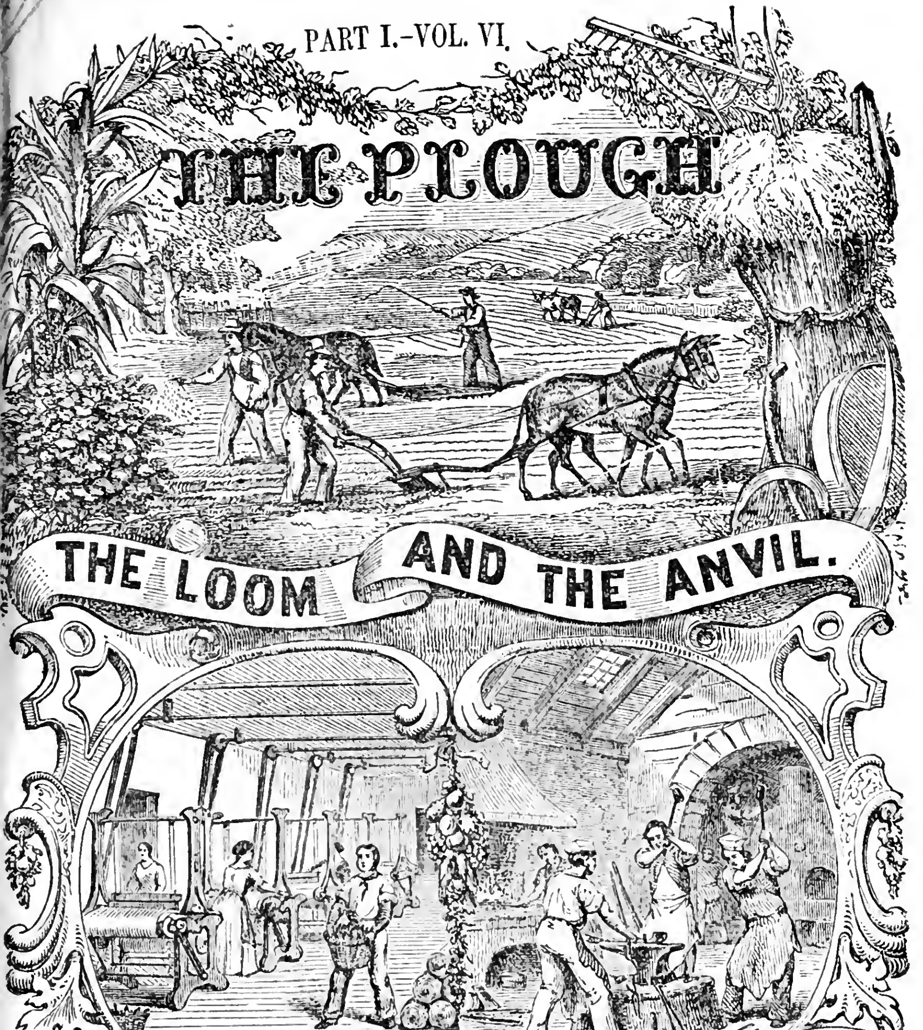

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INDEX TO PART I., VOL VI.

From July, 1853, to December, inclusive.

ILLUSTRATIONS OF MACHINES, &c.

NEW BOOKS NOTICED.

The Plough, the Loom, and the Anvil.

Part I.—Vol. VI. JULY, 1853. No. 7.

THE GREAT EXHIBITION.

We hope we shall be able to chronicle in the next number of our journal the opening of the Great Exhibition, which the public have so long been anticipating. The building is now drawing rapidly towards completion, and on the fifteenth of the present month it is expected the doors will be flung open for the admission of the public. It is a matter of regret that the work could not have been done earlier, so that all the advantage possible might be taken of the season. Yet we presume that little if any difference will be noticeable on account of numbers or of the contributions to the exhibition.

We hail these international Lyceums of Industrial Art and Science—the grand World-Jubilees of Labor and Invention—as the earnest of a better spirit than that which moved the ages of old. The race for artistic and mechanical superiority is one in which the world may safely engage. It will cost no nation its millions of gory and slaughtered victims; it will impose upon empires no tax on behalf of tens of thousands of pensioned wrecks of humanity, or of widows and orphans; it will create no national debt of thousands of millions of dollars. The dominion in the empire of the human mind is better and nobler than the rule over the bodies of men, estimated by devastated acres and impoverished millions. The subjugation of the wilderness and of savage hordes by the arts of peace and the discoveries of science, by the construction of mighty highways for commerce, and the international exchange of living, radiant Ideas, is a nobler conquest than the forcible and oppressive thraldom of the unsubdued although entrammelled races of the world.

We trust that this second World's Competition, now held on the shores of the New World, will be eminently successful in all its details. We regret the delay in the construction of the edifice and the opening of the exhibition, as it is not in harmony with the characteristics of the American mind—promptness and success in execution of plans and enterprises. Yet circumstances may be admitted in justification, and we hail the Art Festival as a significant and important event in the American chapter of the history of 1853.

From the published statement of the "Association for the Exhibition of the Industry of all Nations," we select the following facts, not merely for their own interest to mechanics and Americans generally, but as a fitting introduction to the records of the exhibition itself, a part of which we expect to furnish our readers hereafter.

"No edifice entirely of iron yet exists in the United States, and the want of experience on the part of both architects and engineers presented serious obstacles. Many ingenious plans were offered. Sir Joseph Paxton, with great liberality, furnished one of singular beauty; but the peculiar shape of the ground to be occupied rendered it impossible to use it. The late lamented Mr. Downing—a name dear to this country—offered another of striking ingenuity, but this was also excluded by the terms of the grant from the city, which, as has been said, peremptorily required that the building should be exclusively of iron and glass. Mr. Leopold Eidlitz presented a plan with a suspension roof, intended to obviate the difficulty of spanning great widths by arches. Mr. James Bogardus submitted one of a circular building consisting of successive colonnades placed one over the other, somewhat resembling the Colosseum at Rome, and involving a new mode of joining for which he has obtained a patent. Mr. Julius W. Adams presented one of a great octagonal vault or dome, supported by ribs made of fasces or clusters of gas pipe. Several other plans were offered, of great beauty and originality. The task of selection was difficult and delicate; the Board, however, after much consultation, finally determined on one submitted by Messrs. Carstensen and Gildemeister. Mr. Gildemeister has been some time established among us, and is not only an architect, but an artist. Mr. Carstensen is the designer of the Tivoli and Casino of Copenhagen, the principal public grounds of that city, and had at this time recently arrived here.

"The plan was adopted on the 26th of August, and no time was lost in putting the work under way.

"The masonry contracts were signed with Messrs. Smith & Stewart and Mr. Lorenzo Moses, on the 4th of September, and on the 25th of the same month the principal part of the iron work was contracted for. By the masonry contracts, the foundation was to be delivered on the 21st of October, and by the iron agreements the delivery of castings was to commence at the same time. In order to secure uniformity, a pattern-shop was established in the city of New-York, under the charge of Messrs. Shepard & Purvis; and to insure dispatch, the first contracts for the delivery of the iron castings were divided among Messrs. Jackson, Stillman, Allen & Co., Hogg & Delamater, Buckup & Pugh, and F. S. Claxton, of New-York; Slater & Steel, of Jersey City; the Matteawan Company, of Fishkill; the Messrs. Templins, of Easton, Pennsylvania; Betts, Pusey, Jones & Seal, of Wilmington, Delaware; and Miller & Williamson, of Albany.

"We shall now go into the details of the site and size of the building. Reservoir Square, on which it is erected, lies at the northern extremity of the city of New-York, west of the Croton Distributing Reservoir, and between that mighty mass of stone and the Sixth Avenue. The precise distance from the Reservoir to the Sixth Avenue is 445 feet, and the width, north and south, from Fortieth to Forty-second street, is 455 feet.

"It will be observed that this piece of ground is nearly square. The shape is unfavorable for architectural purposes. In other respects no better spot for the purpose could be found in the city. The Sixth Avenue Railroad runs directly past it; the Fourth Avenue Railroad runs near it; and it lies immediately in the vicinity of the Fourth, Fifth and Sixth Avenues, the main thoroughfares of that part of the city.

"The main features of the building are as follows: It is, with the exception of the floor, entirely constructed of iron and glass. The general idea of the edifice is a Greek cross, surmounted by a dome at the intersection. Each diameter of the cross will be 365 feet 5 inches long. There will be three similar entrances; one on the Sixth Avenue, one on Fortieth, and one on Forty-second street. Each entrance will be 47 feet wide, and that on the Sixth Avenue will be approached by a flight of eight steps; over each front is a large semicircular fan-light, 41 feet wide and 21 feet high, answering to the arch of the nave. Each arm of the cross is, on the ground plan, 149 feet broad. This is divided into a central nave and two aisles, one on each side; the nave 41 feet wide, each aisle 54 feet wide. The central portion or nave is carried up to the height of 67 feet, and the semicircular arch by which it is spanned is 41 feet broad. There are thus in effect two arched naves crossing each other at right angles, 41 feet broad, 67 feet high to the crown of the arch, and 365 feet long; and on each side of these naves is an aisle 54 feet broad, and 45 feet high. The exterior of the ridgeway of the nave is 71 feet. Each aisle is covered by a gallery of its own width, and 24 feet from the floor. The central dome is 100 feet in diameter, 68 feet inside from the floor to the spring of the arch, and 118 feet to the crown; and on the outside, with the lantern, 149 feet. The exterior angles of the building are ingeniously filled up with a triangular lean-to 24 feet high, which gives the ground plan an octagonal shape, each side or face being 149 feet wide. At each angle is an octagonal tower 8 feet in diameter and 75 feet high.

"Ten large and eight winding staircases connect the principal floor with the gallery, which opens on the three balconies that are situated over the entrance-halls, and afford ample space for flower decorations, statues, vases, &c. The ten principal staircases consist of two flights of steps with two landing-places to each; the eight winding staircases are placed in the octagonal towers, which lead also to small balconies on the tops of the towers and to the roof of the building.

"The building contains on the ground floor 111,000 square feet of space, and in its galleries, which are 54 feet wide, 62,000 square feet more, making a total area of 173,000 square feet for the purposes of exhibition. There are thus, on the ground floor, two acres and a half, or exactly $2\frac{52}{100}$; in the galleries, one acre and $\frac{44}{100}$; total, within an inconsiderable fraction, four acres.

"There are on the ground floor 190 octagonal cast iron columns, 21 feet above the floor, and 8 inches in diameter, cast hollow, of different thicknesses, from half an inch to one inch. These columns receive the cast iron girders. These are $26\frac{1}{3}$ feet long and 3 feet high, and serve to sustain the galleries and the wrought iron construction of the roof, as well as to brace the whole structure in every direction. The girders, as well as the second story columns, are fastened to the columns in the first story by connecting pieces of the same octagonal shape as the columns, 3 feet 4 inches high, having proper flanges and lugs to fasten all pieces together by bolts. The number of lower-floor girders is 252, besides 12 wrought iron girders of the same height, and 41 feet span over a part of the nave. The second story contains 148 columns of the same shape as those below, and 17 feet 7 inches high. These receive another tier of girders, numbering 160, for the support of the roof of the aisles, each nave being covered by 16 cast iron semicircular arches, each composed of 4 pieces.

"The dome is supported by 24 columns, which go up above the second story to a height of 62 feet above the floor, and support a combination of wrought iron arches and girders, on which rests a cast iron bed-plate, so constructed as to receive the 32 ribs of the dome. The light is communicated to the dome through the lantern, as well as from the sides, on which 32 escutcheons, in colored glass, representing the arms of the Union and its several States, or the emblems of the different nations, form a part of the decoration.

"The quantity of iron to be used for the building will amount to about

1,250 tons. The roof will cover an area of 144,000 square feet. The glass for the building will amount to 39,000 square feet, in 9,027 panes, 16 by 34 or 38 inches.

"On entering this building, the observer's eye will be greeted by the vista of an arched nave 41 feet wide, 67 feet high, and 365 feet long; while on approaching the centre he will find himself under a dome 100 feet across and 118 feet high.

"It is certain, therefore, that the edifice will be larger and more effective in its interior view than any thing in the country.

"The general mode of erection by base-pieces, columns, connecting-pieces and girders, is the same with that of the great Hyde Park building. But the construction of the arched nave and of the dome is of course entirely peculiar, and the general effect of the building is completely different The London building was certainly deficient in architectural effect. The form of the New-York edifice affords the requisite scope for a pleasing variety of embellishment, by which all monotony can be avoided, and allows a very economical use of the ground. The dome, independent of its effect in the interior arrangement of the edifice, will give height and majesty to the exterior.

"The following are the objects which the architects appear to have striven to combine in their plan:

"1. The greatest possible area compatible with the ground employed.

"2. Perfect safety and elegance of construction.

"3. A well-calculated and pleasing admission of light.

"4. A variety of *coup d'œil* in the interior.

"This building will compare, in point of size, and it is thought of beauty, with some of the greatest edifices of the old world; and until the extension of the Capitol at Washington is completed, it will be altogether the largest in this country. It is hoped that it will be a great permanent architectural ornament to the city."

The sole charge of the interior of the building, its division, arrangements, classification and police, has been confided to two officers of the Navy of the United States, Captains S. F. Dupont and C. H. Davis.

These gentlemen have organized their departments as follows:

J. M. Batchelder, Secretary of the Superintendent.

Samuel Webber, Arrangement of Space and Classification.

Prof. B. Silliman, Jr., Mineralogy and Chemistry.

B. P. Johnson, Agricultural Implements.

Joseph E. Holmes, Machinery.

Edward Vincent, Textile Fabrics.

Felix Piatti, Sculpture.

The classification and arrangement of articles presented for exhibition is such that by the catalogue the visitor will be able to find any department he may wish to find, and also any article in it.

The machinery will be driven by two powerful and highly finished engines of 60 horse-power, built by manufacturers of note—the Lawrence Machine Works, and Nightingale, of Providence, R. I. The boilers are six in number, 40 feet long, 3 feet in diameter, and are in a building on the north side of Forty-second street, about 260 feet from the engines. to which the steam is conducted under the street through an 8-inch cast iron pipe.

We shall not occupy our pages with extended remarks upon this interesting event. The transactions will soon become matters of review, when we may speak of them as facts suggesting high and important considerations to all engaged in industrial pursuits.

RAILROADS IN THE UNITED STATES.

On the first of January, 1853, 13,227 miles of railroad were completed in the United States. About 13,000 were in progress, and about 7000 more were under survey. These items make an amount total in course of construction and actually built, of 33,000 miles. Supposing the average cost to be $30,000 a mile, this entire cost amounts to $990,000,000. The amount yet to be expended, and probably within the next five years, is, in round numbers, $600,000,000.

It is a question of some interest where this immense payment is to come from. It is nearly one fifth of the "cash value of all the farms" in the United States, as estimated in the last census. It exceeds in amount the "total value of live-stock," and is more than thirteen times the "total expenditures of the Government" of the United States for the year ending June, 1852.

Some portions of these roads consume a much greater amount of cost than we have here estimated; and very few fall below it. The expenses of some after the roads are constructed are almost incredible. The Erie Railroad, with its necessary furniture, has cost its stockholders, it is officially stated, over $30,000,000. The road extends 446 miles, and, including switches, side tracks and double tracks, has 701 miles of rails, and requires 140 locomotives, 131 passenger and baggage-cars, and 1885 freight and burden-cars, with the addition of a large sum expended for steamboats, car-houses, station-houses, freight-houses, telegraph line, &c.

But who receives the untold thousands, to earn which, requires the expenditure of these immense amounts? "Oh, the rich, of course." We beg pardon. The best roads seldom pay the "rich" stockholders—who, by the way, are often widows and orphans—so much as 8 or 10 per cent. on their investment. The chief part of these millions goes to the support of those who labor by the month and by the day. The engineers, firemen and switch-tenders, the shovel-and-spade-men, the wood-sawers and porters, and a host of others, all live on the vital heat imparted by the fiery iron horse. And how many of this class do you think there are, every one of whom, were railroads annihilated while you read this statement, would scarcely know where to earn the next dollar, but who are essentially dependent upon their daily labor for the daily support of themselves and their families?

There were employed on six of the principal roads in Massachusetts, as reported to the Legislature, 2,035 men, exclusive of those engaged in their construction. The length of these roads is 274 miles. Taking this as the basis of calculation for the roads above referred to, we shall find that when constructed they will furnish employment to more than 245,000 men; that is, to more than the entire white male population of either Alabama, Connecticut, Maryland, New-Jersey, or Michigan, and exceeds that of Arkansas, Delaware, Florida, Texas, and New-Mexico added together, by more than 40,000. They, with their wives and children, may be said to people the Railroad State.

But the *construction* of these roads gives employment to an immense multitude of men, each one of whom must otherwise be a public pauper, with his family, if he has one, or a rival in some other trade or calling.

But even this is only the fraction of this account. Who manufactured these rails? Some of our economists would send abroad for them. We are for doing this at home. But the rails alone for the roads now contemplated will cost over $100,000,000. And who gets this immense sum? The owners of stock in mines? They will do well to get from 6 to 10 per cent. on their investments. See that crowd of miners, and those other hosts of shops' crews, symbolic, in their appearance, of the workshops of Vulcan, in the glare of the lurid light of the furnace and forge. Their life is also dependent upon the success of the Railroad enterprise.

Suppose that gigantic plan which many of us will live to see completed, the Pacific Railroad, were all in the hands of sub-contractors at once; would we have such an army of able-bodied beggars thronging our larger cities as we now witness? What an immense host in the various trades and callings this work would put into operation! how many would find in this project a permanent and thriving business.

The Railroad interest is not sectional. Like the air we breathe, the more it is wrought upon, the greater is its tendency to expansion. One city unites itself with the producer in the far interior, and, *presto*, its ambitious rival in the race for wealth adopts the same means "in self-defense," and both are benefited. And the third follows on, and so it goes from ocean to ocean. Thus these projects are found to-day, in every stage of progress, in the State of Maine and through New-England and New-York, on and still on, south and west and north, till the waters of the lakes in their tempestuous roar answer along these iron pathways to the noise of the waves that dash against the shores of the St. Lawrence, and the mouth of the Mississippi, as if with a tongue that can articulate, welcomes the traveller with his merchandise from the far East and North. We have thus found the promised land—not the land of rest and indolence, but of respectable and remunerating labor.

There is still another department in this immense interest which must not be overlooked. We refer to the labor expended in repairs. This, of itself, is of very great importance. We have before us a statement by the President of the Erie Railroad, which estimates "the annual self-destruction of motive-power" alone, referring only to their locomotives, at $311,311 16. He also says: "Were all the engines of the first-class dimensions and in *full use*, this amount would be increased far beyond your highest estimate of $4[illegible]3,000."

Having estimated the value of these incidental benefits resulting from the construction of railroads—benefits which were not even considered by those who were engaged in securing their construction—we are better prepared to appreciate their importance as the means of creating and improving the markets of the whole interior of the continent. This view we have partially presented in previous numbers of our journal, though the story is scarcely begun. We should be glad to give a condensed view of these effects, but must wait for more complete statistics.

MINNESOTA.

The following information is gathered from "The Minnesota Year-Book for 1851." If all our new States would present us their statistics, from time to time, in a similar form, a mass of information would be collected, in a course of years, of great value to the future historian:

It appears that general attention was first drawn to this Territory by accounts published by fur-traders in 1654, and by Jesuits who penetrated that wilderness "to convert the heathen to their faith." The first mission was in 1634, on Lake Huron. In 1796, the trading-posts on the Lakes were surrendered by Great Britain to the United States. In 1805, Fort Snelling was purchased by Lieutenant Pike, and since 1819 has been occupied by the United States troops. In 1848, Wisconsin was admitted into the Union

There were then some 3000 people in Minnesota, and they sent a delegate to Congress. In 1849, the Territory was organized, and an actual enumeration of all the inhabitants, except Indians, gave a total of 4,680. Of the twenty-seven counsellors and representatives, nine are from New-England. By provision of law, every township, if not less than five families, is considered a school district, and a majority may vote a tax for school purposes, to be levied upon the property of the district, said tax not to exceed $600 in any one year.

St. Paul is the capital of the Territory. Its population is 1,294. Number of families, 257. It is about nine miles from St. Anthony. Among the industrial occupations enumerated, are five blacksmiths, four bar-keepers, five cooks, two cigar-makers, two editors, seventy-seven farmers, ten grocers, *six gamblers*, four hotel-keepers, seventeen lawyers, three livery stable-keepers, twenty-one mechanics, three ministers, six physicians, one sailor, three school-teachers, &c., &c.

Twenty other settlements are described, all of them on the upper Mississippi. "The cash value of farms," by the census, is $193,003. The number of cows, 534; working oxen, 667.

The northern part of Minnesota is covered with forests of heavy pine. The lumber-trade is very lucrative. During the winter of 1849–50 one team made $2,000 in the pinery. The average of green lumber at the mill is $12 per thousand. Dry lumber at St. Paul's in 1850 was $30 per thousand feet. 160 acres of land cost from $120 to $160. In St. Paul's, flour is $7 per barrel; potatoes, 50 and 75 cents; beef, 8 cents; pork, 10; lard, 14; eggs, 25; oats, 50 to 75; butter, 25.

STENOGRAPHY AND PHONOGRAPHY.

The meaning of these two terms is substantially the same. The former is compounded of two Greek words, signifying, the one "close," the other, "to write." The latter is taken from the same language, the first half of which signifies "sound," with the same word for a termination, "to write." The literal translation of the two may be, of the first, *to write concisely*, and of the second, *to write as sounded*. Both systems would use characters corresponding to the following example:

"The condishun of sum peple is reched enuf,"—meaning, obviously, "The condition of some people is wretched enough." The mode of spelling, therefore, is essentially the same in both.

The two systems, however, differ very substantially in the form of the characters used, and, of course, in the facility with which they are made; and in this respect the system of Phonography has, in our opinion, a decided advantage over all other kinds of short-hand. Many years ago we devoted considerable time to Byrom's system—we think that was the name, though even the name is almost passed out of our recollection—and we found it quite practicable to learn to write it, though it was far more difficult to read what we had written. But to do either required a long time. We afterwards met with another system which we attempted to acquire, and in which we made some progress, but we soon abandoned the idea of making it practically useful. In 1846 or 1847 we were brought into contact with a "professor" or teacher of Phonography, and obtained the necessary books and began the study and practice of the art. In a week or so, spending an hour or two each day, we could read with tolerable ease the *first* form of the language, and write it, slowly, with tolerable accuracy. We continued to give the subject such attention as other avocations would permit, until we had secured quite a command over the characters, and we had advanced into the mysteries of the third or reporting style; and though there have been several months together in which we have not given the subject the least attention, we have never lost our interest in it, but have rather made progress in the art. But to acquire a facility in writing requires time and thought. As in every other good thing, patience must be exercised. A boy of twelve years old will write easily any word he may wish to use after as many *hours'* study, and can read, slowly, his own writing or printed books with little trouble. But to be able to command his pen or pencil so as to follow a speaker, is a work of months of constant and laborious effort. The ability to write as rapidly as we can with the common English alphabet will ordinarily require only the practice of some thirty or forty hours; often much less than this will suffice. A good memory is of advantage in this art, though not essential. We have known persons begin this study and abandon it in despair.

Phonography is written in three forms: the long hand, the corresponding style, and the reporting style. In the first, every consonant which is sounded is written, and the vowels are inserted. But every consonant is made by a single mark. In the second form, part of the vowels are omitted, and about a hundred words of frequent occurrence are represented by the characters representing single letters. Other characters also represent the more common prefixes and suffixes; as de, in, com, inter, &c., and ly, tion, &c. In the third form the vowels are chiefly omitted, the number of characters representing words are increased two or three-fold, and various other contractions are used.

To gratify not only the curiosity but the rational desire of some whose eye may fall on these pages, we will point out, by a few examples, the manner in which the wonderful conciseness of this mode of writing is secured, and the chief sources of difficulty which the pupil must encounter.

1. Every consonant sound, whether single or double, is made by a single character. Thus |, \, ⌒, ⌣, stand for the *consonant sounds* of d, b, m, and n.

The characters \ and ⌣ stand for p and n, and when united form the words pan, pen, pin or pun, without the addition of a vowel, or any vowel may be inserted at the option of the writer.

Again, | stands for t; but with a hook on one side (⌈) it stands for tl, and on the other (⌉) tr; if a circle on the right side is substituted, we get an s instead of l, for ⌈ is st; but if the circle were on the left side, we should get str. \ | united, pt, may express pat, pet, &c., as the sense may require, or any vowel may be written before, between, or after them, making apt, pat, pit, put, pot, pate, peat, or pout, or, by using two vowel dots, patty, petty, pity or putty. The connection would readily show which word was intended. But the vowels, if inserted, would show the word at a glance.

The vowels are mere dots or some other simple form that can be written at a dash of the pen, and their sound is determined by their position. In some few of the following examples they are written. Thus a small dot before the top of the t makes the word *it;* before the middle of the t, *et* or *ate;* and before the bottom of it, *at.* The *vowel sounds* wa, we, wi, &c., and ya, ye, &c., are expressed by a very small curve. Thus ⌉ is *wit,* and if at the middle of the *t,* it would become *wait* or *wet.*

These vowels are often omitted without any inconvenience. Thus, *ths pn s bnt* may readily be recognized as *this pin is bent.* So, *a gd mmr s imprtnt,* with very little practice would instantly be rendered, *a good memory is important.*

3. No silent letters are ever written. Instead of *the troubled stream of time,* we should write, *the trubld strēm of tīm.*

4. Words of very frequent occurrence are expressed by the simplest characters.

Terminating syllables and prefixes are represented by a single movement of the pen: thus, stands for f. But with a curve turned from the bottom, which curve means tion or sion, thus , we have *fashion;* again, if made heavy it becomes v, and this, with the turn , becomes v-sion, or *vision;* or an s may be added at the end, as ; and again, con, com, &c., as prefixes, are written by a dot above the next syllable of the word. Hence, while the last character stands for passions, a small dot before or above it renders it *com*-passions.

Writing a letter only half length adds t or d to it. Thus, if *p* is written but half its proper length, it expresses *pt*, and *f* standing alone expresses the word *if*, but when of half-length only, it expresses *ft* or *if it.* The *d* stands for the verb *do*, but when of half-length, it is *did.* The *n* is the word-sign for *no* or *know*, but if of half-length, it expresses *not.*

Lastly, these simple marks stand for entire words. Thus ` ´ ˎ ˏ stand for of, on, but, who. The letter (g) ¯ above the line stands for *give* and *given;* on the line, for *together;* made half the ordinary length, the former becomes *God*, and the latter *good.* These *word-signs* amount to three or four hundred in number. These characters may also be grouped, and by a little experience the eye recognizes them at once, and you read a whole phrase at a single glance of the eye. Each movement represents an entire word. Thus the following are examples.

which it-would-not; with-which it-is-not; it-is-not; I-have-not-had.

We give these examples only as *samples* of the modes adopted by this system. Other forms of contraction are used, quite as important as either of these, while all combined form an admirable system of short-hand which, as the result of careful study, is scarcely equalled by the original invention of any one mind. This was no accident, but the result of a careful and critical analysis of the sounds of the language, and is applicable alike to all languages.

Phonography has been introduced into many of the common-schools, and has been found a very profitable exercise. We understand that Mr. Webster purposes to commence instruction in this city the coming autumn. He is abundantly competent, and we wish him success.

AFRICA—LEVEL OF THE RED SEA.

We find by a series of levellings recently carried across the Isthmus of Suez, that instead of there being a difference of thirty feet between the level of the Red Sea and that of the Mediterranean, as has so long been believed, there is in reality little or none: an interesting fact, which will be still further verified during the progress of the railway works to be set on foot in that locality under the superintendence of Mr. R. Stephenson. How the past and present will be brought together by having light thrown on ancient geography by modern enterprise! Besides this, an attempt is being made to solve another important problem in the Valley of the Nile. Lepsius has stated in his great work on Egypt, that this river formerly flowed at a much higher level than now, having in the course of ages worn away its bed to a depth of twenty-seven feet; and this statement being disputed, a deep pit or well is to be sunk at Heliopolis, with a view to examine the strata and deposits through which it flows, and thereby determine if any and what change has taken place. The work for this purpose is under the direction of Mr. Leonard Horner, who defrays the cost with a portion of the annual grant placed by Government at the disposal of the Royal Society, which has lately received a consignment of cases filled with specimens of the earth taken from the excavation. Meanwhile it appears that, like Sweden, the Arabian Gulf region and Abyssinia are undergoing slow and gradual upheaval. In addition to these researches, active explorations are going on in the north, east, west, and south of Africa, and more than one treaty of commerce has been signed between England and the petty monarchs of the interior. The Rev. Mr. Livingston announces the existence of another large lake, 200 miles north-west of that now known as Lake Ngami; the great Lake Tchad is being navigated by European boats; and efforts are being made to reach those mysterious mountains in which the Nile is supposed to rise, for, as Captain Smyth observes, "no European traveller, from Bruce downwards, has yet seen its true source."—*Chambers' Journal.*

THE WANTS OF THE SOIL—AND OF FARMERS.

THE *Genessee Farmer* publishes a short article with the first part of the title above given, which contains some very curious statements. It cites a memorial to Congress on the subject of a National Normal School of Agriculture, written by the editor referred to, which he seems to regard as of immense importance. If true, these statements certainly are important, and demand immediate attention.

We first give the article, and then our own comments.

"At present, not far from three fourths of the entire labor and capital of the United States are employed, either directly or indirectly, in the great work of robbing the soil of the few things that God hath placed in it for the support of vegetable and animal life, without making or pretending to make any adequate restitution. All tillage is a most unnatural operation, and the matter removed in crops by no means indicates the whole of the loss of the elements of fertility that arated fields sustain. An intelligent wheat-grower in Wisconsin writes to the agricultural department of the Patent Office, that lands which have been cultivated twelve years in that new State, now yield but half the annual harvests that they did when first tilled and seeded. An extensive corn-grower in Indiana informs your memorialist, that the rich river bottoms of that State now yield seventy bushels per acre. Maize being by far the most important crop grown in this country, much pains have been taken to learn the commercial value of the raw material necessarily consumed to form a bushel of grain; of which over six hundred million bushels are annually extracted from American soil.

"A gentleman in Connecticut writes, that his farm, of some two hundred and fifty acres, has been cultivated two centuries, and consequently has reached what may be regarded as the normal condition of long-tilled earth. He finds it necessary to apply ten cords of compost manure to an acre, to raise forty bushels. The manure costs him a dollar a cord, and twenty-five cents per bushel of his crop. A corn-grower in Virginia has tried many experiments with guano, and finds that one hundred pounds, which cost two dollars and fifty cents, will generally add ten bushels to his harvest. The manure, like that used in Connecticut, costs a quarter of a dollar for enough to produce a bushel of corn. Many letters from practical men of close observation and large experience have been received at the agricultural department of the Patent Office, going to show that if one draws not upon the natural fertility of land to form his corn plants, the raw material to make a bushel of corn can rarely be obtained for a less sum than twenty-five cents. There is collateral evidence worth naming, that corroborates this estimate. Long experience in France and Belgium establishes the fact that the *excreta* from an adult person are worth five dollars a year for agricultural purposes. The night-soil obtained from the human species is equal to the production of twenty bushels of corn to each inhabitant; and for the obvious reason, that no animal has the power to annihilate a single atom consumed in its daily food, nor to create one, if needed to prevent starvation. Field laborers at the South consume about thirteen bushels of corn meal, and as much bacon as from ten to thirteen bushels of corn will make, as the yearly allowance to each. Children consume less, but often waste more than adults. Taking our entire population of 25,000,000 at this time into account, and each consumes, in one form and another, fertilizing atoms drawn from the bosom of the earth, equal to those contained in twenty bushels of maize; showing an aggregate annual consumption of 500,000,000 bushels, which the soil loses as effectually as it would if that amount of grain were cast into the sea every year."

