of the greatest value to all engaged in rural pursuits. Send the sixty cents by mail to the publisher, JOSEPH HARRIS, Rochester, N. Y., and you will receive the paper by return mail. Or, if you wish to examine it, you can get a copy *free* by writing to Mr. HARRIS for one. Subscriptions are received by *the L. C. Agriculturist*.

ELECTION OF MEMBERS FOR THE BOARD OF AGRICULTURE.

The reports of election addressed to the Board of Agriculture, by the Agricultural Societies, give the following result:—

Hon. L. V. Sicotte.
Major Campbell.
Hon. U. Tessier.
E. Barnard.

We believe that no change will be made in this result by the reception of the reports yet to be received.

AGRICULTURAL SOCIETIES, LOWER CANADA, 1863.

Societies.	*Organised at*	*Presidents.*	*Vice-Presidents.*	*Secretary-Treasurers.*	*Board of Directors.*
Argenteuil.....	St. André.....				Has neglected to report.
Arthabaska.....	St. Christophe....	A. Stein.....	L. Tibodeau.....	B. Théroux, fils..	P. Terney, P. Stuart, E. Marcotte, J. Garneau, E. Drouin, E. G. Paradis, N. Lavigne.
Bagot.....	Ste. Rosalie.....	Urgèle Desmarais	John Henderson..	P. S. Gendron....	A. Ouimet, J. Grignon, J. Geoffrion, C. Lefebvre, J. Mallet, A. Bernier, E. Benoit.
Beauharnais.....	Beauharnais.....	James Keith.....	J. B. Scott.....	J. M. Browning...	C. Depocas, J. Symons, L. P. Cootlée, D. Berming, J. Meloche, L. Julien, J. Lebœuf.
Beauce.....	St. Joseph.....				Has neglected to report.
Bellechasse.....	St. Michel.....	A. C. Fortier....	E. Forgues.....	P. Forgues.....	F. Goulet, D. Dubord, F. Fournier, L. E. Turgon, C. Paquet, J. Laincisé, H. Meuland.
Berthier.....	Berthier.....	Gédéon Ferland..	Frs. Dezy.....	N. Doucet.....	M. Brissette, E. O. Cuthbert, E. Mousseau, H. Lambert, F. M. Berard, F. Lavallée, A. Hamlin.
Bonaventure, No. 1	New Carlisle.....				Has neglected to report.
Bonaventure, No. 2	Carleton.....				Has neglected to report.
Brome.....	Brome.....	M. L. Elkins.....	J. Davis.....	H. S. Foster.....	A. H. Chandler, W. McLachlan, S. P. Wood, E. A. Dyer, A. Smith, S. Peabody, R. B. Chamiell.
Charlevoix, No. 1.	Malbaie.....	T. J. Reere.....	C. Demeule.....	Ed. Tramblay....	J. McLaren, F. Belleville, T. Villeneuve, A. Lemieux, F. Harvey, F. Trambly, O. Brassard.
Charlevoix, No. 2.	Baie St. Paul....	D. Tremblay.....	T. Fortin.....	S. Boivin.....	J. Cimon, B. Cimon, O. Simard, A. Tremblay, E. Boivin, M. Perron, L. Gobeil.
Chambly.....	St. Hubert.....	Laurent Benoit...	C. deBourchérville	Ls. Truudeau....	A. Williams, A. Rocheleau, L. Dubuc, C. Fournier, M. Desrochers, L. St. Germain, J. Prairie.
Champlain.....	Ste. Geneviève Bat	J. J. Ross.....	A. Marricotte....	Rob. Trudel.....	J. Grenier, A. Laflèche, P. Lahaie, O. Montplaiser, M. Trudel, F. Merchand, G. Gervais.
Chateauguay.....	Ormistown.....	D. Ed. Laberge..	Geo. Cross.....	A. McEachern....	B. Laviolette, P. Reid, A. R. Bisson, C. Bergernie, C. Bodin, D. Marshall, E. Sadler.
Chicoutimi.....	Chicoutimi.....				Has neglected to report.
Compton.....	Eaton.....	William Fling...	J. H. Pope.....	G. H. Hackett....	L. H. Woodward, B. Hitchcock, J. F. Osgood, T. W. Hurd, C. Jordan, W. Farwell, J. Nourse.
Deux-Montagnes .	St. Benoit.....	J. B. Daoust.....	W. McGeogh.....	D. Messon.....	O. Bauchamp, J. McMartin, N. McColl, L. Rodrigues, J. Morin, J. Gibb, J. Rodrigues.

AGRICULTURAL SOCIETIES, LOWER CANADA, 1863. (*Continued.*)

Societies.	*Organised at*	*Presidents.*	*Vice-Presidents.*	*Secretary-Treasurers.*	*Board of Directors.*
Dorchester.....	St. Anselme.....	H. Audet.....	F. Baillargeon....	F. Buteau.....	N. Tétrault, J. Gosselin, F Baillargeon, J. Butcau, J. Vaillière, J. Fortin, F. Caraière.
Drummond, No. 1.	Drummondville...				Has neglected to report.
Drummond, No. 2.	Durham.....	G. H. S. Browne..	John Bothwell....	J. Bohtwell.....	J. Atkinson, W. Burrill, J.Royston, B. Reid, G. A.Evans, J. Mairs, S. Lysten.
Gaspé, No. 1.....	Percé.....				Has neglected to report.
Gaspé, No. 2.....	Gaspé Basin.....				Has neglected to report.
Hochelaga.....	Montréal.....				Has neglected to report.
Huntingdon.....	Elgin.....	S. H. Steuyler....	Arch. Henderson..	P. McFarlane....	J. McDiarmid, A. C. Stacy, A. Oliver, D. McFarlane, A. McNaughton, P. Gardner, A. McGregor.
Iberville.....	St. Athanase.....				Has neglected to report.
Jacques Cartier..	St. Laurent.....				Has neglected to report.
Joliette.....	Industrie.....				Has neglected to report.
Kamouraska....	Ste. Anne Kam...	Rct. Pilotte.....	P. Dessaint.....	J. Dessaint.....	E. Dionne, O. L. Tétu, A. Casgrain, R. Potvin, V. Taché, H. Pelletier, P. Pelletier.
Laprairie.....	Laprairie.....				Has neglected to report.
L'Assomption...	L'Assomption....	Hon. Archambault	U. Deschamps....	A. Archambault..	J. Perrault, J. B. Lachapelle, N. Vinette, A. Lavallée, L. Lachapelle, B. Rassette, P. Archambault.
Levis.....	St. Henri.....	P. Lagueul.....	A. Carrier.....	F. M. Guay.....	A. Bourget, C. Lemieux, A. Lemieux, J. Morin, Sr., J. Demers, Jr., J. B. Lemieux, G. Fournier.
L'Islet.....	St. Jean Port Joli.	A. Dionne.....	N. Lavoie.....	P. G. Verrault...	S. Roy, S. Drapeau, L. Caron, J. Boucher, L. Bois, T. Gagnon, A. Miville.
Lotbinière.....	St. Sylvestre.....	T. Walker.....	E. Montgerry....	J. Parke.....	J. Brown, R.Lipsay J. Lefèbvre, H.Mackie, P. Stoken, S. Wark, T. Taylor.
Laval.....	St. Martin.....	P. Ouimet.....	A. Bélair.....	Dr. McMahon....	F. Ouimet, E. Ouimet, N. Gravel, E. Gravel, P. Gravel, Jr., L. Auclaire, H. Filion.
Maskinongé.....	Rivière-du-Loup .	Jos. Fortin.....	E. Caron.....	G. E. Mayrand...	R. Lambert, A. Lesage, C. Gélinas, D. Gagnon, D. Maigret, J. Voysard, G. Lessard.
Megantic, No. 1...	Inverness.....	D. McKimon.....	J. Morney	D. McGillivray ..	D. Stewart, S. Slatter, R, Cox, R. Stewart, A. Davidson, J. Kelso, J. Wallace.

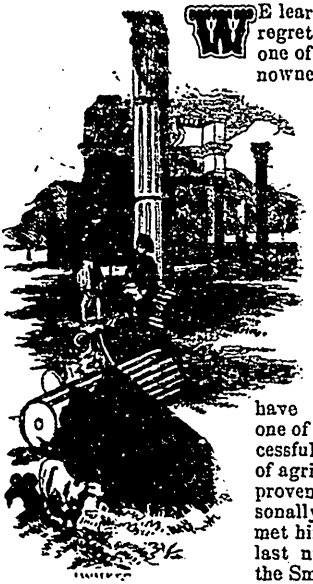
AGRICULTURAL SOCIETIES, LOWER CANADA, 1863. (*Continued.*)

Societies.	*Organised at*	*Presidents.*	*Vice-Presidents.*	*Secretary-Treasurers.*	*Board of Directors.*
Megantic, No. 2...	Leeds.....	J. Ross.....	H. Williams	J. Hutchison.....	J. Aylwin, R. Gullen, J. Oliver, W. Church, J. Scallen, H. Jameson, W. Fraser.
Montmagny.....	Montmagny.....	N. H. Blais.....	Dr Beaubien M.P.P.	G. Allen.....	L. Fortin, A. Rossé, Blais, H. Talbot, L. Dupuis, P. Lavergne, J. Chabonneau.
Montmorency.....	Château-Richer...	Chs. Réaume....	J. Guérin.....	O. Giard.....	J. Cloutier, T. Bélanger, E. Giguère, A. Paré, C. Huot, P. Vesina.
Misisquoi.....	Bedford.....	N. M. Blinn.....	C. Barter.....	J. B. Abbot.....	J. Monette, H. Strite, A. Picker, J. Hase, G. Clarke, S. Row, H. Kraus.
Montcalm.....	Ste. Julienne....	J. Dufresne M.P.P.	J. Melrose.....	A. H. de Caussin.	B. Bertrand, G. Poirier, A. Beaudry, M. Doval, T. Breault, M. Skelly, L. Bordeleau.
Montréal.....	Montréal.....	G. Desbarats Esq.	S. J. Lyman Esq.	J. Bell.....	J. Reekie, J. Coeper, J. Middleton, J. Archbold, R. Spriggins, J. Thayer jun. and T. Wall.
Napierville.....	Napierville.....				Has neglected to report.
Nicolet No. 1.....	Bécancour.....	J. A. Lambert....	L. E. Leblanc.....	J. Jutras.....	A. Leblanc, A. Brisson, E. Brassard, C. Brassard, A. Labarre, A. McDonald, N. Mailhot.
Nicolet No. 2.....	Ste. Monique.....				Has neglected to report.
Ottawa No. 1....	Aylmer.	D. McConnel.....	W. Wirdman.....	C. Symmes.....	R. Kenny, H. Parker, T. Prentice, W. Grimes, R. Black, J. Walker, R. Chamberlin.
Ottawa No. 2....	Thurso.....	N. Abbot.....	J. Parker.....	A. Waters.....	R. Lusk, H. Gorman, J. McLachlan, S. Stevens, J. Cochran, W. Dole, E. Cole.
Pontiac.....	Clarendon.....	A. Smart.....	J. Duff.....	J. M. Judson.....	W. Clarke, W. McDonnell, G. Hudgins, T. Graham, A. Stewart, S. Morrelle, J. Wyman.
Port-Neuf.....	Cap-Santé.....	Hon. J. E. Thibodeau.....	C. Aread.....	F. J. Rinfert.....	L. Hardy, S. Dénichaud, F. Frenette, L. Leclerc, L. Dussault, R. Bernard, F. La Rue.
Québec (Cité)...	Québec.....	H. S. Anderson...	Ls. Bilodeau.....	W. Moore.....	J. Baswell, D. Marsden, J. Renaud, J. Ashworth, J. Dinning, J. Claphan, F. Lawée.
Québec (comté) .	St. Roch.....	Col. J. Lanrin....	Chs. Rhéaume....	J. B. Delâge.....	J. Hamel, J. Jobin, J. Beaumont. Feullion, P. Pagrot. H. Moss, J. Blaés.
Richelieu.....	Richelieu.....	C. Magnaut.....	P. Latransse.....	J. G. Crebassa...	D. Bruncau, C. Chapedelainie, M. Godard, L. Chapedelainie, N. Nadrau, J. Houle, C. Naud.
Richmond.....	Melbourne.....	W. H. Webb.....	J. Stockwell.....	J. Mani.....	J. Pepler, R. Allan, J. McHenty, W. Stewart, G. Silver, C. Williamson, A. Frye.
Rimouski.....	Rimouski.....	E. Grondin.....	L. Col. C. Pineau	E. Pouliot.....	S. Beaulieu, L. Perraut, C. Roy, T. Roy, N. Lemieux, J. Belanger J. Gagné.
Rouville.....	St. Césaire.....	Major Campbell..	Dr. Béique.....	J. B. Forge.....	M. Fregrau, E. Poulin, R. Daignau, P. Menard, F. Chartier, C. Letester, L. Gobeille.

AGRICULTURAL SOCIETIES, LOWER CANADA, 1863. (*Continued.*)

Societies.	*Organised at*	*Presidents.*	*Vice-Presidents.*	*Secretary-Treasurers.*	*Board of Directors.*
Shefford.....	Waterloo.....	J. W. Blackwood.	A. Kay.....	S. Allen.....	A. Lewis, L. Martin, A. Knowlton, T. Ainslee, V. Dailey, S. Chartier, A. Sanborn.
Sherbrooke.....	Sherbrooke.....	A. Steven.....	W. Becket.....	Chs. Brooks.....	A. Ball, C. Maloney, T. Terrill, H. Moe J. Winslow, J. Robertson, A. Loomas.
Soulanges.....	Coteau Landing..	D. Coutlée.....	J. Curry.....	G. H. Dumesnil..	J. Bourbonais, Jr. A. Campeau, C, Monpetit, J. Sauvé, J. Leroux, J. Asselin, G. Benoit.
Stanstead.....	Stanstead.....				Has neglected to report.
St. Hyacinthe....	St. Hyacinthe....	P. Lamothe.....	F. X. Marin.....	Ls. Taché.....	P. Varry, J. Aughel, J. Bourgrois, A. Dallaire, A. Chapedelaine, J. Michon, J. Scott.
St. Jean.....	L'Acadie.....				Has neglected to report.
St. Maurice.....	Yamachiche.....	L. L. Desaulniers.	M. Hubert.....	F. E. Milot.....	B. Tessier, Jr., C. Feron, J. Bellemare, A. Gauthier, A. Dufresne, J. L'Emerise, J. Laurta.
Terrebonne.....	Terrebonne.....	Hon. E. Masson..	Revd. Thérien....	Dr. Dumouchel...	M. Moody, L. Leclair, J. Filion, J. Lonagan, A. Kimptom, F. Limoges, F. Forget.
Temiscouata.....	Isle-Verte.....	L. A. Bertrand...	L. Demeul.	L. A. Gauvrnau..	C. Dubé, Rev. E. Dion, W. Maddison, J. Sirois, M. Coté, B, Cuinette, C. Tériault.
Trois-Rivières....	Trois-Rivières....	J. McDougal.....	H. Duval.....	N. J. Dufresne....	D. Dufresne, E. Barnard, O. Gouin, F. Betty, O. Purmeton, F. Aubry, H. Lacerte.
Vaudreuil No. 1..	Vaudreuil.....	R. Harwood.....	J. Brosseur.....	E. Lefaivre.....	H. Thompson, E. Grout, M. Potvin, A. Leger, E. Dupont, A. Campault, J. Vinet.
Vaudreuil No. 2..	Rigaud.....	D. McMillan.....	E. Lalonde.....	E. N. Fournier....	D. McGregor, J. Vipond, C. McGreary, F. Gingras, E. Julien, J. Park.
Verchères No. 1..	Varennes.....	L. H. Massue.....	C. Danserau.....	J. N. Archambault	M. Girard, C. Bauchemin, C. Amiot, A. Tétrault, P. Chicoine, F. Voligny, C. Chabot.
Verchères No. 2..	.....	A. Vaudandaigue.	R. Marchesault...	L. de St. Aubin..	A. Prefontaine Jr., A. Larose, P. Shank, J. Colette, P. Archambault, C. Leroux, J. Beaudry.
Wolfe.....	Dudswell.....	G. Goodnough...	K. S. Jenkeuson..	A. Lothiop.....	F. Dawson, J. Picard, F. Millett, J. Dion, J. Hagerty, W. Lothrop, J. Hall.
Yamaska.....	St François du Lac	J. Wurtle.....	J. Duguay.....	E. Boucher.....	J. Coté, P. Poyau, F. Lahaie, M. Fortier, J. Lemaître, G. Compton, J. Barbault.

NECHROLOGY—DEATH OF JONAS WEBB.



WE learn with deep regret the loss of one of the most renowned English breeders, Jonas Webb, who lately departed this life.—The news of his death has been received with universal grief. Not only England, but Europe and America have lost in him one of the most successful promoters of agricultural improvement. Personally we have met him during the last nine years at the Smithfield Cattle shows; at the Universal Agricultural exhibitions of Paris in 1855 and 1856, and in June and July last, both on his farm at Babraham on the occasion of the sale of his world-renowned flock of Southdowns, and at London during the Universal Agricultural Exhibition in Battersea Park. On every occasion we have found him not only a true gentleman but a kind friend, always ready to give every information required without the least regard to time or trouble. His name will rank as high in agricultural fame as it is now deep in the memory of every one who knew him. The North British Agriculturist gives the following account of his career as a Breeder:

Jonas Webb was born at Great Thurlow, in the county of Suffolk, on the 10th November, 1796. His demise having taken place on the 10th instant, he was consequently in his 66th year. He was the second son of Mr. Samuel Webb, a farmer who died at the age of ninety-three years, and who retained the use of his faculties to the day of his death. In 1822 Jonas Webb commenced his career as an agriculturist on the farm of Babraham, which originally was not so extensive as it is at present—it having been enlarged by adding two farms which lay contiguous to it. The farm at present is under 1500 acres; but Mr. Webb occupied other lands, and the extent farmed by him was about 2500 acres.

The late Mr. Adeane, of Babraham, was one of Mr. Webb's earliest friends, and the friendship continued without any interruption to the period of Mr. Adeane's death. The original farm of Babraham was small and in bad condition when Mr. Webb entered into possession, but those who have latterly attended the letting of the Southdown rams can speak as to the high condition and excellent culture of the lands under his intelligent management. Farming had always proved a source of very considerable profit to Mr. Webb, although the wealth he acquired was mainly the result of the letting of rams and the sale of the cast ewes of the Southdown flock, which he brought to such perfection during a long course of attention to breeding. Mr. Webb's principles were first to secure symmetry of form; next to obtain size, with a heavy fleece of fine wool. These three combined formed the qualities desired in the Southdown sheep; and it is by Mr. Webb's sedulous attention to the development of these points that his success as a breeder of Southdown sheep was chiefly owing.

It is generally believed by Mr. Webb's friends that the Babraham flock of Southdowns originated from twenty ewes sold to him by the late Mr. Adeane; although Mr. Webb afterwards selected rams and ewes from the best flocks of Southdowns then in the county of Sussex. The merit of improving the original breed of sheep in Sussex is due to the late John Ellman, who was ably seconded by the late Duke of Richmond and other enterprising agriculturists in the county of Sussex; but it is mainly to the unwearied perseverance of Jonas Webb that the Southdown has been brought into repute as the best breed of English short woolled sheep.

In the Farmer's Magazine for March, 1845, the following account, supplied by Mr. Webb of his career as a breeder, up to the year 1844, will be perused with interest:—

As you were kind enough to request me to give you 'any facts relative to my career of sheep feeding,' I will endeavour to do so; but, as I think you will agree with me, that 'on their own merit, modest men should be dumb,' I am sure you will not expect much from me, especially as I fear I can lay claim to only a small share of it.