The subject is two-fold. The first relates to the "unnatural operation" of "tillage." When the word *unnatural* is used as in this connection, we suppose it must be defined as something essentially opposed to nature. But we have supposed that crops were natural productions; not something contrary to nature. Again, we have supposed that the original object of the physical creation was to afford a residence for its future inhabitants, and to furnish them with food and other products, calculated to promote the comfort of the living beings which should dwell upon it. Was Adam placed in the garden for an unnatural purpose? To us the idea is only ludicrous.

But is tillage in any sense "unnatural?" We can attach no possible meaning to the phrase which would make it the expression of truth. The whole science of farming is professedly in accordance with the laws of nature. In no other way can crops be raised. If there is any sense in which the phrase we criticise is admissible, it can only be when applied to the *forcing* system resorted to, not by farmers, but by a few horticulturists; who, by a concentration of nature's energies, light, heat, and gaseous elements, secure a more rapid growth than, when left to herself, dame Nature is accustomed to exhibit. But our brother editor is speaking of tillage in general; and to prove it, apparently, he cites numerous instances in which the amount of crops has essentially diminished. Now we should say that this was for the *want* of tillage. It is because nature is left to her own resources in producing our crops. The *harvesting* of crops may be called unnatural in some sense; for nature, if left to herself, would work up her previous products into new growths. But we abstract them from her for our own benefit, and fail essentially to replace them; that is, if we *neglect* "*tillage*," we rob her of the means of continuing her own accustomed processes; processes without which her nature—that is, herself—must change from being fertile to a barren waste. Tillage alone enables nature to remain herself, while we appropriate her annual growths to our own use. But we take the opportunity offered by this short extract, to say that we have no confidence whatever in the Doctor's prescription as a remedy for the evil, by whatever name it is called. Want of cultivation, neglect of tillage, an attempt to obtain from nature what she cannot give, good crops without suitable cultivation—this is the great, the almost universal mistake of our farmers. They must cultivate the soil, or nature itself will become as inefficient as they are.

But why do they not cultivate? We answer, that, as a general thing, it is not because they are not satisfied that cultivation would secure better crops. There is not a farmer living in civilized communities that does not believe that increasing the supply of suitable manure would increase his crops. But where is he to obtain his supply? He keeps all the cattle he thinks he can afford to keep; he uses all the manure he can collect; and still he earnestly desires more, *much more.* But he "can't afford" to buy. He "can't afford" to buy and compound artificial ingredients that furnish a very good substitute for barn-yard (vegetable) manure. So he thinks; and though he is probably mistaken, he is nevertheless obliged to act according to his own convictions. The first thing to be done, in our view, is to correct this opinion, and satisfy him that "tillage" is not only not "unnatural," but absolutely indispensable; that without it, no man eventually can afford to plant his seed. The crops will not pay the cost of obtaining them. Now, how will the Doctor's prescription, "a National Normal School" of agriculture, correct his opinions on this subject? He can't attend that school; nor can he send his son there. Those only who till and cultivate in a high degree can afford to send to such an institution. "But they will publish their very successful experiments, and thus produce conviction." And will they publish "gratis?" Oh no. He must take "the national agricultural organ of the National Normal School;" and pay for it, too; and pay in advance. But will that paper be any better than some that are now published? We have them now regularly issued by the *would-be editors* of that *National Farmer.* We doubt very much whether we should get any better.

Besides, this idea of "all the wisdom" in any one journal, in any one department of science, is suited only for a one-man government, and the said editor would be very apt to transform himself into a one-idea man. Some of us are quite assuming enough now.

Disseminate—*disseminate*—this is *our idea.* Let every State paper, every country paper, every village sheet which is published, every school, every academy and every college teach the reverse of the doctrine we have been criticising, and proclaim that the command of nature is, Cultivate—*cultivate*—CULTIVATE—and we shall by and by discover that reform is already secured, and that we are following the law that God established in every department of the natural world, namely, that to furnish the best possible materials in the best possible condition is the only way in which we may confidently anticipate the best possible results.

OCEAN STEAMERS BELONGING TO THE PORT OF NEW-YORK.

A LATE number of the *Journal of Commerce* contains an article from which we gather the following facts. The several lines of Ocean Steamers consist of the number of ships and of the tonnage given below:

	SHIPS.	AGGREGATE TONNAGE.
Cunard Line,	9	10,000
New York and Liverpool and United States Mail Steamers, (Collins's,)	6	13,000
Ocean Steam Navigation Company,	2	3,300

New-York & Havre Steam Navigation Company,	3	4,400
Glasgow and New-York Steamship Company,	1	1,962
New-York and Southern Cities,	17	21,912
Pacific Mail Steamship Company,	13	13,000
United States Mail Steamship Company, (Atlantic side,)	10	19,600
Vanderbilt's Line, *via* Nicaragua,	10	18,000
New-York and San Francisco Steamship Company,	4	7,400
Empire City Line,	3	6,800
Total number of ships,	69	119,374

Where there is surplus production, there will be commerce. Commerce follows industry, and never leads it. Profitable industry, actually in operation, or the confident belief in it, alone can open the channels of the seas.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

AN AMERICAN SCHOOL OF MINES.

Messrs. Editors:—The mining interests of this country are worthy of the special attention of all who are attracted towards the consideration of our productive industry. A vast territory, so rich in its mineral treasures as is ours, cannot safely neglect so important a branch of its internal resources as that offered by its stores of metals, and it is a promising sign that so much attention is of late given to these great interests. Among these, we are reminded of the vast repositories of valuable ores in Sussex county, New-Jersey, where the celebrated red oxide of zinc and Franklinite occur in mountainous profusion. Until a few years ago, these ores were thought to be almost too impracticable to be reduced, and for a long time they were entirely neglected. But a new spirit was infused into the mining affairs of the country, and it reached the Sussex hills, and the zinc paint, beautiful and economical, is now abundantly produced. The Franklinite is undergoing careful and extensive examination and experiment, and we have little doubt it will be found to furnish a strong and valuable iron for the market. It is pronounced superior for axles and similar purposes, and we believe that this long-neglected ore will soon become an article of general demand in the manufacture of choice machinery. But it requires, beyond doubt, all that scientific and practical knowledge can do, to give it its true value. This is only one of the numerous indications of the growing interest in mining enterprises.

The constant development of the vast mineral resources of this country is one of the most prominent results of the progress of population westward and northward, and points in the future to sources of national wealth and independence of which we can now form but a moderate estimate. A few years since, when the tradition of the Copper Rock of Lake Superior was almost all that was actually known of the immense quantity of that metal in a pure state which was treasured up with the various ores and oxides on the Ontonagon and the lake shores, no one could have dreamed of the vast masses which a short time was to expose to view, or of the future yield of ordinary, not to say of scientific mining.

A few leagues distant to the south and west of the copper region, the great depositories of lead in Illinois, Iowa, and the region of the Mississippi, have for many years measurably rewarded the labors of capitalists and miners who have chosen to make their investments in that field. Unquestionably but a portion of these treasures has been discovered, as the recent penetration of several extensive caves, said to contain immense quantities of lead, and much of it highly argentiferous, seems to prove.

The gold mines of the Southern States, more particularly the placers of California, are a clear evidence that a more economical and scientific system of mining is indispensable to the full development of the auriferous wealth of our country. As soon as the placers and stream-beds of California shall have been overrun, wastefully as they have been and will be, until exhausted, the gold of that rich region will be sought, as it is now beginning to be, *in situ*, in the veins of the mountains, and in the massive rock, whence the golden sediment has been washed by the storms and floods and erosions of thousands of years. Scientific mining in California would have added probably thirty per cent., if not more, to the yield which has been hastily snatched from its various localities.

But in addition to these, the extended area of the interior continent, from a short distance west of the Mississippi to the borders of the Pacific, is yet to be explored. In this portion of the country explorers are no doubt destined to uncover silver, lead, copper, iron, and gold, while tin, quicksilver, and blende may yet be found in quantities which shall afford the richest remuneration. The Great Basin, Utah, New-Mexico, Oregon, California, Missouri Territory, and the western parts of Missouri, are fields in which coal, not less than the metals, may be found in almost exhaustless quantities.

Yet it is not to the precarious and adventitious products of the gold and silver mines that we look for the true mineral wealth of the country. An accessible deposit of iron ore, of the right per centage to make it yield an iron of good quality, with the natural facilities of fuel, water-power, &c., &c.. would be a greater treasure to each State than a gold mine.

But the metals are not alone the field for the scientific and practical man. The unlimited coal regions of our country, extending from the heart of Pennsylvania southward and westward, and covering so much of the Valley of the Mississippi, with the wide fields beyond, open a domain in which enterprise and capital are yet to find a rich reward.

Many and disastrous have been the undertakings in which a want of scientific and practical knowledge has brought only disappointment and ruin to the adventurers. Professor (now Sir Charles) Lyell, in his lectures at the Broadway Tabernacle, when in New-York, during his first visit, in speaking of the benefit resulting from our State geological surveys, made the following remarks, which cover our whole ground:

"I have been favored with a map, illustrating these points, by Prof. Hall, one of the State geologists engaged in surveying this State, whose labors will soon be made public. And here I cannot avoid saying, that I have been over much of the ground which they have surveyed, and it gives me great pleasure to bear testimony to the accuracy of their labors, to the great pains they have taken, and the science with which they have conducted the survey. I look forward to the appearance of their work, embracing the results of their labors, as *an era in the advancement of science;* and the patronage which has been afforded by the different States of the Union to these surveys is much greater, in proportion to the population, than any European power has ever extended to the advancement of geological science. When we remember, too, the complaints that may be heard in different parts of the State, that the geologists have failed to discover any mineral wealth, even in an economical point of view, these scientific researches are of high value, though their greatest interest arises from the promotion of the knowledge of the structure of the globe.

"But merely in estimating the mischief they have prevented, we shall see an ample remuneration for all the expense attending the survey. I have been told that in this State alone more than a million of dollars have been expended since the Revolutionary War in boring for coal in formations where *it is impossible to find any*—below the carboniferous strata. I should not, to be sure, have ventured to generalize from Europe as a type, and say that the rocks in the crust of the earth occupy the same relative position here, and that coal would be found always in this country under the same conditions as in Europe. But when for twenty years or more we find coal accompanied by the same plants, and that no valuable fuel has ever been found under any other circumstances, we should be safe in saying that none could be found in the older strata. If we begin in the newer beds, we may come down to the coal, and find enough coal to pay the expense of boring for it. But if we begin in the strata beneath the carboniferous, we should never reach the coal until we had bored through the whole earth: we might find it at the antipodes, but not before.

"Thus complaints are made against these geologists, not only that they have found no coal, but that they have passed sentence of sterility upon the State, for they say that through all time no coal shall be found within its borders. And when we reflect on the enormous sums that have been wasted upon strata more ancient than the coal, in searching for coal, we shall see the great saving made in consequence of this survey; for when all its maps and sections are published, it will be seen how impossible it is to find coal in those more ancient beds. This is a kind of advantage which is never easily appreciated; because, to prevent mischief is never so clear and palpable a benefit to the multitude as to find mineral wealth. But one of the greatest advantages which have resulted from these surveys in England—and it will be among the greatest here—is the prevention of this rash and absurd speculation to find coal in strata below that in which those plants known to be essential to the formation of coal are found to exist: and after examining the whole ancient strata, both in the United States and in Europe, there has never been found a single bed of coal where these plants do not exist."

Such being the results of scientific discovery and long experience, it is obvious that the services of men who have given the subject their careful attention and laborious study must be of prime importance. The best miners may sometimes be mistaken, and the results far other than flattering, yet the general rule of economy and policy would be to employ competent men as engineers in mines.

The mineral wealth of the country being of so much importance, and the wants of the rapidly increasing population becoming so much greater every year, the value of a large body of scientific and thorough miners becomes more and more apparent. Yet we believe there is no institution in this country which pays any thing more than an incidental attention to this department of practical science and engineering. We think the time has come when a school for the formation of scientific miners, embracing in its instructions the whole field of Mathematics, Engineering, Geology, Chemistry, Mineralogy, and Natural Philosophy, could be abundantly sustained. The whole course of teaching should be adapted to the education of young men to act as miners, with scientific and practical knowledge sufficient to anticipate and prevent those frequent Utopian enterprises that often absorb splendid fortunes, as well as ruin men of only moderate means.

We invite the attention of the public to this suggestion. Whether the remodelling of some institution already established, or the founding of a new school, be resolved upon, we are convinced that an American School of Mining is needed, and will yet render signal service to the great industrial interests of the republic.

GOOD COUNSEL BY FANNY FERN.

We have not a very great regard for much of the productions of the Triphenas and Sophronias and Jerushas who adorn the pages of so many *weekly* sheets, but the following "Chapter for Nice Old Farmers," by *Fanny Fern*, in the *Olive Branch*, is too good to be unnoticed, and we give it a place in our pages:

Can any body tell why country people so universally and pertinaciously persist in living in the *rear of the house?* Can any body tell why the front door and windows are never opened, save on the Fourth of July and at Thanksgiving time? Why Zedekiah, and Timothy, and Jonathan, and the old farmer himself, must go *round* the house in order to get *into* it? Why the whole family (oblivious of six empty rooms) take their "vapor bath" and their meals, simultaneously, in the vicinity of a red-hot cooking-range in the dog-days? Why the village artist need paint the roof, and spout, and window-frames bright crimson, and the doors the color of a mermaid's tresses? Why the detestable sunflower (which I can never forgive "Tom Moore" for noticing) must always flaunt in the garden? Why the ungraceful, prim poplar, fit emblem of a stiff old bachelor, is preferred to the swaying elm, or drooping willow, or majestic horse-chestnut?

I should like to pull down the green paper window-curtains and hang up some of snowy muslin. I should like to throw wide open the hall door, and let the south wind play through. I should like to go out in the woods, and collect fresh, sweet wild-flowers to arrange in a vase, in place of those defunct dried grasses, and old maid "everlastings." I should like to show Zedekiah how to nail together some bits of board for an embryo lounge; I should like to stuff it with cotton and cover it with a neat "patch." I should like to cushion the chairs after the same fashion. Then I should like, when the white haired old farmer came panting up the road at twelve o'clock, with his scythe hanging over his arm, to usher him into that cool, comfortable room, set his bowl of bread and milk before him, and after he had discussed it, coax him (instead of tilting back on the hind-legs of a hard chair) to take a ten-minutes' nap on my "model" sofa, while I kept my eye on the clouds to see that no thunder shower played the mischief with his hay.

I should like to place a few common-sense, practical books on the table, with some of our fine daily and weekly papers. You may smile; but these inducements, and the comfortable and pleasant air of the apartment, would bring the family oftener together after the day's toil; by degrees they would lift the covers of the books, and turn over the newspapers. Constant interchange of thought, feeling and opinion, with discussions of the important and engrossing questions of the day, would of course necessarily follow.

The village tavern-keeper would probably frown upon it; but I will venture to predict for the inmates of the farm-house a growing love for home, and an added air of intelligence and refinement, of which they themselves might possibly be unconscious.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

WASHING SHEEP—MANAGEMENT OF SHEEP AT SHEARING.

MESSRS. EDITORS:—The old practice of washing sheep, or, as may be properly said, besmearing them with a decoction of tobacco, should be abandoned, although it may be a sure exterminator of the vermin. I have known the poor animal entirely prostrated by the intoxicating effects of the tobacco wash, and have heard of its causing instant death: at any rate, it cannot be agreeable to the animal, and can produce no good effect but to destroy the vermin, while a wash of strong salt brine is quite as efficient in doing this as the above-named decoction, and is productive of many good results besides. When the sheep are sheared, take a stiff brush dipped in the solution, and rub them all over with the saturated brush, which will produce a white lather or foam. This stimulates the skin to redness, and prevents the animal from taking cold; it loosens the scurf, and promotes the future growth of the wool, and also improves its quality. I have known this recipe to be used for several years with excellent effect. Yours,

ARIEL HUNTON.

POINTS OF CATTLE.

THE New-York State Agricultural Society has taken the matter of uniformity of points in cattle in hand. A scale for four breeds—Short Horns, Devons, Herefords and Ayrshires, by Francis Rotch, Esq., a gentleman adequate to the task, is already published. We give below from the Boston *Cultivator* the points of the Short Horn.

SHORT-HORNS—THE COW.

Pedigree. Showing unbroken descent, on both sides, from known animals, as found in the English Herd-Book; 40.

The Head. Small, lean and bony, tapering to the muzzle; the face somewhat long; 2.

The Nose. Of a light delicate color; 1.

The Eye is of great significance, and should be prominent, bright, and clear; "prominent" from an accumulation of "adeps" in the back part of its socket, which indicates a tendency to lay on fat; "bright," as an evidence of a good disposition; "clear," as a guaranty of the animal's health; whereas a dull, sluggish eye belongs to a slow feeder, and a wild, restless eye betrays an unquiet, fitful temper; 2.

The Horns. Light in substance and in color, and symmetrically set on the head; the ear somewhat large, thin, and with considerable action; 1.

The Neck. Rather short than long, tapering to the head; clean in the throat and full at its base, thus covering and filling out the points of the shoulders; 2.

The Chest. Broad from point to point of the shoulders; deep from the anterior dorsal vertebræ to the floor of the sternum, and both round and full just back of the elbows; sometimes designated by the phrase, "thick through the heart." These are unquestionably the most important points in every animal, as constitution must depend on their perfect development, and the ample room thus afforded for the free action of the heart and lungs; 8.

The Brisket, however deep and projecting, must not be confounded with *capacity* of chest; for though a very attractive and selling point, it in reality adds nothing to the space within, however it may increase the girth without.

It is, in fact, nothing more nor less than a muscular adipose substance, attached to the anterior portion of the sternum, or breast-bone, and thence extending itself back. This form, however, of the brisket, indicates a disposition to lay on fat generally throughout the frame, and in this point of view is valuable; 4.

The Shoulder, where weight, as in the short horn, is the object, should be somewhat upright and of good width at the points, with the blade-bone just sufficiently curved to blend its upper portion smoothly with the crops; 3.

The Crops must be full and level with the shoulder and back; and is perhaps, one of the most difficult points to breed right in the short-horn; 4.

The Back, Legs, and Hips should be broad and wide, forming a straight and even line from the neck to the setting on of the tail; the hips or hucks round and well covered; 6.

The Rumps laid up high, with plenty of flesh on their extremities; 3.

The Pelvis should be large, indicated by the width of the lips and the breadth of the twist; 2.

The Twist should be so well filled out in its "stem" as to form nearly an even and wide plane between the thighs; 1.

The Quarters, long, straight, and well developed downwards; 3.

The Carcass, round; the ribs nearly circular, and extending well back; 4.

The Flanks, deep, wide, and full in proportion to condition; 1.

The Leg, short, straight, and standing square with the body; 2.

The Plates of the belly strong, and thus preserving nearly a straight line; 1.

The Tail, flat and broad in its root, but fine in its cord, and placed *high* up and on a level with the rump; 2.

The Carriage of an animal gives style and beauty; the walk should be square and the step quick; the head up; 1.

Quality. On this the thriftiness, the feeding properties, and the value of the animal depends, and upon the touch of this quality rests, in a good measure, the grazier's and butcher's judgment. If the "touch" be good, some deficiency in the form may be excused; but if it be hard and stiff, nothing can compensate for so unpromising a feature. In raising the skin from the body between the thumb and finger, it should have a soft, flexible and substantial feel, and when beneath the outstretched hand, it should move easily with it, and under it, as though resting on a soft, elastic, cellular substance; which, however, becomes firmer as the animal "ripens." A thin, papery skin is objectionable, especially in a cold climate; 8.

The Hair should be thick, short and mossy in water; fine, soft and glossy in summer; 1.

The Udder, pliable and thin in its texture, reaching well forward, roomy behind, and the teats standing wide apart, and of convenient size; 1.

POINTS OF THE SHORT-HORN BULL.

As regards the male animal, I have only to remark, that the points desirable in the female are generally so in the male, but must, of course, be attended by that masculine character which is inseparable from a strong, vigorous constitution. Even a certain degree of coarseness is admissible, but then it must be so exclusively of a masculine description as never to be discovered in the females of his get.

In contradistinction to the cows, the head of the bull may be shorter, the frontal bone broader, and the occipital flat and stronger, that it may receive and sustain the horn; and this latter may be excused if a little heavy at the base, if its upward form, its quality and color be right. Neither is the looseness of the skin, attached to and depending from the under jaw, to be deemed other than a feature of the sex, *provided* it is not extended beyond the bone, but leaves the gullet and throat clean and free from dewlap.

The upper portion of the neck should be full and *muscular*, for it is an indication of strength, power, and constitution. The spine should be strong, the bones of the loin long and broad, and the whole muscular system wide, and thoroughly developed over the entire frame.

EXPERIMENTS WITH GUANO.

As many of our planters are now about trying guano on their crops, we publish for their benefit the following experiments made by Col. T. E. Law, of Darlington District, which were published in the *Darlingtrn Flag* of the 17th:

Experiment 1st, made on land in a high state of improvement from former manurings.—100 lbs. guano per acre produced 1872 lbs. of seed cotton.

Hog-pen manure produced 1768 lbs. seed cotton.

Difference in favor of guano, 104 lbs.

Cost of 100 lbs. guano, $2.50. Worth of 104 lbs. seed cotton, $2.60, or equal to 104 per cent. on cost of guano, over hog-pen manure heavily put on.

Experiment 2d.—On poorer land, 100 lbs. guano per acre produced 988 lbs. seed cotton; without manure of any kind, 676 lbs. seed cotton.

Difference in favor of guano, 312 lbs. seed cotton, equal to 312 per cent. on cost of guano applied.

Experiment 3d.—150 lbs. guano per acre made 1508 lbs. seed cotton; hog-pen manure, 1352 lbs.

Difference in favor of guano, 156 lbs., equal to 104 per cent. on cost of guano.

Experiment 4th.—150 lbs. of guano per acre made 978 lbs.; 200 lbs. guano per acre made 962 lbs.

Difference in favor of 150 lbs. guano, 26 lbs.

This experiment was made on two rows of each, instead of one, as in the other cases; and it so happened that it was where a fence had stood several years, and had been moved, which I think is the cause of giving advantage to the smaller quantity of guano applied.

Experiment 5th.—50 lbs. guano per acre made 676 lbs.; without manure, 598 lbs.

Difference in favor of guano, 78 lbs., equal to 150 per cent. on cost of guano.

Experiment 6th.—300 lbs. guano per acre made 1313 lbs.; without manure, 568 lbs.

Difference in favor of guano, 715 lbs., equal to 238 per cent. on cost of guano.

BLUE DAHLIAS.

"The *Gardener's Chronicle* says that a celebrated cultivator of dahlias expects in a year or two to produce a blue dahlia, by keeping constantly watered the root of a white one with a solution of sulphate of iron. The sulphate of iron turns hydrangeas blue, and why not other flowers as well? Of course the solution must be very weak when used. Try it."

This idea of coloring flowers seems to be an *epidemic* in these days. For ourselves, we have no faith in it. If a given plant can be thus operated upon by this means, with success, we do not believe it would be permanent. The next generation would not follow in the footsteps of its immediate, but of its remoter ancestry; and if but a single plant is affected, and for a single season only, the color desired may be imparted *in effect*, by covering it with colored glass, just as blue and red and yellow lights are obtained in our shop windows.

A SPEAKING TELEGRAPH.

It is mentioned in a late Paris paper, that at a private réunion in that city, a very curious system of telephony, for the transmission of language at great distances, by means of musical sounds, was exposed by its inventor, M. Sudre. The plan is most ingenious, only making use of three notes placed at given intervals, and which, combined or repeated according to certain rules, are capable of rendering the most complicated sentences. Thus, one of the company writes a few lines, and on M. Sudre reading them, he strikes his three notes alternately, according to his method, when a third person, without any previous knowledge of the writing, repeats the words merely from hearing the notes. The system has been, it is understood, tried on a very extensive scale, to test its applicability to naval and military purposes, and is stated fully to justify the high encomiums the Institute and other scientific bodies have bestowed on it.—*Exchange paper.*

The plan above described seems to us nothing more than a change of form of a custom long in use in military, if not in civil matters. The bugle has long been the medium of communicating orders from the officer in command, and is one of the means most relied upon in battles and elsewhere for their rapid and safe transmission.—Eds. P. L. and A.

THE CURCULIO: WATCH HIM.

Now is the time to commence your attack on this enemy of the Plum Grower. A writer in the *Farmer's Journal* gives the following as his experience in ridding himself of these "insects:"—

"Ignorant of the character of the enemy of my fruit," says he, "I determined to try an experiment with one of my trees. I accordingly procured a pound of flour of sulphur, and placing a small iron furnace filled with live coals on a high stock, as near to the lower branches as I could with safety, sprinkled the sulphur lightly on the coals. This was early in the morning, while the atmosphere was perfectly calm. As the fumes of sulphur ascended through the tree, I watched closely, for the purpose of ascertaining whether any effect had been produced upon my unknown foe. Scarcely had the vapor arisen to the topmost branches, when I observed several round-looking objects falling. Upon examination, I found them to be insects which were entire strangers to me. I showed them to a friend somewhat skilled in entomology, who at once pronounced them to be the dreaded curculio—the scamps that had the preceding year destroyed my plums.

"Much delighted with the discovery, I immediately renewed the sulphur fumigation, continuing it for more than a week, and always with success against the foe. The result was most gratifying. The tree which had been fumigated bore me a fair crop of excellent fruit, while on the other scarcely a single plum came to perfection.

"This spring my two trees blossomed profusely. I again caused the sulphur to be applied, and at the period of writing, I am rejoicing in the prospect of a fine crop of plums."

C. Betts, of Detroit, publishes the following in the *Albany Cultivator:*

"Here is a remedy for the curculio which proved entirely successful in the garden of one of our citizens.

"As soon as the fruit began to form, and the curculios were found to be about the trees, he took a barrel of air-slaked lime into the garden, and with a large shovel threw the lime among the trees, covering them completely, and, to use his own expression, 'making a *perfect smudge.*' At this they seemed displeased, and left; he observed them crawling over the lime-covered fruit in a few instances, but they appeared restless and uneasy, and soon all left. Along in June they again made their appearance, and the liming was repeated, which was again successful in driving them away; and once again, just before the plums began to ripen, he gave the trees another dose, having observed some curculios about. His trees were loaded with fruit, while there were but few grown elsewhere in the city. A large branch, loaded, was exhibited at the August exhibition of the Detroit Horticultural Society. I have no doubt this course would prove successful if thoroughly tried, and where the trees, as in this case, are sheltered from violent winds."

HOEING CORN.

THE *Granite Farmer* talks wisely, we think, when it says, as in a late number, "Some ask how many times it is best to hoe corn and other crops. The best answer to that question was given us a few days since by a farmer whom we had observed often at work in a field of corn in sight of our window. In going over the piece with him, and remarking the remarkable growth, we asked him how many times he usually hoed his corn. 'Why,' said he, 'I do as I was brought up by my father to do. He never had any particular number of times, but hoed it all he could. I find it grows faster, and stands dry weather better, the oftener it is hoed.' This is the true philosophy of culture: stir the ground. The direction for early and good crops, after the proper previous preparation, would be, to stir the ground. Crops are like animals—they need petting and care. A friend was remarking to us, one evening, the difference in the growth of melon vines in a neighbor's garden and in his own, side by side, of the same kind of soil, and both rich; with the same kind of preparation for the seed, and the seed sown at the same time. The neighbor's melons were in blossom, while his own, he said, were but three or four inches in height. The difference had been produced by the constant labor and care of the gardener in stirring the ground and regulating the amount of sun and shade, air and moisture they received."

CURE FOR A FOUNDER.—The Ohio *Cultivator* gives the following recipe for curing the founder—more correctly speaking, the water-founder: Bleed the horse from the neck as long as he can stand up; then make him swallow one pint of salt; anoint well around the edges of his hoofs with spirits of turpentine; keep him from drinking too much water, and he will be well in a few hours. The writer says: "The above recipe cured a valuable horse for me, last spring, after trying nearly every other remedy without success. The six dollars paid for the back numbers of the *Cultivator* has saved me a horse worth upwards of $100: otherwise he must have died.

HOOFAIL.—Says another writer in the same paper: "This disease is usually attributed to driving on hard or muddy roads; but we have seen it in its worst form where cattle scarcely left the barn during winter, and having all the appearance of an epidemic. So severe was the disease that the feet of the animals affected became livid, and finally parted at the lower joint, as if the feet had been frozen. The best remedy in our experience is, on the first discovery of the disease, to drive the animal upon a plank floor, and with a broad chisel and mallet cut off the points of the hoofs to produce a flow of blood. A cleansing wash of weak brine, followed by an ointment of corrosive sublimate and lard, will be found beneficial. The animal should be kept from going in mud or water.

GRAPE CULTURE.

IN the February number of *Hovey's Magazine of Horticulture* we find a communication from a successful grape culturist in Maine, Mr. Wm. Gore, of Freeport, who has succeeded admirably in the cultivation of the Isabella grapes. Mr. Hovey pronounced some specimens of this variety, raised by Mr. Gore, "superior to any he ever saw." By request of Mr. Hovey, Mr. Gore communicates his method of cultivating the grape vine on which the specimens were produced. We extract the following particulars from the Magazine in which it was published:—

"The vine on which the sample bunches were grown has been planted in its present place six years, and trimmed the usual way, the growing season, and 'spur' pruned in the fall. In the autumn of 1851, the vine had five canes, (or branches,) from fourteen to eighteen feet in length; but one being somewhat injured by mice the preceding winter, and the canes rather too near together on the trellis, I cut it off, leaving four canes, which, after covering the ground well with stable manure and boards, were loosened from the trellis, let down upon the boards, and covered with spruce limbs for the winter. In the spring, the vines were uncovered as early as the season would admit—early in April; but they were left down until the last of May, as they suffer less from the cold winds in that position than they would upon the trellis; besides, it is supposed the sap flows better through the canes, and consequently that the leaves put forth more uniformly. After securing the vines upon the lattice, which is twelve feet high and twenty-five feet long, at the south end of the house, and eighteen inches from it, I commenced weeding it, leaving but one shoot or fruitful branch to each eye or joint, and these were secured, from time to time, as they advanced to the trellis.

"The flowers did not make their appearance till the 2d of June; and the middle of July, the fruit being formed, I took off all but two bunches from every strong shoot, and reduced others of weak growth still more.

"I have been in the habit, before last season, of shortening in the young fruit wood at the second leaf or joint above the fruit; but the present season I have let all grow, excepting such as injured the symmetry of the vine—they growing from five to twelve feet before September, when they were all shortened in about one quarter of their growth.

"The fruit was gathered on the 20th of October, having been protected from the cold winds and frost one month by an awning of cotton cloth.

"I have pruned again this month (November) as usual, cutting all the fruit wood, or nearly all, to within one or two joints of the main canes, leaving the canes prolonged from eight to twelve, and put the vines under cover as in the previous year.

"I should mention that I watered freely in the first of the summer with soap-suds, and syringed often towards evening with rain-water. The summer packings or weedings [prunings] are buried by the roots of the vine, with a good sprinkling of plaster, and by the first of August *mulch* well about the vine."

Mr. Hovey, who is an experienced nurseryman and horticulturist, as every one knows, approves of Mr. Gore's method of treatment or culture of this vine, and sums it up as follows:—*Thorough weeding* of the young growth—*protecting the vine* during winter—*allowing a free growth* all summer—shortening in the new shoots only one fourth their length—early watering, and syringing freely during the season, and mulching after August when the fruit is rapidly swelling.

ABORTION IN COWS.

The able Editor of the *Cultivator* says:

"Without being able to assign the cause in this particular instance, we can only state what are usually regarded as the most prominent causes, viz.: confined or impure air in stables, stall feeding without sufficient and regular exercise, impure water, bad hay or stale grain, &c., which are supposed to cause flatulency, and increase the danger. Offensive odors, especially of putrid flesh or putrid blood, are supposed to produce a nervous influence, and strongly to contribute to this result. The ergot of rye is known to have a powerful tendency in the same direction, and it is thought that the ergot which grows upon other plants, as some species of grass, on wheat and Indian corn, and which are found more abundantly in certain localities and in certain seasons, may also tend to produce abortion. All the cows of a herd being alike affected by all these causes, when the first animal loses her calf, the peculiar odor which she imparts, and which the others by their keen sense quickly perceive, tends powerfully to produce the same disaster throughout the herd.

The remedy consists in avoiding all the exciting causes, and in moderate and regular feeding, wholesome food, pure water, pure air, moderate exercise, clean bedding, currying, and general attention to comfort."

WHAT IS THE BEST MODE OF CASTRATION?

The *London Veterinarian* contains the following advice, written by a veterinary surgeon of the King's Hussars:

Which is the best mode of castration? If you ask this question of five or six men, you will probably receive as many different answers. I have tried the actual cautery, the clams, the ligature, and scrapings; and I prefer the last, it being simple, safe, and speedy.

You have, doubtless, tried it, and perhaps most of your readers have performed the operation. However, at the risk of telling a twice-told tale, I will endeavor to describe *the mode of scraping.* You begin, as for castration, in the ordinary way. Free the testicle, and grasp it with the left hand; *divide the seminal* part of the cord, and with a tough-edged knife *scrape* the *vascular* cord lengthways, until you scrape through it. Simple enough, and speedy too, since from first cut to last scrape takes rather less than twenty seconds. I have done it in sixteen, and safely; for I never knew a horse bleed more than I wanted, and you have a simple wound, without any foreign substance to deal with. The horse stands quiet for nearly three days, being merely rubbed down. On the third day the coagulum is washed away, and the parts cleansed, and nothing more is required after than to continue to keep them clean. Tetanus is *not* a frequent sequel to castration; though I saw last month you had put a (?) after what I wrote. As to the time most likely for an attack, I have always found it to come on just as the wound has healed, no matter in *what* part of the body it may be. Those attacks arising from castration generally manifest themselves from the fifteenth to the twentieth day; but I have seen them both earlier and later. As a rule, I do not castrate during the hot months, nor during the heavy rains. Wounds and ulcers generally take on an unhealthy action at those seasons, and particularly during rains. But I have operated in every month of the year.

Will Mr. Gavin excuse me if I say, in any future cases of tetanus, "use *camphor*." I think he will find it one of the most useful medicines. He will, I venture to say, agree with me, that blisters are of no use in tetanus.

SMALL VERSUS LARGE HORSES.

The arguments may all be in favor of great size, but the facts are all the other way. Large horses are more liable to stumble, and to be lame, than those of middle size. They are clumsy, and cannot fill themselves so quick.

Overgrown animals, of all descriptions, are less useful in most kinds of business, and less hardy than those of a smaller size. If theory is to be resorted to in order to determine such questions, we suggest to the lovers of overgrown animals the following: The largest of any class is an unnatural growth. They have risen above the usual mark, and it costs more to keep them in that position than it would were they more on a level with their species.

"Follow nature," is a rule not to be forgotten by farmers; large men are not the best for business; large cows are not the best for milk; large oxen are not the best for travelling; large hogs are not the hogs that fatten best; and large hens are not the hens to lay eggs.

Extremes are to be avoided. We want well-formed animals, rather than such as have heavy, large bones. Odd as it may seem to the theorist, short-legged animals invariably prove to be better travellers than any. Short-legged soldiers are better on a march, and the officers say they endure hardships longer than those of longer limbs.

In choosing a horse, take care by all means that his hind-legs are short. If they are long, and split apart like a pair of dividers, never inquire the price of the horse-dealer; run for your life, and make no offer, lest you be taken up.

Horses that are snug-built are not always fast travellers. It is no easy matter to select a horse that is perfect in all points. Snug and tough horses are not fast on the road. The fastest trotters are not always made for very hard service. So says the *New-England Farmer*, and we agree with him.

Iron Scythe Snaths.—Inventors and manufacturers of machines could have learned much, if they had only given attention to the extraordinary examples of contrivance so numerously displayed in the works of creation. We may cite achromatic lenses as one example of this sort, which even Newton pronounced impracticable, while at the very moment he was writing that assertion he was looking through two most perfectly constructed achromatic lenses, just like millions of others which had been in existence for thousands of years. The ancients were puzzled for a substance to write upon—wasps had been making paper since the creation—a crude, brown fabric, to be sure. Flies and tree-frogs had for the same period illustrated practically the pressure of the atmosphere, and the principle of the suction pump, with beautifully constructed miniature machines; and the structure of the arch, which the more ancient nations, notwithstanding their superlative skill in masonry and architecture, knew nothing about, was well understood and constantly practised all that time by a little mining ant. The most perfect form of a rod, shank, or beam, to combine strength and lightness, is illustrated by the tube of birds' quills, and by the straw of grains and grasses—the hollow rod or tube. This principle has been already applied in a number of instances; but not till now, the middle of the nineteenth century, has the hint been taken in the construction of scythe snaths,—implements in which lightness and strength are preëminently required. We observe by the Patent Office records, that these have been successfully manufactured by A. C. & C. N. Clow, of Port Byron, N. Y., and learn that they promise great advantages on the score of durability, strength, lightness, and facility of being bent into any desirable form.

FLAX MANUFACTURE.

The American Linen Company at Marcellus, N. Y., was originally organized in October, 1851, with a moderate capital. Last summer they demonstrated the practicability of producing linen yarns for about the cost of cotton yarns, and the capital stock was increased to $100,000. The woollen factory of Messrs. Machan & Moses was bought with the view of introducing gradually flax machinery.

From experiments already made in the use of machinery and processes invented by the Secretary of the Company, and some machinery imported from England, the following results are obtained:

The cost of breaking and cleaning unrotted flax-straw sufficient for 100 pounds of pure flax fibre, is less than $2.

Cost of refining, purifying, bleaching, and preparing the same for heckling, by the use of four machines, recently invented for the purpose, and a chemical process, about $1.

It is found that the very expensive process of heckling in the ordinary way can be dispensed with by the use of a machine recently invented, which takes out only the shortest fibres and impurities, leaving the heckled and purified flax in the sliver form, ready for drawing-frames, for less than two cents per pound.

The tow or waste taken out by this, consisting entirely of the short fibres of flax, with such impurities only as are easily separated by picking and carding, is suitable for combining with wool, being fine, white and strong. It is far better for this than cotton, which is now extensively used in tweeds and other mixed goods.

The coarsest flax, such as is grown extensively in this country for seed, is rendered quite as fine and soft as the fine flax straw; and even hemp, by this new mode of manufacture, is capable of being made into fine linen.

Great improvements have been made in drawing-frames, by which they are made to cost much less than the English, while they will do about double the quantity of work, and in the most perfect manner. The roving and spinning-frames have also been greatly improved.

Unrotted flax-straw, in great abundance, can be procured here, after the seed has been taken off, for $10 per ton, and at the West, cheaper still.

The American Linen Compan yexpect to be prepared to supply a large amount of machinery the coming season, either for manufacturing linen, cordage, or bagging by the use of either hemp or flax.

To these statements, which are condensed from the *Tribune*, we append the following from the *Agricultural Society's Journal:*

All the rain that falls upon our fields must either be carried away by natural or artificial drainage, or, having thoroughly saturated the soil on which it falls, be left upon the surface to be carried off by evaporation. Now, every gallon of water thus carried off by evaporation requires as much heat as would raise five and a half gallons from the freezing to the boiling-point. Without going to extreme cases, the great effects of the heat thus lost upon vegetation cannot fail to be striking, and I have frequently found the soil of a field well drained, higher in temperature from 10 to 15 degrees than that of another field which had not been drained, though in every other respect the soils were similar. I have observed the effects of this on the growing crop; and I have not only seen a much inferior crop on the undrained field, but that crop harvested fully three weeks after the other; and the setting in of unsettled weather, I have seen that crop deteriorated fully ten per cent. in value.

MAPLE SUGAR.

"An intelligent farmer in Waitsfield, Vt., has discovered an effectual method of removing the coloring matter from maple sap, so that it will make sugar nearly as white as common crushed sugar. His method is to filtrate all his sap, before boiling, through a hopper or box of sand, which he says takes out not only all the dirt, but all the stains derived from leaves, tubs, crumbs of bark, and all other coloring matter that can prevent the sugar from being pure and white."

This little piece of intelligence is cut from one of our exchanges. But it is all gammon. Years ago, we saw specimens of maple sugar at the Windsor County Show, made in Woodstock, as white as loaf-sugar from the cane. In fact, most of the sugar used in Vermont is of domestic manufacture, and that used in their own families is often far more free from impurities than are the imported sugars. We could give names of the makers of some of these beautiful specimens, which date as far back, at least, as 1846. This, however, is a fair sample of many of the "new discoveries" of our times.

GRAPES FOR COLD-HOUSES.

J. Fisk Allen, of Salem, Mass., widely known as a most skilful cultivator of the grape, succeeds admirably, by means of his forcing, cold, and retarding-houses, in furnishing a supply of this delicious fruit during the entire yearly circle. Forcing grapes, so as to ripen them by the first days of summer, and raising them in cold-houses, for a supply throughout autumn, are well understood and commonly practised. A retarding-house, for winter ripening, and for keeping them hanging upon the vines in safety till wanted, is a greater rarity, and it may prove very desirable with those who shall attempt it, to know what sorts do best for this purpose. The late Report of the Fruit Committee of the Massachusetts Horticultural Society furnishes the following list for this purpose, from Mr. Allen, which he states is the result of ten years' experiments:—

Those which continue fresh or without drying in the retarding-house, are Prince Albert, Queen of Nice, Syrian Porteau Noir, Black Portugal, Whortley Hall Seedling, Muscat of Alexandria.

Black Hamburg, Wilmot's New Black Hamburg, and Victoria Hamburg, dry up some.

The following dry badly:—All the Fontignans, Black, White, and Grizzly, and Zinfindal; Black St. Peter's is uncertain.

We have seen much of Mr. Allen's fruit, and are confident that he deserves the commendation given him in the foregoing paragraph from the *Albany Cultivator.* The regard him as one of the most intelligent and most successful fruit growers in the country.

CHURNING SWEET CREAM.

Mr. True, writing from Phillips, Me., for *The Soil of the South*, says:

"Milk should be strained as soon as convenient after milking, and agitated as little as possible, so that, while cooling, it may commence throwing up the cream undisturbed. The cream should be skimmed off while the milk is sweet, and be sure that the milk is not allowed to go in with the cream, for it will sour and curdle, which will be seen in the butter in white streaks, that many cannot account for. Cream should be churned when sweet, and while cool; the buttermilk drained off, and cold water put into the churn, and churned a little, then drained off, and some strong brine put in, and worked again; because the water will turn the butter white, if allowed to remain. When it oozes out, it is better to work it in the churn than to work it by hand, for it prevents its being greasy, which hurts the sale and flavor very much.

One or two spoonfuls of salt to the gallon of cream will prevent its becoming bitter in a great degree.

A piece of saleratus, the size of a walnut, to the gallon, when the cream is bitter, or frothy when churning, will be of great service.

Do not put sugar into your butter, unless for immediate use.

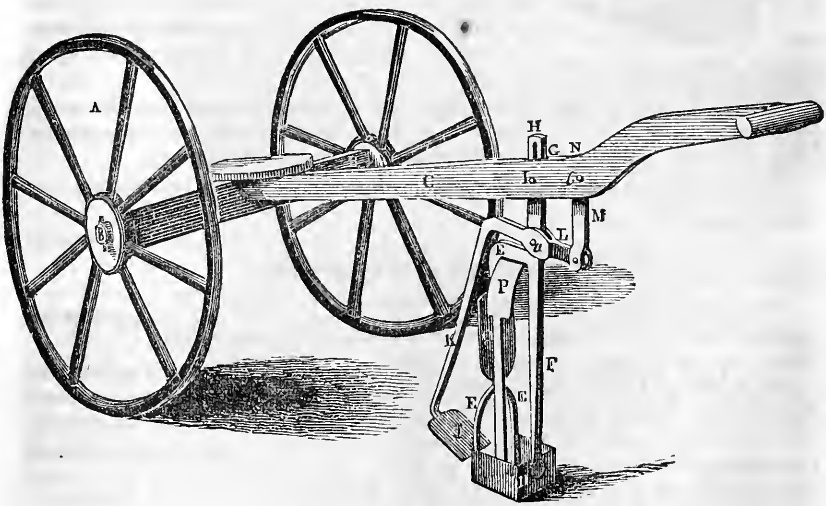
Salt according to the market which it is designed for, but not very salt for any.

Put a layer of salt in the bottom of the tub, then a cloth; fill within one inch, then a cloth and salt; be sure that the cloth does not come over the sides of the tub; cover with a good tight cover; keep it from the ground, in a cool place, from the current of air. Follow these rules, and you may expect that your butter will be sought after, and from one to ten cents per pound in advance of a common article will be your reward.

VALUE OF GUANO.

At a late agricultural meeting, Hon. Marshall P. Wilder being called upon, made the following remarks in regard to guano: He believed that at the present high price of labor, the cost of barn-yard manure on a piece of land would exceed that of an amount of guano sufficient to produce an equal crop. He considered it the very best kind of manure. It always succeeds best in a moist climate, and hence the immense quantities introduced into England, where $8,000,000 per annum is expended for it. Mr. Wilder related some instances of its great fertilizing effects. Mr. Venable, M. C. from North Carolina, had communicated to him the results of its use upon his farm. He had several thousand acres which he regarded as hardly worth cultivation. He applied guano to it, ploughing it in deep, at the rate of only 150 pounds to the acre; and from the whole of this land he obtained an average of 23 bushels of wheat per acre; whereas before applying the guano he got only 5 bushels. Another instance was that of Mr. Holcomb, of Delaware, who purchased a farm of 2300 acres, with a brick house thereon, for $2500, owing to the miserable condition of the land. He sowed 75 acres of it with wheat, ploughing in about 10 tons of guano; and the first crop paid for the farm and all its expenses, and left a small surplus besides.

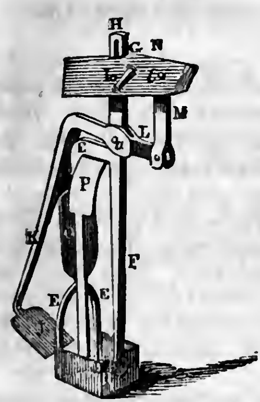
Mr. Wilder's plan was to compound one part of guano with six parts of meadow mud, pulverizing it, and adding another part of charcoal; placing it in a heap (which must be kept covered) three weeks before using it. He had found by experiment that half a handful of this compost was as good as a whole handful put in dry. In sandy soils it should be placed pretty deep, but in clayey lands, shallow. It should be applied early in the spring. Seven years ago he reclaimed a piece of meadow, and dressed it with 300 lbs. guano to the acre. The first year the crop was so heavy that it mildewed, and had not been obliged to renew it.



MORRILL'S IMPROVED DITCHING MACHINE.

This engraving is a perspective view of a ditching machine, patented by Jonathan W. Morrill, of Hampton Falls, N. H., May 10th, 1853.

A A are the wheels; B is the axle of the same, across which the beam lever, C, is secured. The cutters for ditching are placed and secured in this lever. D D D are the cutters for cutting the sides and front edge of the sods. These cutters are united together, and are braced and supported by the stirrup brace, E, which has a vertical bar, F, secured to the front edge, and passes up through the slot, G, in the lever, C. This bar, F, has a slot, H, cut in its upper end with a pin, I, passing through it to make it fast to the lever. As the cutters are raised and lowered, the slot in the bar, F, admits of the lever, C, being depressed and raised. J is a spade, cutter, or scooper; it has a bent handle, K, L, which turns on a fulcrum pin, *a*, which passes through the bar, F. The part L is secured to a link, M, which passes up through a mortice, N, in the beam, and is loosely secured in the same by a pin, *c*, which it allows to move back and forth, as the cutters, D D D, and spade, J, are depressed or elevated. O P are thin plates of metal for guiding the sod as it is raised up, and for throwing it out at the side of the ditch. The plate, P, is only to incline the sod to the one side.



Two men take their position at the handle of the lever, facing the wheels. They press down the lever, which causes the spade to fly out, at the same time cutting the sod on three sides; then, raising the lever, (without changing their hold,) forces the spade in, cutting the sod off at the bottom. The machine, being now on the surface, swings forward seven inches, when the same operation is repeated, one sod pressing out the other, throwing them upon the side of the ditch. Or the lever can be extended across the axle, a man working at each end.

The machines can be made to cut ditches one, two, or three feet deep, and seven inches wide, or fourteen or twenty-one inches wide, by going over the ground twice or thrice, or wider by repeating the operation. It is comparatively easy work for two men. It is fitted to the large wheels of a single-horse wagon.

It may be used to good advantage without the wheels and lever, by having attached to it a piece of wood two feet long, with handles, as represented in the small cut. It cuts a ditch smooth on the sides and bottom.

Applications for machines or rights may be made to the patentee as a

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COPPERPLATE PRINTING.

Few persons have correct ideas of the manner of accomplishing this important work. The engraving, the plate from which the picture is produced, is not so rare a sight; almost every body has at least seen a simple form of it in the plate of an engraved visiting-card, which may be taken as a sample of the whole. Unlike the process of printing, the ink is suffered to remain only in the *cuttings* or "lines." The smooth parts of the surface are intended for the white or uncolored portions of the picture. Hence, after the plate is thoroughly covered with the ink, it is carefully wiped, for the purpose of removing all the superfluous ink, leaving only the "lines" or sunken parts blackened. After it is thus prepared, the plate is covered with the paper on which the impression is to be taken, which should be slightly damp, as it is also in printing. On this sheet are laid several thicknesses of cloth, when the whole is passed between two rollers. These rollers may be made of very hard wood or of iron. The "impression" is the result of the elasticity of the cloth, which forces the paper upon the plate into the lines, absorbing the ink contained in them, which adheres to its surface, leaving the plate comparatively clean. This process may be repeated at pleasure, till several thousands of copies are obtained. The earliest impressions, however, are the best, and are called "proof impressions." Even a moderate use will affect the condition of some of the sharp lines or edges, so that an experienced eye readily detects imperfections. These impressions are also taken with more than ordinary care. On this account they command a higher price than is obtained for impressions taken after the plate has been worn by use, or when less care is taken to secure the best possible impression.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

AGRICULTURE: ITS USEFULNESS, ANTIQUITY, DIGNITY, AND PROGRESS.

As a farmer was sitting under the hands of his hairdresser, and the latter was tying up his queue, or what is vulgarly denominated a pigtail, which then was almost universally worn, he asked the agriculturist what was the difference in each other's occupation, to which the farmer replied in one word, viz., *utility*; i. e., you till.

The command the Creator gave to Adam in Eden, is well worth being borne in mind by the tiller of the soil in the present day. The injunction given to our great ancestor was, "to dress and to keep it," from which we gather that the working of the soil was an occupation from the very highest authority, was deemed truly honorable, and the employment of tilling the ground was neither degrading nor humbling, but doubtless conducive to health, happiness, morality, and independence.

No employment or profession can boast of more numerous or more noble patrons than that of agriculture. From the most ancient records, tradition and history have handed down to us names high among men, who have not been merely patrons, but partakers of the labors and toil of the husbandman, and thus have sweetened their repasts, softened their nightly couch, and given a higher zest to all the enjoyments of life.

We read in Holy Writ, that Uzziah the Jewish king was fond of husbandry; that Elisha was found ploughing with twelve yoke of oxen, when Elijah summed him to bear the prophetic office; and Gideon was threshing his grain when God deputed him to drive the enemies of his country back into their own territory.

Cyrus, the great Persian king, often worked his garden with his own hands, and was extremely fond of horticulture. Cincinnatus was found by his distressed countrymen driving the plough, from which he was called to direct the destinies of the state, and when he had saved it, returned joyfully to the same manly occupation.

And at the present day it is customary for the Emperor of China always, one day in the year, to take hold of the plough and turn a few furrows, that he may honor the labor of the field, and thus give it his royal sanction in the eyes of his numerous subjects.

The Romans gave the name of *pecunia* to their *coin*, which literally means *cattle*, thus showing that they regarded the produce and care of the field as the only real wealth of the country, as it ever has been, and must ever remain so.

It has been justly said, Stop the plough, and you will starve the world. And no greater truth has ever been uttered. We may ransack the bowels of the earth for the precious metals, invent all sorts of machinery, build steam vessels, and erect telegraph lines; but all these mighty developments of the human intellect must yield to the more ancient and indispensable usefulness of the plough. It is the main-spring by which all other arts and occupations become effective.

If we reflect upon the improvements which have been made in agriculture, no one calling or profession can boast of greater progress. The time was, when a limb cut from a tree served the purpose of a plough; and the classic phrase of Virgil was truly descriptive, *curvum aratrum;* and a bough cut from the same took the place of the harrow.

When our missionaries in southern Africa introduced the plough at their stations, and the wondering chiefs saw how rapidly and neatly it turned over the soil, they declared that every plough was worth twelve wives, as the labors of the field among these savages were altogether performed by the females.

The great increase of produce per acre obtained by the scientific application of artificial and natural manures, and the practical knowledge spread abroad by our agricultural papers and Societies, attest the rapid advance that has been made in every branch of field occupation.

When conversing with farmers in the mother-country, the writer has often heard the remark that now he could graze and fatten as many sheep as he occupied acres of land, while the generation before dare not venture to keep half that number upon the same homestead.

The hop and the broom-corn are two remarkable instances of progress, and also of what great effects result often from trivial causes. The former, not many years ago, was proscribed by the British Government as a plant whose properties were pernicious, and prohibited from being cultivated; but it has now become a staple commodity, pays an immense tax, gladdens the hearts of the peasantry, and furnishes employment for thousands of her hardy sons.

Whisk in this country was first raised by Franklin from a single seed, which he took from an imported broom and planted in his garden. The Canada thistle, of which so great complaint is made, and which our Legislatures have endeavored to prevent from spreading by enacting penal laws, was introduced by an emigrant emptying his straw bed, in which were some of the downy seeds of this hardy weed. This is a plant exceedingly difficult to kill, as it has a single tap root, which runs down to an amazing depth, and nothing but deep and frequent ploughing will exterminate it.

Where this plant luxuriates, the land is generally good, and the elm tree is often seen to rear its branching tops in the same vicinity, as both seem to find a congeniality in the same kind of land. A blind man once took a boy with him to visit a farm which he had a desire to engage, and when arrived in one of the fields, told the boy to tie his horse: the boy replied, he could find nothing to fasten him to, except a thistle, of which there was an abundant and a luxurious crop. The blind man, hearing this, made up his mind to engage the land, declaring that if it would grow thistles, it would grow any thing he chose to plant upon it.

To a studious, inquiring, and a philosophical mind, the occupation of the field, the rural scenery of the country, and the care of the various animals which collect around the farmer's homestead, afford the most abundant matter for observation and experiment. Here, the botanist, the naturalist and the chemist are surrounded with favorable opportunities for the gratification of their taste to any extent. The habits of the feathered tribe alone yield a theme which is always interesting, nor need we feel alarmed at the increase of these winged songsters, as it has been proved beyond controversy that they are a blessing rather than an evil, by destroying the grubs and the insects which would otherwise eat up the produce of the soil.

The writer once kept for years a large tame-male buzzard hawk, whose use in the garden was of no small amount. No fowl from the yard dare venture within the limits of his domain, and even strangers of the human species had to be guarded when they ventured there without some of the family. He has been seen to chase and kill a weasel with dexterity and dispatch, and when any of the ground was dug, Jack was always in attendance, devouring the worms which were turned up by the spade. In the spring he generally built a nest in one corner of the arbor, and would shriek with a loud, shrill voice for a mate; but having his wings always clipped, he was unable to make any visits to the lady hawks, and thus was obliged to waste his days in single blessedness. One morning, he was found dead in the garden, but not cold: some thieves had entered it during the night, and by a blow had terminated the life of this faithful guardian, over whose remains the writer ought to have written an epitaph, as Cowper did over his hares.

It is pleasing to observe that agriculture is beginning to be thought essential to a complete college education. This would have a tendency to remove that odium which many of our youth feel towards a country residence. Many a clergyman and men of other professions have sighed for the time when, after long years of service, they might retire and pass the evening of life in some quiet spot in the country, but have been disappointed because of their ignorance of the proper management of rural affairs.

We want writers also who will interest us in the avocations of the field. It is well to have philosophical digests of agriculture, but the poet and the essayist should use their pens to make the subject captivating. R. S.

Madison, N. J., May 24th, 1853.

FARM FENCES.

The best fence is a good stone wall; but if wood is used, skill and judgment are necessary in the selection of the material and the mode of preparing it.

The first item for consideration, in this matter, is *first cost*, and the second is durability. Sometimes a third item may be important, to wit, the land used up by the fence. The second is the only one of these that can be estimated with any degree of accuracy by any general formula, and even this one is far from being uniform. But let us say a word of each.

1. The stone wall. If material is at hand, on or in the soil, and no especial obstacle or objection comes in to vary the result, our own opinion is decidedly in favor of stone fences. When properly laid, they outlast the builders. We know of fences of this kind, apparently as good as new, that have stood at least fifty years. These samples are chiefly of faced walls, with deep foundations, costing originally two or three times as much as an ordinary fence. But if they last as they now promise, the amount expended in their construction was a capital investment. We remember many miles of stone wall in our native place, which have stood an equal length of time, but which have needed occasional renewal or repairs. Portions have been thrown down, and were of necessity rebuilt.

It is well known that, in most parts of New-England, stone wall is the prevailing style of fence, both on the highway and for dividing lots; and in all that region with which we are well acquainted, we have never known a farmer who did not prefer stone to any other material for this purpose.

To secure durability, the foundation should be placed below the action of frost, and the whole should be laid by a skilful man, so as to secure to the greatest extent the aid of gravitation and friction in resisting all violence from either side. When thus laid, this fence is a good security against domsetic animals of all sizes.

But sometimes stones are scarce, and timber is very cheap, while labor may also be expensive. So it often is where pine barrens or other forests abound. There is also a great difference in the *amount of defense*, so to speak, which is required. Sometimes, it is chiefly a mere landmark to point out a highway, and some of the oldest parts of New-England furnish evidence that even this is unnecessary. The path beaten by the hoofs of horses or oxen, and worn by the friction of wheels, is the only index of the existence of a road, while nothing but a marked tree or a post or stone, indicates a plurality of owners of the soil. Such regions of country, however, furnish no occasions for the application of any general rules on this subject.

As to wooden fences, cedar, no doubt, is the most durable of all woods, and where it is abundant, so as to be cheap, should be preferred, especially for posts.

All woods are made more durable by being charred before they are set in the ground. Decay or decomposition is a chemical process which requires the presence of certain elements which in charcoal are essentally wanting. Charcoal, we suppose, is never chemically decomposed by exposure to the air or water. It may crumble. It may be attacked in certain situations by elements not generally encountered. It may absorb moisture, so as to be broken by frosts, and the like; but still charring well pays its way, when timbers are to be set in the ground. But they should not be charred so extensively as to weaken materially their strength.

Many experiments go to prove that the smaller end of timber should be set downward. The rationale of this is rather hypothesis than physiological demonstration, since we know of nothing which has been actually discovered, which implies an upper or under side to the circulating vessels which compose the wood. The tubes and cells present similar appearances at each extremity, though their form or shape, tapering or otherwise, may have an important bearing on this phenomenon.

Saturated solutions of corrosive sublimate, sulphate of copper, acetate of iron, and creosote, prevent the decay of timbers: so does tannic acid and an atmosphere of carbonic acid, however obtained. Pyrolignate of iron is also efficient and economical, as well as melted tar. On the other hand, alkalies and alkaline earths facilitate decay. Hence the character of the soil in which posts are to be set should be considered, and if unfavorable, foreign materials should be used in filling in around them. The deposition of insoluble gypsum in the body of the wood is a very efficient mode of preventing decay. This process may be performed usually by immersing the end of the wood in a solution of gypsum when the tree is first cut, though it requires considerable time to secure the entire success of the experiment. The timber should also be thoroughly enveloped with it.

We might give an estimate of the cost of various styles of farm fence, as some of our contemporaries have done on kindred topics, but no one would perhaps be a safe basis of calculation, for one hundred miles square. Hence we leave the subject here, giving in a tabular form the items which each man must estimate for himself. These will vary, of course, with the season of the year, even on any given territory and for the same job. These items embrace the following:

1. Cost of material it, and of preparing it.
2. Cost of transporting to the spot.

3. Preparing the ground for the superstructure, whether a wall or posts and rails.

4. Cost and amount of labor to be employed.

5. Value of land affected by the fence, whether by occupying space or by casting shade.

As to the age of timber and the season of the year when it should be cut, to secure the greatest durability,—young, or at least sound timber should be selected, and the spring or early summer is probably the best time for cutting it. The latest growth will then have become somewhat hardened, and the condition of the sap at that time *is said* to be favorable to their remaining sound for a long time. We do not attach much importance, however, to that hypothesis.

Wire fences are not generally approved, so far as our observation extends. When wires are stretched across a cheap frame, they may be very convenient for enclosing temporarily a small plot of ground, but for a permanent fence they will not pay. If they are used, they should be confined in their place by passing through substantial wooden posts, sufficiently near each other to attract the notice of animals. For one objection to them is, that cattle do not see them, and hence they are exposed to a degree of violence, even from quiet animals, which will severely try their strength. Live posts, earthen or burnt clay posts, and the like, we regard as ingenious, rather than practically useful. They may sometimes answer well, but not as a general practice.

A fence the lower half of which is stone, and the upper half rails or wires, may serve a very good purpose, and where stone is scarce, it may be the best form of fence.

But, whatever style is adopted, let the materials be of good quality, and the work be done skilfully. Sham fences are among the most expensive forms in which a lack of practical skill in farming operations is often exhibited.

FARM WORK FOR JULY.

Hoeing-time is an important season for the young crops. The earth needs to be loosened: the young weeds will have grown faster than the seeds that were planted, and will steal the food that may be made to pay better than by growing into hogweed or any other of the pests of the field.

The growth of the young corn and of other crops may be improved by a slight sprinkling of a mixture of charcoal dust, plaster of Paris, and guano—the last being a small fraction of the whole, or say one part, by measure, of the guano to ten or more of either of the others, on the hills or around the roots. Charcoal is an excellent fertilizer in almost every kind of soil, and there is no danger of its doing harm, in any quantities in which it would be likely to be used.

Cultivators will be found very useful in the extensive operations of most farmers, though a skilful hand with a hoe does the work better than any labor-saving machinery can do it.

Haymaking is also close at hand. We gave our views very fully on this subject last year, and need scarcely repeat them here. The seed should be well formed, but not dried, before the grass is cut. Clover should always be cut before the flower goes to seed, and so should herds' grass, and all the other varieties.