I commenced breeding Southdown sheep as soon as I began business for myself, about 22 years since, from a conviction, through many experiments made when at home with my father with many different breeds of sheep, that more mutton and wool of the best quality could be made per acre from Southdown sheep, than from any other breed, upon nine-tenths of the arable land in this country, where sheep are regularly folded, especially where the land is poor and the animals have far to walk to fold.

I commenced by purchasing the best bred sheep which could be obtained from the principal breeders in the county of Sussex, regardless of expense, and have never made a cross from any other breed on any occasion since. You are aware that at the meeting of the Royal Agricultural Society of England, held at Cambridge in July, 1840, I won the first prize for the stock ewes and lambs of the Southdown, or any other short-woolled breed of sheep, and also the first prize for the shearling stock ewes, at the same meeting; since which time I have never shown for any prize but for rams, being convinced of the ruin inevitably brought upon all breeding stock by over-feeding. I believe I only raised two or three lambs from the nine shearling ewes which I had fed to exhibit at Cambridge, and I lost, I

think, four of them also. My brother Samuel, who also resides in the same parish of Babraham, has shown for the shearling ewes' prize for the years 1841, 1842, and 1843, and has obtained the first prize every year from my breed of sheep, he having purchased the ewes of me, and always hires my rams to put to them: he has been equally unsuccessful with those which he has over-fed. You are also aware that I won three out of four of the prizes offered by the Royal Agricultural Society of England, at the meeting at Liverpool, in 1841, for Southdown, or any other short-wooled breed of sheep; and at Bristol, by the same Society in July, 1842, I won two out of four of the rams' prizes; and also at Derby, in 1843 at the meeting of the same society, I won three out of four of the prizes for any kind of short-woolled sheep. But in feeding sheep for that occasion I over-fed two of my best, and killed them before the show took place; they were both two-year-old sheep, and were each highly commended by the judges, as yearlings, at the Bristol meeting. I had refused 180 gs. for the hire of the two sheep for the season. I also quite destroyed the usefulness of two other of my aged sheep, by over-feeding them last year. They never either of them prapogated throughout the season, and I have had each of them killed in consequence, which has so completely tired me of over-feeding that I never intend exhibiting another aged ram, unless I greatly alter my mind, or can find out some method of feeding them which will not destroy the animals, and which I have hitherto failed to accomplish. What I intend exhibiting in future will be shearlings only, as I believe they are not so easily injured by extra feeding as aged sheep; partly by being more active, and partly through having more time to put on their extra condition, by which their constitutions are not likely to be so much impaired. I wish particulary to let the public know that in future I do not intend exhibiting aged rams, through the reasons which I have stated. You can, if you please, also notice my repeated success at the Smithfield Club, and that I also obtained the first prize at the Highland Society's Show at Dundee, in 1843, the only time I ever exhibited stock in Scotland, for the best shearling Southdown ram, the only prize I showed for: and contrary to the rules of the Society, the Committee decided to have my sheep's likenesses taken for the Society's Museum at Edinburgh. One of the rules of the Society is that no animal shall be taken as a specimen for that purpose unless it is full grown. My sheep was considered in every respect more finished and complete than any old sheep which had been exhibited. I also won the two first prizes last year, at the Royal Irish Society's Meeting at Belfast, and the Society's medal for the best ram of any breed exhibited at the meeting, never having previously shown my stock in Ireland.

"'I do not know what you will be able to make out of these observations, but you are quite at liberty to do as you please with them.'

"Mr. Webb adds, in a postscript:—'I omitted to state that, at the Saffron Walden Agricultural Society, which is open to any person in the United Kingdom who chooses to subscribe to it, I obtained all the first prizes in all the classes of Southdown sheep, with the exception of two, during the whole period I continued to show in it; and I also won the first prize every year for the best pen of shearling wedders of any breed which, I believe brought the Southdown sheep more into repute in this and the adjoining counties than all the other prizes which I obtained, as there was at one time a strong prejudice against them. I believe I obtained 24 silver cups, varying in price from three to five guineas each, independent of about a dozen silver medals.'

"Since 1844 the name of Jonas Webb has always been before the public in connection with Southdown sheep—as a successful competitor at shows, by his annual lettings of rams. He exhibited Southdowns at the International Exhibition of 1855, held in the Champ de Mars, Paris; and was also an exhibitor at the Paris International Exhibition of 1856, in the Palais de l'Industrie. At the Exhibition of 1855 Mr. Webb, through the Minister of Agriculture, presented to the Emperor of the French the first prize Southdown shearling ram; and he afterwards sent from Babraham a number of his best ewes, remarking at the time that it was useless to give a good tup without also giving good ewes, to put the Emperor in possession of the best materials to begin with. The Emperor during the summer, presented to Mr. Webb a very handsome piece of silver plate as a remembrance of his liberality in giving his Imperial Majesty a flock of Southdowns. This token was usually on the breakfast-table during the mornings of the ram-lettings. Since 1855 the Emperor's flock of Southdowns has been greatly increased by breeding from the original flock presented by Mr. Webb, and also by the purchase of some of the best Southdown sheep which could be obtained. Latterly the disposal by public sales of the Babraham flock of Southdowns has extended the fame of Jonas Webb as a breeder of sheep. The sales were attended by many of the most distinguished agriculturists of the Continent, and by these sales the Babraham flock is dispersed over the whole of the civilized world. On the 10th of June, 1861, the rams and ewes were sold—the lambs being reserved for the sale announced for 1862. The sale of 1861 realised the sum of £10,926 6s 6d; the sale of June, 1862, the sum of £5720 8s—the total of the two sales being £16,646 14s 6d. The sums realized for the best rams and ewes were almost unprecedented in the history of sheep breeding, and the total sum realized exceeded that of any other previous sale of sheep stock.

"Jonas Webb latterly devoted much attention to the formation of a herd of Shorthorns, selecting several animals of the Spencer and Bates families of this fashionable breed of cattle. The herd has since been increased by the purchase of several valuable animals, while occasionally a heifer and cow have been sold, the prices obtained being generally high. At the Battersea Show three bulls and five

cows were exhibited. The gold medal for the best Shorthorn in the classes for bulls was awarded to the bull calf, "First Fruits," 10 months and 18 days old; and the third prize in the class for cows was awarded to "Lady Elizabeth York." The judges in the report of the stock shown thus referred to Mr. Webb's cows: "In point of massiveness and breeding qualities this gentleman showed a remarkable lot of five. Their united ages were under 24 years; yet, without any twins to swell the number, they had bred 14 calves; one was within three and another within seven weeks of calving; two had calved in April, and the time of the fifth was up in September."

"It was the intention of Mr. Jonas Webb, at the urgent solicitations of his friends, to have disposed of his herd of Shorthorns—the half next year, 1863, and the remainder in 1864—and thus to have retired from the more active duties incident to breeding and exhibiting stock of any kind. We learn that the Babraham herd will in a short time be disposed of by public auction, and thus the public will have an opportunity of judging of the success of Mr. Jonas Webb as a breeder of Shorthorn cattle. It is, however, as a breeder of Southdown sheep that the name of Jonas Webb will be in after ages conspicuously associated with the history of the agriculture of the nineteenth century.

"It is pleasing to record that the honourable bearing and upright conduct of Jonas Webb, in all the relations of life have been appreciated by a numerous circle of friends and attached relations, and that he descends to the grave amid the sorrow of those who had the best opportunities of knowing and appreciating his private worth as a man and a Christian."

BOKAHARA CLOVER.

Extract from a letter from W. Wager, late Emigrant Agent to Germany, dated Berlin, Prussia, Nov. 12th, 1862.

"About 8 days ago a young German agriculturist left Hamburg for Ottawa, with the intention of becoming a settler. I have entrusted him with a small parcel of seed of Bokahara clover, raised on the field of experimen- of the Royal Society of acclimatisation for Germany. The 'Bokahara' or 'Melilotus' clover from Bokahara, '*Melilotus alba altissima*' is from that part of Asia on the other side of the river Amoor. The flower is white, has an agreeable smell. The plant was cut three times during the season and was in bloom on the 8th of August. The plant for green fodder or hay has always to be cut when young about two feet high. It produces per acre 17,000 lbs. of green fodder or 7,400 lbs. of dry hay. This clover will also grow on meagre land.

These notes were given me by A. Hannimans director of the Gardens of the Royal Academy for agriculture in Proskarr Silesia, Prussia.

Time for sowing spring."

The sample is now at our Provincial Depot, where we will be happy to furnish our farmers with a small quantity for experiment.

FARM OPERATIONS.

THE DIFFERENCE BETWEEN COVERED AND UNCOVERED MANURE.

That there is a considerable difference in *value*, and in the *effects* produced upon crops, between manure that has been protected from waste, and that which has been left unprotected or exposed to all the wasting influences of heat, and rain, and wind, is a statement so plausible or reasonable in itself, and one which has been repeated so often, that we may presume that it meets a ready reception and an unquestioning assent from every one who hears it or reads it. But a ready reception and an unquestionable assent are not, of themselves, sufficient to give this acknowledged truth or fact, any great amount of power, or practical influence. This is evident to any one who may have visited and observed the farm buildings and fixtures of any district lately, and is able to compare them with what they were ten, fifteen or twenty years ago. An instance is within our knowledge, in which a district of country was recently visited by one who was familiar with almost every farm-house within a circuit of several miles but who had not seen it for about fifteen years. Among the changes which he expected to find, were pits, sheds, or other provision for the protection of that which is so essential to good management and profitable crops, to, wit, the manure made on the farm. At all events, one of the most surprising things that came under his observation, was the al-

most universal exposure of stable and yard manures, just as they had been many years ago, before public attention had been called to this important matter. And what was found in one township has its parallel, we fear, in hundreds of other townships. At all events, every one who has occasion to travel through rural districts will or may notice that, at almost every farm residence there are piles of manure lying adjacent to the stables, without the appearance of any attempt to protect it from waste and deterioration.

Those who would benefit the members of the farming fraternity, by saving them from the losses which they suffer by such negligences as we have referred to, must therefore endeavour to do something more than get their assent to such general statements as are annually made in regard to covered and uncovered manures. It must be proved and insisted upon that there is not only a difference between the two, but one so great as to *be worth attending to*—so great, indeed, that something *must* be done about it immediately. The impression must be made that rains are worse robbers than rats, or any other of the "varmint" that filch from the farmer his hard-earned stores; and that when manures are giving off odors that can be felt, then there is a hole or leak in the pocket of their owners. In a word, those who expect or aim to produce a *movement* and an improvement in regard to this matter, must prove and make it evident that the annual loss from exposing manure amounts to a sum which would soon pay for all the labor, (except where labor is exceedingly scarce and dear,) and all the buildings and fixtures needed to protect it.

With a view to benefit all who may read this article we propose to submit a specimen of some facts, which have been put on record, and which prove that the difference between covered and uncovered manure is one which it would *pay* to attend to, and which cannot any longer be neglected without aconsciousness of *folly* and a certainty of *loss*.

An experiment made by the president of an agricultural society in England, shows that manure which was kept covered by nine inches in depth with earth, so that no evaporation made its escape, produced several bushels more of grain per acre, than the same manure applied to the same extent and quality of land, but which had lain, from January to April, exposed to the weather. Four bushels was the difference, if our memory is correct, (for the original documents are not before us;) and four bushels, of wheat, for every ten or twenty loads covered in this way would pay liberally for the labor.

In the case of some similar experiments made by Lord Kinnaird, detailed in a former volume of this publication, the difference between the produce of two acres in potatoes, the one of which had 20 loads of covered, and the other 20 loads of uncovered manure, was about four tons or nearly 100 bushels. The difference between the crops of wheat grown the next year, on these two acres, amounted to about 14 bushels.

We may submit some similar facts at another time. Meanwhile, these may suffice to show that *it will pay* to make pits, sheds, or other coverings. If any doubt the accuracy of the facts referred to, let them make some similar experiments, on a small scale, for themselves.

Country Gentleman.

PULVERIZATION OF THE SOIL.

As a general rule farmers are not yet fully awake to the importance of having the entire soil reduced to a fine powder. Hard lumps of earth, even when they are full of grain-producing substances, are of but little more value in producing a crop than the same amount of stones. The roots of plants cannot enter hard lumps of earth, and before such lumps can be of any real benefit to the plant, they must be broken down, mechanically with some implment, or be dissolved by rain.

In order to appreciate the importance of thorough pulverization of the soil, we need to have a little spattering of the theory of "vegetable nutrition.

How do plants grow? How does the hard soil and dry manure become changed into plants of any kind? These are important questions which every farmer should understand well; and then he would be able to appreciate the importance of more complete and thorough pulverization of every kind of soil.

No soil or manure can promote the growth of a plant—except mechanically—until after it has been dissolved by rain or water, and reduced to a liquid. Dry earth or dry manure cannot enter the roots of plants. Roots of of grain, grass and trees feed upon nothing but liquid or fluid. When we apply bone dust to plants, rain water must first dissolve the little fragments of bone, and carry them along where they will be taken up by the thousand mouths in the little roots of the plants. So with the hard soil, and hard lumps of earth, they must be reduced to a fine powder by some mechanical operation, and then the rain will dissolve the fine particles, thus forming a fluid, which is the food of plants.

When the soil is very lumpy the atmosphere has but a small surface, comparatively, to act upon; therefore plants grow slowley where the entire soil is one complete clod, or is little else but lumps.

These few thoughts lead us to discuss in a practical point of view

The Philosophy of Ploughing.

Were we to interrogate a thousand farmers, "Why do you plow?" the answer would probly be, "For the purpose of rendering the soil more mellow and porous."

This is correct as far as it goes, but the chief object is to reduce the soil, to its greatest degree of fineness, or comminution of particles, mechanically, so that the rain, or water applied by hand may readily change the elements of fertility in the soil from a solid to a fluid, in which state only those elements are available as food for plants of any or every kind. Therefore by reducing the soil very fine, by some mechanical operation, such as plowing, its solidity is in a measure overcome or destroyed and the roots of plants find little hinderance in

ramifying throughout the entire mass that has been broken up. And if the roots and little spongholes occupy the entire soil, the ten thousand mouths of these roots are ever open to to drink in those substances, which will promote the growth of the plant. On the contrary, if a large proportion of the soil is in the form of lumps, or is turned over in furrow slices of one unbroken mass, the soil is not in the best, nor even good condition to promote the growth of those plants that occupy it.

Now the idea is in plowing to use those plows that will break up the solidity of the soil most thoroughly and effectually. Turning the soil upside down, as if it were a huge slab o, earth, dose not accomplish the desired purposef as its solidity is not destroyed, except in a very limited degree. Every observing farmer knows that when calcareous and aluminous soils are not too dry, nor too wet, if they are plowed with a kind of plow that leaves the furrow-slice on its edge, the pulverization will be about as thorough and complete as it can be made with a common plow; whereas, if such soil be plowed when there is onely a little too much moisture, or not quite enough, pulverization is only partially effected, and consequently it is not possible that the crop should be as great as it would be had the pulverization been more complete.

These thoughts lead us to speak of

Fall Plowing as one of the most effectual means for thorough pulucrization.

After a soil has been broken up, it soon commences to run together again, and to set, very much as mortar does, which has been made of lime and sand; and to assume a solid and almost organized form. In this process almost every particle of the soil that has been plowed is moved several inches from those parts, with which it has long been in contact. This operation is effected by rain and sunshine As a matter of course, this change in the position of the particles of the entire soil, dose much tow ard securing thorough pulverization.

Frost-freezing and thawing of a soil, exrts a very important influence in securing the complete pulverization of all soils. But when a soil has been plowed several months before the time of frost, it becomes consolidated, and the frost will not exert half the influence, in its more thorough pulverization, that it would were it but recenly plowed.

For this reason, plowing earley in autumn—where thorough pulverization is the chief object—will not be as effectual as late plowing, or eaven slowing in the winter. If the rains and frosts of winter can be in operation, when a soil is running together after it has been plowed the pulverization will be more thorough and complete than it would be under any other circumstances. And more than this, the more complete the pulverization is, the longer that soil will remain mellow and porouse; and consequently, the greater will be fhe available amount of fertiliziug matter in that soil, which will promote the gaowth of crops.

Tnnroug pulverization Impracticable without under-drainiug.

Where there is an excess of water in the soil, the particles run together so readily, and set, like mortar, that the most thorough comminution of the soil, by auy mechanical process, will bo of but little advantage to the crop, when compared with the benefits arising from the same pulverization, when just moisture enough to cause such soils to pulverize easily, and remain so for a long time

There is little or no danger of rendering a clayey soil to dry by thorough underdraining, as it will retain by absorption all the moisture that is required for the healthy growth of plants even directly above the drains Therefore, if the superabundant moisture is removed in nnder drains, and our heavy soils plowed well, as they ought 10 be, late in autumn, and then plowed agin the following spring the pul, verization will be most thorough and complete; and then the crops of grain will be increased many times, to double the amount which they have been accustomed to produce

The first step then towards shoronah pulverization of our heavy calcerous soils, will be under draining. The second operation will be fall-plowing, followed by plowing in the spring or summer, when there is just moisture enough in the soil to cause it to crumble well as it is plowed. And the third process will be manuring.

All of these things combined will constitute a renovating system of agriculture; and will render the roil more productive from year to year, and at the same time will require less labor to cultivate a given crop.—.S E. Tod in Country Gent.

TREATMENT OF STUBBLE GRASSES.

"Stubble-grasses" may be a wompoutence, but we have no brief term expressing the stand in autumn of grain fields seeded the previous fall or spring to herds-grass or clover, or both together, and now covered with young grass and grain stubble—of spring or winter wheat, rye, oats or barley.

What is the best treatment of stubble-grasses, is a question coming up experimentally before us in the shape of a winter wheat-field, seeded last autumn to timothy or herds-grass, and this spring to clover, and now thickly covered with these grasses; the more thickly from the thinness of the wheat crop, and the good "catch" of the grass-seed on the surface manured ground. While pondering on the subject, the *Boston Cultivator* of Sept. 13th came to hand with the following appropriate suggestions, which we cannot do better than to copy answering the query:

"As to stubble-fields on which clover and grass-seeds were sown last spring it would be undoubtedly better to graze them with sheep. The surface of such fields is generally too light and loose to give a proper bed for grass. It is a frequent practice in England to roll stubbles, where there is young grass, as the grain is taken off. We have sometimes seen it done in this country, and it might be more generally done with advantage. The pressure of the roller gives to the soil a degree of compactness that enables the clover and grass to take firmer root, by which more growth is made in the autumn, and the plants are better secured against winter-killing. This

tread of animals has a similar effect; but in many instances the top of the ground is so soft and light that the feet of large animals sink into it too much, damaging the clover and grass by breaking the roots and throwing out or disturbing the plants. They also pull up some of the grass that has not a strong hold of the soil, in feeding. Hence it is better to turn on sheep or calves, which do no damage to the roots, and by their mode of cropping the herbage will rather thicken and strengthen it. Still it will in many cases be desirable to roll the fields before turning on any stock.

"In this section of the country, stubble-fields are too often covered in autumn with a growth of weeds—such as Roman wormwood, Spanish needles, &c. If left untouched they fill the ground with seed, and injure the next crop of hay by their dead and worthless stalks, besides obstructing the scythe or mowing-machine. They should be cut before they go to seed. It is but a trifling job to do this with a mowing-machine; and with a horse-rake the crop may soon be gathered for the hog-pen or barnyard, or a portion of it saved to give the cattle, as a condiment, in winter."

SQUASHES AMONG POTATOES.

It has been generally supposed by farmers that in order to raise good squashes they must be planted on ground especially prepared for them, and then cultivated with great tenderness and care. A piece of rich land is usually selected, ploughed, and thoroughly pulverized and manured, and the squash seeds planted in raised hills. In this way they are cultivated in masses, and hold out the most tempting invitation to all the bugs in the neighbourhood to come and feed upon them. Under these circumstances the utmost vigilance is necessary to preserve even one plant from destruction, —and those that remain with the breath of life in them, are generally so disfigured and poisoned as to require about half of the growing season to recover from such blighting influences.

Attended with all this labor of the preparation of the soil, and the subsequent care which the squash yard requires, it is rarely the case that squashes do not cost the farmer altogether too much.

There is a cheaper and better way of raising this delicious and wholesome article of food. It may be common to others, but it came to our knowledge through the necessity of finding some more certain way of obtaining a crop than by the "squash yard" process. Several experiments were made, and among them one resulted in giving us the greatest abundance of excellent squashes, almost without cost.

We plant our field potatoes in hills at a distance of three by three and a half feet apart, and dress these hills or holes with strawy, unfermented manure. Into these hills we pour occasionally a squash seed with the manure, but these are intended for early use—for the young *Marrow* or *Hubbard* squash is as delicious as the true *Summer* squash. At the first hoeing, seeds are pushed into the potato hills, pretty near the potato plants, where the plants are slightly sheltered while young and tender, and soon begin to stretch away into the open spaces between the rows and hills, and grow with great vigor and luxuriance. All our hilling of the potato is done at the first hoeing. The cultivator is passed through the rows afterwards, and all weeds kept down, but all this occurs before the squash vines have extended themselves so as to be in the way.

By this mode of cultivating the squash, few plants are injured by bugs, the crop is secured at a most trifling cost, and it has invariably been a good one. The vines should never be so close as to run into each other—nor nearer than two or three rods. Those who try this plan will be quite certain to abandon "squash yards," and to have at harvest time as many high-flavored and excellent squashes as they desire. A dozen or two of squash seeds planted in an acre of corn will be likely to produce similar results—but they should be six or eight rods apart.

TROUBLESOME WEEDS

The present season has been peculiarly favorable to the growth of weeds, while the work of destroying them has been much retarded, especially in heavy lands, by the constant showers of the past few weeks. It seems to us we have never before seen a more rampant growth of everything in the form of weeds, and as it is now late in the season and work is behind, there is a very fair chance of ripening an unusually large crop of foul seeds. With the greatest care and plenty of time many will escape, but under present circumstances the number we fear will be far greater than usual. When we take into consideration the fact that the whole economy of a weed plant, so far as its individual existence is concerned, is devoted to its reproduction, the causes for their wonderful tenacity of life and excessive fruitfulness of their kind are apparent. Weeds, by nature annuals, if maimed and bruised, will oftentimes preserve their vitality through a second year, and complete therein the design of nature. The increase of a weed plant is so enormous as to almost stagger belief. From a series of experiments instituted by James Buckman, our Professor of Natural History at the Royal Agricultural College, Cirencester, England, we obtain the following table relative to this peculiarity, as exhibited by several specimens considered only as medium in their reproductive powers:

	No. of flowers to each plant.	No. of seeds to each flower.	Total for a plant.
Common groundsel..	30	10	300
Corn-cockle.....	10	40	400
Corn sow-thistle....	25	20	500
Fool's parsley.....	300	2	600
Wild carrot.....	600	2	1200
Red poppy	25	50	1250

The Professor further says:—"In most plants the perfecting of the seed does not occur simultaneously; there is usually one set of seeds developed from the primary or first flower, the which, if it be perfected and sown, may increase groundsel ten-fold; corn-cockle forty-fold; red poppy, fifty-fold. And this

shows us that in dealing with seeds, we cannot be too careful of observing their natural history; for if our hoeing, for instance, be delayed until these first seeds are ripened, the very process may cause the sowing of enough seeds to insure a future crop of the pest. Hence, then, the whole facts connected with the seeds lead to the conclusions that, when practicable, weeding should be done as early as possible, even before the weeds may be in flower; and if delayed until the seeds be ripe, measures should be taken for the complete destruction of weeds, which is best done, where practicable, by fire."

Canada thistles are now coming into flower, and though some few may have taken the pains necessary for their destruction, still, from the abundance of these plants in the fields and the road-sides, we judge this to be the exception and not the rule. There is yet time to prevent the spread of this pernicious weed, but no time to lose.

TOP-DRESSING IN AUTUMN.

The more we think of it, the more we are convinced that top-dressing is one of the most direct and effectual ways by which grass lands can be made to keep up their original fertility; and from our own experience and the writings of practical farmers we are also convinced that autumn is the best season in the whole year for applying a top-dressing of stable or barn-yard manure to grass lands. We have before spoken of close mowing as a reason why grass fields "run out" so quickly after having been newly seeded down, and this is doubtless one cause; but another reason is, that the roots of the grass lack nourishment, and without it the plant dies out. It is as reasonable to suppose that roots of any other plant can get along as well without manure as the roots of grass, but we know that the latter seldom receives it, except when applied to a field at the time it is seeded down. The usual practice among our farmers is to break up a field or pasture—as often without spreading any dressing on the surface as with—and plant it with potatoes. Then manure is spread on, the field is plowed, planted with corn and manured in the hill. The next season is sowed to oats or barley and seeded down. Allowing the ground to have been in no very excellent condition before being broken, it is safe to say that the crops taken from it have exhausted nearly all the manure applied; and yet it is expected to produce a fair crop of hay for five or six years, without any dressing, until it is again broken up. How land, without this treatment, can be expected to produce even a fair yield of grass, is one of the unaccountable things in our agriculture. But with the application of four cords of manure per acre, once in three years, a good crop of hay can be harvested each year, for almost an indefinite period.

Allowing then, that it is a good policy, and one of the most economical farm practices to top-dress mowing fields, and if there were no particular difference as to the season when it was done, the fall would at once be suggested as the best time. There are many reasons why the fall presents advantages over spring for top-dressing. The first is that it is undoubtedly the best time. In the spring, although it may be dissolved and washed down by spring rains, yet if it should be dry the dressing would remain in lumps upon the surface, affording no nourishment for grass roots, and acting as a hinderance in mowing, especially if done with a scythe If applied in the fall, it will all be dissolved and carried into the soil, the roots having the direct benefit of the whole amount applied, and be in readiness to start with new strength and vigor on the approach of spring. Besides, there is more leisure for doing it in the fall than the spring. There is a great hurry with farm operations in spring time—particularly if the farmer is a little "behind time"—and such a job would rarely be accomplished in time to do much good to a grass-field the same season. Again, in the spring, fields are not suitable for the passing of heavy teams, the soil is too moist and yielding and lots would be greatly cut up and damaged by teams passing over them. This can be done in fall with little or no disadvantage of this sort. But one reason why farmers do not apply dressing to their grass-fields in the fall, is because they do not have it. On this account it is put on in the spring if at all. But a proper attention to the matter will secure to most farmers a sufficient amount of dressing in the fall, to apply several acres of their grass-lands which most need the application. The use of muck in the yards and stalls during summer and autumn, and the yarding or stabling of cattle at night, together with composts, or even the use of a special fertilizer for the purpose, will, if applied to grass lands in the fall, ensure a good yield of hay, and keep the hay field in good condition.

THE BENEFIT OF TRENCHING.

So much has already been written on the advantages resulting from trenching, deep plowing, and other cognate means of raising and bringing into action the latent powers of the subsoil, that it would be superfluous to say a single word in commendation of the practice. We are aware, however, that there is still considerable difference of opinion regarding the ultimate benefit derived from the practice on different kinds of soil. In this, as in other matters, the intelligent agriculturalist will be guided more by the peculiar circumstances of the soil than by any general rules. It is only by studying carefully the nature of the ground he cultivates, and its peculiar wants that he will be able to turn its capabilities to the best advantage. When this is intelligently done, there will be little fear of a successful result. As illustrative of the value of deep trenching, we shall briefly state our experience of trenching a plot of ground about a quarter of an acre in extent.

For a number of years, potatoes had been grown successively upon the plot, and, as it had got little or no manure, the ground was much worn out. Last year, we endeavoured to take out another crop of potatoes off it, but with very indifferent success. Owing to particular circumstances the crop was somewhat

late in being put into the ground, and when it came away the stems had from the first that exhausted "spirly" appearance which bestokened a weakly plant, and a miserable return. The result was as had been anticipated. The crop was little better than a failure, two and three, and not unfrequently only one, being found at a shaw. The potatoes themselves were watery and waxy, and quite unfit for human food. We mentioned the circumstance to a high agricultural authority, and he immediately suggested deep trenching. Acting upon the advice, the plot was trenched in the end of the season to a depth of about two feet. It was then allowed to lie in a rough state throughout the winter until the usual season for cropping, when it was manured with dung from the pigstye, mixed with the refuse of the dustpin, and again planted with potatoes. The result of the experiment has been such as to be scarcely credible. As soon as the potatoes began to appear above the ground this year, it was evident that the labour had not been in vain. They came away with strength of stem and a breadth of leaf quite remarkable.

Notwithstanding the somewhat backward season, they grew apace, and have continued growing until some of them are at the present time three feet in height, and the average about two feet and a half. The stems, or rather some of the principal branches—as they have more the appearance of a bush than a potato-shaw—are two inches and a half in diameter. Of course, it is impossible to say what what the yield may be, but when we see a good shaw we expect something good at the root.

It may be supposed that a greater stress has been laid upon the trenching than is its due, and that the manure had as much to do in the production of the extraordinary crop as the turning up of the subsoil. This, however, is not the case, and the proof is to be found in the ground itself. The borders were not trenched, and the same quantity of manure as the plot, but the size of the shaws are not more than one third of those of the middle plot. Another peculiarity may be mentioned as tending still further to show the benefit of deep trenching. One side of the ground was not so deeply trenchly trenched as the other, and towards that side the size and exuberance of the shaws gradually decrease. As one fact is worth a whole cartload of theories, however specious, we leave the above simple statement to speak for itself, without adding a single word of comment, feeling that it will commend itself io all whom it may concern.

SNOW-ITS USES.

Every farmer is aware of the fact, that soils well covered with snow during the winter, are improved for the next year's crop. This improvement arises from a variety of causes, but they may be explained, in groups, by familiar illustrations.

Snow acts as a mulch, and, like a coating of straw or litter, materially improves the soil, and for the same reasons. Snow occupies more space than water, and is therefore more porous, permitting the heavy gases held by the atmosphere to pass through it into the soil. It is also capable of holding large quantities of these gases until it begins to melt, when they are carried into the soil in solution, giving to water the power of dissolving larger portions of inorganic matter to feed plants. Snow being imbued by atmosphere, is an excellent non-conductor of heat; and while it prevents the colder atmosphere of winter from freezing and disorganzing the vegetable organisms, it at the same time prevents the escape of the internal heat of the earth, leaving the soil free to receive gases and fluids even in winter. As the snow melts in the spring it passes generally too slowly into the soil to compact it, and permits new portions of gases to be received from the atmosphere as older ones are carried into the soil in solution. It also prevents winter rains from compacting the soil, preventing rain drops from coming into direct contact. In more northern climates snow is the equalizer of seasons, by protecting the crops from the colder atmosphere during the winter. Even the polar bear seeks protection from the inclemency of the weather, by burying himself under the snow; and the Esquimaux Indian has a confortable shelter in his winter tenement of snow.

Grass and grain crops are often protected by heavy coverings of snow, while those from which the snow has drifted are of ten injured. In city enclosures, where portions of grass plots are heavily covered with snow, and other portions left bare, the growth of grass the following spring and summer clearly indicates the benefits arising from the covering.—*Working Farmer.*

HOW TO PROTECT YOUNG TREES FROM RABBITS.

I have noticed several receipts in the Co. GENT. for preventing rabbits from barking fruit trees. I will tell you what has proved effectual with me. Some two years ago the rabbits commenced barking my young apple trees, and also my neighbors' trees. I happened to be in Waukegan about the time, and as I did not know what to do to prevent them, I applied to MR. ROBERT DOUGLAS. the extensive nurseryman, for a remedy and he told me to mix equal quantities of lard and soot, and rub the trunks of the trees; but on consultation with a neighbor, who advised lard and sulphur, I concluded to mix all three together; so I mixed equal quantities of lard, sulphur, and soot, and applied it, and it proved effectual. On the trees that were partly barked, it stopped them from injuring any more, and they have completely recovered, and healed over. The mixture dried on to the trees, and has protected them since.

The same winter my neighbor had a young orchard of 60 trees completely destroyed, and last winter another of my neighbors had about thirty trees destroyed by them, although he rubbed them with lard and soot; the rabbits eat grease, soot, bark, and all. While they run round in my orchard, and eat all the twigs they could reach, and barked one tree that was not coated with the above mixture, they *never touched a tree that had been rubbed within two years with the lard, sulphur, and soot,* because the remains of it were still there.

BREEDER'S DEPARTMENT.

TREATMENT OF COLTS.

IN our last, we gave some general principles of breeding. It is our purpose in this to speak of the training and general management of horses. Farmers are apt to go to one of two extremes with their colts—either to halter them and drag them about through the heat of summer, on roads of all kinds alongside their dams at work, or else to turn them out to run wild during the first six months of their existance, out of sight and hearing of human beings. Now, we take exception to both these methods of proceeding—to the first, because the limbs and feet of the young animal are tender and apt to be strained and bruised by being compelled to keep up with the dam (even when walking) for several consecutive miles. The young colt requires frequent rest, and should be at liberty to lie down whenever inclination prompts. When the colt becomes tired, it drags on its halter, straining the cords of the neck, back and legs. It is also disadvantageous to allow the young animal to run too long without subjection, for when the attempt is made he will resist with great force and often with injury. At the risk then of some extra work, we advise that the colt be accustomed to be handled often, until he has no fear to approach persons, and when they always receive caresses, they are very ready to do so. At two months old, put on the halter; but allow the colt to go very much as he likes, occasionally drawing him towards you and caressing him. In two hours, you will have imperceptibly broken him to lead. Then when you tie him, do so with a halter he cannot break—a short struggle will satisfy him he is conquered. Never suffer any one to strike or yell at a colt; one such barbarous act will cause a day's work to overcome its bad effect. When first cleaning him, avoid the head—then approach that part tenderly; and if he resists, go to some other point. In a few moments return, and so continue till he submits with pleasure, rather, to being handled and rubbed anywhere and on any part. Your colt is then half broken. Wean the colt at five or six months old, first teaching him while suckling the mare to eat oats. When taken from the dam confine the colt closely, and put them out of hearing of each other for one week. During the *first winter*, feed daily two quarts oats and all the hay the colt will eat. This with good warm shelter will keep him growing and improving. Don't turn out in spring till the weather is settled and warm, and a full bite of grass. The first year makes or ruins the colt. It is the most important of his life. Keep him *fat* the *first* year, whatever you do afterwards, for this year decides whether he is to be a full grown horse or a miserable pony—no after care can atone for neglect during the *first twelve* months. Good pasture (mountain if possible) the next season and plenty of hay the next winter, with a quart of grain if convenient, will bring you a finely formed, powerful two-year old. If a horse, alter him early *before fly time*, and turn to good grass. In the fall, begin to break, by bitting gradually tighter each day—within two weeks you have his head as high and graceful as nature allows. The neck should be arched and the face *vertical*, without constraint. When the bitting is accomplished, put on your harness, and let the straps dangle around his legs: continue this until he pays no attention to them, but do not over fatigue the colt either in the bitting bridle or harness. The bending in of the neck is exceedingly painful and should be done by degrees, the work requiring two weeks. While in the bitting bridle, exercise him on a circle to the right and left, alternately, the radius never less than 10 to 15 feet, otherwise he will learn to step too short. Make him walk, and walk *fast* while walking; no gait is more important; and our Agricultural Society should offer premiums for fast walkers. While harnessed accustom the colt to waggons, sulkies, &c., by running them around and about him. Then harness to the sulky and lead him several days until he no longer notices the pushing or jostling of the vehicle. Then let one get in while another leads, and so *gradually* get him accustomed to all around him; on finding he is not hurt he will soon become quiet. Occasionally harness double with a steady, quiet horse, but put on no load. Teach him to back by standing in front and pressing on the bit—calling out "back," &c. *Always caress when he has done his duty.* During the second winter, hitch in double, making the other horse draw all the weight and drive for a short distance (say one quarter of a mile at a time) alternately fast and slow. Train your colts to three gaits in harness, the fast walk always, the moderate or road gait for distance, and the rapid trot. As if we desired to make a man a good dancer, we would begin young while the limbs were nimble and the actions graceful—so if we desire a fast walker and a fast trotter too, we must take the colt while young, and so when pressed he will take up the fast trot, instead of the gallop, so natural in after years. A horse can be trained that he is to trot and not to break up, as well as the boy can that he is to glide but never jump in the waltz. We do not pretend that all horses will learn to trot *equally* fast more than all the boys dance equally well, but all can be trained to exert every muscle in the trot, as

well as in the run. Colts should never be driven fast for long distances; they become leg weary, and cut themselves, or "interfere," as it is called. At three years old, the horse can perform very moderate work. At 4, more still; but not until 5, should he be expected to do "day's work," and better yet if deferred until 6; most horses are ruined *before* 5, by early and injudicious driving or brutal treatment of some kind. The *farmer* can best use horses up to this age; all his work can be done by his brood mares and colts and leave all his *matured* horses for market. One horse thus raised and trained is worth two such as we now often meet, and so the breeder's purse will prove who tries it.

GROOMING AND FEEDING HORSES.

A few words now about grooming and management. Every horse should be thoroughly cleaned each day. The bedding, instead of being thrown under the manger to fill his food, his eyes and his lungs with ammonia, should be thrown behind him or out of doors to air. His manger should be *kept* clean and once a week washed with salt and water, and salt left in it. One night in each week, he should have a warm bran mash—8 quarts—generally given on Saturday night as it is somewhat loosening and weakening, and the horse is presumed to be idle on Sunday. Oats are by far the best food and ground oats wet with water is better than whole dry grain. Cut hay is a great saving, and moistened and sprinkled with ground oats, forms *the best of food.* The hull of the oats is hard and often unmasticated, and passes undigested through the system, thus taking away instead of imparting strength and nutrition. For medium sized horses, with moderate work, 9 to 12 quarts of oats per day and 14 lbs. hay are ample. For large draft horses, 18 quarts oats and 16 lbs. hay. Food consisting of one-third corn, ground with two-thirds oats, forms strong, hearty, *winter* food for work or coach horses. But corn is unfit for road or *fast* horses. It is too heating. Good beds and good grooming are as important as good feeding. Horses, like men, want good, dry, warm, clean beds. In grooming, tie your horse so he can't bite his manger and thus learn to crib bite; and if you find your groom currying and tormenting the poor animal when tied, so he is uneasy and restless, use your stable broom over the groom's back—it is an excellent instructor to teach him to be gentle. Let the currycomb be very moderately used on the body to loosen up the scurf and dirt, but never permit one near the mane and tail. *Rely mainly on the brush* and rough cloth for cleaning. Banish combs from your stable. They tear out more hair in a day than will grow in a month, and they ruin all the manes and tails that are ruined. The tail should be washed with Castile soap and water once every week, and *brushed with a wet brush every day in the year,* holding up the bone of the tail and brushing the hair from you. Half an hour is enough for a *good* groom to one horse, but one hour's time at the outside, ample to be very complete. City horses on dry floors should have cow manure put into their feet once a week, to draw out fever and keep hoofs growing. It should be put in over night and allowed to wear out of itself. To conclude, always be gentle about your horse's body, *especially his head*;—"more haste less speed" is peculiarly applicable to grooming and breaking. Use whips as little as possible—use your reason and exercise patience and kindness, and instil by precept and example the same useful lessons in those untutored creatures denominated grooms—and if you cannot inculcate wholesome truths into their heads, you can ameliorate the condition of that much-abused animal, the horse, by occasionally exemplifying the power of their own treatment on themselves.