There is such a thing as drying hay too much. All drying is in excess which is not necessary to preserve the hay in the mow. If it could be kept sweet as it is cut, it would be much preferred by cattle to the same grass in a dry state. A slight sprinkling of salt tends to preserve hay on the mow, when not thoroughly dried, and it does no harm to the hay or to the cattle.

The earlier part of July is a drier season than the latter part, and should therefore be used by the farmer, as far as is possible, for the curing of his hay. We know a judicious farmer in Connecticut, whose acres indeed are comparatively few, but who took advantage of the seasons from year to year, so that he very seldom had his cut grass wet by the rains.

Fruit trees require constant attention now, to preserve them from the ravages of insects. Remove also the excess of fruit from your favorite trees at least, and from all if you have opportunity, and the fruit will improve in size and quality much more than is lost by the operation.

In severely hot and dry seasons, occasionally watering gardens is highly useful. We have tested this to our entire satisfaction. This should be done at night, and the whole of the water may be secured to the soil. If done earlier in the day, much of the water will evaporate. It should not be colder than rain-water.

Bulbs should be taken up soon after the flower is gone. Dry them carefully and keep them cool, but safe from frost, till they are reset. Tall flowers should be supported by stakes or frames, otherwise the stems may be broken.

Keep your garden walk clean. A little salt sprinkled over it, or brine poured upon it, will assist; and look out for thistles, &c., and not allow them to go to seed. Sow at your leisure green crops, intended for ploughing in in the fall. This work may be done at almost any convenient time.

Ley made from horse-manure is an excellent *tonic* for rose bushes, &c., if not used too freely. Forcing plants too much often destroys them.

Lastly, continue to add to your manure-heaps any sort of offal, vegetable or animal, that comes to hand; and if dead animals or other active agencies are found, add liberally of muck, or turf, or any thing in the shape of soil.

FLAX CULTURE IN INDIANA.

Mr. R. T. Brown, of Crawfordsville, in a communication to Governor Wright, President of the Indiana State Board of Agriculture, says:

"I send you enclosed a few samples of 'Flax Cotton,' presented to me by the Hon. H. L. Ellsworth, of Lafayette. Mr. Ellsworth has secured the machinery necessary for the manufacture of the cotton, and will have it in operation early in the season. He has on hand the 'stem' grown on 120 acres last season, which, from experiments already made, will, he supposes, yield about 300 pounds per acre of 'cotton' similar to No. 2 of the enclosed specimens. The expense of reducing the fibre to this state, after the stem is produced, is about two cents per pound, which, at the usual price of cotton, (10 cents,) will leave eight cents per pound, or $24 per acre, for the farmer who produces it. To this must be added the value of the seed, which will range from $6 to $8 per acre, giving a final result of $20 at least for each acre. This is Mr. Ellsworth's calculation: it may be too high; but if we allow for the magnifying effects of his zeal one third, or even one half, still flax will be as profitable a crop, in proportion to the amount of labor required to produce it, as any of the staples of the country.

"Mr. E.'s method of flax farming is to break his ground in the fall, and secure it from being trodden in the winter. Between the middle and last of April he harrows it well, sows his seed, harrows in, and passes the roller over it, leaving a level surface. He harvests it with a horse-power reaper, cutting about two inches from the ground. As soon as it is dry, the seed is threshed off, (for which operation we yet need an appropriate machine,) and the 'stem' baled for transportation to the factory. The amount of labor is about the same as that required for a wheat crop."

ULSTER LEAD MINE.—STICKNEY'S IMPROVEMENTS IN BLASTING.

We lately embraced an opportunity of visiting the mine and works of the Ulster Lead Mining Company at Ellenville, and were much gratified at the state of the enterprise, and the judicious and prudent arrangements made for the economical and successful working of this mineral deposit. We had intended giving in our own words a full description for the information of our readers, but we avail ourselves of the Report submitted by Mr. James T. Hodge, as being a careful and accurate statement of the locality, capabilities, and probable productiveness of the mine. Mr. Hodge says:

"The Ellenville Lead Mine, recently opened at the foot of the western slope of the Shawangunk Mountain, in Ulster county, N. Y., is situated just without the village of Ellenville, eight hundred feet east from the Delaware and Hudson Canal. The mouth of the mine is about thirty feet above the level of the canal, towards which the ground slopes gently down. Above the mine the mountain rises, faced by a wall of rock, which slopes upward at an angle of forty-eight degrees with the horizon. This rock is known by the name of the 'Shawangunk Grit.' It is a coarse, grayish-white sandstone, hard and durable, lying in broad sheets, which repose upon each other at the above angle. The course of the mountain is N.N.E.—S.S.W., and the dip of the strata is towards the W.N.W. The vein containing the lead ore crosses these strata obliquely, running into the mountain in a direction S. fifteen degrees E., and inclining towards the north at an angle of seventy-eight degrees with the horizon. A portion of the vein, near the mouth of the drift, crosses over to the N.E. and takes a position between the strata of sandstone, dipping with them under the valley in front of the mountain. This portion has the appearance of, and is in fact, an included bed, but its connection with the true vein is apparent on examination. The metalliferous contents of the vein, introduced through and filling the vein fissure, appear to have been carried between the strata on the north side, forming there a collection of ore of uncertain extent. This bed is represented in the accompanying section at the point marked 'C.'

"Standing in front of the ridge, the outer edge of the vein is seen up the face of the rock for forty or fifty feet, sometimes presenting on the outside a thickness of several inches of galena, and sometimes shutting into a mere crack. It is accompanied by other parallel fissures or cracks, some of which, in the immediate vicinity, have been filled with quartz vein stones more or less metalliferous. All these running across the strata in one direction, no question can arise as to these repositories of ore being a system of true veins. Several of these veins are favorably noticed, as occurring along the Shawangunk Mountain, by Professor Mather, in his State Geological Report. (See pp. 358, 359, &c.) Sometimes they take the form of included beds, but, with rare exceptions, he found them all transverse veins. He expresses an opinion that valuable repositories of lead ore may be found along the range of the mountain.

FIGURE 1.

"The Ellenville vein was first opened by Captain Rickard, by an adit following its course, driven in from the base of the ridge. In the preceding section, (Fig 1,) drawn on the plane of the vein, *a* represents the western slope of the mountain. The parallel lines, *b*, the sandstone strata. The included bed of lead ore, already referred to, is seen at *c*. The drift *d* is run in on the line of the vein, which extends downwards along its floor, and its edge is seen up the slope *e*. *f* is the limestone formation, resting against the sandstone, and *g* the superficial loose earth and stones.

Figure 2.

"The position of the vein will perhaps be better understood as it appears in front, and sketched in Fig. 2, where *a* represents the vein of galena, and *a a* are parallel fissures.

"The vein, which on the outside appears as a mere crack, with some scattering quartz and galena, rapidly enlarges within, and between its sides are included large bunches of rich galena, intermixed with some quartz, blende, or sulphuret of zinc, and copper and iron pyrites. For a distance of several feet, the galena, nearly pure, was found from eighteen to twenty-four inches in thickness. At the end of the drift, some twenty feet in, the vein contracted again, but in the floor the ore still continued downwards, retaining its richness and width. To further develop it in this direction, Capt. Rickard very judiciously came back, taking up a stope, or level, five feet lower down, and this will be followed by another of the same depth, which is as low as can be conveniently drained. This is done preparatory to sinking, upon the vein near the edge of the hill.

"There being no question as to the value of the ore when extracted, the great point to be considered is the probability of finding a large available supply of it. We have seen that it occurs in a true transverse vein; and such veins never give out, however irregular they may be in form and production. Several of these veins have been, at various periods, opened and partially worked in the sandstone along the Shawangunk Mountain. They have all the peculiar features of productive veins of other regions; the same mixtures of gangue with different ores; the opening of cavities or 'vugs,' lined with quartz, crystals, and containing red clay; and the occurrence of this red clay, or 'flucan,' between the lode and one or both of its walls. Almost every thing concurs to the probability of this proving to be a valuable mineral district. More lime than lead ore has been usually found in the veins, and this has been the principal cause that the mining operations were not more extensively prosecuted. In this mine, so far as opened, galena is found to be the prevailing ore, the others being hardly more than noticeable. It is reasonable to expect this will continue so. No falling off of the ore in the floor of the drift was found up to the time of my last examination of the mine, on the 23d to June. On the contrary, there was the greatest encouragement to look for a most productive lode in sinking below the level of the valley; and this I should strongly recommend, as well from the fact that veins usually yield best at some depth below the surface, as for the purpose of reaching the *limestone formation*, which under the valley will be found inclining against the sandstone, and the veins extending across them both. For it is the limestone that, in most places, is found to be the lead-producing rock, and this belt of it that is known to be along the valley, resting against the sandstone, is the continuation of the lead-bearing limestone of Wisconsin."

After considerable detail on other points, too general for our pages, Mr. Hodge says:

"With all these advantages, and the prospect of abundant ore, presented by the large quantity already taken out, I know of no new mine offering as great inducements for the investment of capital."

We give the above statements as printed by Mr. Hodge for the information which they contain, and without reference to any influence for or against the enterprise. We believe it to be important that our mining interest should be well understood, and for that purpose reliable statements from every source will be welcome to our pages.

Since Mr. Hodge's report was published, Capt. Rickard struck into a large cavern, lower down in the vein, by some twenty or thirty feet, than the drift represented in the figure, the sides of which are rich in the ore, while the vein, which we followed down the sides about forty or fifty feet, is solid galena, in some places two feet in thickness. The work necessary to lay this mass of mineral in a conveniently accessible position, by the clearing away of the superfluous rock, is vigorously prosecuted; and not a long time must elapse before the true value of the Ulster Mine will be ascertained with a fair measure of certainty. That a large body of rich galena, with a share of copper sulphuret, is contained in the vein, is beyond a doubt. The continuous vein of fifteen to twenty-five inches of pure galena is followed down the whole depth as far as gone in the cavern, while the structure of the rock is an indication of no little importance to the miner.

Since our visit, we learn that the Company have put their smelting furnace in operation experimentally, and that there is every reason to believe that the works will be fully equal to the demands of the undertaking. The washing and smelting-houses are plain, capacious, and fitted for the purpose; and we are glad to record the favorable auspices under which the Company appear to be prosecuting their labors. We trust that they will be abundantly rewarded.

At the time of our visit, Mr. A. Stickney, of Norwich, Vt., was at the mine, experimenting with his new mode of blasting, by operating in the very hard sandstone grit of this locality.

Mr. Stickney's method consists in drilling a hole in the usual way into the rock, and then, at the extremity, no matter what the depth of the drill, a hole is *burned* in the rock by means of fuel, and a current of air kept up by a bellows for the purpose. The tube attached to the bellows is an ingenious and admirable application of scientific principles, and eminently serves the design of the inventor. The hole burned gradually enlarges, and with the increased capacity, of course a larger quantity of fuel is admitted; and consequently a larger fire is kept up, the tendency being to a more rapid enlargement with each increment of fuel. The object of this cavity is obviously to afford a receptacle for a larger amount of gunpowder than can be contained in an ordinary drill, this cavity being formed in the only practicable mode by which it can be obtained artificially. For dry and compact rocks this will be of vast service. Where the rock is shelly, it may be unnecessary, as the powder may be easily introduced into the natural seams of the mass. A charge of two kegs was thrown into the cavity formed while we were on the ground, and its explosion, though not performed under as favorable circumstances as were desired, caused an extensive rupture of the rock, which is very hard, and was judged to be a satisfactory exhibition of the plan of the inventor. We think the question rests chiefly here: Is it desirable to produce an extensive disruption of rock at a small expense of time, and a reduction of the great labor of drilling a large number of holes for blasting? If so, then we believe Mr. Stickney's plan accomplishes these desiderata; and by burning a hole, which requires one man to blow a bellows, and one to feed the pulverized fuel, which, indeed, may be done by the blower, a cavity can be obtained in a few hours of easy labor by one or two hands, which many, by excessive toil, can scarcely execute in a much longer period. The mechanical force of a large quantity of powder is thus made available at a small cost, while the economy of the plan, we think, must be evident to all interested in mining or quarrying enterprises.

Mr. Stickney's invention, if we are rightly informed, has never been made public, although he has sold the right for several of the Southern and Western States, and England and the Colonies in part. The facts which we witnessed we communicate for the benefit of those whom they may concern. Should this new mode be adopted extensively, (we think it is used at Quincy,) we believe the labor and expense of mining and quarrying will be to a great extent reduced. We shall be glad to have facts on these and similar questions of industrial economy from all sources.

CIRCULATION OF SAP.

A CLERGYMAN of some distinction not long since commenced his Sabbath discourse as follows: "There are some things that I know I know, some things that I think I know, and some things that I know I do not know." We have often thought of this comprehensive sentence when we have read the philosophical explanations of some of our contemporaries, in regard to subjects which we are very much inclined to think might better be classed in the last division of subjects above given, while they speak as if with authority. One of our most judicious writers, who seldom mistakes the imagination for the actual perception, (the learned editor of the *New-England Farmer*,) in a recent number says, "The sap is elevated (in the tree) in the same manner as oil rises in the wick of the lamp." We "do not know" that this is not true, but it seems to us safer and therefore wiser to give only as *hypothesis* what must be acknowledged so very far from absolute demonstration. Perhaps the elaborated sap descends "in the same manner," and perhaps too it does not. There are very serious difficulties attending any theory which has undertaken to provide for the circulation of fluids in vegetables. We have little doubt that it is the same system of influences which causes the entire circulation of vegetable juices, which first sets it in motion at the root. But we should be unwilling to assert any thing on this subject, as a matter of absolute truth, beyond the mere fact that this circulation is actually carried on.

Some recent investigations in Europe have been published, which are of considerable importance. They refer to the formation and propagation of cells, &c., and to the circulation of the sap. The former are too purely scientific, without much practical importance, to receive very general attention. The theory on the latter branch of the subject approaches the point of actual demonstration. The results arrived at are, that the nitrogenized elements, which are used by the plant, are conveyed upwards from the root exclusively through the woody tissue of trees, while oxygen and carbon are absorbed and given out only by the leaf. As this process is essential to growth, the inference is inevitable that there can be no growth when there are no leaves. Whether this is in accordance with supposed facts, we are not so clear. The descending sap, after its preparation in the leaf, descends only *in the bark*, forming new layers on the outside of the wood already formed. Hence cutting a ring through the bark does not prevent the ascent of sap, nor its elaboration in the leaf, nor its descent until it encounters the ring. Here its progress is stayed. The result is a greater growth above the ring, more wood, and *more fruit*. Hence this may prove of practical benefit to the fruit-grower.

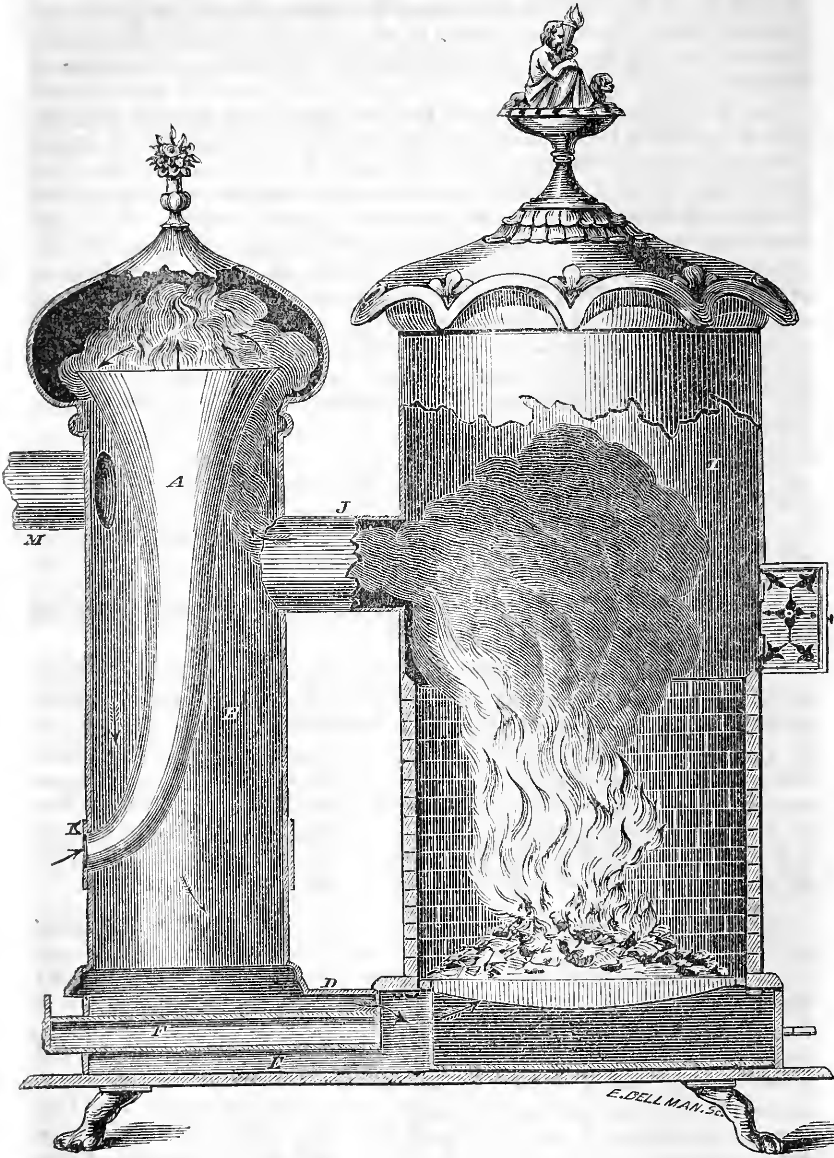
The excess of sap, or that portion which is not used up in new formations, enters the wood through the horizontal organs, and again ascends, thus making a constant circuit, as in animals. We cannot believe that capillary attraction does all this.

FREE TRADE—PROTECTION.

A WRITER in our able contemporary, the *Merchants' Magazine*, utters the following paragraph in the June number:

"The fallacy of the 'protective policy' can be made quite apparent, by applying it to each of the States of our Confederacy. No matter on what pretense it may be, for protection, or it may be for revenue, the effect would be the same. Louisiana produces sugar and cotton, and Maine produces timber and potatoes. Each State needing the products of the other, exchanges are constantly going on. But suppose each State should subject the product of the other State to a large duty before it could sell the goods, and suppose this to be the general arrangement between all the States: the delay, the expense, and the evasion of the law would be vexatious and ruinous."

Well, suppose it would, what then? "Why, it will be equally so between nations." Who denies that duties, injudiciously laid, will be productive of evil, rather than good? If Louisiana really *wants* the potatoes of Maine, it surely would not be wise to demand a high duty on them. But how would it be if she had 10,000 men idle, and 100,000 acres of arable land lying waste, on which potatoes would yield a good crop, after it was properly subdued, and inducements were held out to her own citizens to supply their own State: would *this* produce such horrible results? If Louisiana is, and wishes to be, dependent on Maine, she would properly decline any restrictions to the prompt and bountiful supply of her markets. If she wishes to be *absolutely independent* of them, she must take the opposite course. We can scarcely believe that even the partisan reader of that paragraph would fail to see that the evils resulting from a senseless, heedless, reckless mode of doing a thing would not furnish good reason for refusing to do the same thing in a judicious manner.



ATMOSPHERIC REVERSING-DRAFT FURNACE.

ATMOSPHERIC REVERSING-DRAFT FURNACE,

The opposite engraving represents a very ingenious and valuable improvement in Hot Air Furnaces, owned by William Ennis and R. W. Fenwick, for which a patent was granted to the inventor, Mr. Ennis, of the firm of Keyser & Co., Furnace Manufacturers, this city, (New-York,) on the 29th of March, 1853.

The fire is shown in the furnace I. The grate is supplied with fresh air through a back tube or channel, F, above the ash-pit or pan, E. A pipe or passage, J, connects the fire-chamber or stove, I, with the radiator-chamber, B, in which is placed an inverted hollow cone of cast iron, A, to deflect the fine solid particles of coal that are sometimes carried off from the fire when fresh coals are put on, and also to absorb and retain a great amount of heat, and give it out by radiation so as to economize heat; also to make a portion of air return and feed the fire along with any carbonic oxide that may escape, and thus economize fuel. The pipe F can be closed to regulate the feed of fresh air. The atmosphere is admitted through the hollow cone at K, and passes up as shown by the arrows, then out by the pipe M. The large part of the cone being placed near the pipe J, compresses the smoke into a smaller space before it reaches the top, where it expands and creates a partial vacuum, thus combining the element of an artificial draft without the employment of any mechanical force to do so. This furnace, therefore, must always draw well. If used for burning bituminous coal, from which much volatile matter escapes, the supply of fresh air by the hollow cone, if any flame passes up, will saturate the gas with air, so as to render it combustible, and burn; and thus this stove will be a smoke-consuming one, well adapted for all places where they burn bituminous coal. The arrows show the reversing draft of heated air to support combustion when F is closed.

More information about rights and furnaces may be obtained by letter addressed to William Ennis & R. W. Fenwick, at the furnace manufactory of Messrs. Keyser & Co., 398 Broadway, New-York.

THE GREAT EXHIBITION.

The first pages of this number are devoted to this subject; but since that sheet was put to press, we have been favored with important additional information in reference to this interesting show. We are glad to have it in our power to give these statements to the public, for many have expressed their disappointment at the comparative size of this structure and that in Hyde Park. At the same time, it should be remembered that size is not the true criterion of merit. In taste and elegance, looking either at the proportions of the building or at the minuter details, this is pronounced, by all who have seen both, as by far superior to that. This is said both of the exterior of the building, and of its interior arrangements. When it is well filled with a selection of the goods offered, (for many articles have been rejected for want of room,) we doubt not that the *coup d'œil*, to use a technical phrase, will be quite satisfactory. If deficient in the rich and splendid, compared with the former exhibition, it will no doubt be far superior, even in these respects, to any thing we have ever seen in this country.

But this building is not to contain the whole show. Finding its limits too small for carrying out the objects of the enterprise, and not adapted to the proper display of one of the most important elements of American industry—

to wit, machinery—the Directors of the Association determined to add a building, about 450 feet long, and averaging nearly 30 feet wide, for the purpose of containing machinery on the ground floor, and paintings in the second story. The exhibition will therefore contain a display of machinery in motion hitherto unequalled in this country, and a show of paintings equally without a rival heretofore. This gives about an acre of additional area for the exhibition, making the total nearly five acres.

The day of opening is at hand, and the public are beginning to catch not a little of the spirit which it is so well calculated to inspire.

LOWELL MANUFACTORIES.

On a recent visit to Massachusetts, we spent a day at this centre of American industry, and were allowed by our excellent friend, Mr. Battles, paymaster of the Tremont corporation, to examine the improvements that are just introduced into the mills of that company.

They have erected two turbines, each 12 inches deep, and 100 inches diameter, with which they are to drive the machinery of the whole mill, amounting to 16,600 spindles, with the other machinery connected with the establishment. These wheels operate by means of an immense iron shaft, 450 feet long, weighing at the larger end 180 lbs. to the foot, and tapering to a diameter of six inches.

We were again reminded of the fact, which we had seen stated elsewhere, that the soldiers of Calcutta are clothed in American cottons. We were also furnished with their annual table of the statistics of the manufactures of Lowell for the year 1852, which is condensed as follows:

No. of Manufacturing Corporations,	12
No. of Mills,	51
Amount of Cotton consumed in 1852, bales,	91,650
" Wool " " pounds,	5,148,000
" Iron " " tons,	4,500
" Coal " " tons,	30,575
" Charcoal " " bushels,	68,350
" Wood " " cords,	3,220
" Oil " " gallons,	69,677
" Lard " " gallons,	47,000
" Starch " " pounds,	1,409,000
" Flour " " barrels,	1,565
Total Capital,	$13,000,000
" Spindles,	342,722
" Looms,	10,606
Females employed,	8,470
Males "	4,163
Cloth woven per week—Cotton, yards,	1,460,000
" " Osnaburgs,	90,000
" " Woollens,	27,000
" " Carpets,	25,000
Cotton Dyed and Printed—yards,	705,000
Average wages of Females, clear of board, per week,	$2 00
Average wages of Males, clear of board, per day,	0 80
Medium produce of a Loom, No. 14 Yarn—yards per day,	45

Medium produce of a Loom, No. 30 Yarn—yards per day, 33
Average per Spindle—yards per day, ... $1\frac{1}{4}$

The Middlesex Company make use annually of 6,000,000 Teasels, 2,000,000 lbs. fine Wool, 50,000 lbs. Glue, $30,000 worth Dye Stuffs, and $13,000 worth of Soap.

In addition to the above, the Merrimack Manufacturing Company use 1,000,000 lbs. of Madder, 380,000 lbs. Copperas, 60,000 lbs. Alum, 50,000 lbs. Sumac, 40,000 lbs. Soap, 45,000 lbs. Indigo, per annum.

The Lowell Bleachery use 40,000 lbs. Indigo, and $25,000 worth of other dyeing materials per year.

Other manufactures are produced in the city than those specified above, of a value of $1,500,000, employing a capital of $400,000, and about 1,500 hands.

There are four Banks; the Lowell, capital, $200,000; the Railroad, capital, $600,000; the Appleton, capital, $150,000; the Prescott, capital, $100,000.

The population of Lowell in 1828 was 3,532; in 1840 it was 20,796; in 1850 it was 33,385. Increase in ten years, 12,580.

The Lowell Machine Shop, included among the above mills, can furnish machinery complete for a mill of 6,000 spindles, in three months; and a mill can be built in the same time.

The several manufacturing companies have established an hospital for the convenience and comfort of persons employed by them respectively, when sick, which is under the superintendence of one of the best of surgeons and physicians.

There are two institutions for savings, the Lowell and the City. The Lowell had on deposit the first Saturday in Nov. 1850, from 4,609 depositors, $736,128 12; the City, Jan. 8, 1853, had on deposit, from 2,374 depositors, $192,006 01. The operatives in the mills are the principal depositors in the above banks.

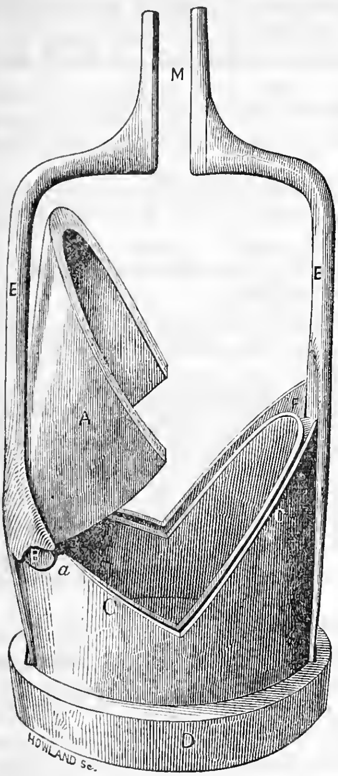
A vast amount of laudable and successful enterprise of a more strictly private character might not be inappropriately alluded to in this sheet, not the least of which are the extensive Powder Mills of Oliver M. Whipple, Esq., and the Paper and Batting Mills of Perez O. Richmond, Esq., both on the Concord river, within the precincts of the city. Messrs. Fiske & Norcross's extensive lumber-yard and saw-mill, on the Merrimack, are also worthy of notice.

A reservoir of great capacity has been built on the high ground in Belvidere, east of the city, for the purpose of furnishing a ready supply of water to any part of the city, in cases of fire. The water is conveyed into the reservoir by means of force-pumps from the Lowell Machine Shop. Pipes are laid from the reservoir to various parts of the city, at which points hose can be attached to the hydrants without delay, when necessary.

Estimated population of Lowell in 1853, 37,000.

The Potato Plant.—Potatoes are not strictly roots, and the plant is not in that sense a tuberous rooted plant. Its true root is fibrous, and consists solely of those small fibres which are attached to the base of the stem. The potato (the fruit) is not supported directly from the root, but like the balls, or like all other fruits, its nutriment is drawn up chiefly through the root, goes through the stem to the leaves, and thence descends in the bark to the potato. A circuitous route this, surely; but unlike some men, Nature never does violence to her own laws, even to expedite a good work. The food of the buried potato is prepared by the same process as if it were placed in a more *eminent* position.

IMPROVEMENT IN PUMP VALVES.



Mr. Nehemiah Dodge, of this city, has taken out a patent for a new arched valve which may be applied to various purposes, and which seems to us a very great improvement over those now in use. A representation of this valve, is here given, which may be described as follows: A is the valve, turning upon a hinge at B; *a* is the valve socket, or one of the two plane surfaces upon which it rests when closed; E is the staple which holds the box together; D is the bottom ring on which the outside hydraulic packing rests; F is the space designed for the packing inside when the valve is open: it rests against one side of the staple E, which keeps it in its place. When it is closed, it shuts down upon the two surfaces beneath, which may be packed, if desired, though for ordinary purposes this would be unnecessary. The spear is fastened at M. The valve should be constructed of a thin piece of metal.

The peculiar excellences of this valve consist, first, in giving a large passage through it when it is open. This passage is not more limited at the valve than on the lower parts of the piston. Second, it is simple, and not liable to get out of order; and third, it is durable, being made of materials that will not wear out in many years.

It may be applied to various purposes, being useful not only for common water pumps, but equally applicable to steam engines. It may be fitted into small metallic tubes as readily as into larger bores.

NEW ROTARY ENGINE.

By the invitation of the inventor, Capt. Barrows, we were of the small company on board the little steamer *Rotary* on the 19th ult., in a trip of twelve or fourteen miles, designed to exhibit her capabilities. The readers of the *Farmer and Mechanic* will remember an engraving with a description of this new engine, under date of Oct. 23, 1852. We can now give only a general account of its arrangements. The power is applied directly to the shaft of the wheels, or, more accurately, to the steam-wheel, the axis of which is the shaft of the paddle-wheels. The machinery is thus brought into a very small compass. The steam passes from the boiler into the top of the cylinder which encloses the steam-wheel. Four sliding pistons project beyond the circumference of the wheel, and fill the vacant space between it and the cylinder. The power of the steam acts directly upon one of these pistons, driving it forward and causing the wheel to revolve. By a very simple cam-arrangement, the moment the next piston comes under the power of the steam, the first piston slides in towards the centre, opening a passage for the steam behind it to escape, so as to prevent all resistance to the power acting upon the second piston. This process is repeated as either piston is brought in contact with the steam. This action is also "double," the steam being admitted on each side of the cylinder at the same time, so that the power is applied to each half of the wheel. An escape-valve is also provided on opposite sides of the cylinder, near the entering valves. We need not here refer to the details of the engine, any further than to say, that the anti-friction rollers, the stuffing-boxes, packing-pieces, &c., by which a very perfect action is secured, are of the simplest form, and of thorough workmanship. Information on these subjects can be obtained of the inventor, at the corner of Beekman and Water streets. We regard this as a quite successful experiment. An engine is here presented to the public, at a much less cost than those of the usual form, occupying but a small part of the space they require, the power of which is apparently capable of being increased indefinitely. The boat "Rotary" is about 36 tons burden. The machinery, except the boiler, scarcely occupies a cubic yard. The paddle-wheels are 8 or 9 feet in diameter; the paddles, ten in number, are each ten inches wide and three feet four inches long. Two are immersed at one time. The wheels revolve, under a pressure of 80 lbs., which her certificate allows her, about forty-two times per minute, and give her a speed of quite ten miles an hour, in still water.

ATMOSPHERIC TELEGRAPH.

This seems to be the next step in the order of progress, and one which presents fewer apparent difficulties than most of the great mechanical inventions of the day led us to anticipate when they were first proposed.