THE SHOEING OF HORSES.

Another practice disapproved in the pamphlet now under notice, is that of cutting and carving at the frog, which, being intended by nature as a pad to obviate concussion, should be allowed its full and natural development, and only trimmed, at each shoeing, of any ragged parts. The disapproval of this practice is by no means new or peculiar to the author of these "Notes"; but there is one point in which Col. F., appears to go a step beyond all previous authorities, namely in the interdiction of all paring and rasping whatever, except a moderate shortening of the toe, and the cutting and subsequent rasping of the lower or shoe surface of the crust, to the extent represented by about a month's growth. Neither sole, nor bars, nor seat of corn, are to be meddled with any farther than this. The views presented on this subject seem so important, and so comparatively new that it may be best to transfer them quite fully to our columns:

"The sole, on account of its construction in fibres laid transversely, one over the other in layers, and not perpendicularly to the ground, as are the fibres of the crust, *does not require to be pared out.* The fibres will of themselves exfoliate in flakes at their own proper time. The exterior, that is the lower surface of the sole, is not furnished with an external gluey layer. like the crust, to preserve its moisture; but each other layer of fibres in its turn, before it exfoliates, acts as a covering to the fibres underneath to preserve their moisture."

The author next remarks upon the fallacy that if the sole be not pared out, it will accumulate and become hard, and thus injure the sensible sole which lies immediately above it. As to the supposed accumulation, Col. F. remarks that it never does nor can take place, as the new layers of fibres, as they come down from the sensible sole, are perpetually pushing off the old and outer ones; and as the supposed hardness, he observes that the outer flakes are not as hard in a sole that is not pared as in one pared in the ordinary way. Among the advantages of the non-paring of the sole is this that it obviates the necessity of the ordinary practice of stopping the feet, or of employing leather as an artificial covering for the sole. The object of these applications is to keep, or make the sole soft and moist; but nature will do this better than art, if the natural outer

covering of flakes be not removed.

After some remarks on the use of bars, and the folly and mischief of paring them or cutting them away, and on the folly of paring out the seat of a corn, Col. F. presents some entirely original views on the turning up of the toes of the four shoes, which may be best understood from his own words, which are as follows:—

"Every person conversant with horses must have remarked the very uneven manner in which the wear falls on, that is, is distributed over the fore-shoe, and the wear of the shoe is of course only an indication of the degree of weight or friction thrown on different parts of the foot. With ordinary—that is, straight—shoes at the end of the month, the toe of the fore-shoe is the only part worn out. Is it likely, I would ask, that it is the intention of nature that only one part of the foot should comparatively speaking, be brought into action and wear? From the structure of the foot, as well as from regard to the generally beautiful economy of space and material by nature, I should presume not. The whole foot is but a small space to bear the superincumbent weight; the crust which alone is calculated to bear weight, is a still smaller surface. From nature we should argue, that, under such circumstances, the weight would, having reference of course to the capabilities of the different parts be as eavenly distributed at possible, and, following the same guide, we should argue that the greatest weight, and, therefore, the greatest wear, would fall on the broadest part of the circumference of the foot, viz., on the quarters, and here it will fall if a shoe, turned up at the toe, such as that made and used by Mr. Hallen, the late veterinary surgeon to the regiment, be used. May not althe very common and serious evil of contracted heels be aided, if not in some measure pronuced, by the degree in which the ordinary method of shoeing withdraws the posterior portion of the foot from the healthy natural and legitimate influence of wear? It is a rule in nature that all parts intended for wear, shrivel up and contract if not subjected to wear, and it is equally a rule that all parts intended for wear, strengthen and develop under the influence of use; *e. g.*, compare the arm of a farrier with that of a man who has had his arm in a sling for six months.

But to return. It is remarkable how badly horses go when first shod; that is to say, for the first few days after shoeing. From noticing this fact, my friend, Mr. Hallen, took his first idea of turned up fore-shoes; and from the fact he reasoned to its causes. At first simply to remedy the evil which I have just spoken of, he made the new shoes in shape exactly like the old ones. Improved going was the result. At the next shoeing he followed up his advantage, and made the new shoes like the then old ones, and so on, each time with improving results. He did this at first only with horses that stumbled; horses that 'toed,' as horsemen say. He thought on the subject, followed it up, watched the results carefully, and at last saw that nature intended a horse to have a bearing on his whole feet, and not only or mainly on the toe. He saw not merely that the straight toe caused horses to trip, but that it produced an unnatural resistance, like a lever against the ground, every time the foot was attempted to be lifted from the ground—*i. e.*, that every time a horse lifts up his foot in action, he has first to overcome, by additional exertions of his flexor tendons, the resistance of the toe against the ground. (I may remark that it is a mistake to suppose that in action a horse simply lifts up and puts down his fore-foot. If he did there would be no progression; the lifting up and putting down of the foot is really joined with a semi-circular progressive motion, caused by impulse from behind.) And eventually he shod all horses with the toe so turned up that the wear should at the end of the month have been nearly even all over the foot, arguing that if stumbling horses were sensibly relieved by complying with nature's requisitions, all horses would go more comfortably by following the same guide.

"I am not arguing for any arbitrary degree of 'turn up' at the toes, but for a general principle—viz., so to shoe the horse that there shall not be an unnatural friction at one part, an almost total absence of wear from another.

"I think we may infer from the structure of the foot towards the heels, from the reduplication there of the crust in the form of the bars, and the presence there of an elastic pad in the form of the frog, that nature intended a fair proportion of wear to fall on the heels. But is this the case with horses shod according to the common system? It is not the fact that the toe of the shoe is almost the only part worn at the end of the month? A farrier unaccustomed to make turned up fore-shoes, very generally fails to make them well. The turn up at the toe should be wide. Not merely is the point of the toe truned up, but the portion turned up more, of course at the toe than at the sides, should extend nearly, but not quite, from the anterior part of the quarter on the one side to a similar position on the other, so as almost to square or blunt off the anterior part of the foot."

HOW TO TEST THE QUALITY OF WOOL.

A Texas paper says:—Take a lock of wool from the sheep's back and place it upon an inch rule. If you can count from 30 to 33 of the spirals or folds in the space of an inch, it equals in quality the finest Electoral or Saxony wool grown. Of course, when the number of spirals to the inch diminishes, the quality of the wool becomes relatively inferior. Many tests have been tried, but this is considered the simplest and best. Cotswold wools and some other inferior wools do not measure nine spirals to the inch. With this test every farmer has in his possession a knowledge which enables him to form a correct judgment of the quality of all kinds of wool. There are some coarse wools which experienced wool growers do not rank as wool, but as hair on account of the hardness and straightness of the fibre.

FEED FOR FARM HORSES.

W. R. Lewis, Esq. of Milford, Mass., gives in the *American Agriculturist*, the following hints upon the management of farm horses:

When I was a boy in the north of Vermont we used to feed dry hay and oats, unless the horse had the heaves, which was very common among them at that time, owing to feeding too much dry hay and oats, and driving too fast when full. We then supposed they ought to have hay before them all the time. This is a fall idea; all kinds of animals will do better on regular meals. Farmers usually feed too much dry hay. You may keep a horse eating all the time and not have it thrive. I came to Massachusetts about 12 years ago, and was engaged in the teaming business about seven years. I began to feed cut hay and corn meal, and found the ho ses would do more work and last longer, and be in better condition then when kept on dry feed. Cracked corn and oats make a very good feed for noon, when in a hurry. I would feed carrots all winter in small quantities, especially o young horses and breeding mares. This keeps hem in a healtly condition. Team horses may be fed on them once each day to advantage. I am not able to state the amount each horse should be fed; this depends on the size and age of the animal. I would advise all owners to keep their horses, especially those they use, in good condition; it costs less in the end. Colts ought not have much grain unless very thin in flesh; they are often iniured by graining. A few ground oats, with hay or straw wet and mixed, and half a pint of ashes added, once in two or three weeks, is all colts need besides hay. The ashes keep the bowels open, and, it is said, free from worms. If living in Maine or Vermont, where hay and oats are cheap, I would have the oats ground, and cut a portion of my hay and straw to mix with what grain I fed, and consider myself well paid for the time and trouble.

WILL IT PAY TO WINTER TURKEYS.

The great seasons for the sale of poultry are Thanksgiving and Christmas, and then the market is abundantly supplied, and prices rule low. Farmers are anxious to sell their fowls to get rid of the expense of keeping them through the winter, when their appetties are ravenous, and the corn and boiled potatoes disappear rapidly. It is clear it will cost something to keep them; it may not be so clear that il will pay. A little transaction of my own, last winter, may throw some light upon the question. I bought a flock of twelve turkeys —the mother bird, and eleven young ones—the last of August, the average live weight of the young being about two pounds apiece. They were killed along as wanted in the family from November 'to March, and the monthly gain in weight was about two pounds and a half for the hens, and three pounds for the gobblers. They gained quite as much in the winter as in the fall, living upon corn, oats, boiled potatoes, and having access to the pigs' troughs. ' The number of males was six, and the weight of the mother ten pounds. The market price of turkeys was eight cents in November, and thirteen in February. Had they all been killed November 1st, they would have weighed about 93 pounds and, come to $7.44. Had all been kept to the 1st of March, they would have weighed about 215 pounds, and come to $27,95. The double gain, in weight, and price, is an important consideration. The gain in weight was more rapid than I had supposed, before applying the steel yards.

The experiment furnishes a useful hint to farmers, and to villagars. If prices are not satisfactory, it will pay to hold on, and keep feeding poultry. The growth and the increased price in mid-winter and spring, will pay for feed and leave handsome profit, I think.

I find A difficult to raise turkeys, on account of my own and my neighbors' gardens. But the garden is out of the way by the 1st of September, and a late brood of turkeys, bought of a farmer, will do no damage. They are about as easily managed as a hen and chickens and give a great deal of stisfaction, where there is room for them. They are beautiful to look at while growing, and they make roast turkey cheap and easyto a good many who do not know exactly how to pay the common market price for the luxury. This is an item of household economy worth looking at by those who have only an acre ortwo of land. So thinks Jonathan. —*Agriculturist.*

LARGE DEPOSIT OF HONEY.

A somewhat singular discovery was made in a house in St. Louis. The *Argus* gave the following account of the story:—The inmates of one of our largest up-town mansion houses, a few days since, were surprised to find a large number of bees flying about in two of the upper rooms. As the little fellows continued to occuppy the places, a bee naturalist was sent to investigate. On entering the rooms, he exclaimed: 'You have honey somewhere here,' and proceeded to search for it. On removing the fire-board, he discovered that one flue of the chimney was full of honey-comb, which was hanging down into the fire-place, and the honey dropping from it; proceeding to the top of the house to sound the chimney, he found it the same; one flue of the chimney was full, and the bees were industriously at work there also. These flues of the chimney had never been used; they were plastered smooth inside, and were perfectly dark, a stone having been placed on the top of each flue. The bees had descended the adjoining flues, and found small holes about ten inches from the top of the chimney, leading into the closed flues, and through these holes they had made their way in and out. They have, it is supposed, occupied these places for three years, having been kept warm in the winter by the heat from the adjoining flues. On removing the fire-board, the bees, seeing the great light which had broken in upon them, descended to the room and gathered on the windows, until they were covered to the thickness of three inches. It is estimated that there are in the two flues from 40,000 to 50,000 bees, and from 2,000 to 3,000 pounds of honey."

BUTTER MAKING.

From a lecture by James Dumbrill delivered before the London Farmers' Club, we take the following:

The dairy-room should be used for nothing but its legitimate purpose, the reception of milk.

The floore should be a few feet under ground, dry, and airy, and shaded from the sun. Benches should be open wood-work. It should be heated in winter with hot water pipes, so as to maintain a temperatuse of about 56 degrees. This is the easiest mode of applying artificial heat, and as efficacious as any. From experiments which I have made upon the application of heat to milk, I have found that a sustained temperature of 56 degrees raises as much of the cream as can be raised, and that although by increasing the temperathre by direct aplication of heat, either by applying boiling water, or by placing the pans of milk on a hot plate, the cream may be drier and appear thicker, yet there is in reality no increase of butter. A dry, warm, temperature, and a current of air through the room, aae the best conditions for raising cream; a heavy, damp atmosphere the worst. The milk pans should be made of tin, oblong, with rounded corners. With round pans too much bench room is waated. With earthen pans, the lactic acid will, after a time, destroy the glazing; auk glass pans chip too easily.

Now comes the greatest secret of successful butter-making, namely, churning frequently. Butter, to be perfect, must be churned every day, or at any rate, every other day. The cream must not be in a state of demptisn, or you cannot possibly have good Great attention must be payed to this point, and the most scrupulous cleanliness is reduired in every part of the management.

THE WAY TO KEEP MILK.

From a treatise on the Consumption of Milk, by Silas S. Loomis, A.M:, M.D., in the volume of the Patent Office Report devoted to agriculture, we extract the following remarks on the preservation of milk :—

There are three methods of preserving milk. 1. By heat. 2. By evaporation or condensation. 3. By cold and quiet.

1. HEAT. There are two methods of preserving milk by heat. First, by heating it in the open air. This is very commonly resorted to under the name of scalding the milk. Several years since Gay Lussac demonstrated that if milk be heated gradually to boiling point two days in succession in the winter, and three in the summer, it would keep two months without souring. Second, the milk is first bottled up tightly with wired corks and placed in kettles of cold water. The water is now gradually heated to boiling point, when the kettles are removed from the fire and allowed to cool. The bottles are then taken out and packed for future use. Milk treated in this manner will keep for six months. It has been claimed that the addition of soda or hedge mustard has a good effect, but it is believed that the real preservative power is the heat. By these methods the milk loses its primitive taste, and is not suitable for many purposes, nor can they be practically employed by dairymen supplying our cities.

2. EVAPORATION OR CONDENSATION.—This process was patent a few years since, and consists in evaporating the watery portions of the milk till it solidifies. It is then put up in sealed tin cans and can be carried to all parts of the world. It keeps sweet a great length of time, and is used most extensively by people at sea. There are several large manufatories in Connecticut and New York which have been in operation for several years. The particulars of the process are not known to the public.

PRESERVATION BY COLD AND QUIET.—This is the process practised by dairymen generally, who are compelled to send their milk to market by the cars. The process consists in cooling the milk to about 40° Fahrenheit, as soon as possible after milking, and in keeping it at that temperature, in perfect quiet, till it is ready to be carried to the cars.

The essential requisite is a spring of cold water. The quantity of water is not of so much consequence as its degree of coldness and permanency. The water should be conducted underground the 'shortest possible distance to a suitable place for the location of the milk house. This place, if possible, should be on the north side of a hill, well shaded, and so situated that the water from the tank will readily flow off. The house should be of such size and form as to admit of a tank two feet wide, and of sufficient length to hold all the milk cans. The depth of the tank should be about four inches less than the depth of the can. Each can should have a separate division, and the divisions so arranged that the water may pass from one to another.

The water from the spring should enter at the bottom of the first division, and from the top of the first enter the second, then from the bottom of the second enter the third, and so on alternately entering at or near the top of one and the bottom of the next division. This secures a perfect current around each can, particularly if the top entrances are at the back side of each alternate division and the bottom entrances at the front side of the tank.

The tank should be so arranged as to be out of the way of any currents of air. The ventilation of the house should be only sufficient to keep the air pure. Most milk houses admit altogether to much air. In all cases, all ingress of air to the house should be prevented as soon as a thunder shower is seen rising, and no admittance allowed till the milk is to be removed. In clearor in rainy weather the ventilator may be open, but never in showery weather.

Ozone, which is freely generated by electricity, acts energetically on milk, souring it a few minutes, many times destroying the milk before the shower had passed over. Therefore, all air from the vicinity of thunder showers, which always contain ozone, should be carefully excluded from the milk house.

Having prepared a place for the reception of the milk, its treatment remains to be considered. The cows are milked in the cool of the evening, just after sunset, and the milk is strained into the cans which are to convey it to market. These cans hold about forty quarts, and when filled weigh about one hundred and twenty pounds. They are made of strong tin, and are well bound. As fast as the cans are filled they are placed in the tank, beginning at division No. 1. The cans remain uncovered, and the milk is not allowed to be stirred or even jarred.

The tank should be so constructed as to be

disconnected with the building. It should rest flat on the ground, so that any jar of the building cannot disturb the milk in the cans.

In the morning the cows are milked before sunrise, and the milk placed in the cans as before. If there is a can partly full of night's milk, it must remain so; the warm morning's milk must not be mixed with the cold night's, but kept separate. In no case must a can of morning's milk stand in the tank above a night's can, for in that case the warmth of the morning's can will be distributed over the night's milk, and the process of souring initiated.

At about 3 or 4 o'clock in the afternoon the milk is to be carried to the cars. The cans are then to be filled if necessary. The milk being all cool can be mixed; in fact, there is no difference between the night's and morning's milk. No parts of cans are to be sent to market, but to be kept over twenty-four hours longer.

The cans are then placed in a wagon, and a wet covering spread over them, over which are thrown buffalo robes or other covering. At the railroad station the cans are closely packed in a closed car without anything being thrown over them, and during the night reach New York. "The rate of a night milk train when in motion is twenty miles per hour."

The cans are then taken by milk carts, and the milk is distributed to consumers. The milk, therefore, does not leave the cans till it is sold, and generally it is disposed of at a temperature nearly as low as it left the milk house. In this condition it will keep sweet twenty-four or even thirty-six hours, and is a pure country milk, quite different in value from that peddled at a smoking temperature of 70° or 80°

A similar process of cooling milk has been practised several years. It has been thought necessary to stir it several times while in the tank to aid in cooling, but it is now, however, found that this treatment is highly injurious. The milk should be kept as still as possible till cooled to about 40° Fahrenheit, or below, when it may be stirred or transported to a great distance without injury, provided the temperature is not elevated.

The above process is that practised on the Harlem railroad during the hot months. Not so much care is necessary during cool weather. The water, however, is always kept running, and the milk houses kept patterns of neatness. The cans are cleansed with boiling water and sand after returning from the trip. The cost of transportation averages one cent per quart; the producers sell it, delivered at the station, for two cents; therefore it costs, ready for delivery in New York city, three cents per quart. Usual retail price six cents.

This process is available and practicable for all milkmen. The milk should be cool in all cases before carting it. Milk that is not cooled commences decay in a few hours after milking, and is not a healthy diet. Sour milk is not so injurious. It is milk that is in a state of change that is unhealthy.

No food should be eaten while a chemical change is going on among its constituents.

The plain suggestion, then, is to have milk cooled before it is offered for sale. Milk in the evening and peddle it in the morning, and sell the morning's milk in the afternoon.

In this manner the territory around our large towns and cities for producing milk will be greatly enlarged, and milk may become an important article of food.

There are certain purposes for which feed-cutters are very useful. We do not intend to say that it is expedient to cut all fodder. Take good fine hay for example: It is easy to see how any saving can be made by cutting, if it is to be fed to stock that have nothing to do but to eat. If intended for horses or oxen which are worked so constantly that they have but little time to eat, the cutting may enable them to fill themselves sooner than if the hay was in a long state, and may also save something in the muscular force expended in mastication. But if the hay is coarse—clover, timothy (herds-grass), orchard grass, &c.—cutting will render it more acceptable to the, and it will be eaten with less waste than if uncut. Again, if coarse fodder—as straw or corn-stalks—is to be mixed with that of better quality or with meal, the intermixture can be more readily effected by cutting. There is still another advantage in coarse or refuse fodder: it works more readily into manure. We have known good farmers, who had cutters worked by horse-power, cut coarse corn-stalks which were unfit for cattle-food, and straw that was intended only for manure. They argued that the coarse uncut stalks and other fibrous matter remained in the manure-heap too long without rotting; that they were troublesome in loading and unloading the manure in the spring; but that by running them through a cutter all this difficulty was obviated. Besides, corn-stalks in a whole state do not absorb liquids readily; cut them into inch pieces, and the spongy substance which constitutes the inner portion, will immediately take up a large quanity of liquid, which, especially if it is urine, hastens their decomposition. A farmer who has a cutter which can be worked by horse or steam power, can find many days in the course of the winter when a great amount of cutting can be done with little cost.

MANAGEMENT OF HONEY BEES.

This season, in Central New York, has been one of the best for storing surplus honey that I have known for many years; and it is important that bee-keepers should know how to avail themselves of the labors of the bees on such extra occasions, so that they may not be idle for the want of space in which to deposit the honey.

In many cases, as all experienced apiarians know, a set of caps will be filled before, or about the time that swarming commences. Stocks which thus fill the caps, and swarm immediately after, will not generally be able to store up any more honey; but if they do not swarm, as often happens, the bees increase in numbers till large clusters adhere to the outside of the hive day and night, and their labors are wholly lost. My system with such families is to supply a double set of caps, one upon the other, with a passage of inch holes through

them. I frequently set these double tiers of caps upon all my strong families early in the season, and then regulate them according to circumstances. If I find that but one set can be filled, I remove the others where they are needed, even after a good beginning of comb building has been commenced in them. In some cases, when the caps are nearly filled, and it is evident that the bees are too weak in numbers, owing to having swarmed out, to complete the filling of them, I remove them to hives where they will be completed.

I remove the bees in them as follows : I set the caps upon boards, with the holes in them so as to allow the bees to come out, and then cover the whole with a box, which I raise from the boards about half an inch, which allows a little light to enter, and the bees all leave their boxes during the day, and return to their hives. Sometimes, in cases of brood being in the caps, the bees will not leave them, and it becomes necessary to return the caps to the hives, till the brood matures. I found drone brood in a good many of my caps this season, which was caused by the lack of space below to rear that class of bees, owing to the cells having been filled with honey, before the queen was ready to deposit her eggs for drone brood.

Where hives are made in moveable sections —the upper parts to lift off, a set of caps, with bees therein may be rid of them very handily, by covering them with the upper part of the hive, while the holes in the hive proper may be temporarily closed with anything handy for the day. At evening the boxes will be free of bees, and the *supers* of the hives may be placed in their proper position.

On one occasion, I tried the experiment of removing a set of boxes, about half filled with honey and bees, from an old stock to a swarm, about two weeks old, which I considered able to fill up said caps. The bees in the hive immediately began to eject the bees in the caps, and the war waged about 24 hours, when I judged that half, at least, of the bees in them had been killed. From this experiment, we learn that it is better to give the bees a day, under boxes, or the supers of the hives, to leave the caps, before they should be placed over other families.

Cases occur where caps are filled with combs and honey, but the cells are not sealed over, and if left to have that done, a week of time is lost in the best of the honey harvest. On such occasions, I transfer the caps to some weak family, or swarm, with bees enough to seal over the caps, while I place an empty set of caps upon the hive from which they were taken, which are filled; but if I had waited to have had the combs in the original set sealed over, I should have failed to obtain a second set of caps filled.

My caps, when filled, weigh from six to seven pounds, and *four* constitute a set, worth in the New York market about *one dollar* each; therefore it may be readily said that a family of bees may be made to store up *four dollars'* worth of honey *extra* from what is generally expected, merely by a little good management.

I had one family, this season, very strong, which filled *thirteen* caps, and would have filled several more, had not some of those filled contained drone brood, and could not be removed. Here we have a case in which *thirteen dollars'* worth of honey, at least, was stored by a single family of bees, when under ordinary management, it would not have stored over 20 lbs., worth from $3 to $4 in New York. This family did not swarm, of course.

But after all, bee-keeping in most hands is not very profitable; and frequently, where large numbers of families, say from 15 to 100, are purchased by persons who are not skilled in the management of bees, a considerable loss occurs, and eventually the business is abandoned in disgust. I advise no one to embark in this busines, until he has first spent years in the careful management of bees, and then it is unsafe to invest much *cash* in it. If one can obtain a large apiary, by the increase of a few original families, it is well; but to invest hundreds of dollars in bees, with but little practical knowledge, is not wise. Some people after having read some good practical work on Bee-keeping, imagine that they know all about it, and at once launch out into the untried field, to reap a great deal of disappointment, to say the least of the matter.

But little can be done with bees from now till they are put into winter quarters, except to prevent their robbing each other's hives, which is effected by letting down hives, if raised, upon the stands, and partially closing the entrances of weak families—not *after* the robberies commence, but now before the damage is done. When the honey harvest has not been abundant, and where weak families of bees exist, they must be looked to immediately and their passage-ways closed so as to allow but two or three bees to enter at once; and in some cases of weaker families, but one bee at a time.

A little attention to this matter *now* will, perhaps, save the loss of several weak families in every apiary. You need not trouble yourselves at all about the strong families, as they can and will take care of themselves.

ASSOCIATED DAIRIES.

To a countryman who visits the city and spends a morning hour away from the marts of trade, one feature that is likely to attract his attention, is the number of milk waggons with their tin cans that are seen passing to and fro. This feature is usually wanting in country places. But since the first of May it is added to the travel that passes our door. Unlike the city milkman, however, we do not see them stopping at the houses on their way distributing their load, nor do we hear the city milkman's peculiar shout. But passing quietly along, they return again in an hour or so. This has become a regular feature now, evening and morning, every day in the week.

The cause of this new business feature is this: some 25 or 30 dairymen in this neighbourhood have combined, and bound themselves to one man, Mr. G. B. Weeks, to deliver to him during the term of five years the milk of a certain number of cows—Mr. Weeks to provide suitable buildings and apparatus for making and

curing cheese, and to receive a stipulated sum per cwt., for manufacturing. Each man is to pay his share of the expenses for making, and for all the materials that go into the cheese, such as salt, bandage-cloth &c; and to receive his share of the nett proceeds of sales in proportion to the quantity of milk that he delivers. A committee of three, of which Mr. Weeks is one, are authorised to make purchases and sales.

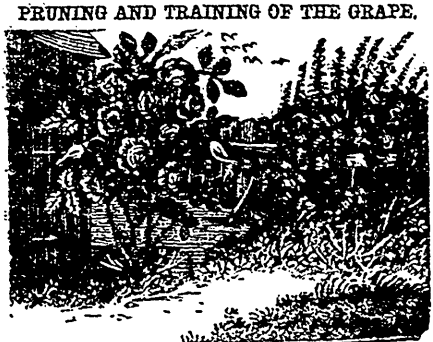
A visitor to the establishment, if the hour was at 6 to 8 o'clock in the morning, would probably be attracted to the smaller of two buildings—26 by 46 feet—for at this time the morning milk is being delivered. The cans pressly for this purpose, round, of the same size from top to bottom, with covers to fill the inside, so as to be pressed down upon the top of the milk, and a faucet or gate at the bottom through which the milk is discharged by tin pipes into a similar can inside the building. In this can each man's milk is measured by gauging, and is thus discharged into one of three tin vats, of a capacity of 500 gallons each, occupying the centre of the building. These tin vats are standing in plank vats, with a narrow space between the plank and tin, through which a current of cold spring water is made to pass during the night, keeping the milk of the evenings delivery cool through the night. When heat is required, it is raised to any desired temperature by turnin off the cold stream and introducing in its place a current of steam from a boiler like a small locomotive boiler. No other heat is used; and in these three vats the milk is made into curd ready for the press. On one side of the room across the ends of the vats, is another shallow vat or sink of plank, standing on wheels, on a railroad track extending into a wing of the building used as a press-room. The curd, when ready, is dipped into the hoops standing in this shallow vat, and thence passed out to the presses. A simple iron screw, turned by hand, is the form of the press preferred.

From the press-room the cheeses are taken to another building—26 feet by 100 feet, two stories high—used for curing and storage. Four double tables extend lengthwise through each story, for sixteen rows of cheese. About 300 are now to be seen on these tables, and they are adding to the number at the rate of over fifty per week, of a diameter of 23 inches, by about nine inches thick, weighing about 150 lbs.

The advantages claimed for this combination of dairies are many. Among them are the saving of labor—the service of only four or five persons, men and women, being required—a saving in material, the expenses for bandage and boxes being proportionally less for large cheese than for small. But the greatest advantage is found in the superior quality, and high market value of the article manufactured. This is secured by the employment of persons qualified by exclusive application to this business, and by the superior facilities which can be secured for a larger establishment.

HORTICULTURAL DEPARTMENT.

PRUNING AND TRAINING OF THE GRAPE.



As usually received from the nursery, one or two year old plants, if raised from cuttings, consist of a short stem two to six inches long, one or two shoots and a large quantity of spray or small twigs, consisting of the laterals of last year. If raised from eyes, there will, in general, be but one shoot, with perhaps a few laterals. Under any circumstances, the plants ought to be cut back at planting to two good eyes, and as soon as they have made a few leaves, cut off the upper one as close as possible to the one left, taking care, however, not to injure the base of the remaining shoot, which ought to be kept tied up to the stake as fast as it symptoms of leaning over. The base of the shoot which is retained, (that is, the point at which it springs from the old wood,) should be as low down as possible—if even with the surface of the ground, so much the better.

The object of leaving two eyes at first, is merely to guard against accidents. If we could be insured against them, the upper one would be better away. Little else can be done during the first year than to keep the ground mellow, loos about the plants, and free from weed. The vine must also be tied up during the season, and if a little liquid manure could be applied to them while growing, it would prove of great benefit. In applying this stimulant, its is necessary to use it in a very diluted state, and if possible, just before or during wet weather. When applied during very dry weather remove the surface soil to a depth of three or four inches, and gives at least a pailful to each plant, working the soil as little as possible, lest it be converted into puddle. Such an application will last for ten days during even very dry weather, and will do more good than frequent sprinkling.

Winter Protection of Young Vines.

At the close of the season, the vines may either be bent down and covered with earth in the manner usually adopted for covering raspberries, or they may be left upright, and tied to the stakes, a mound of earth being raised up around each such mound, being at least 18 inches high. The soil of which it is made should be taken from the centre of the rows, as if we

take it from about the plants, we only cover the stem to expose the roots.

Where the vines are left tied to the stakes, we prefer to leaving them unpruned. True, most of the wood gets killed, but this is of little moment, since it is to be nearly all cut away at the spring pruning.

Management during the second Year.

As soon as the severe frosts of winter and early spring have passed away, uncover the young vines, and if not already pruned, cut them to a good bud within nine to fourteen inches of the ground. They should be shaded for a few days from the sun and cold, which may be very well done by sticking a shingle before each, though two shingles placed so as to form an angle in which the vine may stand, will be better. We have now arrived at a point where it will be necessary to decide upon the peculiar system to be adopted in the training of our vines. Instead, however, of describing all the different modes of pruning and training in this place, we shall give only that which we consider best adapted to the Native American varieties, and leave the consideration of the others to the chapter on general pruning and training.

I fthe plants have made but a weakly, stunted growth, it will be necessary to all them another year before proceeding to grow shoots for permanent arms or branches. In this case but one shoot should be trained up, which may be treated peecicely as directed for the first year.

But if a cane of from six to twelve feet has been produced, we may safely proceed to train up two cane, which will serve for the future arms of our vine. To do this, after cutting down the first year's shoot as directed, remove all the buds except the three uppermost, and as soon as these are beyond danger of accident, rub off one if three should still remain. The two shoots which are left must be carefully trained up, the laterals being pinched out and any fruit blossoms which may appear being removed.

The ground should be kept clean and mellow during the season, and by the first or middle of September the further growth of the canes should be stopped by pinching off the ends—the wood being much more thoroughly ripened when this is done.

It will be necessary or at least advisable, to lay the vines down this season also and protect not only the old stem, but at least four feet of the young shoots. The stakes may be removed, and during the fall or early spring the trellises may be erected.

Management during the third Season.

The trellises having been constructed in such a manner that the lowest slat or wire may be just below the base of the second year's shoots, that is from nine to fourteen inches above the surface of the ground, these two shoots should be firmly, though not tightly tied, in a horizontal position and all buds should be rubbed out cept three on each arm, (orshoot,) thus leaving six on each vine. Each of these buds should produce a shoot which, if the ground has been in good condition and the plants healthy and properly set out, wouldreach from twelve to twenty-five feet unless stopped; and it is upon every second one of these that we depend for our next years supply of fruit, they deserve and will require great care and attention in order that they may be finally of equal strength and well ripened. Every second shoot should be stopped when it has made a growth of about two feet, and if any of the others should so far outstrip their compeers as to reach the top of the trellis much before them, they should be stopped also, though exceptin the case of excessive growth all shoots had best be allowed to grow on until the first of September, when they may all be stopped at once, unless it be deemed best to allow the weakest a few days longer growth, in which case it is surprising how soon they will overtake their companions.

Stopping, or pinching, consists in breaking off the end of a shoot, and its immediate effect is to arrest the further growth of the cane, or at least its further lineal development for the time being. But although no more leaves are immediately formed those already in existence form their usual functions and the whole energies of the plant are directed to the ripening of the wood already produced. After a time, one of the buds near the extremity of the shoot will probably break and become the leader, when it should be stopped in turn, this process being repeated as often as any symptoms of vigorous growth are exhibited. The result of all this checking is to lessen the ultimate amount of wood produced and to improve its quality both as to ripeness and density.

Stopping furnishes us with an effectual means of equalizing the growth of our young canes —a most important point, not only as regards the neatness of their appearance, but the regularity with which the fruit buds will break next season and the strength with which they will shoot. But as the latter points depends not upon the *size* of the canes, but their *maturity*, it is necessary that an equal growth be kept up during the whole season. This is easily accomplished, as the stopping may fortunately be performed at any time.

The same directions as to the removl of laterals and the clearing of the ground, should be observed during this as during former years. Greater care is, however, required in the treatment of laterals when raising fruit-bearing canes, as if by too close pinching we should cause the buds which are found at the base of the leaves and upon which we depend for our next year's fruit to push, our prospects would be materially injured. A good rule will be, never to pinch out the laterals, and stop the main cane at the same time; and if the vines show a very vigorous growth of wood, to allow the laterals to make two leaves before stopping them. If the vines are weakly, we may stop the laterals as soon as they appear, as in this case, the main shoot makes sufficient draft upon the roots to keep all other growth in abeyance.

SUMMER PRUNING AND GRAPE VINE.

At a meeting of the Grape and Wine Growers' Association of Northern Ohio, on the 24th ult., Charles Carpenter, of Kelly's Island, gave the following as his method of Summer Prune

"The many directions given for summer pruning grape vines are enough to bewilder the novice, if not those of some experience, and I hope, in attempting to elucidate, I shall not further mystify the subject. As a general rule, prune as little in summer as you can, and not let the vines get so thick as to cause any of the leaves in the thickest places to turn yellow, or deprive the fruit of plenty of light and air. The winter pruning should be more severe than is usually done. In vineyard culture, where forty or forty-five superficial feet of land are allowed to a vine, from thirty to forty eyes to a vine for bearing are plenty for most varieties. Never leave one bud or joint per surface foot of land where the soil is favorable; and where it is unfavorable, the vines should be planted farther apart, and a less number of eyes for a given surface left.

"Now, if the winter pruning has been properly done, but little will be necessary in summer, and should commence early by removing water sprouts, superfluous buds, and wherever, from short-jointed canes, or too close training of them, there will evidently be too dense a mass when grown, thin out a part.

"As soon as the fruit is set, select the shoots for the next year's bearing, which should be grown on spurs, on the lower part of the stock, and trained as much as practicable aside from the fruit and above it, and have the laterals picked out for three or four feet, so as to have a clean cane for next year, and keep the vine open near the fruit. Beyond this, remove no laterals, nor stop the ends of their canes.

"Some of the fruit bearing shoots, particularly those near the ends of the canes, will incline to make too much growth; these may be stopped at from three to six leaves from the last cluster of fruit. Of the fruit-bearing shoots, except those near the end of the cane, but few will need stopping, if there is a full crop of fruit, and proper attention is given to tying up so as to keep the growth *spread* and open. Always endeavor to prevent growth by stopping ends and removing buds rather than to cut away after the growth is made.

"In all summer pruning and tying up, care should be taken that fruit grown in the shade should not be exposed to the direct rays of the sun. If the shade under which it has been growing is removed, it will surely be injured, if not spoiled.

"The best grapes are always grown in the shade of the foliage. They require light and circulation of air. Those grown under the direct rays of the sun are smaller, harder pulped, and inferior to those grown where they have considerable protection."

CROPPING ORCHARDS.

We have been somewhat surprised at finding in the *Gardener's Monthly* an editorial article recommending seeding orchards down to grass. The editor of the *Monthly* is an experienced horticulturist, and his opinions on this subject are entitled to respectful attention. We give his article entire, as follows:

"A question of immense importance to the fruit grower has for some time been under discussion, namely, should orchards be kept cultivated with other crops, be kept hoed and cleaned without other crops, or be laid down as a pasture or be kept in grass? We have forborne for some time any fresh allusion to the topic, as it is one worthy of discussion without prejudice, or with an influence in favor of foregone conclusions; as an orchard in bearing is not the work of a day, and we should be slow in adopting a practice either way that may injuriously affect our trees, without a conviction, founded on some pretty sound reasoning, that it is a correct and proper one.

"There are several good reasons in favor of cultivating and cropping an orchard. A soil that has a loose upper surface such as the cultivator leaves, is always cooler and moister in summer than one which is suffered to lie in a hard and neglected state. This must be conducive to free growth and to a full and perfect setting of the fruit. Another good point is that in cropping, manure is generally applied, and a portion of this plant food is appropriated by the fruit tree. This also stimulates an active growth, and in certain periods of the tree life is of course a benefit. There are no other advantages claimed for this course, and they are summed up in this way: Cultivating and manuring make the trees grow.

"On the other hand, vigorous growth is not always emblematic of health and productiveness,—rather the reverse, for vigorous growth is antagonistic to abundant fruitfulness. A tree that bears young is soon exhausted, becomes stunted, and is never worth the room it occupies; while one that is in a continued state of vigorous growth rarely bears fruit in any abundance: and this is the advantage claimed for laying an orchard in grass, that this exuberant growth is held in check, while, by annual top-dressings, a sufficiency of nutriment can be furnished the trees to keep up a sufficiently vigorous growth to maintain the productiveness of the tree.

"We have advocated and still defend this practice. The writer was raised in an orchard. Circumstances so ordered that trees and plants were very near the sole companions of his boyhood days. Not until the threshold of manhood was reached, had he much other amusement or occupation than to note the beauties and attraction, the wants and wishes, of his vegetable friends. Yet, from that early day to this, he cannot remember an instance where fruit trees, in a well-kept and cultivated garden, remained perfectly healthy for a long period, or ever produced but a very moderate crop of fruit.—the Dwarf Pear alone excepted, and this reservation he is not sure need be made under all circumstances. On the other hand, orchards in rich pastures, or in well-cared for meadows, have uniformly been as healthy, moderately vigorous, and with a prolonged productiveness, as the most exacting fruit grower could desire. And since the existence of this journal, we have noted all that has appeared on every side of the question, both by actual observation and from the experience of others; and we cannot but conclude, that the uncropped orchard has the best of the argument, all things considered.