This plan contemplates the sending of packages, mail bags, &c., in all their huge bulk, through a given distance at a very rapid rate, and yet a rate which may be substantially under the control of the operator. Suppose a tube were extended from New-York to Boston, having a diameter of two feet. The plug or plunger or piston is at the Boston end, and pumps are set in motion on this side. The pressure of the atmosphere becomes constantly diminished on the inner surface, while on the outer it remains the same. As soon as the difference of these pressures equals, or rather exceeds by a small amount the resistance of friction within the tube, the plunger will be set in motion, and the amount of motion will depend upon the extent to which the pnmps are operated. Were the plunger forcibly detained till the exhaustion was pretty thorough, when set at liberty its velocity would be very great, and perhaps in practice it might be found that, to overcome certain obstacles, in passing curves, or from other causes, a considerable velocity would be necessary to prevent its progress from being entirely checked. The more rapidly the exhaustion is carried on, the more speedily, of course, would the object be attained; and the only practical difficulty which seems to us to present itself, is the possibility that the friction of the plunger, increased by the weight to be carried, would be too great for the pressure of the atmosphere on the tube.

This friction of the plunger must be something essential, to insure it from admitting the air between its own surface and that of the tube. And if this pressure is equivalent to a force of many pounds, it may exceed the efficient pressure of the atmosphere on the outer surface, which must be less than fifteen pounds to the square inch. This would be the greatest possible working power, were the vacuum behind it perfect. If the air is only partially exhausted, the working pressure will, of course, be much less. Probably this difficulty may be overcome, if found to exist, by applying forcing pumps behind the plunger. If this were done, we can see no reason to doubt that almost any weight could be driven through a pipe free from short curves or other prominent obstructions. We shall be glad to see this project commenced and carried through forthwith.

RAILROAD OPERATIONS.

Portland and Montreal Railroad.—The grading of this road beyond Island Pond, and the junction with the Canadian terminus, is completed, and the placing of the rails has been commenced. This section extends about thirteen miles.

Albany and Binghamton Railroad.—The contracts have been let, on the condition that it shall be completed in the fall of 1855.

Reading Railroad.—This company are about commencing four new stone bridges, in the place of wooden ones. One is to be at Peacock's Locks, over the Schuylkill; one at Orwigsburg Landing; one at Black Rock, and one at the Falls of Schuylkill. The last will consist of six oblique arches, each of seventy-eight feet span, with an elevation of roadway forty-eight feet above the water. They are also adding ten new locomotives of the first class.

Cleveland, Medina, and Tuscarora Railroad.—The route of this road is laid down as follows: the Cleveland, Cincinnati, and Columbus Railroad is used to Grafton, twenty-five miles; thence to Medina and to Dalton, through Seville, and through Dover to New-Philadelphia. From thence to the Ohio, opposite Wheeling. Its length is 418 miles.

Attica and Alleghany Valley Railroad.—Ten miles of this road are graded and nearly ready for the rails. This road connects with the New-York Central line at Batavia, and runs to the south line of the State, there connecting with the Alleghany Valley Railroad to extend from Pittsburgh to the northern line of Pennsylvania, connecting these sections of country with the far West.

The St. Lawrence and Atlantic Railroad Company has declared a dividend of 27¾ per cent. This includes all the back interest from the commencement of the work, and is a final settlement of the road stock previous to the amalgamation with the Grand Trunk Company. It is supposed that the cars will run regularly from Portland to Montreal by the middle of July next.

Kennebec and Somerset Railroad.—The stock of this railroad is taken up. It extends from Augusta to Skowhegan, through Vassalborough and Waterville.

Nashua and Lowell Railroad.—The income for the year ending March 31, 1853, was $142,129 26; expenditures, $86,108 05; earnings, $56,021 21. Two dividends of 4 per cent. have been declared, and there is a nett surplus on hand of $8,021 21.

VERMONT AND MASSACHUSETTS RAILROAD.—Earnings for the year ending April, 1852, were $15,442 18; for that ending April, 1853, $22,577.

BOSTON, CONCORD, AND MONTREAL RAILROAD has commenced running to Woodville, opposite Wells river, and the event was celebrated by a great gathering, with a dinner, speeches, toasts, &c.

GIRARD RAILWAY.—This road, as surveyed, will be about 225 miles in length, from Girard, Alabama, to Mobile. This city, Mobile, has subscribed $1,000,000 towards its construction to Greenville.

MARIETTA AND CINCINNATI RAILWAY.—This Company have advertised for contracts.

RAILROAD IN CALIFORNIA.—It is proposed to build a railroad from Benicia to Marysville, a distance, as surveyed, of about eighty-five miles. The report of the surveyor is favorable.

OHIO AND PENNSYLVANIA RAILROAD.—An indignation meeting has been held at Massillon, on account of alleged mismanagement of this road. Sundry resolutions were adopted.

DUBUQUE AND PACIFIC RAILROAD COMPANY.—A Company has been organized for the construction of this road, with a capital of $11,000,000.

RAILROADS IN VIRGINIA.—Completed roads measure 600 miles, and 610 more are now in progress.

NORTH CAROLINA has completed 280 miles, and proposes some 500 more.

OHIO has 1,285 miles completed, and 1,719 in process of construction, besides others advertised for contract.

THE PACIFIC RAILWAY COMPANY has completed a road for fifty miles west of St. Louis, and it is under contract for 135 miles. Its length is to be 600 miles to the boundary of the State. The point where the road intersects the Kansas river, is the point from which Mr. Edward Beale is to take his departure on the survey of the Benton and Fremont route for a railroad to the Pacific.

PHILADELPHIA, EASTON, AND WATER-GAP RAILROAD.—Twenty-two sections were allotted to contractors on the 28th ult. The Company expect to finish the road through to the Lehigh river next year.

THE ALBANY AND SUSQUEHANNA RAILROAD is said to be contracted for by Governeur Morris, George L. Schuyler, Sidney G. Miller, Jonah W. Baker, James S. T. Stranahan, and C. G. Case.

NEW-YORK AND NEW-HAVEN RAILWAY.—Receipts for the year amount to $806,713 19, and the expenses, $380,052 32—leaving a profit balance of $359,490 31.

The whole cost of the New-York road and equipments is $4,318,606 60, exclusive of real estate and buildings, amounting to over half a million. The capital stock is $3,000,000, and the bonds of the Harlem road and Canal lease, $1,840,000.

The whole number of passengers carried over the road the past year is 956,753—as follows:

Between New-Haven and New-York, - - - - -	614,715
Commuters, - - - - - - - - - - -	130,115
Between New-York and Naugatuck road, - - - -	21,789
Between New-Haven and Junction of Naugatuck, - - -	39,517

Between New-York and Bridgeport, - - - - - -	19,725
Through passengers between Hartford, New-York, and New-Haven,	48,603
Between New-York and Boston both ways, - - - - -	42,167
From Canal Railroad, both ways, - - - - - - -	4,407
To and from Hartford, - - - - - - - - - -	112,513

There has been a large outlay in capital for the completion of the second track, a most important and necessary work, which will enhance the receipts of the Company, and immeasurably increase the protection of travellers.

THE first passenger train from Syracuse to Rochester, by the direct route, passed over the road on the 11th ult.

ON the 17th ult., direct railroad communication, it was expected, would be open from Columbus to Macon, Ga., by the completion of a branch uniting the South-western and Muscogee roads.

THE vote in Milwaukie on the loan of the city credit to the amount of two hundred thousand dollars to the Lake Shore Railroad, was 1,566 in favor, to 409 against the measure.

ARRANGEMENTS have been made between the Danvers and Georgetown and Newburyport Railroads, which will secure a route from Haverhill and Newburyport through the centre of Essex county to Boston, by these railroads, in connection with the Boston and Maine Railroad.

It is reported that the Boston and Maine Railroad have taken a lease of the Danvers Railroad for one hundred years, guaranteeing five per cent. on the cost, with all that it may earn above that amount.

These roads, when completed, will open a new avenue of travel between Salem and Haverhill, and also between Salem and Danvers and Boston, via the Salem and Lowell, Danvers, and Boston and Maine Railroads.

WISCONSIN has given charters for fifteen thousand miles of railroad, that will require $300,000,000 to construct.

CANADIAN RAILWAYS.—Arrangements have been made for an immediate survey of the route from Port Whitby to Lake Huron.

The contract for this road has been taken by Messrs. Mallish, Morrill, and Russell, of Brantford, for about $600,000, the work to be finished in two years.

The Town Council of Brockville has before it a by-law to enable the municipality to take £50,000 in the railroad from Brockville.

The City Council of Toronto has refused to sell the £100,000 stock held by the city in the Toronto and Guelph Railway, at par, by a vote of 13 to 10.

It is expected that the Great Western road will be completed to Port Sarnia by the first of July, 1854.

ST. LAWRENCE AND CHAMPLAIN RAILROAD.—Receipts for the year were $140,000, being $36,000 more than the receipts of 1851.

MENDENHALL'S HAND-LOOM.—We copy from the *Pittsburgh Post* the following notice of S. C. Mendenhall's hand-loom:—

"Another most beautiful and truly valuable new invention that I examined with some care, is a hand-loom which has very lately been patented by S. C. Mendenhall, of Richmond, Indiana. This loom is constructed, as are almost all other really meritorions inventions, in the most simple manner. It is light, and very neat in its appearance; and may be easily worked by a child of ten years old. It is worked without cams or gear-wheels: the ells are raised and the shuttle thrown at each movement of the beam; and in less than five minutes a change can be made on the same warp from a twill to plain goods—from satinet to flannel, or from either of these to any other goods that are woven on a common loom. This invention is peculiarly adapted to the newer settlements of our country, where manufactories have not been started; and if extensively introduced, may retard the advance of manufacturing establishments, (which I should look upon as a great blessing,) because of the cheapness of the machine, the ease with which it may be worked, and the increased amount of cloth that may be made in a given time: for I am told that on this loom one man may weave thirty yards a day of any common cloth."

"FEEDING BEES" AGAIN.

Our neighbor of the *Scientific American*, in his journal of the 18th, copies our notice of his statement, that a pound of sugar will make two pounds of honey, as follows:—

"Our neighbor must revise *his* chemistry. How can a stalk of corn produce more weight of fruit than the guano applied to manure it? The question is not how much honey is produced from a pound of food, but a pound of sugar. Does not honey contain more moisture than sugar? Let our neighbor put 20 pounds of honey in a sugar evaporating-pan, and expel all the moisture, and then weigh the product, and see if he gets any more than 10 pounds of a gummy sugar."

While we admit that we know very little about the transformation of food into secretion, or of the manner in which plants grow, we suppose there is an important difference, well established. The stalk of corn is not made from the substance of the guano, wholly or chiefly. Nearly 98 per cent. of all plants is from something else than the soil, or the manure applied to it. This is established by numerous careful experiments. But with the conversion of food into animal secretions, the fact is perhaps equally well established, that the secretion is invariably less than the quantity of food. In other words, there is always more or less of excrement, while the quantity of secretion is not materially increased by the appropriation of free gaseous matter. An animal probably never increases in weight to the whole amount of his food, nor does, probably, the amount of his food fall essentially below the sum of his secretions and excrements. In the case of bees, they are known to void a considerable amount of excrement (which comes originally from the food) when at work, though very little while idle, and their food goes to sustain their bodies in a healthy condition, and to form the peculiar secretion honey, and also wax. In the animal, the food is the entire material, perhaps, with the exception of oxygen; while in plants, the soil seems to be chiefly a medium for conveying nourishment to the plant. Without intending to assert expressly the truth of either of the two theories on this subject, we suppose it is and must be admitted, that if the soil gives up a portion of its own substance to the plant, it gives up far less than the plant receives, a great portion of it being conveyed through the soil as a medium, from the atmosphere.

We do not doubt, by the way, that our neighbor possesses a thorough knowledge of chemistry, but should rather have said that he misapplied his knowledge. Nor is he alone in the same misapplication, in reference to this article of honey. Apiarists of years' experience have asserted the same doctrine. Our statement was made on the strength of actual experiments, a given quantity of food being given and eaten, when they had no access to other food. This seems the surest mode of testing the truth on this subject.

NEW-YORK HORTICULTURAL SOCIETY'S EXHIBITION.

We paid a visit to this annual show, held at Metroplitan Hall, June 14, 15, and 16, and found, as usual, quite a collection of plants, most of them in flower. We failed, however, to see many individual plants that were especially worthy of notice, further than for their comparative merit, as intimated in the list of premiums. Fuchsias seem to be the flower of the season, almost as many pots of this being exhibited as of all other kinds. Mr. Cope's splendid *Victoria regia* again made its appearance from Philadelphia. One of the finest things in the show was a cut specimen or two of the *Magnolia mycrophylla*, from a tree of Dr. Kearns, Hudson street. The flowers are very fine. The usual varieties of hot-house plants were exhibited by the well-known florists of the city and neighborhood. There was a good show of cut flowers, by Isaac Buchanan; of the Cactus tribe, &c., by Thomas Hogg & Son, and various plants by J. B. Lenoir, Alfred Bridgeman, Andrew Reid, and others. Mr. Dunlap's fine sago plant, *Cycas revoluta*, was there, and some excellent lemon trees, with the banana plant, from Shepherd Knapp, Esq., and others of less imposing appearance. The *Cupressus funebris*, by Thomas Hogg & Son, is a beautiful plant.

The following is the award of premiums, so far as we are informed.

Ericas.—First premium, L. Menard, Albany.

Geraniums.—First premium for six Pelargoniums to George Hamblin, gardener to W. C. Langley, Brooklyn; 2d premium, three Scarlet Geraniums, to Wm. Vandermenter, Astoria. Mr. Chorlton, of Staten Island, showed some fine specimens.

Fuchsias.—First premium to John Humphrey, gardener to F. Howe, Esq., Brooklyn; 2d premium to Mr. J. H. Prentice. Discretionary premium to George Hamblin, gardener to Mr. Langley, of Brooklyn.—very fine plants.

Hot-house Plants.—There was quite an extensive show of these, though limited in varieties. First premium to James Weir, Yellow Hoop, L. I.; 2d premium to M. Colman, gardener to Mr. Cummin, of Williamsburg.

Orchis.—First premium to L. Menard.

Cactus.—A discretionary premium to Luke Mullen.

Carnations.—First premium to Wm. Chorlton, gardener to J. C. Greene, Esq., Staten Island.

Fruits.—In this department we noticed good specimens of strawberries and cherries, but no grapes, gooseberries, &c. The 1st premium for *cherries* was given to Joseph Cudlepp, Jr; *strawberries*, 1st premium to Isaac Buchanan, Astoria; 2d, to Isaac C. Winans; 1st premium for three quarts do. to J. Hardman, gardener to W. H. Paine; good specimens were also shown by Wm. Smith, West Farms.

Vegetables.—This part of the show was good, but limited.

Cauliflowers, 1st premium to Martin Collophy, gardener to J. H. Prentice; 2d do. to A. Gordon, gardener to E. Hoyte, Astoria.

Rhubarb, 1st premium to A. Gordon; 2d do. to John Brill.

Potatoes, 1st premium to James Angus, gardener to W. W. Fox, West Farms; 2d do. to J. Hardman.

Peas, 1st premium to James Angus; 2d to J. Hardman.
Beets, 1st premium to Joseph Cudlepp, Jr.; 2d do. to John Brill.
Cabbage, 1st premium to Joseph Cudlepp, Jr.; 2d do. to John Brill.
Radishes, 1st premium to James Angus.
Cucumbers, 1st premium to A. Gordon, gardener.
Lettuce, 1st premium to John Brill; 2d do. to Joseph Cudlepp, Jr.
Best Vegetables, 1st premium to John Flick, Bloomingdale.

LAYING OUT SURFACES.

A few simple rules are oftentimes convenient to thoso who are not conversant with surveying operations, and a writer in the *Western Horticultural Review* has communicated to that work some very good ones, some of which we copy, and to which we add a few others.

To lay out an acre in a circle.—First fix a centre, and with a rope as a radius, seven rods, three links and three eighths long, one end attached to the centre, and kept uniformly stretched, the sweep of it at the other end will lay out the acre.

For one quarter of an acre, a rope three rods and fourteen links will be the right length.

For one eighth of an acre, a rope two rods and thirteen links will be the right length.

Triangles.—If you wish a triangle to contain just an acre, make each side nineteen rods, five and a half links long.

A triangle whose sides are six rods and twenty links long each, will contain one-eighth of an acre.

To lay out an ellipse or oval.—Set three stakes in a triangular position. Around these stretch a rope. Take away the stake at the apex of the triangle, which will be where the side of the oval is to come; move the stake along against the rope, keeping it tight, and it will trace out the oval.

A square to contain an acre, or just one hundred and sixty rods, should have each of its sides just twelve rods, ten feet and seven tenths long.

To draw an oval of a given size.—The long and short diameter being given—say twenty feet for the shorter, and one hundred for the longer—divide the short diameter into any number of equal parts—say ten—and from each point draw a line parallel to the long diameter; then divide the long diameter into the same number of equal parts, (ten,) and from each point draw a line parallel to the short diameter. Then draw a line from point to point where each corresponding line cuts the other, on the outside, and this connecting mark will describe the oval or ellipse required.

NEW STAPLES FROM AFRICA.

A London correspondent has recently sent to the *North American* a letter on this subject which is worthy of attention. It appears that a new trade is now opened with that continent, which contains 160,000,000 of inhabitants. One of the articles recently received in England is a fibrous substance, sent by a missionary from Abbeokuta, as *red cotton*. It is not cotton, but a new species of silk. It is brought from the Houssa country, in great quantities, and is supposed to have been colored with *alkanet root*. Another article, sent also as cotton, is a peculiar description of wool, from Gratta, on the west coast of Abbeokuta. It is tolerably fine, of a buff color, worth about one shilling and three pence a pound, and proves very acceptable to wool-dealers. It may be had in large quantities.

The finest merino textures, like those used in the manufacture of the finest shawls by the Persians and others, are also grown in Africa. The sugar-cane is beginning to receive attention, and finds there a congenial soil and climate. Rice is also grown. Grapes and oranges are found every where "in wild luxuriance," and are found to pay the gatherer very liberally. That continent must eventually prove of great value to our commerce.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

CANADA THISTLES.

July and August are the months to exterminate Canada Thistles. Some people doubt whether they can be killed even by perseverance; but I am no doubter on this point. Thistles can be eradicated, and with much less difficulty than quack-grass. The best way to get rid of them is to mow them when they have attained to their full size. Any man who has had experience in mowing and killing them, can judge as to the time when they should be cut down. The stalks are hollow; the blossoms are red—not much faded; the lower leaves are dead; and the weather warm and dry. When these appearances present themselves, you should make an attack upon your beds of thistles. Several years since, we had a large and thrifty "patch" of them, on rich soil, and the land was seeded down to timothy, though, in consequence of the luxuriant growth of the thistles, the grass did not amount to much; and the whole mass of stuff was mowed down in the month of July, and not one bit of it removed from the field. The second year after they were thus mowed, they were scarce, a few only remaining in the field. The lot has been mowed every year since, and to my certain knowledge there is scarcely a thistle to be found in the field. Another "patch" was served the same way, and the lot is now clear of thistles. Ploughing them out by the roots is adopted to some extent in this section of New-York; but, on the whole, mowing them down in the months of July and August seems to be the best mode of extirpating them. I do not look upon them with one-half as much horror, either in the meadow or corn-field, as I do upon quack-grass. This is decidedly a bad grass, and will soon take advantage of a large field.

I am of opinion that Canada thistles can be killed by deep and thorough ploughing. For instance, if you have a piece of land which you wish to summer-fallow, and which has been and is burdened with thistles, you would doubtless make money by ploughing it at least three times, and not let your plough run less than *ten* inches deep. I think this mode of managing them would result in their final extermination. When they are mowed down close to the ground, the remaining portion of the stalk is usually filled with water; and this leads to the decay of the roots, and the death of the thistle.

In Central New-York we are troubled a good deal with thistles, though we are gradually getting rid of them, and ultimately shall free ourselves entirely from them; or, at least, I think such will be the case if we adopt the system of mowing them in hot weather, and at the right stage of their growth. W. Tappan.

Baldwinsville, N. Y., June, 1853.

SERPENTINE.—We are surprised that no more account is made of this rock for ornamental purposes. Much of it is as elegant as any *verd antique*, and localities of it are not very unfrequent. We have personally visited some half dozen of them, and are persuaded that the supply is abundant. It is of various colors; and while some of it is of a uniform green, other specimens are as handsomely variegated as any of the mottled marbles.

For fire frames and ornamental hearths, it is said to be superior to marble. There is an extensive supply of serpentine in Cavendish, Vermont, which for a time was operated; and though the mill where the rock was sawed is still standing, and scores, if not hundreds of slabs are lying about the building, many of them handsomely polished, nothing has been done with it for years. Again, in Orange county, in the same State, immense masses of this rock are found all along the Green Mountain range. It again crops out in Orange county, in and around Troy, in connection with the iron ore.

In Newbury, Massachusetts, there is a bed of it, which, however, is probably less extensive than in the other places named; but from personal observation, we have no doubt that all the other localities might be turned to good account. All are in the vicinity of a railroad, (that at Troy being most remote,) and in places quite accessible. We have seen elegant fireplaces from Cavendish locality, that would compare well even with the choicer kinds of Italian marble.

TABLE FOR PLANTING CORN, TREES, &c.

THE following table may be useful for pointing out the number of hills of potatoes, corn, plants, trees, &c., required for an acre of land, when planted at any of the distances given:—

Distances apart.	No. of Plants.
½ ft. by ½ ft.	174,240
1 " 1 "	43,560
1½ " 1½ "	19,360
2 " 1 "	21,780
2 " 2 "	10,890
2½ " 2½ "	6,969
3 " 1 "	14,520
3 " 2 "	7,260
3 " 3 "	4,840
3½ " 3½ "	3,555
4 " 1 "	10,890
4 " 2 "	5,445
4 " 3 "	3,630
4 " 4 "	2,722
5 " 1 "	8,712
5 " 2 "	4,356
5 " 3 "	2,904
5 " 4 "	2,178
5 " 5 "	1,742
6 " 6 "	1,210
7 " 7 "	888
8 " 8 "	680
9 " 9 "	531
10 " 10 "	435

SCIENTIFIC AND MECHANICAL MONTHLY RECORD.

The Gauge Question.—Edward H. Brodhead, civil engineer, has a long article in the *Milwaukie News* on the subject of the gauge of railways. In the course of it he says:

"I passed over portions of the New-York and Erie Railroad last season, on foot, for the purpose of examining the effect produced on the rails, and especially on the curved portions, by the passage of the trains. I knew theoretically that the pressure against the outer rail was much increased by an increase of the width between them, and also, that it might be lessened by elevating the outside rails, though this would only be true for a given rate of speed. Still I was surprised to find that the flanges of the wheels acted, to a greater extent than I had before seen on the narrow gauge, as a plane to shave off the inside of the top of the outside rail, in consequence of the increased resistance by reason of the extra width, and found that a shaving of iron was left in the track for nearly the entire length of the curve after the passage of trains.

"Now, it requires some considerable power, with a sharp-edged tool in a planing machine, to cut off a shaving of the same size. How much power, then, must have been exerted to produce a like result by pressing the smooth surface of the flanges of the wheels against an equally smooth surface of the rail?"

To Keep Felloes Tight.—Soak each felloe before the tire is put on, for one hour, in hot linseed oil. This will essentially prevent it from absorbing water, and thus it prevents decay. We get this from a writer in the *Southern Planter*.

New Cotton Mattress.—A patent has been secured for a new mattress of cotton, so prepared that it will not mat, but retain its elasticity as well as hair. If the plan succeeds, it will be of value in two ways: one in giving a good bed at a cheap rate; the other, in opening a new and general market for one of our chief staples.

Refining Sugar.—John McIntosh, of Surry, England, has patented a new process for refining sugar. The improvement consists in placing evaporating pans, used in the concentration of saccharine fluids, in rooms, the air of which is heated to such a temperature as will evaporate the fluid. A current of air is made to circulate through the room, so as to carry off the vapors as the saccharine fluids are raised by endless bands passing over and under rollers, in and above the pans, to expose an extended surface to the action of the heated air.

India Rubber and Coal Tar.—Mr. C. Goodyear, of this city, has recently taken out a patent in England for a new compound, composed of India rubber and coal tar vulcanized with sulphur. Coal is heated in an open boiler until it requires the consistency of melted rosin, when it is mixed with India rubber, in proportions which may vary according to the character of the material to be produced for a specific purpose. It is mixed with sulphur, and then heated to vulcanize it.

India Rubber Teeth.—This article, in the form of purified white India rubber, has been patented in England for making artificial teeth, gums, and palates. By its adoption, many advantages, hitherto impossible to be attained, have been introduced. The adhesion is complete; it can be moulded with perfection to suit every inequality of the gums and teeth, and supplies an artificial periosteum, as it were, to the teeth, which often become painful by the wasting away of the gum. Added to these, is the elasticity of the material, which completely obviates the inconveniences that arise from any motion with artificial teeth as made by other means. Combs are also manufactured from the same material.

Wonderful Pegging Machine.—It is said that a machine has been invented that will peg a shoe in two or three minutes, with one, two, or three rows of pegs, and *make its own pegs* as it does the work. The *Buffalo Express* stands godfather to this statement.

New Screw-Cutter.—Mr. D. M. Robertson, of Piermont, N. Y., foreman in the machine-shop of the Erie Railroad, has lately invented and constructed a machine for cutting screws on iron bolts, which has two peculiarities: one is, that the driving-power is applied to a pulley, giving the pulley and the cutting-die one uniform rotary motion, and thus avoiding the reverse motion of the common machines, and thus saving at least one third of the power and time of bolt-cutting. Another advantage is, that the cutting edge of the cutting die is perpendicular to and parallel with the centre of the bolt when fitted to its place to be cut. The machine promises to be of much utility. Patent pending.

Cast Iron Welding.—In the foundry connected with the railroad repair-shop at Piermont, N. Y., Harvey Rice, Esq., Superintendent, the experiment has been successfully tried of casting fused iron upon unmelted iron. A flange had been broken from the out surface of a locomotive cylinder. Mr. R. E. Falkenberry, foreman of casting, so adjusted the moulding-sand to the broken flange and to the cylinder, and so applied the fused iron as to restore the part wanting. The minutiæ of the process he will explain to those who inquire. The new part added to the flange is so skilfully welded on, that the precise line where the new and old parts unite cannot be detected after the parts are polished. Broken bills have been mended in this same manner, at these works.

Use of Coke on Railroads.—The *Cumberland Alleghanian* says that the passenger engines on the Baltimore and Ohio Railroad, west of Piedmont, are now using coke as a fuel, instead of wood, and that it meets the most sanguine anticipations of the Company, as to economy and efficiency. The coke was furnished from the mines of the Swanton Coal and Iron Company. The introduction of coke instead of wood on all the roads on the Atlantic seaboard must now soon follow; thus opening a new and immense market for the products of our mines. It is doubtful if any other section of the United States than our own Alleghany region can furnish a suitable coal for the purpose of making coke for locomotives.

Colored Photographs.—A new process of coloring photographs has been patented by J. Leon Jardieu, of Paris. It is applicable to pictures taken on paper rendered transparent, or on glass, and consists in applying oil or other colors at the back of the picture, so as to give the requisite tints to the several parts of the photograph, without interfering with the extreme delicacy of effect which characterizes this class of productions. Application has been made for a patent in this country.

Street-cleaning Machines.—A man named Nurton Ramkin, of St. Louis, has invented a machine for cleaning streets, which is thus spoken of by the *Republican:*

"It is a scraper so peculiarly constructed, that as it passes over the street it throws the earth on the street up in rows, at the curb-stones, much as a plough will throw the sod over in a particular direction. When the earth and cleanings of the street are thus deposited, another machine throws the whole into heaps convenient to be carted away. It is said by mechanics and others who have examined the model, that with two horses and two men, the labor of fifty men can be performed in less time."

Improvement in Joining Stones.—An improved method of uniting or locking stones together in building light-houses, and for other like purposes, by which the necessity of using mortar is entirely superseded, has been invented by John P. Avery, of Stonington, Connecticut, who has taken measures to secure a patent. It consists in dovetailing together the sides of the stones used for the foundation, and joining them again in a similar manner with others, so that it is impossible to separate them without first breaking the stones in pieces. In order to unite them more firmly, a bolt or key is employed for pressing the dovetails firmly in their corresponding slots; or pieces of stone or other material may be employed for this purpose, and the crevices filled up with mortar.

Straw Paper.—This manufacture was first introduced about fifty years ago, but was only partially successful. By an interesting and important improvement in the mode of preparation, the use of straw as a material for paper may now be considered permanently established in England, Ireland, and the United States. So little difference is perceptible between rag and straw paper, that the latter is used by one of the London journals regularly. One peculiar feature of the manufacture is, that although the article can be produced at a price not exceeding that of ordinary printing paper, it is applicable for both writing and printing purposes.

Novel Mode of Bridging.—The method adopted for bridging the Great Peedee river, on the Wilmington and Manchester Railroad, is worthy of remark, as showing another purpose to which iron may be extensively applied. The piers for the bridge are composed of large hollow cylinders of cast iron, nineteen feet in circumference: their bases are sunk many feet into the bed of the river by exhausting the air from within them, by the method know as the Pneumatic Process, for forming foundations. The cylinders are filled with concrete, and thus form hills of great strength and permanency.

Horse-Power.—On the trial of the Broadway Railroad question, it was testified by James Lorey, civil engineer, that the power of a horse is about sufficient to draw twenty tons on a level railroad. The weight of 60 men, at 140 lbs. each, would be about four and a half tons, and car and passengers, ten and one fifth tons. "Two horses cannot be depended on to draw this weight up a grade of 110 feet to the mile. It would be equal to 64 tons on a level. A horse could draw four times as much on a level, in a car on a railway, as in an omnibus over a cobble-stone pavement."

Curious Device in Grafting.—The gardeners of Italy sell plants of jasmins, roses, honeysuckles, &c., all growing together from a stock of orange, myrtle, or pomegranate, on which they say they are grafted. But this is a mere deception; the fact being, that the stock has its centre bored out, so as to be made into a hollow cylinder, through which the stems of jasmines and other flexible plants are easily made to pass, their roots intermingling with those of the stock. After growing for a time, the increase in the diameter of the stems, thus enclosed, forces them together, and they assume all the appearance of being united to one common stem.

Compressed Air Carriage.—The *Paris Presse* says that it has seen, upon the Champs Elysées, a carriage containing two persons, proceed for twenty minutes, at the full speed of a horse, by means of a cylinder of compressed air, of so small a volume that you might put it in your pocket. The inventor thinks he has obtained a practicable plan of utilizing compressed air, and has discovered a means of compressing it at a merely nominal cost. A paper on this subject has been read to the Academy of Sciences. M. Julienne proposes to adapt the principle to carriages and street vehicles merely, to which it may be applied with great economy and perfect safety. With a small cylinder, a party may take an airing at the Bois de Boulogne, at any rate of speed, from a walk up to a gallop.

Important Invention.—At a late sitting of the Austrian Academy of Sciences at Vienna, Herr Von Amer read a paper upon a newly discovered process of printing from all sorts of objects with comparatively plain surfaces. Among the articles mentioned which have been copied by the new process, are plants, some of them in flower, embroidery, etched agate, insects, fish-scales, &c. The speaker calls this "Natursolbetdruck"—printing from Nature—and said that this discovery forms a new era in the pictorial illustration of works on science and art. The objects copied were given with singular fidelity to the originals. No hint was given as to the process.