"Advocates of this practice are at times charged with inconsistency. 'You oppose great vigour in fruit trees,' say some, 'and recommend

root-pruning as a corrective; yet, when we root prune with the cultivator, you oppose the practice!' But root pruning and fibre pruning are different matters, and have different results. The one checks growth—the other increases it. Such is the consequence in practice, and we need not enter here into an argument to explain why it is so; our limits will only permit us to say, as the result of a careful examination of the subject, that when trees appear weak and stunted, cultivate and manure until you get them into a fair free growth; after that seed the orchard down in grass, bearing particularly in mind that annual top dressing or mulching under each tree, must by no means be neglected."

Management of the Bare Stems of Trees, and Watering.

It is familiar to horticulturists and physiologists, that as long as trees continue in a state of vigorous growth, they keep cool or maintain a low temperature in every part. An apple, while growing on a tree, or remaining attached to the branch after maturity, will not become heated, with the severe rays of summer pouring upon it. When it is severed and falls to the ground, it soon becomes hot in the sun's rays. It is so with the stem or trunk of a tree. If there is a free growth, the bark is rarely injured by heat; if the tree has been checked or rendered nearly dormant by previous transplanting, or by neglect in cultivation, the danger from this cause is greatly increased. We frequently see half dormant trees with burnt and peeling bark on the south side, after a hot summer. The remedy for this evil is good cultivation in the first place, and if this is insufficient, shading the stems by tying on a loose covering of straw, and if but few leaves have come out, keep this straw wet by occasional applications of water. Transplanted trees sometimes remain green many weeks without expanding their leaves, and they are often injured in this condition by soaking the roots, and leaving the stem to dry. Roots need a copious supply of moisture only when they have plenty of leaves to throw it off and pump it up from below.

Many newly set trees are killed by injudicious watering; the water is poured on the surface, and first wets and then hardens it, and renders it worse than before. If any watering is given, the soil should be first taken off the roots, that it may pass freely among them, and the mellow earth is to be replaced. But even this must afford but an irregular supply, and cannot be so sod as the constant and uniform supply furnished by a well cultivated mellow soil, or by a well mulched surface. In conclusion, our readers who may have planted out *cherry trees* the past spring, may properly be reminded that there is nothing that will more certainly secure them from the midsummer death to which they are so liable in hot seasons, even after making two or three inches growth, as a thick heavy mulching of old straw hay, or saw-dust extending several feet about the tree; and in the more doubtful cases, it may be best to straw the whole stem, and keep this daily watered for a time. At the same time surface watering for such trees is positively detrimental; in proof of which we may mention a single instance out of many. A neighbour set out 50 fine cherry trees—he watered 25 and left 25 unwatered. Of the former, one-half died; of the latter but two of the whole. A good mulch would probably have saved all.

Remedies for Barren Fruit Trees.

It seems strange, many times, that some fruit trees will blossom profusely, from year to year, and always appear to be thrifty, and healthy, and never produce any ripe fruit. In many instances, we see no more signs of fruit than the blossoms, while in many other cases, the young fruit will all perish before it has attained the size of peas. Without noticing any of the *causes* of the want of fructification in fruit trees, I will simply notice some of the efficacious remedies for those trees which never bear, or at least, never produce any fair and sound fruit.

In the good old days of hard cider and pure rye whisky, when I was quite a small lad, I well remember that my father had a large cherry tree which was loaded from year to year with fruit, having a perfect pit and skin, but almost destitute of pulp. Pruning was resorted to without the desired effect; and it was concluded that no remedy would render it productive. But, at the suggestion of a stranger, a hole was bored almost through the body of it, with an inch and-a-half auger, slanting downwards, when it was filled with pure rye whisky, and the hole was plugged up tightly. On the following season, when we looked with anxious eyes for good ripe cherries, we were by no means disappointed; and every year since that time, until the tree became too old to produce, unless it was cut off by an unseasonable frost, the old tree produced an abundance of fair fruit. Whether the whisky had any efficacy in producing fructification, I am unable to state. But one thing we know; it produced well afterwards.

About twelve years ago, I had on my own farm, two barren trees, about twenty years old —one was a Richmond cherry tree, and the other a quince pear. I had pruned them from time to time, as they appeared to need it; and had scraped off the bark of their bodies; and had manured them. Still I sought fruit on them in vain. I then made a portable fence around one of them, enclosing about one rod square; and then, put in two shoats that were to be kept during the winter. This was early in autumn. They were allowed to remain five or six weeks in that yard, when they were removed to another tree. They rooted the entire surface over and over, to the depth of several inches, around each tree. The result was, that every season since, when the fruit was not injured by frost those trees produced a good supply of fruit.

Another pear tree, but a few rods from these just alluded to, would seldom produce a single specimen of fair fruit; it would all be knotty, full of cracks, one-side very small and covered with a black crust, or kind of scale.

With the plow and scraper, all the earth around it was removed, to the depth of four or more inches. Afterwards a few loads of soil

were hauled from the highway side, and spread around where the earth had been removed. About half a two-horse load of the best barnyard manure was spread on the surface, in autumn. The tree had been properly pruned u former years. The result was, that the season, it was well loaded with large, fair and licious fruit; and has produced abundantly every alternate season, ever since, which the frost in the spring did not injure your trees.

An infallible insect destroyer.

Almost every day we receive inquiries for some easy method of destroying insects—some process by which they can be routed at one blow,. and without labour, care or expense. As a general rule, we have no such information to give, no easy road to success—vigilance is the price that must be paid by every one who succeeds in growing fine fruits and flowers. The last number of the *Gardener's Monthly*, however, contains an excellent article, giving an infallible remedy for the destruction of insects that destroy our fruits and flowers, and mar the beauty of the shade trees, which we copy for the benefit of all earnest inquirers after truth:

"Oh dear! oh dear! what shall I do with them nasty worms on the shade trees at the sidewalk and the bugs on the roses; we shall have to cut down the trees, and give up growing flowers altogether." Thus, half inquiringly, half in despair, Mrs. Smith appealed to her better half, who was engaged over his evening paper, calculating the chances of a rise in stocks at the next morning's board, as the result of the last "glorious news" of a complete victory of the government forces over the rebels. "Don't know much about them things," he growled; write to the editor of the *Gardener's Monthly*."

But the indefatigable Mrs. Smith, despondent when humored, but importunate when crossed, was not to be put off this time; and with a "Now do come out and see how the horrid things have ruined me," she led the meek Mr. Smith out as a sheep to the shearing, to behold the desolation the insidious scavengers of nature had brought upon her garden. She could not have hit on a more propitious moment for that excursion. Another man, on such an errand, led by such a leader, would have at once brushed up his earlier studies in chemistry and the natural sciences, in the hope of suggesting a judgment on the momentous case he was led out to try; but he, wrapped in his figures and his calculations, was in the most practical mood possible, and ready to give to any subject brought before him the benefit of his matter of fact ideas.

And first, they went to the "trees in front," where all over the bare shoots the caterpillars were holding a glorious carnival—gorging on leaflet, and hanging from limb as if in conscious security, having already withstood the most powerful attacks of the most popular nostrums that the tact and talent of Mrs. Smith could bring to bear against them. "What shall we do?" now again demanded Mrs. S., feeling instinctively that from their united action some good idea was about to flow. "Don't see much difficulty," doggedly remarked her spouse; "there can't be more than six hundred on the tree altogether." "Only six hundred! and what of their number; see the damage they do us—not a leaf—." "Wait a moment; I was going to remark that there are not six hundred altogether. I am sure I could pick off three hundred an hour; and any smart man you can employ, in a few hours would rid your trees of these vermin at once and forever."

That idea did not fall on stony ground, but on rich soil, where it took root, and the next day sprouted quite into action. By the third day after the tree was cleaned of caterpillars, and by the end of the week, each rose bug had gone to that bourne from whence no rose bug returned that year or the year after.

"Mr. Smith," said his good lady to him one day the next year, while beaming with the pleasure her insect-cleared garden afforded her, "why don't you apply your arithmetic to the curculio in your fruit patch?" "Can't catch him like you could your caterpillars," says he. But Mrs. S. had learned something by this time. Her success had encouraged her, and she had studied Rathvon's insects in the *Gardener's Monthly*, and was ready with an answer. "You could not catch the moths that originated the caterpillars, but the caterpillars, their larvæ, did not escape your unerring figures," she archly replied, "and if you cannot catch the curculio, cannot you destroy its larvæ also?"

Mr. S. took the hint. It was May; the cherries were turning colour; the plums were well set; the peaches, apples and pears gave promise of an abundant crop, only for the mark of the little beast on their waxy fronts, which told a suspicious tale. His mind was made up; before night John got his orders, and before another sun had set, every cherry, peach, and plum—every fruit, good, bad, and indifferent, that could afford a nidus for the curculio, and probably had—was carefully gathered and committed to the flames. There was no fruit left that year, and we suppose no insect eggs left to rear another crop. But whether it was worthy of the sacrifice, it is not for our pen to tell; all we know is, that the little Smiths were set to reading of Æsop's Fables the last winter's nights, and that one was particularly underscored for their attention, which relates how a certain man, on his death-bed, set his lazy sons trenching up the ten acre lot in order to find gold, which they only found in the increased productiveness of the deep tilled land after all; and the moral we draw from the whole story is that a little more labour and perseverance on the part of horticulturists would render the numerous insect-destroying nostrums as valueless as love-powders are usually found to be.

Culture of the Strawberry.—J. Knox, of Pittsburgh, (who has 50 acres of strawberries in the highest state of cultivation,) gave, at request, the following statement, in substance, of his method of cultivating the strawberry.

His soil is a light clay, with limestone. He thought such a soil preferable to a light one. He first underdrained thoroughly, and then stirred the soil twenty inches to two feet in

depth. Such treatment is best for almost any kind of fruits or fruit trees, as peaches, grapes, and all else. He employs two horses with a common plow and a subsoiler drawn by a yoke of oxen; I continues to plow in different direction. Il the whole is thoroughly rendered mellow down about two feet. Strawberries, he has found, do not need much manuring; good wheat or corn land answers well. He plants in rows two and a half feet apart, and ten inches asunder in the row. He has used a cultivator between the rows, and after this a subsoil plow; but latterly he has discarded all horse-cultivation, believing that the less the roots, which cover the whole ground with a network of fibres, are disturbed the better. He merely has the weeds cut with a hoe, and carefully takes all the runners off by hand. No plantation for fruit should be allowed to produce any runners, nor to bear any fruit the first year—this course only applies to that portion which is set apart for a crop—another portion is allowed to increase by runners for the purpose of making new plantations. The plants are set out early in the spring. By keeping the runners closely cut, the plants bear an abundance of fruit only; the two objects, fruit, and new plants, should be kept perfectly distinct.

The plants are protected in winter by a covering of straw threshed with the flail that it may be easily handled and spread. Rye is preferred for this purpose. Two loads per acre is the usual quantity. In answer to an inquiry if the straw did not introduce the seeds of weeds, he said he had never found any difficulty of this sort. He thinks that protection preserves the vigor of the plant, and that it bears better. In spring he removes the straw away from over the plants and places it between the rows.

He stated that he could not speak with confidence as to the best varieties of the strawberry, because some succeeded best in one place, and others in another place. Hovey's seedling, for instance, did well at Boston and Cleveland, but with every kind of management at Pittsburgh it had failed. Buist's Prize was formerly very successful, but it has now run out, and is hardly worth cultivating. He has found certain pistillate sorts to do best with some peculiar impregnators—and is experimenting on this subject. Hence he cannot, with these considerations, speak with confidence on the subject of varieties. Of the early sorts he prefers Baltimore Scarlet, Jenny Lind and Burr's New Pine—and after naming several for a general crop, said that the Triomphe de Gand was "the strawberry of all strawberries," —and left little more to be desired—being a healthy, strong grower, and producing a heavy crop—not so much as the Wilson, but the fruit was worth more per acre—is satisfied it may be made to yield three hundred bushels per acre, and that this amount may be raised, picked and marketed for two hundred dollars, or sixty-six cents per bushel, all told—being so large it is easily picked. The Triomphe de Gand has, however, one disadvantage—it attracts so much attention in market that you can sell no other sort while it remains on hand. He has sent them to Buffalo, Cleveland, Chicago, Philadelphia and New-York; they carried safely, and he has had telegraphic despatches for more than his whole crop. He could have sold more than his entire crop in New-York city alone. If he could have but one variety, it should be the Triomphe de Gand. He thinks highly of the Wilson.

The great depth to which he cultivates before setting the plants will, he thinks, be sufficient to give 10 or 12 crops without replanting; but for the ordinary depth of 8 or 10 inches, two or three crops are enough. Cutting off all the runners, he stated, tended to prevent exhaustion, and made strong shoots that bore abundance of fruit. The only fertilizer he uses is well rotted stable manure. A member inquiring if he could succeed with this management applied to Hovey's seedling, he said he had never succeeded with Hovey with any kind of treatment, but Burr's New Pine and others had done well.

[We were informed by some of the members that they had tried this mode of cutting off the runners, and had not succeeded to satisfaction —had lost money by it. It no doubt needs the best of management, and perhaps the deep mellowing of the subsoil here described.]

This kind of management he regards as the most profitable, although requiring much hand labor; the question is not, "With how small an outlay can you raise an acre of strawberries?" but, "Which pays the best?" If this does, and if it yields a hundred per cent. on the money invested, then, *the more money invested the better.*

SEEDS.—Now is the time to get out the box or basket and look over the packages of garden and flower seeds, and see what you have and what you want. If you wish to try any new sorts this year, be sure to send your orders to the seedsman early enough to secure them, and not wait till they are all gone. Almost every one who has a garden is desirous of trying to obtain new kinds of flowers or new varieties of old sorts. In many cases no doubt there is disappointment in finding that the new varieties are no prettier than the old ones, frequently not as handsome; but still many very desirable sorts are annually introduced, and therefore do not be afraid of spending a few shillings for new kinds. It will pay.

FRUIT TREES.

I have found that almost any fertile soil that is fit for ordinary farm crops will answer well for fruit trees. It should, however, be dry, and if not so naturally, it should be drained so that the water will not stand about the roots. None of our ordinary fruit trees will thrive in a soil saturated with stagnant water during a great part of the year. Soil for fruit trees should be as well prepared as for a crop of wheat or potatoes, and even better, for in the former case the work is done only for a season, but in the latter for a life-time. Plow twice, as deep as possible, and if the subsoil plow follows the ordinary plow, all the better. On new land, or that which has not been rendered poor by cropping, no manure will be needed. It is better to apply manure on the surface, as the tree grows and requires additional nourish-

ment. Where manure is applied to land before setting out an orchard, it should be well rotted, and even then not allowed to come in contact with the roots more than possible. A good clover sod turned under makes a good preparation for trees. When ground is prepared in this way, it is not necessary to make a large or deep hole for the tree. Scrape away a few inches of earth, spread out the roots nicely about as thes grow, and cover them with mellow soil, and the work is done.

No matter how carefully trees may be taken up and packed, some of the large roots will be bruised and broken, and many of the smaller oues will perish, so that about one-half the good roots are lost. The top is not injured. So, wheu the tree reaches the planter, it has at least twice the amount of top that the roots can well support. If the tree is planted in this condition it will have a hard struggle for life the firit summer, will make no groth at all, and if the season should prove dry and hot, will very likely die. The planter must restore the balance that existed cefore the tree was taken up, by removing one-half of the top, more or less as mey be judged necessary besth appearance of the roots. Any bruised root sshould be cut away, because a clean cut will soon heal, while a bruised root will rot, usually clear back to the trunk, and sometimes dose much injury to roots near it.

In pruning trees we must pay proper regard to the form we desire. Standard trees for the orchard, cut back the branches to four or five buds, and if there appears too man small limbys some may be cut away altogether. Dwarf trees that are to make pyramids, cut in a pyramidal form by pruning the lower branches so as to leave only about one-half their original length, those next above a little shorter, and so on, until the top branches are cut to one or two buds. The leading upright shot may be left four or five buds above the top branch.

All trees should be well staked and tied, especially where stormy winds prevail, giving the strain in the direction of the prevailing winds. Care must however, be exercised to prevent chafing. A piece of cloth or old carpet may be put around the stake, but the aim should always be to keep the stake from the tree, and support it with the bands.

Four or five inches of well rotted manure thrown around the tree so far as the ruots extend will furnish all needed nourishment, and be a good protection from severe frosts in winter and the heat of summer, but use nothing for this purpose that will harbor mice. Allow no grass to grow around the trees. It will prevent growth, and eventually ruin the trees. Give trees as good culture as corn or potatoes, and they will do well.

Few amateurs grow fine roses, although they purchase the choicest varieties, and the reason is, they treat them badly. Roses require a very deep soil; eighteen inches or two feet, and one quarter of the bulk of the soil in which they grow should by well rotted stable manure. In the Spring prune every last year's vigorous branch back to three or four buds, remove all the old wood that you can, of two or more years old, and all the weak shoots of last year. The young wood produces the best flowers. *Running Roses* of course must be pruned to suit the object for which they are needed, whether to cover a pillar or trellis, &c., but in all cases cut out the old wood that will not be likely to give good flowers, and prune back the side shoots to one eye. With good soil and a little care in pruning every one can have fine roses nearly the whole summer.

Tulips, Hyacinths, Crocuses, Lilies, Crown Imperial, and nearly all our garden bulbs are hardy, and should be planted in the autum. Prepare the ground well, by making it very mellow, then set the bulbs, and cover the small bulbs like the crocus about an inch or so, and the larger, like the tulip, there inches. After the bed is finished, cover the three inches of leaves to protect from severe frost, or rotted manure will, answer or evergreen branches.

THE ORCHARD.

THERE is no danger, at least for many years to come, that people will give their orchards more care than they require, or more than will be profitable. With some exceptions here and there, and the number is increasing, the orchards of the country are neglected sadly. Line upon line and precept upon precept seem to be needed to convince people that trees require attention and good culture. The following from a venerable horticulturist of the, school of Dr KENNICOTT, will have much weight with those who know the "old doctor."

HOW TO PLANT.—If you get nearly all the roots of a tree in good condition, you need remove very little if any top. If short of root, then shorten in or cut back the new growth, to compensate for loss of root; and do the same if the head of your tree needs forming, or shaping—remembering always that leaf-producing branches, or top, is as essential to growth as roots.

I will now suppose thar your trees are nicely heeled in—and you should heel them in when you get them, even if to be planted in half an hour—and that your well-prepared ground has been measured and staked off, at proper distance apart, for the trees; the next work is to plant them *right*! and be in no hurry about the work.

But I am forgetting the distances. And this is really a question I would gladly ignore—my own ideas and practice being so much at variance with others, and especially eastern orchardists. There is a wide difference in the growth of varieties of the same species of fruit tree; and there should be a difference in the space given them. Take the apple for example: a yellow Bellflower will soon occupy, and really needs, double the space require by a Hawthornden, Lady Apple, or Duchess of Oldenburg; and, to a greater or less extent, this holds good all through the list. Yet, eastern men tell you to plant apple trees forty to fifty feet apart and some few western men follow suit; while others say sixteen to thirty-two feet only. Both are, in part, right enough. At the east the large spaces are needed for other crops; and dense plantations are not DEMANDED, as here by the climate and meteorology, and especially high winds sweeping over treeless plains. I

am, therefore, one of those advocating close planting IN THE PRAIRIES. I would rather plant close, and cut away half when too thick, than not to have the PROTECTION of *close* plantation for the first twenty years.