Improved Lithographic Press.—An improved press for lithographic printing has been invented by H. C. Spaulding, of Hartford, Connecticut. The object accomplished by the improvement consists in giving a uniform and forcible impression to all parts of the stone, with the expenditure of but a very small amount of power. The arrangement of Mr. Spaulding for effecting this object is this: a wood or metallic air-tight chamber or tube, containing water or other fluid, with its bottom or one side composed of India rubber or some other water-proof, elastic or pliable material, is used to give the impression; said chamber being furnished with a tub and plunger, and the pliable bottom or side of the chamber serving as the tympan. By applying pressure to the plunger, an equal amount of pressure is transmitted by the water or fluid to every part of the tympan, and by using a small plunger an immense pressure may be obtained with a small expenditure of power. Measures have been taken to secure a patent.

Glazed Ware—American Porcelain.—*Glaze*, with which our "china ware" is covered, is variously prepared. Gypsum, silica, and a little porcelain clay are ground together, and mingled with water. Into this mixture each article is dipped, and immediately withdrawn, when the glaze is left evenly spread over its surface. It is then dried, and exposed afterwards for several hours to a powerful heat.

The glazing for common earthenware is a mixture of the oxides of lead and of tin.

The glazing of "stone ware" is made by volatilizing common salt in a heated furnace, which combines with the silex of the ware. The substance of "stone-ware," is a kind of porcelain clay, containing an oxide of iron and of lime. The Editor of the *Tribune* says:

"The custom-house valuation of china, porcelain, earthen and stoneware, imported into this country in the year ending June 30, 1846, was $2,261,331; in 1850, $2,601,363; in 1851, $2,320,002. The sum actually paid for these articles during the last year by our jobbers was probably not less than five millions, and by the consumer at least eight millions of dollars. And there is not a particle of reason for our importing these wares from the Old World, outside of the fact that Europe had the start of us with regard to them, and has so far managed to keep it. We have every natural requisite to their cheap and elegant production, as we trust will soon be made evident. Old dealers have assured us that while almost every ware or fabric extensively produced in this country has been steadily and materially cheapened, the wares we are contemplating now sell at very nearly the prices of thirty years ago.

Opalescent Paper.—How can we make one kind of paint or liquid produce many different colors; and this with an amount of material almost beneath the power of man to weigh or measure? Mr. De la Rue has solved this question by the production of his beautiful iridescent and opalescent paper. Water is poured into a flat vessel; and when quite tranquil, a very minute quantity of spirit varnish is sprinkled upon the surface; this, by a species of attraction between the two liquids, spreads out on all sides, and covers the whole surface with a film of exquisite thinness.

A sheet of paper, or card board, or any other article, is then dipped fairly into the water, and raised gently, with that surface uppermost which is to receive the color; it lifts up the film of varnish from off the surface of the water, and the film becomes deposited upon the paper itself. The paper is held in an inclined position, to allow the water to drain off from beneath the film; and the varnish then remains permanent on the surface of the paper.

The paper thus coated with colorless varnish exhibits the prismatic tints with exquisite clearness. The film of varnish is so extremely thin, so far beneath any thing that could be laid on with a brush or pencil, that it reflects light on the same principle as the soap-bubble, exhibiting differences of color on account of minute differences in the thickness of the film at different parts. And not only so, but the self-same spot exhibits different tints acording to the angle at which we view it. It is a means of producing a beautiful result with a marvellously small expenditure of materials.

Hemp.—The New-Orleans papers speak highly of specimens of hemp made from the fibres of the okra, or "gumbo" plant. They state that the merit of this hemp consists in the cheapness of its culture, the abundance of the raw material, the quickness with which it grows—giving, they understand, three crops a year—its superior yield to the acre—five times as much as the Kentucky hemp—its more durable qualities in water or damp than any other hemp, and its easy manufacture into bagging. It is stated that the article can be produced at the North as well as at the South, though not so profusely, and that it will supersede all other sorts of hemp in the manufacture of bagging.

Great Improvement in the Treatment of Flax.—A great improvement in the early preparation of flax has been discovered in Ireland by a Mr. Watt. By it the flax is prepared for scutching without fermentation in 24 hours. The coarse flax is steamed along with some lime-water, or high-pressure steam itself will answer, for five hours in a close, tight vessel: it is then taken out, run between heavy fluted rollers, and dried, when it is fit for scutching. By this process the woody matter is rendered easy of separation from the fibrous; in scutching, very little tow is made. It is a plan highly spoken of by the Royal Flax Society.

Plastic Materials for forming various Objects.—Five parts of sifted whiting are mixed with a solution of one part of glue. When the whiting is worked up into a paste with the glue, a proportionate quantity of Venetian turpentine is added to it, by which the brittleness of the paste is destroyed. In order to prevent its clinging to the hands while the Venetian turpentine is being worked into the paste, a small quantity of linseed oil is added from time to time. The mass may also be colored by kneading in any color that may be desired. It may be pressed into shapes, and used for the production of bas-reliefs and other figures, such as animals, &c. It may also be worked by hand into models, during which operation the hands must be rubbed with linseed oil; the mass must also be kept warm during the process. When it cools and dries, which takes place in a few hours, it becomes hard, and may then be employed for the multiplication of these forms.

This is no doubt practicable, and we give it as one mode, but probably gutta percha is now the cheapest and best material for all such uses. We purpose to prepare a paper on this *material* in our next number.

Ship Ventilation.—A new mode of accomplishing this important service has been devised and put in practice in a new Liverpool ship. The masts are hollow, and are furnished with valves to open or shut at pleasure. Those who have noticed the effect of a tall chimney-glass or a common solar lamp, will appreciate the efficiency of this plan. An argand burner at the bottom of such a tube would greatly add to its efficiency.

The following analysis of wheat bran, made by Professor Norton, of Yale College, shows that it contains ingredients valuable for feeding. The Nos. indicate different qualities of wheat and bran:

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Oil, - - -	5.16	6.17	6.16	6.53	6.49
Water, - -	11.29	11.82	12.02	12.06	12.91
Ash, - - -	6.90	6.09	9.09	7.08	6.07

Iron Railroad Bridge.—A bridge of this kind is nearly completed, over the Monongahela, above Fairmount, Va. It is second only to that over the Menai Straits, in England, having no rival on this continent.

The Clipper-Ship "Northern Light" has made the most successful voyage from California that has been made by any vessel, including the steamships. Her time was only 76 days. She was built by Messrs. Briggs, South Boston.

Another Yacht Victory.—The American yacht "Truant," the property of Mr. Robert Grinnell, has recently beaten all her competitors at a regatta on the Thames. She was built in this city by Mr. Robert Fish.

New Use for Mustaches.—The stone-masons of Glasgow are cultivating these appendages of the face, to screen the mouth from the fine sand to which they are exposed in their trade. If found useful, we submit and might recommend them to some other tradesmen, but the evidence ought to be conclusive ere such a custom is regarded with much favor.

Important "Strike."—The wood-choppers, we learn, are determined on a strike. Some demand more *wedges*, and threaten to *split* unless acceded to. After some time of *log-rolling* and *barking* on both sides, this *knotty* question was settled by their demands being granted.

EDITORS' JOTTINGS, ETC.

Steamboats from New-York to Boston.—The author of *An Englishman's Experience in America* came from Boston to this city in the *Empire State*, one of the boats of the Fall River route. He uses, in this work, the following well-deserved commendation:

"The word *boat* gives a very imperfect idea of this floating palace, which accommodates, at the very moderate charge of four dollars each, from five to six hundred American citizens and others, of all classes, in a style of splendor that Cleopatra herself might envy. Her barge with suits of purple silk, in which she received Marc Antony, was nothing to it. There is little to remind one of machinery, for the paddle-wheels are covered, and the engine is rendered invisible by being surrounded with glass and drapery. However, one thing is certain: the vessel moves smoothly and quickly through the water. I followed a crowd of five hundred up a handsome staircase, through splendidly furnished saloons, covered with carpets of velvet pile, to the upper deck. . . . . Tea being announced, we all adjourned to the gentlemen's cabin. . . . . There were three tables the entire length of the room, covered with every thing that was beautiful, but nothing that seemed eatable except pineapples and some small, delicate, delicious-looking things, that, for want of a better word, I shall call rolls, though it vulgarizes them sadly. Notwithstanding this unusual appearance, you no sooner wished for any thing than a ministering spirit was at your elbow to gratify you. At his touch, pineapples became butter, pyramids tea-cakes, and magical boxes savory pies. Tongue, ham, and all kinds of delicacies issued from their flowery retreats at his bidding. At the end of the banquet, you heard whispered in your ear, "half a dollar." It was produced and silently disappeared; not a chink was heard.

Harlem Railroad.—This road has a shop for repairs of cars and locomotives. Mr. Sloat, Superintendent of road; John Leach, Superintendent of repairs. This road has 132 miles of track, and sends out daily three through trains; nineteen trains to William's Bridge, three to Croton Falls, and fifteen shorter trains. Two daily through freight trains are sent out, and fifteen Sunday trains go out and return; one going as far as White Plains: 2,000 miles are run daily, and 37 locomotives and 350 horses are used on short routes.

The Company's machine-shop has five lathes, and other tools in proportion. It is soon to be further enlarged. The carpenter-shop, on Forty-second street, has, on an average, sixty hands.

New-York and New-Haven Railroad.—G. W. Whistler, Superintendent of road; G. B. Simonds, Superintendent of motive-power. This road has seventy-nine miles of single, and seventy miles of double track. The canal road has thirty-eight miles of track, and eighteen miles of branch track, connected with the New-York and New-Haven Road.

The machine-shop has five lathes, two drills, and other tools. The carpenter-shop has fifty hands, and the blacksmith-shop, eight fires.

They send out seven trains to New-York and back daily, two each way to Port Chester, two each way to Bridgeport, and two daily freight trains. Twelve through express cars from Boston to New-York have just been added; twelve more for this road only are soon to be added. The largest locomotive has 16 by 22-inch cylinder, and weighs 26 tons. The driving-wheels are 6 feet in diameter.

Hartford and New-Haven Railroad—From New-Haven, Connecticut, to Springfield, Massachusetts. E. M. Reed, Superintendent of locomotion; M. L. Sikes, Superintendent of road. This road has sixty-two miles of track, and in six months will have sixty-two miles of double track. It has sixteen locomotives, the largest of which has 16 by 20-inch cylinder, and weighs 25 tons. It runs six daily trains to Springfield, four to New-Haven, and two through freight trains daily.

The machine-shop has seven lathes, two planers, and other tools in proportion.

The carpenter-shop employs eighteen hands, and the blacksmith-shop has seven fires. The repairs are all done in Hartford.

New-Haven and New-London Railroad.—Repair-shop in New-Haven. R. M. Dowd, Superintendent of road; Henry A. Lincoln, Superintendent of repairs. This road has fifty miles of track, six locomotives, and runs two passenger and one freight through trains daily. The machine-shop has two lathes and other tools in proportion. All the buildings and shops are new, and are continually enlarging.

Camden and Amboy Railroad.—On this road, which connects New-York with Philadelphia, we noticed a new, but very good arrangement for the comfort of invalid passengers. This is a medicine-chest put up in the Ladies' Car. We were assured by the conductor that it was often found of great service to children and others. The road, under the successful agency of Captain Bliss, of New-York, and Wm. H. Gatzmer, Esq., of Philadelphia, is one of the best paying roads in the country.

Latting Observatory.—The most attractive building in the vicinity of the Crystal Palace is the Latting Observatory, now in course of completion. It is situated on the highest part of the island, in full view of all the surrounding country, and will reach the height of 350 feet. The structure is of an octagon form, with a base of seventy-five feet in diameter, and will accommodate 2,000 people at one time on its various landings. It is of timber, well braced with iron, and anchored at each of the eight angles with about forty tons of stone and timber. At distances of 100, 200, and 300 feet, passengers will be lifted by a steam car to landings.

At the highest point will be placed a telescope of great power, which will be the largest in the country, with a 16-inch glass, or a glass one inch larger than the Cambridge telescope. The glass is now manufacturing in Europe, and until it is completed, a 10-inch glass will be used. The instrument will cost about $24,000. At the lower landings, the vision will be aided by achromatic telescopes, with 4-inch openings. From the second landing, the ascent, to those who do not choose to avail themselves of the steam car, will be by means of a spiral stairway. The Observatory will cost about $75,000.

A Simple Fire Annihilator.—A paragraph is going the rounds urging the use of burning sulphur in extinguishing a burning building. A package of two or three pounds of sulphur thrown into the kindling fire before the air rushes into the building, is said to be very efficient in extinguishing the flames. This is no doubt true. But we fear that the application of this extinguisher would not always prove, in the event, unlike the man who burnt the wasps' nests that were in his barn. The barn was consumed with the wasps. The gases so plentifully evolved by burning sulphur are very destructive to life. They cannot be breathed with impunity, and hence the use of this material might prevent the trial of other means of very great importance. Water could only be thrown upon it from a distance. When fires are in the hold of a ship or between decks, or in other conditions where human life is not put in jeopardy, these means would no doubt prove very efficient.

Artesian Well at St. Louis.—One of these deep borings was commenced in St. Louis in 1849, by Mr. Wm. H. Belcher, which has now attained the depth of 1,590 feet. It is bored or drilled by a "sinker" which is 34 feet in length, 2½ inches in diameter, and between 700 and 800 lbs. in weight. It is attached to poles, each of which is about 30 feet long, which are screwed together as they are required. The whole is moved by a "doctor," worked by the boilers used for the refinery engines. The object of Mr. Belcher is to obtain pure water, limestone water only being found near the surface. At the present depth, a stream of water, strongly impregnated with sulphur, issues from the well. The different strata which have been pierced are as follows:

1st, Limestone, 28 feet; 2d, shale, 2 feet; 3d, limestone, 231 feet; 4th, cherty rock, 15 feet; 5th, limestone, 74; 6th, shale, 30; 7th, limestone, 128½; 8th, shale, 1½; 9th, limestone, 38½; 10th, sandy shale, 6½; 11th, limestone, 128½; 12th, red marl, 15; 13th, shale, 30; 14th, red marl, 50; 15th, shale, 30; 16th, limestone, 119; 17th, shale, 66; 18th, bituminous marl, 15; 19th, shale, 80; 20th, limestone, 134; 21st, cherty rock, 62; 22d, limestone, 138; 23d, shale, 70; 24th, limestone, 20; 25th, shale, 56; 26th, limestone, 34; 27th, white soft sandstone, 15 feet.

The first appearance of gas was at the depth of 466 feet. It was strongly impregnated with carbonated hydrogen. At 520 feet the water became salty; 200 feet lower, the water contained 1⅞ per cent. of salt, which afterwards, at near 1,200 feet, increased to 3 per cent. The level of the sea is reckoned about 532 feet below the surface of the city.

Crime in London.—A recent official report gives an abstract of returns of the children below the apparent age of fourteen, found by the police as mendicants and thieves, as follows: Without parents, 94; having parents who appear to be in a condition of life to maintain and educate them, 231; having parents capable of contributing to their maintenance and education, 580; whose parents send them to beg and live in idleness and profligacy on their earnings, 411; total number of children at large, 1316. The total number of children in common lodging-houses is 1782, distributed respectively under the foregoing heads in the following numbers: 54,—105,—1190,—433, making a total of 1782. This number, added to the former, 1316, gives a total of juvenile mendicants and thieves amounting to 3098. The number of children at large, and living in idleness without education, and apparently neglected by their parents, of the lower classes, who are generally in the receipt of wages, amount, as nearly as can be ascertained, to 20,641 *under* 15 *years of age*, and there are 911 who have been charged with other offenses than as mendicants and thieves.

The Village of Cohoes, N. Y., on the lower Falls of the Mohawk, contains two axe factories, making about 2,200 axes and tools every day; four large cotton mills, employing about twelve hundred operatives; three extensive knitting mills, giving employment to about six hundred hands; one linen thread factory on a very extensive scale; one mill for making carpet and other yarns, manufacturing 1,000 lbs. of wool per day; one bobbin and spool factory; one large mill for sawing veneering; one extensive bedstead factory; one mill for manufacturing omnibus wheels; two machine-shops; one furnace; one marble-yard and works; one flouring-mill. The population of the place is estimated at one thousand, and the capital invested at two millions of dollars and over.

Destroying Wasps.—A method of destroying wasps is recommended by a correspondent of the *Revue Horticole*. It consists in mixing up plaster and emptying it while liquid into the nest. This plaster introduces itself perfectly into the cracks. It forms a mass and envelops all the wasps, so that their larva, eggs and all, are destroyed. It should be practised at the close of the night, so that all may have returned into the common abode.

Another equally efficacious plan to destroy wasps which have taken up their quarters in mud walls, is to make a sort of glue by boiling old hides, and mixing this with soot. Several coats of this mixture were applied over the surface of the wall with a hair broom. The wasps, closed up by the coats of glue in their nests, perish by hunger.

A Gigantic Steamship.—The following are said to be the dimensions of an iron steamer about to be built by Mr. Scott Russell, of London, for the Eastern Steam Navigation Company. She is to be 620 feet long, 100 feet beam, 6,000 horse-power, and 12,000 tons burden. She is to be propelled by four paddles, and a screw. The horse-power will be proportioned as follows; 2,000 for the screw, 2,000 for the midship paddle-wheels, and 2,000 for the fore paddle-wheels.

Horse Statistics.—The New-York *Herald* has an elaborate article in relation to the horses kept in this city. The number is stated to be 22,540, and their value, $2,495,000. The number of persons directly dependent on the labor of horses for subsistence is 12,710. The annual value of the labor of the horses is put down at $4,443,860. The construction of railroads through the principal thoroughfares of the city, on which are used cars drawn by horses, will probably lessen the number employed in omnibuses. The Sixth Avenue railroad, which has been in operation about seven months, employs 236 horses.

List of Patents Issued from May 24 to June 21.

Duncan E. McDougall, of Troy, N. Y., for Improvement in Door Fasteners.

Philip H. Keck, of Morgantown, Va., for Improvements in Cultivators.

R. H. Middleton, of Alexandria, Va., for Improvement in Compound Rails.

Charles Neer, of Troy, N. Y., for Improvement in Fire Places and Stoves.

Marie Louise Roucout, of Paris, France, for Improvement in Grate Bars. Patented in France, Sept. 10, 1851.

Arnold Buffum, (assignor to J. D. Lynde,) of New-York City, for Improvement in Gold Washer and Amalgamator.

William H. Jenison, assignor to Charles Millington, now deceased, and John Jordan, assignor to James M. Parker, all of New-York City, for Improvement in Compositions for a Filter.

Henry Baker, Catskill, N. Y., for Converting Rotary into Reciprocating Motion.

T. A. Dugdale, Richmond, Ill., for Improvement in Washing Machines.

Henry W. Hewett, New-York, for Improvement in Propellers.

William S. Hubbell and Amos Barnett, Kingsville, Ohio, for Improvement in Compositions for Treating Wool.

S. P. Kittle, Buffalo, N. Y., for Improvement in Door Fasteners.

R. W. Betson, Philadelphia, Pa., for Improvement in Boilers for Cooking Stoves.

Oliver Ellsworth, Hartford, Ct., for Improvement in Knob Bolts.

R. J. Falconer, Washington, D. C., for Improvement in Hose Coupling.

P. G. Gardiner, New-York, for Improvement in Quartz Pulverizer and Gold Amalgamator.

Herman Goldsmith, jr., New-York, for Improvement in Water Closets.

Leon Jaresson, Jersey City, N. J., for Improvement in Painting on Cloth.

Gerard Sickles, Brooklyn, N. Y., for Improvement in Platform for Ferry Bridges.

George W. Wright, New-York, for Improvement in Screw Presses for Packing Boxes.

Ebenezer Talbot, Windsor, Ct., for Improvement in Boring Rock.

Julius Hornig and Ludwig Suess, Union Hill, N. J., for Improvement in Artificial Stone.

H. L. Smith, Cleveland, Ohio, (assignor to H. L. Smith, of Cleveland, and Levi Battles and H. A. Swift, of Ravens, Ohio,) for a Paper File.

L. P. & W. F. Dodge, Newburg, N. Y., for Improvement in Pumps.

Charles B. Fitch, of Galena, Ill., for Improvement in Mode of Cutting Tenons.

William G. Huyett, of Williamsburg, Pa., for Improvement in Harvesters of Grain and Grass.

Sherman S. Jewett and Francis H. Root, of Buffalo, N. Y., for Improvement in Stoves.

Harvey Murch, of Lebanon, N. H., for Improvement in Mop Heads.

George F. Muntz, Jr., of Birmingham, England, for Improvement in the Manufacture of Metal Tubes.

Lea Persey, of Patterson, Pa., for Improvement in Self-waiting Dining Tables.

Fergus Purden, of Baltimore, Md., for Improvement in Mortising Machines.

Alexander A. Sampson, of New-Orleans, La., for Improvement in Brick Machines.

E. H. Smith, of New-York, N. Y., for Improvement in Copying Presses.

John H. Sturgis, of New-York, N. Y., for Improvement in Type-casting Machines.

Giles F. Filley, of St. Louis, Mo., for Improvement in Cooking Stoves.

James M. Brookfield and Ephraim V. White, of Honesdale, Pa., (and Jacob Faatz, having been decided to be a joint inventor with said White) the said Faatz and White, assignors to Andrew K. Hay and James M. Brookfield, for Improvement in Manufacturing Glass.

John L. Kingsley, of New-York, N. Y., for Improvement in Moulding Gutta Percha Stereotype Plates.

John J. Greenough, of Boston, Mass., for Improvement in Manufacture of Plate Glass.

Horatio Allen and D. G. Wells, of New-York, N. Y., for Improvement in Cut-Off for Steam Engines.

Benjamin E. Colley, of Cambridge, Mass., for Improvement in Piano-Fortes.

William H. Danforth, of Salem, Mass., for Improvement in Power Printing Presses.

Jno. A. Elder, of Westbrook, Maine, for Improvement in Jacquard Apparatus of Looms.

Edmund L. Freeman, of Ann Arbor, Mich., for Improvement in Bog-Cutting Cultivators.

Frederic W. Howe, of Windsor, Vt., for Improvement in Machines for Planing Metal.

William S. Hyde, of Townsend, Ohio, for Improvement in Cultivator Ploughs.

Simon Ingersoll, of New-York, N. Y., for Improvement in Feed Motion in Plug-Cutting Machines.

Jno. H. Manny, of Waddam's Grove, Ill., for Improvement in Cutters to Harvesters.

David A. B. Newcomb, of Conewango, N. Y., for Improvement in Hill-side Ploughs.

Augustus R. Pope, of Somerville, Mass., for Improvement in Electro-Magnetic Alarms.

George Rohr, of Charlestown, Va., for Improvement in Seed Planters.

I. R. Shank, of Buffalo, Va., for Improvement in Lath Machines.

Walter Sherrod, of Providence, R. I., for Improvement in Expanding Mandrels for Turning Machinery.

William McK. Thornton, of Bloomsburgh, Pa., for Improvement in Horse Collars.

Jos. H. Tuttle, of Seneca, N. Y., for Improvement in Saws.

Jonas B. Wilder, of Belfast, Maine, for Improvement in Hill-side Ploughs.

Benjamin R. Norton, of Syracuse, N. Y., for Improvement in Metallic Pointed Pens.

William F. Tyson, of Orwigsburgh, Pa., for Improvement in Propellers for Canal Navigation.

Enoch Hidden, of New-York, N. Y., for Improvement in Side Lights for Ships.

R. L. Hawes, of Worcester, Mass., for Improvements in Envelop-Folding Machines.

The Plough, the Loom, and the Anvil.

PART I.—VOL. VI. AUGUST, 1853. No. 2.

CAREY'S NEW WORK ON POLITICAL ECONOMY—ABSTRACTION AND RESTITUTION.

THE progress of agricultural science during the last half century has been very rapid, and has kept an even pace with the most successful of its competitors in the labor of subduing the material world to the complete control of man, and making it contribute to the wants and purposes of the intelligent beings by which it is peopled. Although the triumphs of the laboratory, and the demonstrations of the severest analyses, have thus opened a wide domain to man, the practical adoption of the truths and the measures they prescribe is, however, but slow. The time-honored usages of the past are invested with an air of sacredness which repels the novelties of the innovator; and the prejudices of the majority of producers in favor of ploughing in the same field, and following in the beaten paths of their predecessors, serve to keep up customs which the true light of scientific demonstration proves to be imperfect, if not actually pernicious.

If it is true that "he who makes two blades of grass to grow where but one grew before, is a benefactor of the race," then the agricultural chemist of our day, and the scientific agriculturist of our age, are truly benefactors; for they show conclusively that vast improvements may be made in our agricultural methods, and that largely increased rewards of labor may be won, oftentimes by slight improvements or changes in the mode of cultivation. As production is the true basis of the national wealth, as well as of that of the individual, and labor is the agent in production, it is clear that the interest of producers of every class lies in the direction of the largest return for the least labor — thus dignifying and investing with a moral power, and in a better form, the debasing maxim of commerce, to sell dear that which is bought cheap, or, in other words, "get the largest return for the least outlay."

Of all the developments and facts of modern chemical science, none have a more important connection with the interests of the world than those indicated by the caption of this article — those which relate to the abstraction of the properties of the soil, and the restitution in some shape of those elements which impart fertility and value to the soil. The analysis of the various soils and their products show, beyond doubt, that there is a law of nature operating in a thousand forms, so universal and so rigid, that a disregard of its demands leads surely to poverty and decay. Those products which contain phosphate of lime must be fed with phosphate; those containing a distinct proportion of sulphate of lime must be fed with sulphate of lime or gypsum; and so of all other elements whatsoever. The law of supplying the proper elements of fertility, which is but affording food for the plants upon which they may subsist and grow, is just as stern as the same law in the animal economy. The animated organism must have food, or exhaustion, disease, and death must ensue. It must have that kind and quantity of food which will furnish elements of growth to the bones, the tissues of the integuments, and the various parts of the animal frame, or one will be developed and another will be weakened. The assimilation must be complete and suited to all the wants of the system, or the system will fail and lose by so much as it is deprived of its needful nourishment. As an illustration of the exhaustion of the soil, the following facts are given by the eminent Liebig:

"A field in which phosphate of lime or the alkaline phosphates form no part of the soil, is totally incapable of producing grain, peas or beans.

"An enormous quantity of these substances, indispensable to the nourishment of plants, is annually withdrawn from the soil, and carried into great towns, in the shape of flour, cattle, etc. It is certain that this incessant removal of the phosphates must tend to exhaust the land and diminish its capability of producing grain. The fields of Great Britain are in a state of progressive exhaustion from this cause, as is proved by the rapid extension of the cultivation of turnips and mangel wurzel—plants which contain the least amount of the phosphates, and therefore require the smallest quantity for their development. These roots contain eighty to ninety-two per cent. of water. Their great bulk makes the amount of produce fallacious, as respects their adaptation to the food of animals, inasmuch as their contents of the ingredients of the blood—*i. e.*, of substances that can be transformed into flesh—stand in a direct ratio to their amount of phosphate, without which neither blood nor flesh can be formed.

"Our fields will become more and more deficient in these essential ingredients of food, in all localities where custom and habit do not admit the collection of the fluid and solid excrements of man, and their application to the purposes of agriculture. In a former letter I have shown you how great a waste of phosphate is unavoidable in England, and referred to the well-known fact that the importation of bones restored in a most admirable manner the fertility of the fields exhausted from this cause. In the year 1827, the importation of bones for manure amounted to 40,000 tons, and Huskisson estimated their value to be from £100,000 to £200,000 sterling. The importation is still greater at present; but it is far from being sufficient to supply the waste.

"We believe that the importation of one hundred-weight of *guano* is equivalent to the importation of eight hundred-weight of wheat; the hundred-weight of guano assumes, in a time which can be accurately estimated, the form of a quantity of food which corresponds to eight hundred-weight of wheat. The same estimate is applicable in the valuation of bones.

"If it were possible to restore to the soil of England and Scotland the phosphates which during the last fifty years have been carried to the sea by the Thames and the Clyde, it would be equivalent to manuring with millions of hundred-weights of bones, and the produce of the land would increase one third, or perhaps double itself in five years."*

To such accuracy has this scientific application of chemistry to agriculture attained, that, as remarked by the same author,

"We can calculate exactly how much and which of the component parts of the soil we expect in a sheep or an ox; in a quarter of barley, wheat, or

* Familiar Letters on Chemistry, in its Relations to Physiology, Dietetics, Agriculture, Commerce, and Political Economy. By Justus Von Liebig. London, 1851. p. 522.

potatoes; and we can discover from the known composition of the excrements of man and animals, how much we have to supply to restore what is lost to our fields."—p. 498.

This exportation of the valuable fertilizing elements has been going on for a long time in Ireland, by the shipping of grain and live stock to England, and leaving the potatoes to be consumed by the people of that country. According to the London *Times*, the day will probably come, and is not remote, when Ireland will be a grazing country, to furnish cattle for the English market. This is announced in the following extract from that journal:—

"When the Celt has crossed the Atlantic, he begins for the first time in his life to consume the manufactures of this country, and indirectly to contribute to its customs. We may possibly live to see the day when the chief product of Ireland will be cattle, and English and Scotch the majority of her population."

The destruction of the soil implied in the above paragraph is appalling, in an economical point of view. During the ten years from 1841 to 1851, the population of Ireland decreased 1,659,330, while, by a true course of things, it should have increased three fourths of a million; so that Ireland is now nearly two millions and a half poorer in population than she should be. The impoverishment of the soil produced poverty and disease of her chief article of food; this decay of the potato occasioned disease, and death, and expatriation among the people, and hence England has been making the rich soil of Ireland poorer by a three-fold process—exhaustion of her soil, exhaustion of her men by famine, and expatriation to a foreign land. To the climax of the two latter, she purposes to add a fourth—the exportation of all the cattle which can be tantalized into a marketable form for English dinner-tables.

But to quote again from the distinguished author of the Letters:—

"The principal problem for agricultnre is, how to replace those substances which have been taken from the soil, and which cannot be furnished by the atmosphere. If the manure supplies an imperfect compensation for this loss, the fertility of a field or of a country decreases; if, on the contrary, more is given to the fields, their fertility increases."—p. 499.

The principal problem for political economy, to apply the above proposition to our theme, is, how to replace those elements of wealth which are abstracted from a nation, and which cannot be replaced by commerce. If labor supplies an imperfect compensation for this loss, the wealth of a country decreases. If, on the contrary, a greatly increased amount of diversified labor is employed, its wealth increases.

The application and proper elucidation of these principles in connection with the great question—In what does the wealth of nations consist? is a work of no little consequence to the economist. We may be satisfied with clinging to old truths until new ones shall have been thoroughly tested; but when new truths demonstrate and brighten the old, then every reason is to be found in favor oft he speediest adoption of these better guides. So in the present instance: if the history of the world, and the enlarged experience of to-day, proves that the reasoning of the philosopher and the maxims of the economist are abundantly confirmed by the triple force of history, experience, and analytical and synthetical demonstrations, then wisdom points out but one path to her enlightened children.

The work* which the present brief notice is intended to introduce to the

* The Slave Trade, Domestic and Foreign: Why it exists, and how it may be extinguished. By H. C. Carey. Philadelphia: A. Hart. 1 vol. 12mo., pp. 426. 1853.

reader, we believe we may characterize as being based upon this truth for its corner-stone. It takes no narrow or sectional view of the leading subject which appears on the title-page, but, with a broad and masterly grasp of the philosophy of natural, moral and physical action, it discusses boldly and nobly the relations of the material and the moral world, and points out, with an unerring finger, some of the causes of social bondage, and the means by which it is to be overcome.

There can be no doubt that the rewards of labor are to form the central point in some of the questions connected with the social problems of our age. Why do some men grow richer while others grow poorer at their side? Why do some communities increase in splendor, ostentation and magnificence, while beneath the tinselled drapery which attracts the eye of the spectator there is a vast and terrible derangement and corruption which is appalling to the lover of his race? Why do millions "bleed gold for ministers to sport away," and pour out the heart's blood of a nation for the purpose of clothing with richer robes the few who hold or usurp the chair of state? Why do millions become enslaved in all that makes freedom precious, in lands boasting constitutions, and liberty, and law? The answer is found by recurring to first principles, and detecting the fact, every where obvious, that abstraction is not followed by the restitution demanded by the laws of nature and the true economy of the race.

We are not disposed to find fault with the title of the work. Yet it does not, by any means, convey a true idea of the comprehensive discussion contained in its pages. The sensitive "State Rights" or "Union" man, who is jealous of any interference with what he conceives to be his guaranteed rights; the passive sleeper, who sustains his country, "right or wrong," and the ultra abolitionist, are alike, by the title, unprepared for the complete unveiling of the system of universal enslavement enforced by the industrial policy of one nation occupying a commanding position in the affairs of the world.

The author opens with a review of slavery and emancipation; how continued, how effected, and why; and why and how emancipation has *failed* in the West Indies. In successive chapters of the work, these views are unfolded and applied to Ireland, Scotland, Germany, Russia, India, China, the United States, Turkey, and other nations; and the colonial, commercial, and industrial dependence of these countries upon the great centre of the world's forces is illustrated convincingly, we think, by abundant testimony. The philosophy of the book may be summed up in one sentence: Abstraction from the soil produces the abstraction and exportation of man, while restitution to the soil occasions the increase of man and his means for social and national happiness, by multiplying the rewards of his labor. Hence, to make man *free*, he must make the most direct exchange, 1st, with the soil, 2d, with his neighbor, and 3d, with other communities or nations.

The reader will probably be curious to know how this theory is worked out, as it is, into one of the most important contributions to political philosophy which have appeared for many years. Speculations of profound thinkers are valuable for the truths they often teach; but philosophers who spend their time, like the ancient Athenians, in "hearing or telling some new thing," are often led to view as moral facts the conclusions at which they arrive, when, indeed, their starting-point, or their stand-point, is seriously wide of the truth. As a consequence, speculations submitted to the test of experience often vanish as dew before the rays of the sun.

The author of "The Slave Trade" is eminently a man of FACTS. Nothing is of any value in his esteem which is not based upon past experience, or which anticipated experience will not confirm. The multitude of facts furnished as illustrations of the truths he propounds, are themselves worthy the attention of thinking readers of every class.

Among the forcible exhibitions of the slavery occasioned by this exhaustion of the soil by the false commercial and industrial policy which aims to make Great Britain the workshop and exchange factor of the world, compelling all nations to send the fertilizing properties of their soils to England in raw products, to receive back again nothing in return, the chapter on Ireland is valuable and thrilling in painful interest. Our space forbids a quotation of the whole, and we confine ourselves to a selection of passages from the author's argument:

1. "That if there is to be but one place of exchange or manufacture for

ERRATUM.

There should be inserted (before these propositions) the sentence of two lines printed on p. 75—"The impression," &c. And the paragraph following those lines should not be marked as a quotation.

5. "That the impoverishment of the land renders necessary a removal to new and more distant lands.

6. "That this renders necessary a larger amount of transportation, while the impoverishment of the farmer increases the difficulty of making roads.

7. "That the increased distance of the market produces a steadily increased necessity for limiting the work of cultivation to the production of those commodities which can be obtained from high and dry lands, and that the quantity of products tends therefore to diminish with the increased distance from market.

8. "That with each step in the progress of exhausting the land, we are compelled to separate more widely from each other; and that there is therefore a steady diminution in the power of association for the making of roads, or the establishment of schools; and that the small towns, or near places of exchange, tend gradually towards depopulation and ruin.

9. "That the more men separate from each other, the less is the power to procure machinery, and the greater necessity for cultivating the poorest soils, even though surrounded by lead, iron and copper ore, coal, lime, and all other of the elements of which machinery is composed.

10. "That with the diminished power of association, children grow up uneducated, and men and women become rude and barbarous.

11. "That the power to apply labor productively tends steadily to diminish; and that women, in default of other employment, are forced to resort to the field, and to become slaves to their fathers, husbands, and brothers.

12. "That the power to accumulate capital tends likewise to diminish; that land becomes from day to day more consolidated; and that man sinks gradually into the condition of a slave to the landed or other capitalist.

13. "That with this steady passage of man from the state of a freeman to that of a slave, he has steadily less to sell, and can therefore purchase less; and that thus the only effect of a policy which compels the impoverishment of the land and its owner is to destroy the customer, who, under a

reader, we believe we may characterize as being based upon this truth for its corner-stone. It takes no narrow or sectional view of the leading subject which appears on the title-page, but, with a broad and masterly grasp of the philosophy of natural, moral and physical action, it discusses boldly and nobly the relations of the material and the moral world, and points out, with an unerring finger, some of the causes of social bondage, and the means by which it is to be overcome.

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1. "That if there is to be but one place of exchange or manufacture for the world, all the rest of the people of the world must limit themselves to agriculture.

2. "That this necessarily implies the absence of towns, or local places of exchange, and a necessity for resorting to a place of exchange far distant.

3. "That the distance of the place of consumption from the place of production forbids the possibility of returning to the land any of the manure yielded by its products.

4. "That this in turn implies the exhaustion of the land and the impoverishment of its owner.

5. "That the impoverishment of the land renders necessary a removal to new and more distant lands.

6. "That this renders necessary a larger amount of transportation, while the impoverishment of the farmer increases the difficulty of making roads.

7. "That the increased distance of the market produces a steadily increased necessity for limiting the work of cultivation to the production of those commodities which can be obtained from high and dry lands, and that the quantity of products tends therefore to diminish with the increased distance from market.

8. "That with each step in the progress of exhausting the land, we are compelled to separate more widely from each other; and that there is therefore a steady diminution in the power of association for the making of roads, or the establishment of schools; and that the small towns, or near places of exchange, tend gradually towards depopulation and ruin.

9. "That the more men separate from each other, the less is the power to procure machinery, and the greater necessity for cultivating the poorest soils, even though surrounded by lead, iron and copper ore, coal, lime, and all other of the elements of which machinery is composed.

10. "That with the diminished power of association, children grow up uneducated, and men and women become rude and barbarous.

11. "That the power to apply labor productively tends steadily to diminish; and that women, in default of other employment, are forced to resort to the field, and to become slaves to their fathers, husbands, and brothers.

12. "That the power to accumulate capital tends likewise to diminish; that land becomes from day to day more consolidated; and that man sinks gradually into the condition of a slave to the landed or other capitalist.

13. "That with this steady passage of man from the state of a freeman to that of a slave, he has steadily less to sell, and can therefore purchase less; and that thus the only effect of a policy which compels the impoverishment of the land and its owner is to destroy the customer, who, under a

different system of policy, might have become a larger purchaser from year to year."

* * * * *

"The government which followed the completion of the Revolution of 1688, pledged itself to discountenance the woollen manufacture of Ireland, with a view to compel the export of raw wool to England, whence its exportation to foreign countries was prohibited; the effect of which was, of course, to enable the English manufacturer to purchase at his own price. From that period forward, we find numerous regulations as to the ports from which alone woollen yarn or cloth might go to England, and the ports of the latter through which it might come; while no effort was spared to induce the people of Ireland to abandon woollens and take to flax. Laws were passed prohibiting the export of Irish cloth and glass to the colonies. By other laws, Irish ships were deprived of the benefit of the navigation laws. The fisheries were closed against them. No sugar could be imported from any place but Great Britain, and no drawback was allowed on its exportation to Ireland; and thus was the latter compelled to pay a tax for the support of the British government while maintaining its own. All other colonial produce was required to be carried first to England, after which it might be shipped to Ireland; and, as Irish shipping was excluded from the advantages of the Navigation Laws, it followed that the voyage of importation was to be made in British ships, manned by British seamen and owned by British merchants, who were thus authorized to tax the people of Ireland for doing their work, while a large portion of the Irish people were themselves unemployed.

"While thus prohibiting them from applying themselves to manufactures or trade, every inducement was held out to them to confine themselves to the production of commodities required by the English manufacturer, and wool, hemp, and flax were admitted into England free of duty. We see thus that the system of that day, in reference to Ireland, looked to limiting the people of that country, as it limited the slaves of Jamaica, and now limits the people of Hindostan, to agriculture alone; and thus depriving the men, the women, and the children of all employment, except the labor of the field, and of all opportunity for intellectual improvement, such as elsewhere results from that association which necessarily accompanies improvement in the mechanic arts.

"During our war of the Revolution, freedom of trade was claimed for Ireland; and as the demand was made at a time when a large portion of her people were under arms as volunteers, the merchants and manufacturers of England, who had so long acted as middlemen for the people of the sister kingdom, found themselves obliged to submit to the removal of some of the restrictions under which the latter had so long remained. Step by step changes were made, until at length, in 1783, Ireland was declared independent. Shortly after which, duties were imposed on various articles of foreign manufacture, avowedly with the intention of enabling her people to employ some of their surplus labor in converting her own food and wool, and the cotton-wool of other countries, into cloth. Thenceforward, manufactures and trade made considerable progress, and there was certainly a very considerable tendency towards improvement. Some idea of the condition of the country at that time, and the vast lamentable change that has since taken place, may be obtained from the consideration of a few facts connected with the manufacture of books in the closing years of the last century. The copyright laws not extending to Ireland, all books published in England might there be reprinted; and, accordingly, we find that all the principal English law reports of the day, very many of the earlier ones, and many of the best treatises, as well as the principal novels, travels, and miscellaneous works, were republished in Dublin, as may be seen by an examination of any of our old libraries. The publication of such books implies, of course, a considerable demand for them, and for Ireland herself, as the sale of books in this country was very small indeed, and there was then no part of the world to which they could go. More books were probably published in Ireland in that day, by a single house, than are now required for the supply of the whole kingdom.

"With 1801, however, there came a change. By the Act of Union, the copyright laws of England were extended to Ireland, and at once the large and growing manufacture of books was prostrated. The patent-laws were also extended to Ireland; and, as England had so long monopolized the manufacturing machinery then in use, it was clear that it was there improvements would be made, and that thenceforth the manufactures of Ireland must retrograde. Manchester had the home market, the foreign market, and, to no small extent, that of Ireland open to her, while the manufacturers of the latter were forced to contend for existence, and under the most disadvantageous circumstances, on their own soil. The one could afford to purchase expensive machinery, and to adopt whatever improvements might be made, while the other could not. The natural consequence was, that Irish manufactures gradually disappeared as the Act of Union came into effect. By virtue of its provisions, the duties established by the Irish Parliament for the purpose of protecting the farmers of Ireland in their efforts to bring the loom and the anvil into close proximity with the plough and the harrow, were gradually to diminish, and free-trade was to be fully established; or, in other words, Manchester and Birmingham were to have a monopoly of supplying Ireland with cloth and iron. The duty on English woollens was to continue twenty years. The almost prohibitory duties on English calicoes and muslins were to continue until 1808, after which they were to be gradually diminished, until in 1821 they were to cease. Those on cotton yarn were to cease in 1810. The effect of this in diminishing the demand for Irish labor is seen in the comparative view of manufactures at the date of the Union, and at different periods in the ensuing forty years.

"Deprived of all employment, except in the labor of agriculture, land became, of course, the great object of pursuit. 'Land is life,' had said, most truly and emphatically, Chief Justice Blackburn; and the people had now before them the choice between the occupation of land *at any rent*, or *starvation*. The lord of the land was thus enabled to dictate his own terms; and therefore it has been that we have heard of the payment of five, six, eight, and even as much as ten pounds per acre. 'Enormous rents, low wages, farms of an enormous extent, let by rapacious and indolent proprietors to monopolizing land-jobbers, to be re-let by intermediate oppressors for five times their value, among the wretched starvers on potatoes and water,' led to a constant succession of outrages, followed by Insurrection Acts, Arm Acts, and Coercion Acts, when the real remedy was to be found in the adoption of a system that would emancipate the country from the tyranny of the spindle and the loom, and permit the labor of Ireland to find employment at home.

"That employment could not be had. With the suppression of Irish manufactures the demand for labor had disappeared. An English traveller, describing the state of Ireland in 1834, thirteen years after the free-trade provisions of the Act of Union had come fully into operation, furnishes numerous facts, which will now be given, showing that the people were compelled to emain idle, although willing to work at the lowest wages—such wages as ould not by any possibility enable them to do more than merely su tain life, and perhaps not even that:

"'CASHEL.—Wages here only *eightpence a day*, and numbers altogether without employment.'

"'CAHIR.—I noticed, on Sunday, on coming from church, the streets crowded with laborers, with spades and other implements in their hands, standing to be hired; and I ascertained that any number of these men might have been engaged, on constant employment, at *sixpence per day* without diet.'

"'WICKLOW.—The husband of this woman was a laborer, at *sixpence* a day, *eighty* of which sixpences—that is, eighty days' labor—were absorbed in the rent of the cabin. In another cabin was a decently-dressed woman, with five children, and her husband was also a laborer at *sixpence a day*. The pig had been taken for rent a few days before. I found some laborers receiving only *fourpence per day*.'

"It might be thought, however, that Ireland was deficient in the capital required for obtaining the machinery of manufacture to enable her people to maintain competition with her powerful neighbor. We know, however, that previous to the Union she had that machinery; and from the date of that arrangement, so fraudulently brought about, by which was settled conclusively the destruction of Irish manufactures, the *annual* waste of labor was greater than the whole amount of capital then employed in the cotton and woollen manufactures of England. From that date, the people of Ireland were thrown, from year to year, more into the hands of middlemen, who accumulated fortunes that they *would* not invest in the improvement of land, and *could* not, under the system which prostrated manufactures, invest in machinery of any kind calculated to render labor productive, and all their accumulations were sent therefore to England for investment. An official document published by the British Government shows that the transfers of British securities from England to Ireland—that is to say, the investment of Irish capital in England—in the thirteen years following the final adoption of free-trade in 1821, amounted to as many millions of pounds sterling; and thus was Ireland forced to contribute cheap labor and cheap capital to building up 'the great works of Britain.' Further, it was provided by law that whenever the poor people of a neighborhood contributed to a saving fund, the amount should not be applied in any manner calculated to furnish local employment, but should be transferred for investment in the British funds. The landlords fled to England, and their rent followed them. The middlemen sent their capital to England. The trader or the laborer that could accumulate a little capital saw it sent to England, and he was then compelled to follow it. Such is the history of the origin of the present abandonment of Ireland by its inhabitants.

"The form in which rents, profits, and savings, as well as taxes, went to England, was that of raw products of the soil, to be consumed abroad, yielding nothing to be returned to the land, which was of course impoverished. The average export of grain in the first three years following the passage of the Act of Union, was about 300,000 quarters; but as the domestic market gradually disappeared, the export of raw produce increased, until at the close of twenty years it exceeded a million of quarters; and at the date of Mr. Inglis's visit, it had reached an average of two and a half millions, or 22,500,000 of our bushels. The poor people were, in fact, selling their soil to pay for cotton and woollen goods that they should have manufactured themselves; for coal, which abounded among themselves; for iron, all the materials of which existed at home in great profusion, and for a small quantity of tea, sugar, or other foreign commodities, while the amount required to pay rent to absentees and interest to mortgages, was estimated at more than thirty millions of dollars. Here was a drain that no nation could bear, however great its productive power; and the whole of it was due to the system which forbade the application of labor, talent or capital to any thing but agriculture, and thus forbade advance in civilization. The inducements to remain at home steadily diminished. Those who could live without labor found that society had changed; and thus fled to England, France, or Italy. Those who desired to work, and felt that they were qualified for something beyond mere manual labor, fled to England or America; and thus by degrees was the unfortunate country depleted of every thing that could render it a home in which to remain, while those who could not fly remained to be, as the *Times* so well describes it, mere 'hewers of wood and drawers of water to the Saxon.' Happy when a full-grown man could find employment at *sixpence a day*, and that, too, without food!

"'Throughout the west and south of Ireland,' said an English traveller in 1842, four years before the exhaustion of the soil had produced disease among the potatoes, the traveller is haunted by the face of the *popular starvation*. It is not the exception; it is the *condition* of the people. In this fairest and richest of countries, men are suffering and *starving by millions*. There are thousands of them, at this minute, stretched in the sunshine at their cabin doors with *no work*, scarcely any food, no hope seemingly. Strong countrymen are lying in bed, "*for the hunger*"—because a man lying on his back does not need so much food as a man on foot. Many of them have torn up the unripe potatoes from their little gardens, and to exist now must look to winter, when they shall have to suffer starvation and cold too.'—*Thackeray*. 'Every where', said the *Quarterly Review*, 'throughout all parts, even in the best towns, and in Dublin itself, you will meet men and boys—not dressed, not covered—but hung round with a collection of rags of unrivalled variety, squalidity, and filth—walking dunghills. . . . No one ever saw an English scarecrow with such rags.'

"The difference in the condition of these poor people—even the slave of Jamaica of that day—consisted in this, that the negro slave was worth buying, whereas the others were not; and we know well that the man who pays a good price for a commodity attaches to it a value that induces him to give some care to its preservation; whereas he cares nothing for another that he finds himself forced to accept. 'Starving by millions,' as they are here described, death was perpetually separating husbands and wives, parents and children, while to the survivors remained no hope but that of being enabled, at some time or other, to fly to another land, in which they might be permitted to sell their labor for food sufficient to support life.

"The existence of such a state of things was—said the advocates of the system which looks to converting all the world outside of England into one great farm—to be accounted for by the fact that the population was too numerous for the land; and yet a third of the surface, including the richest lands in the kingdom, was lying unoccupied and waste.

"'Of single counties,' said an English writer, 'Mayo, with a population of 389,000, and a rental of only £300,000, has an area of 1,364,000 acres, of which 800,000 are waste! No less than 470,000 acres, being very nearly equal to the whole extent of surface now under cultivation, are declared to be reclaimable. Even the Union of Glenties, Lord Monteagle's *ne plus ultra* of redundant population, has an area of 240,000 acres, of which 200,000 are waste, and for the most part reclaimable to its population of 43,000; while the barony of Ennis—that abomination of desolation—has 230,000 acres of land to its 5000 paupers—a proportion which, as Mr. Carter, one of the principal proprietors, remarks in his circular advertisement for tenants, is at the rate of only one family to 230 acres; so that if but one head of a family were employed to every 230 acres, there need not be a single pauper in the entire district; a proof, he adds, that *nothing but employment is wanting to set this country to rights.* In which opinion we fully coincide.'

"Nothing but employment *was* needed; but that could not be found, under the system which has caused the annihilation of the cotton manufacture of India, notwithstanding the advantage of having the cotton on the spot, free from all cost for carriage. As in Jamaica, as in India, the land had been gradually exhausted by the exportation of its products in their rudest state, and the country had thus been drained of capital; a necessary consequence of which was, that the labor even of men found no demand, while women and children starved, that the women and children of England might spin cotton and weave cloth that Ireland was too poor to purchase. Bad, however, as was all this, a worse state of things was at hand. Poverty and wretchedness compelled the wretched people to fly in thousands and tens of thousands across the Channel, thus following the capital and the soil that had been transferred to Birmingham and Manchester; and the streets and cellars of those towns, and those of London, Liverpool, and Glasgow, were filled with men, women and children in a state almost of starvation; while throughout the country men were offering to perform the farm labor for food alone, and a cry had arisen among the people of England that the laborers were likely to be swamped by these starving Irishmen; to provide against which, it was needed that the landlords of Ireland should be compelled to support their own poor, and forthwith an act of Parliament was passed for that purpose. Thence arose, of course, an increased desire to rid the country of the men, women and children whose labor could not be sold, and who could therefore pay no rent. The 'Crowbar Brigade' was therefore called into more active service, as will be seen by the following account of their labors in a single one of the 'Unions' established under the new poor-law system which, in many cases took the whole rent of the land for the maintenance of those who had been reduced to pauperism by the determination of the people of Manchester and Birmingham to continue the colonial system under which Ireland had been ruined.

"'In Galway Union, recent accounts declared the number of poor evicted and their homes levelled within the last two years, to equal the numbers in Kilrush—4,000 families; and 20,000 human beings are said to have been here also thrown upon the road, houseless and homeless. I can readily believe the statement, for to me some parts of the country appeared like an enormous graveyard—the numerous gables of the unroofed dwellings seemed to be gigantic tombstones! They were, indeed, records of decay and death, far more melancholy than the grave can show. Looking on them, the doubt rose in my mind, Am I in a civilized country? Have we really a free constitution? Can such scenes be paralleled in Siberia or Caffraria?'

"A single case described in a paper recently published by Mr. Dickens, in his '*Household Words,*' will convey to the reader some idea of an eviction, that may be taken as a specimen, and perhaps a fair one, of the *fifty thousand* evictions that took place in the single year 1849, and of the hundreds of thousands that have taken place in the last six years.

"'Black piles of peat stood on the solitary ground, ready after a summer's cutting and drying. Presently, patches of cultivation presented themselves; plots of ground raised on beds, each a few feet wide, with intervening trenches to carry off the boggy water where potatoes had grown, and small fields where grew more ragwort than grass, enclosed by banks cast up and tipped here and there with a brier or a stone. It was the husbandry of misery and indigence. The ground had already been freshly manured by sea-weed, but the village—where was it? Blotches of burnt ground, scorched heaps of rubbish, and fragments of blackened walls, alone were visible. Garden-plots were trodden down and their few bushes rent up, or hung with tatters of rags. The two horsemen, as they hurried by with gloomy visages, uttered no more than the single word—EVICTION!"

Our pages forbid a complete analysis of this valuable work, or a further quotation from its pages. The argument above given in relation to Ireland, is applied with equal power to other nations, from the poor and suffering, emancipated, black slave of Jamaica, who is compelled to send his sugar to England to be refined, to the sturdy Teuton; from the famished rice-grower of India, who is too poor to buy the rice which he grows, while it is shipped off for a market, to the more advanced subject of the Flowery Land. Slavery in all lands, whether that of the negro race in the East or West, in the United States or in South America; whether existing among the Coolies of India or China, or among the oppressed and degraded people of the British Islands, made slaves by a commercial policy—this universal slavery is held up to view in the light of science and philosophy. The numerous facts, gleaned with the industry of a thorough student of history and human nature, are valuable as materials of thought for all readers, even though the application of the argument is not welcome.

The impression left on the mind of the reader we think must be in accordance with the following truths, stated by the author in a series of propositions:

"England is effectually working out her own destruction with that of all other nations which place themselves in a colonial dependence upon her, through commercial regulations. The power of England is now that of machinery. She employs hundreds of thousands of steam engines and spindles. The coal and iron for the supply of these underlie her own area. But she has millions of human machines which depend upon the consumption and combustion of a large quantity of phosphate of lime and other elements. She has robbed her own soil, as well as that of Scotland and Ireland, of the phosphates, and seeks to restore it by digging up the bones of the Englishmen slaughtered at Waterloo, by importing guano from distant islands, and by attracting and compelling the soils of all other nations to lay their phosphates down on her shores in a superabundance of cheap fuel or food, to be consumed by her human machines, and then to be washed away from large manufacturing cities into the ocean. For this enormous waste, she offers the world the privilege of buying her fabrics at her own prices. For all which we are bound to be duly thankful."

We believe the work under review is calculated to produce a profound sensation among thinkers every where. We have read it with the interest of a romance, and we shall be greatly surprised if it does not attract unusual attention in every part of Europe. We commend it to the careful perusal of every man and woman who desires to know HOW MAN MAY BE MADE FREE.

AGRICULTURAL EDUCATION.

A bill has recently passed the Legislature at Albany, establishing an Agricultural College. Of its details we have not informed ourselves, chiefly for want of opportunity. We are not aware that the bill has ever been printed in any of the public journals.

We congratulate the friends of agriculture in view of this result, as we do all other interests, when they obtain a public grant. We doubt whether it is possible to find any provision of this kind that has been made for a useful purpose, that did not accomplish some good. At least, such instances must be exceedingly rare. In this act of legislation, we have no doubt that good will result, and if a bird in the hand is worth a whole flock on the wing, the ultimate results cannot fail to be very desirable.

But if any one supposes that a collegiate institution is an efficient means of speedily reforming the agricultural practices of the mass of farmers, we are very sure he will find himself mistaken. It will do no such thing. It will not approximate to it in any essential degree. We would not oppose its establishment, because it will do some good. It is another light kindled in the midst of darkness. It tends to dissipate some of the ignorance which envelops the community. It will do this by giving new energy to intellect now dormant. Some youth, otherwise destined to go without any education above that of a horribly deficient district school, will be placed there, and have his eyes opened so as to discern what would otherwise be beyond the reach of his vision. There may be scores of such cases. If so, we shall get a rich recompense for the outlay of bags full of gold and silver. The indirect or secondary results of such measures are far greater than the primary. It is the snow-ball which accumulates as it is rolled. All, or nearly all, educational efforts, ever so unwisely conducted, present this same feature.

But this is nearly all that can be expected. How many will become pupils there? If, in three years, five hundred students should go through a systematic course, we presume "the experiment" would be pronounced "wonderfully successful." But how many farms are there in the State? According to that official document called *the Census*, which is, perhaps, as accurate as the responses of rapping spirits, there are about twelve and a half millions of acres of improved land. How long, at this rate, would it take to educate the owners of these and the seven millions of unimproved land? But this would not be necessary. Educate one in ten, and the rest would imitate, eventually, the *successful* experiments of the graduated operator. But how long would it take this tenth man to come into the possession of his farm, and, when there, to acquire such a knowledge of his own land as to qualify himself to exhibit any very marked results from his new modes of farming. If three seasons would prove sufficient, we should admire the remarkable skill of the new professors of the new institution. But, meanwhile, many failures would nearly counterbalance, in popular effect, the more successful attempts at reform.

Even this degree of success, we believe, is utopian—a mere picture of the fancy. As we said in our previous number, farmers already know that they need much more manure. They know that a liberal outlay for enriching their land will eventually return them much more than its cost, in increased crops. They know equally well that, on a majority of farms, movable steam engines, reapers, mowers, and other machinery, would save them much hard work. But they cannot find the means of buying them, and they dare not incur debt in the purchase. What our farmers need, is an actual conviction that the remedy is within their reach; that it is possible for them to enrich their lands without incurring debts they can never pay, and that, with these facilities for their work, they can afford to run some risks. How can such convictions be produced? We answer:

1. By contriving manures that actually will be within their reach. Now, the Peruvian guano and the bone manures, the prepared charcoal and the "improved superphosphates" are "to be had," but they are locked up by patent-rights, or in secret recipes, or in "*terra culture*," or in some *other terra incognita*, if not *terra imaginata*, and are held at prices that frighten the timid man. He is not sure that they are so very good, or, if good on some soils, that they will pay on his. Now, if these gentlemen would be the real friends of agriculture, willing and wishing *in their heart* that their neighbors should grow rich, even though it does not enrich themselves, let them sell their wares at actual cost of time and material. Guano often pays a profit, we are quite sure, of much more than a hundred per cent. ere it reaches the consumer, and charcoal preparations quite as much; and our learned friend of the *Working Farmer* can tell how much profit he makes out of the *farmer who works* on his own land, before the latter can avail himself of his valuable compound. We doubt the propriety of making men pay great profits for that which is their life. Were a drowning man to call upon us for a rope or a board, we ought not to stand and higgle about the compensation for our services. Men *are* starving, because their crops can't get *vital air*. These gentlemen of the patent-right and 200-per-cent.-profit class tell them, "You are dying by inches, and you may die for all we will do, unless you will make for us a handsome fortune. We have the remedy just suited to your wants in casks and bags, but not a pound shall go out of our storehouse—not an item of our valuable discoveries shall you possess, unless you pay us a large tribute." Men may be taxed for luxuries, but we contend to the death against high taxes on the essentials of life.

While crops are exported, and other fruitful sources of loss are constantly open, barn-yard manures cannot be had to a sufficient extent to secure permanent fertility to the soil. There will be a great waste, as in cities, for example, and in what is consumed by ships at sea. The whole crop cannot be returned to the soil: and unless there is an entire reform in this matter; unless more prudence is exhibited in securing the immense amount of offal, excrement, and various kinds of waste in cities and elsewhere, there must be an immense loss. Taking "swamp-mud" and other deposits from our farms, is only borrowing what was collected in other places. This is as much the annual product of vegetation as any other manure, although the collection of these masses may have been the work of years. It is also obvious that another portion of annual growth which is incorporated in human organisms at their death, is essentially lost; and this is not a small item. We need not give statistics on such a topic, but a little calculation will satisfy any one that here is an immense loss that cannot be avoided. It is true that much of these crops came from the atmosphere, but the growth of every leaf and of every stalk uses up a portion of the soil, or at least tends to destroy its fertility. What was furnished by the atmosphere will be furnished again, of course, but only on condition that the soil shall be in as good a state to act as a medium.

2. The next requisite is to teach farmers the proper use of manures. How shall this be done? In the lecture-room of a college? This is not, in our view, the best place for giving or receiving such instruction. The machinery

now in use seems to us not only the best, but, in some important sense, the only available means. To give in detail all the information necessary on this subject, would be to read to the pupil the better part of all the agricultural publications in the land. This the college professor cannot do. He lays down general principles, and leaves the pupil to carry them out as best he may. But this is just what the periodicals of the day are doing, with the addition of full statements of actual experiments in the very district where the pupil's farm is situated. And besides this, periodicals are permanent. Their statements and instructions are in black and white, and may be referred to as required. The lecture is heard and forgotten. Let the State, or the "boys" and "girls" who are asked to give their small earnings to this college, expend $10,000 a year on the gratuitous circulation of the best agricultural journals, sending them to those who cannot or who will not pay for them from their own pockets, and, in our opinion, much more good would be accomplished than by the best course of collegiate instruction.

3. Without the invaluable aid of the well-conducted journal, ten good lecturers, going over the State eight months of the year, not so much to talk about "phosphates," and "chlorine," and "primary elements," and "alluvium," and "diluvium," &c., as to present simple facts and successful experiments, and to give judicious advice to those who have not self-confidence, would do more good than a dozen colleges which should require an annual payment of $200 or more from each of those who are placed under such instruction.

We regard well-informed itinerant lecturers, in the present condition of our farming population, as altogether the most efficient means of securing agricultural reform. What has this kind of effort done in temperance! It would do much more in agriculture, for it would have to contend not so much against established and determined prejudice as against ignorance and timidity. These teachers would visit the farmer in his home, and walk with him over his fields, and point out to him his important mistakes, and encourage him with assurances of success. Various modes of exerting a good influence would present themselves to such men.

Unite the free or the general circulation of journals and the constant efforts of good lecturers, and we should have, in our judgment, the most efficient reformatory measures that can be devised.

4. We would add to these, well-arranged county and State shows, where farmers would congregate to exhibit the results of their more successful experiments, and learn, also, the experience of others who tried processes different from their own. But this should not be the whole. Ministers meet in "Associations," &c., to discuss points of doctrine or of practice. Physicians do the same. Musical conventions are becoming common, where lectures are delivered, and each member gives his views. Teachers' conventions afford an opportunity to listen to a studied and formal presentation of some useful topic, but this is followed by extempore discussion, in which all are invited to join.