For apples that attain the largest size thirty-two feet is none too great a space after twenty or twenty-five years, for those of small growth it is more than will ever be needed. But in a small orchard, of mixed sorts—unless you are determined to devote your orchard to fruit alone—it is well enough to give all your trees all the space they will occupy when thirty or forty years old, or else plant with the intention of cutting out half when crowded; for it is inconvenient to plant and cultivate at different distances in the same plat. Perhaps we may say, the extremes for apple trees should be sixteen to twenty feet when in squares, and half intended to be sacrificed; and thirty to forty feet where *all* are to remain, and all, or nearly all, are of large-growing sort. In quincunx, or diagonal plantations, a less space will do; for you will have broad diagonal space for the wagon and plow, and the trees a better chance to expand, in proportion to measurement .by acre.

CULTIVATION.—Fruit trees need as much cultivation as corn and potatoes, and should have it—not for one year or five, but forever—or as long as they pay for it in fruit. But the cultivation should not be continued too late in the summer, lest a late and consequently immature wood-growth should ensue. This caution is especially called for in relation to all tender-wooded sorts, like the peach and pear. You can raise any kind of hoed crop you please among fruit trees, Beans, potatoes, vines, roots &c., best; and corn good when not shingad the young trees too much.

NEVER "SEED DOWN" a young orchard. Never let one of the forage "grasses" get a foothold in it. It is next to impossible to keep down "blue grass" and "June grass" when once established in an old orchard. Red clover is sometimes admissible to check a too luxuriant wood-growth, in deep, rich loam. "Small grains" NEVER. A crop of rye barley, oats, or wheat, is worse than "fire blight" and caterpillars among fruit trees.

A shallow-running corn plow, "cultivator," and four-tined fork, or pronged hoe, and common hoe, are the implemets of cultivation. Keep the spade out of the orchard, and the large plow, too, after the trees begin to bear.

MANURING ORCHARDS.—I have left this till the last, because it is the last thing to practise, except in rare instances; as driving sand, which may be helped by clay, leached ashes, and cow manure, and barren clay—seldom found—which, after through drainage and exposure to winter frosts, by autumn plowing, may be made good by early applications of coarse stable or horse manure, peaty earth, and like matters. Manuring to sustain fruitfulness, is another thing and is not much needed in most orchards west, till the trees have been years in bearing; and, as often given at planting, it is a great damage and sometimes death to fruit trees. When you manure bearing orchards, let it be in autumn; spread evenly, and plow under lightly in spring, but be careful to place it where the roots are—not close to the stem! and avoid breaking roots when you plow.

Special manures are often of great moment, especially broken or dissolved bones, leached ashes, air-slacked lime, &c. Analyses of soils, analogies, and experience will teach you these special wants; and care and patient watching will insure a just reward for all your WELL-DIRECTED WORK.

FRESH BLOWN FLOWERS IN WINTER.

Choose some of the most perfect buds of the flowers you would preserve, such as are latest in blowing and ready to open, cut them off with a pair of scissors, leaving to each, if possible, a piece of the stem about three inches long; cover the end of the stem immediately with sealling wax, and when the buds are a little shrunk and wrinkled, wrap each of them up separately in a piece of paper, perfectly clean and dry, and lock them up in a dry box or drawer; and they will keep without corrupting. In winter, or at any other time, when you would have the flowers blow, take the buds at night and cut off the end of the stem sealed with wax, and put the buds into water where in a little nitre or salt has been diffused, and the next day you will have the pleasure of seeing the buds open and expand themselves, and the flowers display their most lively colors and breathe their agreeable odors.

DOMESTIC ECONOMY.

VALUABLE RECEIPTS.

Blue Ink.

A solution of neutral sulphate of indigo (indigo dissolved in sulphuric acid, and the excess of acid then neutralised with chalk) makes a good writing blue ink which does not precipitate and requires no gum in it. The most beautiful blue ink, however, is made by dissolving Prussian blue in oxalic acid. The common Prussian blue of commerce, is first triturated in a mortar; then about its own weight of oxalic acid in solution is added, and the whole stirred together occasionally for about 48 hours. The oxalic acid renders the blue soluble; water is then added in sufficient quantity to enable the ink to flow freely, and a little gum arabic mucilage mixed with it. A porcelain mortar should be used for making this ink, as the oxalic acid would act upon an iron mortar.

Red Ink.

Common red ink is made in the most simple manner by mixing common carmine with a sufficient quantity of aqua ammonia to flow freely from the pen. Any person can manufacture red ink in a few hours by this method. A cheaper red ink may be made by boiling 2 ounces of Brazil wood for half an hour in a quart of water, then straining it and adding half a drachm of the chloride of tin and 1 drachm of gum arabic. Such ink is used for ruling red lines on blank books. Carmine ink does not affect steel pens like that made with Brazil wood; none but quill or gold pens however, should ever be employed with red ink. Liquid Solferino (aniline red) also makes a good red ink.

COLONIZATION REVIEW.

FEBRUARY.

CONTENTS:—Official Return of the Numbers of Emigrants embarked for Canada—Births—Deaths—Total Landed—Tonnage and Number of Vessels—Length of Passage, for 1862.

OFFICIAL RETURN of the number of Emigrants embarked for Canada, with the number of Births and Deaths during the voyage and in Quarantine; the total number landed at Quebec and Montreal, distinguishing Males from Females and Adults from Children, with the number of Souls from each Country; also the number of Vessels arrived, with passengers, their tonnage and average length of passage during the Season of 1862.

Whence.	Class.	No. of Vessels.	Average Number of Days on Passage.	Tonnage.	Number Embarked. Cabin Passengers.	Adults. M.	Adults. F.	Children from 1 to 12 years. M.	Children from 1 to 12 years. F.	Infants.	Total Steerage.	Births. M.	Births. F.	Total Number of Souls on Board.	Deaths on Passage. Adults. M.	Adults. F.	Child'n. M.	Child'n. F.	Infants.	Total.
England	Steamers	34	13¼	46336	1521	1977	1028	389	336	177	3907	3	3	5434	1	...	...	...	2	3
	Sailing Vessels	40	38	29105	41	593	397	180	149	85	1404	1	2	1448	...	...	...	...	2	2
Ireland	Steamers	...	...	...	227	2146	1091	288	279	149	3953	...	...	4180	...	...	...	...	...	...
	Sailing Vessels	11	36	7831	...	124	133	44	46	17	364	1	...	365	...	...	...	...	...	...
Scotland	Steamers	20	18	21711	317	1122	880	228	211	97	2538	1	1	2857	...	2	...	...	...	2
	Sailing Vessels	8	35	6300	2	57	32	13	14	6	122	...	...	124	...	...	...	...	...	...
Germany	do do	13	55	3846	5	878	729	366	347	169	2489	2	3	2499	7	2	30	25	13	77
Norway & Sweden	do do	29	58	12679	26	1831	1552	860	831	326	5400	7	9	5442	12	6	84	58	24	184
Other Countries	do do	9	38	4355	...	71	38	19	15	7	151	1	1	152	...	...	...	...	...	...
Totals		164	...	132163	2139	8799	5880	2387	2228	1033	20327	16	19	22501	20	10	114	83	41	268

Whence.	Class.	Deaths in Quarantine. Adults. M.	Adults. F.	Children. M.	Children. F.	Infants.	Total.	Total Deaths.	Total Landed in the Colony. Adults. M.	Adults. F.	Child'n. M.	Child'n. F.	Total. M.	Total. F.	Infants.	Total Steerage.	Cabin Passengers.	Grand Total landed in the Colony.
England	Steamers	...	...	...	...	...	...	3	1976	1028	389	336	2365	1364	181	3910	1521	5431
	Sailing Vessels	...	...	...	...	...	...	2	593	397	180	149	773	546	86	1405	41	1446
Ireland	Steamers	...	...	...	...	...	...	...	2146	1091	288	279	2434	1370	149	3953	227	4180
	Sailing Vessels	...	...	...	...	...	...	...	124	133	44	46	168	179	18	365	...	365
Scotland	Steamers	...	...	...	...	...	...	2	1122	878	228	211	1350	1089	99	2538	317	2855
	Sailing Vessels	...	...	...	...	...	...	...	57	32	13	14	70	46	6	122	2	124
Germany	do do	1	2	3	5	4	15	92	870	725	333	317	1203	1042	157	2402	5	2407
Norway & Sweden	do do	13	11	9	6	3	42	226	1806	1535	767	767	2573	2302	315	5190	26	5216
Other Countries	do do	...	...	...	...	...	...	...	71	38	19	15	90	53	9	152	...	152
Totals		14	13	12	11	7	57	325	8765	5857	2231	2134	11026	7991	1020	20037	2189	22176

MANUFACTURING REVIEW.

FEBRUARY.

BOARD OF ARTS AND MANUFACTURES FOR LOWER CANADA.

Board Rooms, Mechanics' Hall.
Montreal, 7th January, 1863.

Your sub-committee have the honor to report:

That on assuming office for the year just closed, they had hoped to avoid the evil under which their predecessors laboured, and by which their efforts to realize the objects for which this Board was constituted, were rendered futile,—the want of the necessary funds to carry out the important trusts with which they were charged. This hope, however, they were unable to realize, for the renewal of the small pittance meted out to their predecessors in office, amounting to the sum of two thousand dollars, was all that was allotted to this Board for the year just terminated.

Previous to the establishment of the Boards of Arts and Manufactures in this Province, grants were annually made by parliament to all Mechanics' Institutes, and so called associations, and moneys were thus obtained for purposes far different from those intended, until the attention of the government was called to this abuse; and upon enquiry the facts elicited established the correctness of the allegations. By this means the appropriation of moneys to illegitimate purposes was prevented, and a large saving was thereby secured to the Province.

The originators of these Boards sought unsuccessfully, however, to obtain for them a position as regards Mechanics' Institutes and kindred associations, equivalent to that occupied by the Board of Agriculture in relation to the county Agricultural Societies, but they secured however the formation of these Boards whose duties are;

First. To take measures to collect and establish museums of minerals and other material substances and chemical compositions susceptible of being used in Mechanical Arts and Manufactures, with model rooms appropriately stocked and supplied with models of works of art, and of implements and machines other than implements of husbandry and machines adapted to facilitate agricultural operations, and free libraries of reference, containing books, plans and drawings, selected with a view to the imparting of useful information in connection with Mechanical Arts, and Manufactures:

Second. To take measures to obtain from other countries new or improved implements and machines (not being implements of husbandry or machines specially adapted to facilitate agricultural operations,) and to test the quality, value and usefulness of such implements and machines:

Third. And generally to adopt every means in their power to promote improvement in the Mechanical Arts and in Manufactures in this Province.

Your sub-committee's predecessors in office established a free library of reference, containing all the English and American specifications and drawings, reports and other works of a suitable description, which your sub-committee have kept regularly open, and to which some additions have been made during their term of office. The whole number of volumes now in their possession amounting to one thousand and thirty six.

Shortly after the formation of this Board, intelligence, of the proposed visit to Canada of His Royal Highness the Prince of Wales was received, and this was considered by the predecessors of your sub-committee, a fitting occasion for this Board to put forth its best efforts to secure an exhibition of the raw and industrial products of this country. Their views were promptly seconded by government who appropriated for this purpose the sum of $20,000. The want of a suitable building for exhibition purposes had long been felt; and this Board, with an energy and alacrity unparalleled in this Province, procured a site and erected a building for that and future exhibitions. The efforts of the Board were successful as to the exhibition, which was one alike creditable to its originators and managers (your sub-committee's predecessors in office,) and to the country.

The building was not erected without involving the Board in liabilities it never would have assumed, but for the informal pledges made to it by members of the government, of an increased annual grant, and from the non-fulfilment of which have arisen its present inability to carry out the objects for which it was constituted. It was the intention of your sub-committee's predecessors to have removed their offices and library to the exhibition building, and to have taken measures to establish in connection with the library a museum for minerals, models, machines, and manufactures; but want of means to prepare the building for that purpose, prevented them from carrying out this intention.

The receipts of the Board for the exhibition building and the government grant having fallen short of the expectations of your sub-committee's predecessors in office, they were under the necessity of mortgaging the building to the contractor Mr. Mc Nevin for the sum of $11,000 for two years, from the 25th January 1861, with interest at seven per cent. per annum, payable semi-annually, the first payment of the interest to be made on the 25th June, 1861; and in case the Board should make default in the payment of the said interest to accrue and become due on the said principal sum of $11,000 for the space of thirty days after the said interest payments should become due and payable: then the whole of the debt, with all interest then due, should immediately be and become due and exigible.

Owing to the non-payment of this interest previous to the 25th day of July, 1861, a suit was instituted against this Board for the recovery of the principal, although tenders had been made of the amount of interest previous to the institution of the suit. At the

time of your sub-committee's assumption of office this suit was pending; and it was only in the month of April last that a judgment was rendered, condemming the Board to pay the amount demanded by the plaintiff.

Your sub-committee were unable to meet this demand; and execution was subsequently issued, under which the building was seized, and advertised to be sold on the 27th day of November following, now past.

A deputation was named by this Board to proceed to Quebec, to lay before the members of the government the affairs of the Board and its position with regard to the exhibition building; which they did, but the results of which have yet to be realized.

In the meantime the sale of the building was postponed by the action of the Royal Institution for the advancement of learning Governors of the University of Mc Gill College, who claim that the building shall be sold subject to the restrictive clauses contained in the deed of the property from that body to this Board. As this claim is resisted by the contractor, some time must elapse before further steps can be taken. Your sub-committee strongly recommend their successors in office to bring this matter prominently before the government, that this Board may be relieved of the incubus of this debt to the contractor.

During the past year, the Agricultural Association, at the meeting held at Sherbrooke in September last, decided to hold their next exhibition in this city; and that a proper representation of the Arts and Manufactures of the Province may be secured. Your sub-committee recommend their successors to immediate action in the matter.

The importance and necessity of an increased grant, together with amendments in the constitution of these Boards, was deeply felt by your sub-committee's predecessors in office; and representations were duly made to parliament, and a bill containing the latter submitted, but without success. Your sub-committee, equally desirous of shaking off the trammels which limited them in their operations, made similar applications; but although supported in their views by the Upper Canada Board they were unable to effect any change.

The desirability of a change in the Patent laws, and the act respecting Trade Marks and Designs, was also a matter of serious consideration as well on the part of your sub-committee as of their predecessors; and although a bill containing such enactments as were considered desirable for the country was introduced during two successive sessions of parliament, the desired changes have not yet been made.

Your sub-committee now recommend to their successors the consideration of these three measures, the securing of which will do much towards enabling this Board to fully discharge their important duties.

A course of lectures on mechanical and scientific subjects was established by your sub-committee's predecessors; but the meagre attendance of those for whose benefit they were given, deterred your sub-committee from making a similar effort: they however recommend to the consideration of their successors, whether it would be desirable to make another effort in this direction.

The contribution of the Board in aid of the classes of the Mechanics' Institute has been renewed for the present year, and your sub-committee regret their inability to do more.

The exhibition building continues to be occupied as an armory for the Montreal Field Battery of Artillery under the arrangement made with the government by your sub-committee's predecessors. A small rental has been obtained by letting it for concerts and other amusements, a statement of which is herewith submitted.

It is highly desirable in the opinion of your sub-committee that arrangements be made for using the building for the purpose originally intended; and your sub-committee recommend the consideration of this matter, to their successors as one of their first duties: but, failing in this, they recommend that some definite arrangement be made for its occupation for other purposes, by which the Board may be relieved from further responsibility respecting it.

Your sub-committee cannot conclude without referring to the Exhibition of all Nations held in London during the past year, and which is now closed. They regret extremely that the contributions from this Province were, for the most part, confined to raw and mineral products, in consequence of the tardiness attending the appointment of Canadian commissioners, and the small amount appropriated for this purpose. Had more zeal for the prosperity of the manufacturing interests of the Province been exhibited in proper time; and had the appointment of commissioners been made, as it should have been done, when the attention of government was called by your sub-committee's predecessors to the restrictions of the Home Commissioners; and had a suitable sum been placed at the disposal of Commissioners to enable them to secure a proper representation of the progress made in the Arts and Manufactures of this country, Canada would have occupied a higher position than that allotted to her in the great exhibition of 1862. As it is however, she has her prizes, and her position among nations, which position it is now the province of this Board to assist in maintaining and elevating.

The Treasurer's accounts are herewith submitted for audit.

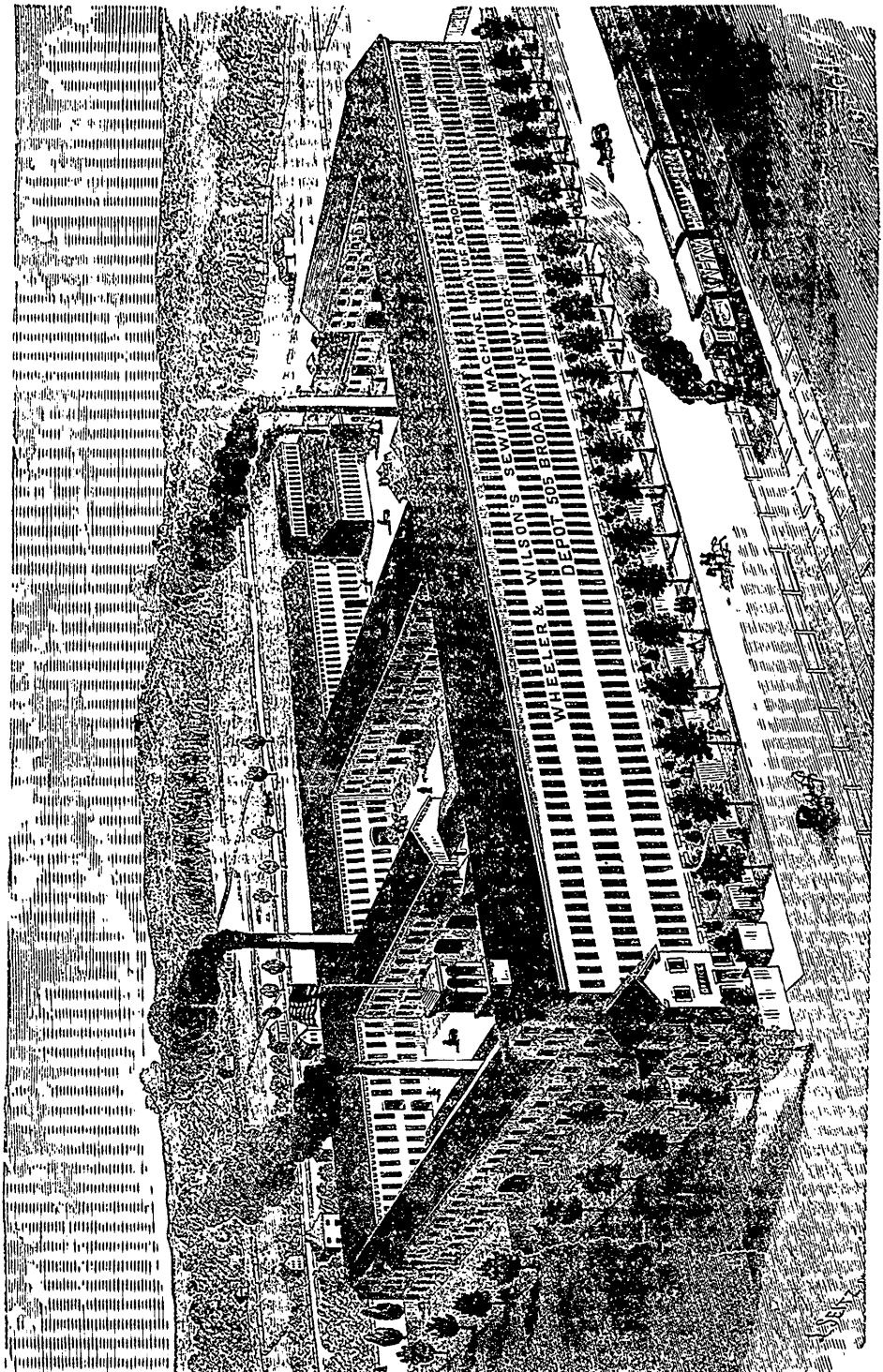
The whole nevertheless respectfully submitted.

(Signed,)
WILLIAM RODDEN,
Vice President.

(Signed,)
DUNBAR BROWNE,
Sec. pro term.

THE WHEELER AND WILSON SEWING MACHINE—A MODEL WORKSHOP.

The great inventions of modern times may be briefly enumerated. They are the steam engine, the electric telegraph, and the sewing machine. Others of great importance have been introduced, but we refer to these three, as those



Wheeler & Wilson's Sewing Machine Manufactory, Depot 505 Broadway, New York.

which have, to a great extent, revolutionized our social institutions. Certainly none can have a higher standing, in this respect, than the last one upon the list. While the others have created for themselves a fame and history which shines brilliantly among the mechanical achievements of the age, neither of them come so close to the common interests of both sexes as that machine which has signally triumphed over obstacles and prejudices which seemed insurmountable.

So great has been its popularity, that, in order to meet the demand for it, immense factories have been erected in different parts of the country. The feeling in favor of particular machines is perhaps something incomprehensible, when the general excellence of one is apparent to all. The industrial associations throughout the United States, as well as the jurors at the great International Exhibition lately held at London, have declared almost unanimously in favor of the Wheeler and Wilson pattern. Its merits, as a machine for general work, are so palpable to those who are familiar with it, as to need no praise at our hands; lightness, ease of action, simplicity of design, thoroughness in construction, nonliability to derangement, these are the great essentials in a sewing machine, and these qualities are all combined in the one which we shall make the subject of our article. We were in East Bridgeport a few days since, where the Wheeler and Wilson Company, have their factory, and thinking that a few hours could not be more profitably employed than in looking through it, we made known our desire at the office, when the President, Mr. Wheeler, at once afforded us every facility.

Let us, however, premise before going further, that the Company have no secrets in the construction of their sewing machine. To any one who is desirous of witnessing their tools and workshops, the doors are open and permission accorded to view everything and every branch of the business, from beginning to end. From Alpha to Omega nothing is concealed; a frank and liberal spirit which it would be well for the manufacturing community at large to imitate. Let us, also, entreat the sometime visitor who shall come after us, to remark the order and discipline which prevails on every hand. After this brief diversion, with Mr. Superintendent Perry, we enter the factory. Stepping across an ante-room from his office, he opens a door, and at once, a long vista of busy machines and their attendants is disclosed; five hundred and twenty-six feet in length, and thirty-six feet in width, are occupied on the ground floor by a system of machinery which seems to act with almost human facility and discrimination. Here the heavier parts of the sewing machine are prepared for the other fittings. In order to have a clear idea of the plan pursued throughout the establishment, it will be necessary to inform the reader that all the materials and tools are furnished by the Company, and the work is executed for them by contractors or jobbers. To each of these jobbers, a certain part of the work is assigned, one man taking the beds or solid frame of the machine, the frogs, as that part is called which carries the cloth dresser, and the needle arm. Another man will make the connecting rod, or the piece which goes between the hook shaft and the vibrating arm, the slide rings, that part which holds the bobbin or spool up to the rotating hook, and any other divisions of the sewing machine which his experience or natural skill has assured the Company will be well executed in his hands. Thus all the details are parcelled out among the several contractors.

Now, be it borne in mind, the Wheeler and Wilson machine is not made from hand to hand, as the saying is, but from its inception to the last nail driven in the packing box which carries it to its final destination, every operation performed is but one of many, tending toward completion, that belongs to the mechanical system employed in the manufactory to insure absolute fidelity in every particular. It is easy to see that, if every jobber executed his work as best suited him, and according to his own ideas of what was required in the premises, a grand era of chaos and disorder would be inaugurated, which would speedily put an end to the Company's fame and the good quality of their machines. In order that such a catastrophe may be avoided, there are a set of gages, or duplicates, provided for every screw, spring, or bar, employed in the sewing machine; these gages are supplied to the various contractors, and are made from originals in the possession of the Company, to which no one has access but the superintendent. For each piece there is not only one gage, but there are also separate gages for every variation and curve existing in those shapes; so that every radius and every angle is precisely similar in each individual machine. It is not necessary to have a professional education in order to appreciate the benefits arising from this plan, but our mechanical readers will readily understand the advantages springing from it. We wish the manufacturing community at large could have one glance at the beautifully made and kept gages which the Wheeler and Wilson Company uses; our word for it, no one, who has a regular and stipulated pattern of an invention to make the year round, would ever be without similar devices.

Not only are these tests kept for the purpose of insuring accuracy in the forms of the working parts, but fac-similes are also made of all the screws, from the largest to the smallest; in their bodies, in their threads, and lastly, in the distance from under the head, to the point where the rounded top meets the sides. Since all the holes are drilled to just such a depth, as a matter of course, every screw must be of a standard length and size, and we can readily see how by conforming to the rules made for the guidance of the contractors, the whole factory works as one brain. Part after part goes through the required operations, never coming back from one machine to another, but entering at one end of the room, and so going the round of all the tools in the various stories, being finally carried into the inspecting rooms.

Here they are put together, tested, run and approved. Indeed to such lengths is the principle of order and regularity carried, that after leaving the workshops, the visitor feels an

irresistible inclination to step exactly square and true, and to otherwise conform to habits of regularity and method. Thus it will be seen that these factories have also a vast moral influence which must be felt to be appreciated.

Let us after this necessary introduction, look at the planing machine, on which the bottoms of the beds or frames are being faced; this being the starting point to which all subsequent parts are accessories, and the other operations subordinate; it is a very simple performance, and is only mentioned as a base of operations.

After the bottom is faced, the bed is then removed to another machine, called in mechanical parlance, a miller or "slabber," this cuts out the recess for the feed-bar and trims the plate faces. The rib that receives the foot of the cloth presser or frog, and the squared faces at the back, are done upon another similar machine. Thus having secured two planes at right angles with each other, everything else is done with reference to them. As for instance the several holes with which the sewing machine is pierced for shafts or screws; these are all in a line with some one of the other planes or faces, there is no obliquity or divergence from a right angle, unless such a feature is required in the machine.

The holes are drilled by what are called gang drills, that is, one drill for as many holes as are required, all running in the same frame and revolving together. The bed is then placed in a "jig;" this is an apparatus which is furnished with projections that touch all the working faces in the sewing machine bed. The holes to be drilled are laid off in this jig, and bushed with hardened steel thimbles, so that their positions remain always the same. Supposing the plate of the drill press to be perfectly square, or at right angles with the tool and the surfaces of the "jig" bearing upon it also correct, the holes which are pierced by following those laid out in the pattern, are always true, and each machine in this particular is a fac-simile of the others. To see that the "jig" is always in a proper condition is the business of the contractor, for upon it depends the fidelity of his work.

Having thus seen the process employed in this one particular, we will not detail the others at great length. To do so would require a vastly greater space than that comprised in a newspaper article; follow us on down the shop, which is closely stowed with every conceivable variety of tools—some, indeed, inconceivable in their dexterity and ingenious working. Of the latter is the machine which makes the rotating hook, one of the most beautiful pieces of mechanism that it is possible to imagine. The hook and shaft are made out of a steel rod but very little larger in diameter than the finished piece; it is first cut off about seven or eight inches long, then heated in a furnace and placed under a drop press, which has dies in either face corresponding to the shape desired. Four distinct dies are necessary to bring it to the rough form. It is then annealed or softened and brought to the machinist, who performs all the work needful to complete it—such as turning the shaft to fit accurately, turning the hook part, which is, in this stage, nothing but a round button, like a flatened pill box—placing the shaft in the lathe and cutting out the recess in front where the bobbin rotates—sawing down behind the face so as to form the clearance required—shaping the cast off, and, in short, executing the multifarious details which must be completed before it is perfect. In all of these operations the machinist has little else to do than superintend the lathe or tool that does the work. From the soft steel, gray, cheese-like parings come away until the whole piece is of the required dimensions. So we follow through the shop, and see first one part and then another, brought into contact with the rapid noiseless cutter, until we have traveled nearly the entire length. We stop for a moment to look in at the two steam engines of eighty-five horse power, also built in Bridgeport, which drive the works, and remark the admirable cleanliness and order visible there; also to view the wash-rooms where the mechanics have every facility requisite to make themselves presentable to the outer world, though one would hardly think it necessary, so neat, intelligent and respectable do they look. We then hasten to follow our chaperon, Mr. Perry, to the second floor.

Here the smaller, and consequently lighter, parts of the sewing machine are fabricated, and we look upon operations similar to those we have just left. Ascending once more we find, in the third story, the several appliances which belong to the sewing machine in various stages of construction; these are the needles, spools, hemmers, and other extra appliances, the invention of which has greatly increased the machine's utility.

The needles deserve more than a passing notice; few persons have an accurate conception of the labor and time expended upon them. One, taken in the hand, is a slightly curved steel wire with a round body and a sharp point, whose eye is near the end; but to reduce it to this form, out of a piece of stock, requires much ingenuity. After the wire is softened, being previously cut to the right length, it is turned in a lathe to nearly its proper shape; the groove must then be formed in one side. For this purpose a pair of steel dies are made having grooves in them the size of the intended needle; in the center of this groove is a raised edge or rib, running along as far as it is desirable to carry the recess to be made in the former. The thickness of the rib varies in the standard of the implements made; in the 0 number, for instance, which is the finest size, the groove is not much wider than the column rules of this journal. When we reflect that an eye or hole for the thread has to be drilled in this needle, and the groove polished, we are naturally astonished, nevertheless it is done. By means of a fine thread, the size with which the needle is to be used, and some flour emery, or its equivalent; the eye is polished and left perfectly smooth. To make perfect needles much skill and care is necessary. Mr. Perry informed us that he frequently received proposals from abroad from parties desiring to furnish the company with this branch of their manufacture, stating, as an inducement, that they could make them much cheaper. Unfortunately,

however, for the proposers in one instance, the sample sent was very much poorer in quality than the worst ones thrown away weekly by the company. And we might cite many other instances which would support the value of the system insisted upon by the company, that is—absolute accuracy in construction.

In one of the lower shops we were shown a hook shaft which had a slight scratch in it, made by the turning tool; its value was not impaired in any way—it would work perfectly, but yet it was, we were informed, likely to be condemned, because, as our guide remarked, to allow it to pass unnoticed would be a departure from established rules, for which there was no precedent, and to which infraction no bounds could be set. Here lies the secret of the success of the Wheeler and Wilson sewing machine; for as all parts are interchangeable, being exact duplicates, the one of the other, entire uniformity throughout is attained.

The growing length of our article warns us to be brief. We must pass through this department hastily, only glancing at the bobbin or spool that runs between the hook and slide ring this is, in appearance, the simplest part; of the invention, hut much depends upon its construction. They are made in three pieces, the two sides and a brass center; the sides are stamped out of a tin sheet, then put over the brass center, and that closed up on to them; the spool is then apparently done, but it must be placed in the lathe, turned to an exact size at its edges, and to a specified shape on its sides. Mr. Perry informed us that at one time great difficulties were encountered in the working of their sewing machines: they would go very well for a time, but on resuming operations, after ceasing a while, no satisfactory work could be done. This, as it may be supposed, was a source of much anxiety to the Company, and our informant stated that the trouble was laid to the hook; that whenever anything was out of order in the machine, *that* part always took the burthen of the blame. Finally, however, he took a machine home and puzzled over the cause of its mal-operation for some time, until he at length discovered that by always putting the bobbin with the same face toward the hook it ran perfectly well. This trouble led to the invention of special machinery for the manufacture of this part, and no further inconvenience of any kind is experienced.

With this little interpolation, let us leave the machine shops and all their attractions behind, and enter other apartments. If we look in at this large room we shall find it full of polished and finely-executed cabinet-work. These are the cases which adorn and protect the new household god that now sits upon nearly every hearthstone in the land. We remark how the tables are put together in sections, so that they shall not check or spring, each one being made of five thin pieces laid one upon top of the other and then glued fast. Let us pass the packing room and the japanners at their labors, and go to the "tuners" or inspection rooms. This branch of the sewing-machine business comprises the accurate and final adjustment of the several details which have passed through other hands. Unto these men is given the authority to reject any and every portion of the work that does not agree with the gages; for these latter tools are brought into requisition again for the we-do-not-know how many hundredth time. Arbitrary accuracy is insisted upon, and the unlucky jobber or workman, whose labor is thrown out, must bear the expense of it himself. After the machines are all adjusted, they are then put on a long table, and run for two hours, by belts attached to the shafting overhead, so that all their working parts may have the little asperities which still exist in them, smoothed off. They are then handed in to a mysterious-looking apartment, closely walled in on all sides, having the announcement "No admittance" staring us in the face; by reason of the presence of the superintendent, however, we march into this *a sanctum* and see the practical operations there. The workmen alone are excluded from this room; visitors accompanied by the authorities are at all times allowed access to it, as they are to all the other departments within the building.

It will be palpable to any one that this department requires much experience with the subject, and great business integrity, for into the hands of these two men are committed the reputation, in a great degree, of the Company's manufacture. No matter how well made they may be, primarily, if the adjustment is bad the machine is unsatisfactory in its operation. The machines are sewed with and tested in every way to prove them, and if they fail in any one particular, the inspector opens a little door in his apartment and thrusts the machine out with its fault affixed to it written on paper. No words pass on either side, and the affair, seems quite an inquisitorial process. If every part works harmoniously, the piece of cloth that was used in trying the machine by sewing, is left on the plate with the thread still through it, both above and below, remaining in the needle. This prevents any suspicion on the part of purchasers that the piece was ingeniously manufactured for business purposes and then attached to the Wheeler and Wilson machine. It is almost supererogatory to say in concluding this division of our article, that none but the best materials are used. The steel for the hook and shaft (it being all in one piece) is English, the cast iron is American, and the wrought iron is also native, from Ulster county, one of the finest brands in the world for tenacity and integrity of fiber.

It is with much regret that we pass, with only a slight mention, the several branches of decorating the machine, or silver-plating, and the foundry and blacksmith departments. In the artist's rooms we saw several machines most beautifully finished in gold and pearl, and indeed, in all the different trades and operations carried on within the workshop, such as cabinet-making, the foundry, the japanners, finishers, decorators, blacksmiths, adjusters and needle makers, matters of new and striking interest presented themselves. It is only left us in concluding our article, to remark upon some of the most noticeable features of this vast manufactory. These are the cleanliness,

order, and good discipline which prevail, and also the system of gages, and the thoroughness and utter fidelity throughout of the different attachments of the sewing machine with relation to each other. Such a complete and perfect principle of accuracy as the gages used secure to the Company has never fallen under our notice before. We have seen many shops where perfection was supposed to be the rule; but it was so far from being the case that any irresponsible person altered the drills, or rimers, as best suited his own sovereign pleasure. Of course, where such departure from established rules occur, the routine once broken, is never re-established. The perfect good feeling and mutual respect co-existing between the superintendent and the employées, was not the least agreeable part of our visit. And for one we can bear witness to gentlemanly qualities on the part of our guide, to whose modesty we hope we shall not do violence, if we mention his "initials"—Mr. Perry.

It is remarkable also, to see a machine shop were no files are used; we mean by this, none in comparison to what are generally consumed. The various tools do all the work without further finishing, except such as is given to them by emery wheels and the operations. Those who have seen Messrs. Wheeler and Wilson's invention need not be told how beautiful that is. Near the factory is a beautiful brick engine-house which shelters a fine steam fire-engine, called the "Seamstress," one of the handsomest pieces of workmanship we have ever seen, belonging to the Company and manned by its employées. A brass band and drum corps, recruited from the 320 men in the Works, discourses music of an excellent quality.

We leave the factory, but cannot throw off so soon the impressions which have fixed themselves upon us during our visit. To look upon the long row of workman, intelligent, well to do, and industrious, gives one new ideas of the value of well-directed labor. Among the contractors are some who have made fortunes by their own industry and ingenuity. One of these persons was pointed out to us, who made his drawings for new machines so perfect that the men constructed these directly from the design; and if the tools were found inoperative or useless, the defect was through some radical fault, not in any want of precision in the drawing.

It has been remarked and lamented by various writers that the romance of the seamstress or sewing woman's life has been destroyed by the introduction of machinery. If, in speaking of romance, it is intended to recall dark and cold garrets, fireless and foodless rooms, scanty and insufficient raiment, and starvation and temptation to nameless vice generally, then we fully agree with those poetasters, who deplore the loss of their occupation, that the gloomy pictures which we have mentioned are among the past. Aladdin wore a ring upon his finger, which caused, when he rubbed it, a fierce genius to appear who gave him sundry and manifold possessions. But what was Aladdin and his swarthy slave to our modern servant, who performs tasks with an ease and celerity that would have made the homely old ogres in ancient story stretch and strain their mighty sinews in vain? It would be a fine fancy to suppose all the material operations of nature suspended for a while, and to let sound cease, and the roar and rush of clashing humanity still for a time its turbulence. Then from the remote parts of the globe, nay even from the borders of the desert, let the sewing machines begin their song; say, what theme could be like that? No English lark, soaring at day dawn from the green bosom of the fields, trills forth such strains; for the bird's hymn is but the natural impulse which the earth's bounty suggests, while the whirr of the sewing machines tells of the power and strength of the human brain. It boasts of the attributes imparted to it, and carries conviction to every hearer, that through the steady pursuit and triumphant achievement over great obstacles, the sewing machines have won their way in the world until they stand almost as new mechanical forces.

We cannot imagine anything more capable of being wrought into an original and beautiful romance than the invention and results of the sewing machine. By the fountain in the desert the Bedouin may fill his water-skins, if he chooses, whose seams no longer let through the precious fluid. The Turks in their lethargic sittings may band their dusky foreheads with turbans white and fair with pearl-like stitches; for away through the tall grass of the Western prairies, the horseman flies like the wind, with the scarlet blanket streaming from his back, bound and hemmed by the Wheeler and Wilson sewing machine. The contemplation of its resources opens at once to the reflecting person a long vista of delightful fancies upon which we should like to dilate at length. Let us, however, close our article with the assurance that whatever old associations have been removed by the use of the sewing machine—the good wife sitting at her fireside with the slow-plodding needle, or the maiden at her lattice singing over her embroidery—the loss has been more than repaid by the increased benefit to mankind and the great human family throughout the habitable globe, by increased comfort as well as great pecuniary gain.

COMMERCIAL REVIEW.

Potash, per cwt.,	$6.70 to 6.75	Wheat, U.C. White, per 60 lbs.,	$0.92 to 0.94
Pearlash, "	6.25 to 6.30	" U.C. Red, "	0.92 to 0.97
Flour, Fine, per 196 lbs.	3.75 to 4.00	Peas, per 66 lbs.,	0.65 to 0.68
No. 2 Superfine,	4.30 to 4.40	Indian Corn, per 56 lbs.,	0.45 to 0.47
No. 1 "	4.55 to 4.60	Barley, per 50 lbs.,	0.95 to 1.00
Fancy "	4.70 to 4.75	Oats, per 40 lbs.,	0.41 to 0.42
Extra "	4.95 to 5.00	Butter, per lb.,	0.15 to 0.16
S. Extra Superfine	5.20 to 5.30	Cheese, per lb.,	0.07 to 0.08