So it should be in agricultural meetings. Let the doors of our hospitable farmers be thrown open for two or three days, or a week, to those who will attend such gatherings; let mutually pleasant and profitable acquaintances be formed; successful, and even unsuccessful, experiments be "talked over," both in and out of doors, and ideas be interchanged in various ways and on a variety of subjects, according to circumstances. They all might sit at a common table, furnished with *material* brought from the homes of those who are assembled; imposing only upon the wives and daughters of the place where they meet, the labor of its preparation: or, still better, in one view of the subject, these farmers might bring their own wives and daughters, who should each show her own skill in preparing the table; or the labor of cooking might be done at home, so far as meats and pastries, &c., are concerned, while in the coffee, and tea, and chocolate, &c., each might exhibit her own skill: and we add, there is no branch of this subject in which there is more universal need of instruction. Good coffee and good tea and good chocolate are among the *rarities* of the country. Do this, or any thing like this, and your colleges will, by and by, find they must go into the farm-house for the matter of their lectures; and writers on agriculture, to be read, can only retail what they learn directly from the practical farmer. In fact, what other than this is now the condition of things on this subject?

CANALS IN INDIA.—IRRIGATION.

Bayard Taylor gives the following description of some works of this sort in the East:—

"The Ganges Canal has rarely been heard of out of India, but it is one of the grandest undertakings of the present day. It is being constructed under the direction and at the expense of the Government, mainly for the purpose of irrigating the level fertile tracts between the Ganges and Jumna, but also to afford the means of transporting the productions of the country to the head of navigation in the former river, at Cawnpore. The labor of more than ten years has already been expended on it, and four or five years more will be required to complete it. It will be 80 feet wide, varying in depth according to the season, but probably averaging eight feet, and, including its numerous branches, will have an extent of 800 miles! It taps the Ganges at Hundwar, and returns to it again at Cawnpore, a distance of more than 400 miles. The total cost, when completed, will not fall much short of £2,000,000, but it is expected to yield a return of £500,000 annually. This calculation is based upon the success of the East and West Jumna Canals, which are comparatively on a small scale. The former of these was finished in 1825, since which it has paid all the expenses of construction, together with an annual interest of 5 per cent. thereupon, and £320,000 clear profit. The latter, finished a few years since, has paid the cost and interest, with £30,000 profit.

"The use of the water for irrigation is not obligatory upon the inhabitants, but they are generally quite willing to avail themselves of it. There are three ways in which it is furnished to them: First, by villages or companies of cultivators contracting for as much as they want; secondly, by a fixed rate per acre, according to the kind of grain, rice being the most expensive, and cotton the cheapest; and thirdly, by renting an outlet of a certain fixed dimension, at so much per year. Along the Jumna Canals, the people do not wait, as formerly, to see whether the crops will be likely to succeed without irrigation, but employ it in all seasons, and are thereby assured of a constant return for their labor. The Ganges Canal will be of vast importance in increasing the amount of grain produced in Hindostan, the design of the Government being to *render famine impossible.* It is to be hoped that such a dreadful spectacle as the famine of 1838, when hundreds of thousands perished from want, will never again be seen in India. That such things have happened is the natural result of the tenure by which land is held and cultivated. The Government is the proprietor, and the *zemindars*, or tenants, pay 75 per cent. of the assessed value of the products. The land is sub-let by the zemindars to the *ryots*, or laborers, and these, the poor and ignorant millions of India, of course gain little or nothing beyond a bare subsistence. If the crops fail, they have nothing at all. The Ganges Canal will therefore, to a certain extent, prevent famine, by assuring perennial crops. It will enrich the Government, because, in addition to the sale of the water, it will increase the rent of the lands as they become productive, but it will very slightly mitigate the condition of the ryots.

"The greatest modern work in India is the Canal Aqueduct over the Selanee river, at this place. It is entirely constructed of brick, and, including the abutments, is about a quarter of a mile in length, by 180 feet in breadth. There are about sixteen arches of about seventy feet span, and rising twenty feet above the river, the foundations of the piers being sunk twenty feet below the bed. The arches are four feet thick, in order to support the immense pressure of such a body of water. Hundreds of workmen are at present employed on the structure, and a small railroad has been laid down for bringing the materials. A locomotive was imported from England, but, through the neglect of the native firemen, soon became a wreck. During the short time it was in operation, a great number of accidents occurred. It was found almost impossible to keep the natives off the track. Their stupidity in this respect is astonishing. If you have a hard heart, you may run over as many as you like in a morning's ride, for they will assuredly not get out of your way unless you force them to it."

CITY AND COUNTRY.

"If the towns grow, the country grows. Show us an old-looking, rickety, paintless, dilapidated town, and we will show you a country of shiftless and thriftless farmers near it."

So says the editor of the *Prairie Farmer;* and among the volumes of good things that have come from his pen, he has never published a more truthful sentence, nor one more worthy of serious thought. "Town *vs.* country," "country *vs.* city!" Did you ever see the two blades of a pair of scissors worrying and bullying and fighting each other? It is not the head saying to the foot, "I have no need of thee," nor the "vessel of honor" turning with disdain from the "vessel of dishonor." There is no such inequality of position. If one presents to the eye piles of brick and stone, with markets and merchandise, the other spreads out fields of green, and quiet and tasteful homes; and the land waves its golden harvests in graceful obeisance to the traveller from the city, as if it would bid him welcome to the spot where the sustenance of the world is grown, and to the families to whom he owes much of his own prosperity.

No, they are not head and tail, nor lord nor peasant; they are rather the two arms of the lever by which the world is moved. They are the two noble steeds, unlike in regard to color, form, &c., which lift out of the fog and darkness the chariot of day, while neither, alone, would give motion to its ponderous wheels.

Without the city there is no market. Without the country there can be no city. Cities do not grow at hap-hazard. They will not extend their busy streets and marts at the command of men's fancy or caprice.

Nor, on the other hand, can the country flourish without cities. Where are our rich farmers? Invariably where they have access to large markets. Exceptions are such only in appearance. The ancestor from whom the wealth was first inherited, if a farmer, acquired his profits where he could sell readily the products of his land.

Who constitute the throngs in the streets of cities? Many of them are strangers from the country. Who occupy the stores and counting-rooms of the city? The former companions and schoolmates of those strangers, if not their brothers and sisters, who chose to try their fortunes in a new and more venturesome pursuit.

Does the agricultural State of Vermont wish to raise large sums with which to endow her colleges, where do her agents go? Among her own sons in Boston and New-York. Does agricultural New-Hampshire wish to get up a splendid social feast, where the natives of the State can assemble and renew old acquaintances, and revive old associations, and honor dear memories? What more fitting place could have been found than that selected in the city of Boston?

Would her "only seaport," which has sometimes been thought to look down with an air a little too lordly upon the interior portions of that State, assure themselves of a "glorious Fourth," that shall not ever be forgotten? Who could better have made assurance sure than her sons in Boston and New-York for the day just approaching? They will not fail. When were they known to fail?

We once kept the tally for the President of that old "aristocratic" institution, "The Old Massachusetts Bank," himself a country minister's son, as he counted over the Boston boys among the (then) sixty Boston members of the State Legislature, and the *whole sum total* was less than a dozen. The rest were from the country, and yet there is sometimes a jealousy between city and country! If this is reasonable, then a house may properly be divided against itself—father against son, brothers and sisters, mothers and daughters, cousins and uncles, and even betrothed lovers against each other. Such a contest is essentially a family feud.

In the olden times, and even in many cities now scattered over the Eastern Hemisphere, the flocks and herds which, during the day, are led out into the broad fields of the rural districts, at night are collected around or within the walls of the city for protection. This is an apt illustration of the relative position of the country and the city. When these shepherds and herdsmen are ready to conspire together to destroy that which protects them and their flocks—to kindle a blaze under the walls and roofs which afford them comfort and shelter, then may jealousies spring up and be fanned into bitter quarrels and angry fightings, and all contend manfully for the common destruction of all classes.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

THE DIGNITY OF LABOR.

Messrs. Editors:—No one will deny the necessity of manual labor, yet too few are willing to award to the toiling millions that position in society to which they are justly entitled.

Without effort and without labor nothing can be accomplished. The heavens might pour forth refreshing showers; the gentle dews descend, and the sun send forth its genial rays; the seasons regularly return and cover the face of the earth with verdure; but without the effort of man to profit by the bounty of Omnipotence, all would be in vain. By the hand of the laborer the forest falls, seeds are planted in the ground and yield many-fold for the sustenance of man.

The artisan erects comfortable dwellings, builds ships, spreads an iron network over the face of the earth, and provides those means of conveyance to facilitate intercourse which are fast rendering the inhabitants of the earth one people, and enabling them to exchange the productions of one clime for those of others. By the skill of the mechanician, machines are constructed to relieve man from much laborious exertion and from too heavy burdens. It must be evident to all who will bestow any thought upon the subject, that those who apply the powers that the Creator has bestowed upon them to some useful purpose, are benefactors, and entitled to the respect of the good and the wise, and must receive the approving smiles of Heaven. And, on the other hand, those who spend their time in idleness are unworthy of the society of the virtuous, recreant to their duties, and rebellious against the laws of nature and the commands of Heaven. These undeniable truths being admitted, we propose examining into the cause of the insignificant position awarded to the sons of toil, and the inadequate remuneration for their services.

The greatest obstacle in the way of progress for the laborer, and of his advancement to the dignity and honor to which he is justly entitled, may be attributed to his own faults—his voluntary acknowledgment of inferiority, and his obsequious cringing to those who have wealth and station. And especially does he lower himself when, lacking self-reliance, he enters into combination with others to effect that which his own merits ought and, if properly presented, would command. The operation of "Trades' Unions" has had a most deleterious effect upon the interests of the most worthy and useful members of society. The sober, industrious and intelligent man who joins one of these Associations, lowers himself in the estimation of the public, and often in his own mind, to the level of the most intemperate, slothful and ignorant member of the Society to which he is attached.

The judgment of the world, and often of individuals, is ungenerous and unkind. Many a well-disposed person, with the purest motives, has left honorable and profitable employment on account of some imaginary wrong inflicted upon a worthless member, and in doing so, has unintentionally incurred the disrespect of those who previously honored him for moral worth and unimpeachable integrity. The worst feature of these Associations is their effect upon individual members. We venture the assertion without fear of contradiction, that the first stipend any person ever received, while in health and able to earn a living, from any Association, lowered him, in his own estimation, from the dignity of an independent citizen to the condition of a feeder upon charity. Such are the inevitable effects of Associations that attempt to control the conduct of individuals in their business transactions with others. No combination ever established as high a rate of wages as could be commanded, at any and all times, by the best workmen of the art; nor did they ever put the rate so low but that the poorest workmen would be more than paid. Consequently, the whole burden falls upon the best members, and the benefits are received by the most worthless hangers-on of those Associations. Another evil effect of these Associations among mechanics is the tendency that strikes among workmen have to induce employers to take incompetent men to fill the places of those who, in obedience to the rules of the Society, leave their situations. We must not be understood as arguing that the laborer is overpaid; on the contrary, the wages received by the industrious workman hardly ever approach a just reward, and often are entirely insufficient to yield the necessaries of life for himself and family. If we believed that these Associations were calculated to increase the respectability, intelligence and comfort of the members, they would receive our hearty concurrence and support; but they must not be confounded with purely Beneficial Societies, those that allow their members to work at such prices as they see fit and can obtain; and when the resources of the members of such Societies are exhausted, they can conscientiously and without humiliation, receive assistance from the common treasury. But to compel a member to quit a situation where he receives for his services eight, ten, or twelve dollars per week, and accept from the funds of the Society three or four dollars, and spend his time in idleness, with opportunity and example to contract habits of intemperance, is at least a doubtful policy, the consequence of which should receive the careful consideration of all those who are disposed to unite their interests in the cause of human amelioration.

"The laborer is worthy of his hire;" and he who unjustly withholds the hard earnings of an employee is a robber, and no less a criminal than he who, under cover of night, robs his neighbor for gain. And little less guilty is that man who, while overloaded with wealth, seeks to wring from the poor laborer the greatest possible amount of work for a miserable pittance.

J. S. G.

Media, Delaware Co., Pa., June 25, 1853.

AMERICAN MINES.

The mining interest of these States is just beginning to be developed, and we do not hazard much in prophesying that those of iron and lead and copper, &c., will be of more substantial value than those of gold and silver.

We intend to give these matters especial attention, and invite those interested to send us statements of facts for our pages. A correspondent of the *Tribune* writes thus of the Copper Mines of Lake Superior:

"The Norwich is situated on the west branch of the Ontonagon river, about 18 miles from the mouth, and 12 miles from Collins' Landing. It is a well-defined vein, and has been traced and partially opened for more than half a mile in extent. The lode is well charged with copper, from good stamp ore to masses of 4,000 lbs. One shaft has been sunk to the depth of 245 feet on the vein; another 80 feet, and two others to an inconsiderable depth. The ten-fathom level has been extended about 240 feet; the twenty-fathom level 220 feet; the upper part of the mine has been partially stoped out, producing about 800 tons of stamp and barrel-work, and 30 tons of masses. There is sufficient copper in sight to guarantee a shipment of 75 tons this season without robbing the mine. They are driving a working adit level 440 feet in length, which will give a back of 250 feet, and enable the Company to work the mine to great advantage. This adit will be completed about the first of August.

"The Windsor is situated about half a mile east of the Norwich. One shaft has been sunk 105 feet; two others about 80 feet each. Levels have been extended 290 feet, but there is not sufficient work to develop the mine. It produces good stamp and barrel-work, and a few small masses. This mine is worthy of a large expenditure to prove it up.

"The Ohio Trap Rock Company are working on the north side of the Norwich Bluff. They have sunk one shaft 260 feet, one 200 feet, and several others 10, 20, and 30 fathoms. Levels have been extended for 200 and 300 feet; an adit level driven 150 feet, and cross-cuts north and south. It does not present a very flattering show at the point where they are now working, although good stamp and barrel ore has been raised. This Company own a large and good tract of land, have erected stamps, and are prepared to work with vigor when they get a paying mine.

"The Derby is about five miles west of the Norwich. They have been working two veins on the south side of the bluff, both of which are of very fair promise: one shaft is down about 30 feet; an adit is being driven in the course of the vein, which will give a back of 225 feet. There is every indication of this making a paying mine.

"The Hudson is a half mile west of the Norwich, and has sunk a shaft 40 feet, on what appears to be the same vein that the Ohio Trap Rock are working on the other side of the bluff. It is a good show.

"Yours, W. D. K."

INCREASE OF IMPORTATION.

The New-York *Journal of Commerce* says, that the total receipts of dry-goods at this port since January 1st, is $12,945,509 greater than for the corresponding five months of last year, and $8,592,141 greater than for the same period of 1851, as will appear from the annexed comparison:

IMPORTS OF DRY-GOODS AT THE PORT OF NEW-YORK DURING THE MONTHS OF JANUARY, FEBRUARY, MARCH, APRIL, AND MAY.

ENTERED FOR CONSUMPTION.

	1851.	1852.	1853.
Manufactures of wool, - - - -	$5,513,126	$4,588,869	$8,495,117
" cotton, - - -	5,355,438	4,295,267	6,718,790
" silk, - - - -	10,296,506	8,156,557	13,395,311
" flax, - - - -	3,291,168	2,643,389	3,799,591
Miscellaneous dry goods, - - -	1,742,901	1,858,522	2,539,874
Total, - - - - - - - -	$26,199,139	$21,542,604	$33,948,683

WITHDRAWN FROM WAREHOUSE.

	1851.	1852.	1853.
Manufactures of wool, - - -	$474,386	$779,610	$498,791
" cotton, - - -	822,057	1,004,230	554,598
" silk, - - - - -	520,655	1,163,650	671,656
" flax, - - - -	332,322	566,149	117,230
Miscellaneous dry goods, - - -	220,667	219,324	201,758
Total, - - - - - - - -	$2,370,087	$3,732,963	$2,044,033
Add entered for consumption, -	26,199,139	21,542,604	33,948,683
Total thrown on market, -	$28,569,226	$25,275,567	$36,992,716

ENTERED FOR WAREHOUSING.

	1851.	1852.	1853.
Manufactures of wool, - - - -	$589,058	$683,435	$767,202
" cotton, - - -	763,854	536,073	610,254
" silk, - - - - -	861,037	1,434,510	826,778
" flax, - - - -	322,561	187,772	160,294
Miscellaneous dry goods, - - -	190,080	187,967	204,659
Total, - - - - - - - - -	$2,726,590	$3,029,757	$2,569,187
Add entered for consumption, -	26,199,139	21,542,604	34,948,683
Total entered at port, -	$28,925,729	$24,572,361	$37,517,870

ANATOMY OF THE HORSE.

THE following abstract of one of Dr. Slade's lectures, as reported in the *Traveller*, will be useful to all those who have the care of that noble animal:

"The posterior extremities are divided into the haunch, the thigh, the hock, leg, and foot, being the bones concerned in forming this portion of the animal. The hind legs of the horse resemble very much the legs of man. The branch or pelvis forms the posterior boundary of the trunk, and is connected with the spine. It presents a large, irregular cavity, open before and behind, and contains the urinary and genital organs, with a portion of the intestines. It is composed of four bones. Two of these, called the haunch bones, or *ossa innominata*, form the lateral and inferior portions of the pelvis. Each of these two bones consists of three bones, termed the ilium, ischium, and pubis. The pubis is the smallest, and sustains the bladder, and uniting with the opposite bone, forms the symphisis pubis. From the loins to the setting on of the tail, a line should be carried almost straight. The width of the haunch is of great importance, as it affords more room for the attachment of muscles.

"The thigh bone is the largest and strongest in the skeleton, is short and thick, and has prominences, hollows, and roughnesses for the attachment of powerful muscles. The lower extremity is very complicated, and presents two prominences which are received into corresponding depressions in the next bone, and a depression in front in which the bone of the knee plays as over a pulley. The stifle bone, corresponding to the knee-pan in man, glides over the pulley-like surface in front. This and the two prominences below and behind constitute the stifle joint.

"The leg bone of the horse, or the lower bone of the thigh, as it is called, is composed of two bones, the tibia and fibula. The tibia is the largest, and in front reaches from the stifle to the back. The fibula is very small, and reaches a third of the way down.

"The lower bone of the thigh forms an angle with the upper one, exactly the reverse of the one between the upper one and the pelvis. The object of this is to obviate concussion, on the principle of the spring, and also to give a favorable direction to the muscles. This part of the thigh should be long, in order that the contraction of the muscles may be as great as possible.

"The inferior extremity of this bone enters into the formation of the hock joint, which consists of three sharpened projections and two deep articular grooves—one of these projections separating the grooves and the others forming the lateral prominences.

"The line of direction below the hocks should be perpendicular to the fetlock. The weight and stress will thus be equally diffused not only over the entire back, but also over the pasterns and foot. Some horses have their hocks closer than usual to each other, and the legs and feet turn outwards. These animals are said to be cow-hocked, and are thought to have considerable speed. This may be the case, but the advantage gained is more than counterbalanced by many evils to which they are liable, such as spavins, windgalls, and curbs.

"The other bones of the hind legs are very similar to those of the fore legs which have been described.

"The muscles of the posterior extremities are more powerful than those of any other part of the frame, and provision is made to confine them in their respective positions, and to contribute to their security and strength. When the skin is stripped off, the muscles are not found naked, but they are covered and closely compacted together by a dense, strong membrane which is called a fascia.

"The diseases of the posterior extremities are numerous.

"The stiff joint is often sprained, and sometimes dislocated. Sprain is indicated by swelling, and is of little harm to the horse. Dislocation is much more serious, and often the horse never recovers, but always remains lame. Thorough-pin affects the hind legs, and is similar to a windgall. The treatment is bandaging, blistering, or firing if necessary. It is not a serious disease, but should be watched, lest the causes which produce it should weaken other parts.

"There is sometimes a sprain of the hock, or inflammation of that part of the leg, which may be abated by applying blisters and allowing the horse to rest. Sometimes it will not yield to treatment; and although a horse may work moderately for three or four years, yet when called on to do any extra day's work, lameness comes on and may always continue.

"The ligaments of the leg sometimes become sprained, and then arises a tumor called a 'curb.' Blistering should be tried, and sometimes firing is necessary. A horse affected with the curb should be regarded with suspicion. The swelling is best observed when looking sideways at the leg. A horse with the curb should be allowed to rest at least a month after the treatment is commenced. It is often an hereditary disease.

"Bone-spavin is a very common disease. When it first comes on, the horse is quite lame, and suffers great pain. Soon both disappear, the parts becoming used to the tumor on the hock joint. If the disease does not interfere with the ligaments, it is of little disadvantage; if it does, the disease is more serious. It is a peculiarity of the spavined horse that when first taken out he is very lame, but after travelling a while, he becomes almost entirely free from the limping. Spavined horses are best fitted for farming, where no great speed is needed. Little can be satisfactorily said of the treatment of spavin. Continued blistering sometimes is effectual.

"A disease sometimes affects the membrane between the bones of the hock joint. It causes lameness, but little is known of its character.

"Swelled leg arises from irregular exercise and seldom use. If not properly attended to, it may result in trouble. The limb should be bound firmly, and physic applied.

"'Grease' is a disease arising from wetting the legs and then allowing them to dry. When the hind legs are washed, they should be well wiped. The 'grease' appears as an itching near the top of the hoof, and cracks often are found as the result of the disease. The disease often debilitates the horse, and he becomes useless. In carriage and pleasure-horses, the hair on the fetlock joints should be cut off. In cart-horses, the hair should be allowed to remain, and the legs should not be washed, but brushed.

WOOL-GROWING AT THE SOUTH.

There seems to be a disposition in a few of our friends in Virginia to enter upon this business. We rejoice to see this. They must succeed in it, far better than in the modes of farming hitherto prevalent in that State. The *Richmond Dispatch* has a short article on the subject, in which he says:

"Virginia has stood aside, and seen the wealth derivable from the growth of wool absorbed and appropriated by her neighbors. But a new era has been opened, and we boldly predict that our State will shortly rank among the first in furnishing wool for the marts of the world. We saw, yesterday morning, a sample of fine Saxony wool grown in this State, that would bring, in any market, from 85 to 90 cents per pound. We also looked over some samples of Merino, grown within 20 miles of Richmond, that brought 60 cents in this market. The grower remarked, that at such rates he could not engage in a more profitable business. It seems that he had entered upon wool-growing merely as an experiment, and had only 170 sheep in his flock. For this season's clip he received about $350. He informed us that he had 100 lambs for sale, for which the butchers had repeatedly offered $5 per head, but that, as they were full-blooded Merino, he had sold most of them at $10 each, and expected no difficulty in selling the remainder at the same price. At this rate his profits for a single year will be from $750 to $1,350 upon 170 sheep! On being asked the annual cost per head of feeding them, he replied, *forty cents;* but added, that since their manure was worth three times that sum, he concluded that his wool had really cost him *less than nothing*. Considerable attention is now being paid to the growth of wool upon the poorer lands of Fairfax and Prince William, and the business is steadily increasing throughout the whole Piedmont region, from Harper's Ferry to the North Carolina line. We doubt not that even in the tide-water sections of our State, the growth of wool will be found profitable."

Let many others of the Ancient Dominion go and do likewise.

ROTATION OF CROPS.

In English papers, this is a constant subject of discussion. The precise order of rotation, and the number of years to be occupied by the series, for producing the greatest crops, are regarded as questions of very great practical importance. In that country, where the lands are highly cultivated, it may be deserving all the attention given to it. Some crops seem to possess the power of rendering available elements over which others have no power. Their roots penetrate more deeply, or are more abundant, or perhaps have a peculiar organization which gives them some special adaptation to appropriate nutriment inaccessible to other plants.

The same question is sometimes brought before us in our own journals, and even here it is no doubt worthy, oftentimes, of careful consideration.

But we would guard our readers against one grand mistake. When a soil contains all that is necessary to make it fertile, a given crop exhausts the available portions of one or more of its elements much more rapidly than it does others. Hence the repetition of the same crop for several years may in the end leave the land utterly destitute of those given elements, while it contains an abundance of all others. When this is the state of things, it is obvious that it cannot produce another similar crop, while it may be able to produce one of a different character or requiring different elements.

But what is the result of thus tasking the land? Continuing the same crop, a small one only can be obtained; but by changing it, it may, for the time being, be more productive. But what is the final consequence? *While manure is withheld*, instead of being destitute of one, it becomes destitute of several elements, and if the process is continued, is made totally barren, and requires a general and thorough renovation before it can produce any thing.

We have seen this course pursued by tenants for a term of years. Having exhausted the power of the soil to produce one growth, they plant another with tolerable success. This exhausts in its turn, but in a different way, and ere long there is no crop for which it has the necessary aliment. But his lease has expired, and he has no further use for the land. The owner can do with it as he pleases.

The first course alluded to is like driving away one swarm of insects with which your horse or yourself may be covered, to make place for a fresh supply of others as hungry as the first were at the beginning, and so progressing from bad to worse. But the second, the process of rotation without manure, is but another illustration of sacred writ: 'that which the cankerworm hath left hath the palmerworm eaten." Thus, corn requires more silex than peas; peas and kindred plants more nitrogenous manure than cucumbers or melons, &c.

Ordinary farmers overlook one very important feature in the system of rotation. We refer to a season of rest and of ploughing in green crops, with which it may be qualifying itself for abundant harvests in future years. They see the evil of cropping the same growth year after year; their scanty harvests proclaim this in a voice that cannot be unheeded; but if they can change the crop and receive in return a bare recompense for their labor, they are satisfied. Thus they go on, till at last they cannot gather even a crop of beans. What then? Do they thoroughly manure, and allow a season of rest? Not at all. They sow grass-seed, perhaps; and mowing the growth of every year till they find this unprofitable, they turn it into pasture, and require their cows and oxen to find on it what they could not find—a liberal supply of feed. It is thus we imitate the habits of others, leaving out, partially if not exclusively, those very things which give value to the general system, omitting that which can alone secure for any growth an abundant harvest.

But even this season of rest is not enough. Manures, as we have seen, are as essential with a rotation of crops as without. The kind of manure may be modified with the nature of the growth, but the supply of some manure, and that which is suited to the condition of the soil, is indispensable in any system of farming, and in the growth of any variety of crops.

The rotation system has been thought unwise, because unnatural. If left to itself, each plant scatters its seed around its own roots, thereby securing a permanent succession of the same growth. But in this case, nature does what the farmer does not. She returns the entire growth to the same soil which produced it, with the addition of a large amount of organized elements derived from other sources, as air, water, &c. But, again, this is not always true. In forests, when the growth is cut off, we often see a different species growing in its stead.

FISH AND BONES FOR MANURE.

Every one knows that bones are exceedingly valuable as manure, but many are deterred from using them by the labor and cost required to prepare them for the soil. Their value consists chiefly in the phosphate of lime which they contain.

An interesting experiment is detailed by Mr. C. L. Flint, in the *Journal of*

Agriculture, showing how easily fish can be converted into manure. It answers, as will appear, the same purpose, essentially, as guano. Mr. Flint says:

"We have ourselves formed a compost, which for fertilizing properties is nearly equal to guano, by dissolving fish with sulphuric acid. The process is so simple, and the result so valuable for those living in the vicinity of the sea-shore, who can procure fish in considerable quantities, that we will state it, in the hope that it may prove of value to others. Sulphuric acid can be procured at about three cents a pound, more or less, depending upon circumstances. We applied the sulphuric acid from the laboratory to the flesh and bones of a large codfish, simply pouring the liquid in a small quantity over the fish. In less than two days the decay had been so rapid as to be distinctly perceptible; when a little more acid was sprinkled over the fish. In less than a week, flesh and bones were in a state of decay, and shortly after, we mixed it with a little earth, and applied it around the roots of plants. It caused them to grow with the most astonishing rapidity.

Circumstances did not allow us to try the experiment on a large scale, but it is easy to perceive how simply it could be done. Let fish, which can ordinarily be procured, in summer, in large quantities around the wharves, or the refuge of the fish market, consisting of heads, bones, &c., be first procured. Dig a hole in the earth, of any desirable size, in the shape of a bowl, into which put all such animal substances as can be procured. Obtain from the apothecary or manufacturer good sulphuric acid, (vitriol,) and dilute it slightly with water. The rapidity of the decomposition will be in proportion to the strength of the acid. We used it undiluted, though for practical purposes it would be better to dilute it somewhat,—perhaps four or five, or even ten parts water to one of acid;—additions can be made from time to time, as convenience may dictate; and the application of acid renewed in any quantities. A few experiments may be needed to ascertain the most economical management of these quantities, &c. No loss of any valuable properties, like ammonia, &c., need be feared from exposure to the air; though if a great rain should occur soon after the application of acid, a fresh application should be made. The former one would be too much diluted.

"After this mass has lain some days, till the bones are sufficiently dissolved, sand or loam may be added, and the whole mixed together. It will now be in a state to be used, and may be applied on the surface, or ploughed in. If used in the garden, it will be convenient to cover it slightly with the spade. Here has been produced a rapid decomposition of a substance containing a very large amount of phosphate of lime, the bones of fish being mostly composed of it, and the flesh containing it in a state very easily soluble. This decomposition has been attended with no great difficulty; no stench has been produced, no nuisance caused. All applications of lime to this simple compost should be carefully avoided.

"Any other than fish bones may be used with equal success. We mention them in particular from their containing so large an amount of phosphates, and being so easily attainable. We have no doubt this mode of forming a very rich fertilizer will be tried with great success by gardeners and farmers who have the enterprise to use all the means in their power to enrich the soil, and who prefer to manufacture their own guano to paying the expense of freight, and the profit which the importer and the retailer expect to realize; at the same time running the risk of frauds, which can hardly be detected without an expensive analysis.

"The use of guano is attended with much labor in the preparation, and some danger in the application; nearly as much, perhaps, as the whole trouble of forming this rich compost of phosphate of lime will cost. The substance produced as above described is very easily soluble in water, and thus acts very soon, while bone-dust, being less soluble, will be found to act more slowly, and, unless very finely ground, will scarcely be felt before the second year. All bones, however, contain a large amount of phosphate of lime, and are easily prepared for use by the farmer, or obtainable at no very great expense at the manufactories."

CONSUMPTION OF COTTON.

The following table was published by Messrs. Du Fay & Co., of Manchester, and exhibits a view of the quantities of raw cotton consumed by various countries, from 1836 to 1852 inclusive. The figures express the number of millions of pounds.

COUNTRIES.	1836	1837	1838	1839	1840	1841	1842	1843	1844	1845	1846	1847	1848	1849	1850	1851	1852
Great Britain	350	369	435	362	473	422	462	531	543	597	604	425	591	627	584	648	745
Russia, Germany, Holland, and Belgium	57	58	61	48	72	65	78	82	86	96	97	105	112	160	133	118	172
France (including adjacent countries)	118	121	133	110	157	154	163	152	146	158	159	126	127	186	142	149	199
Spain	....	....	....	....	....	....	....	....	....	....	....	....	....	....	29	34	44
Countries bordering on the Adriatic	28	32	26	26	28	29	38	44	26	38	39	31	29	47	45	45	55
United St. of North America	86	82	92	103	111	115	105	131	143	158	175	175	209	205	188	158	232
Sund's, Mediterranean, &c.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	23	29
Total	639	662	747	649	841	785	846	940	944	1047	1074	862	1068	1225	1132	1175	1481

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

CHARACTER AND POSITION OF THE FARMER.

Messrs. Editors:—At a fair held at Hyde Park, Lamoille county, in 1849, an address was delivered by a farmer, who complained that the class to which he belonged were neglected and looked down upon by professional men. I write this to assure him and the rest of his class that there is one professional man who does not look down on them. Our Declaration of Rights avers, we are all born equal; and I contend, all the difference with us (aside from degrees of intellect) is our morals. I esteem myself as good as any man, if my morals are of as high a grade. It is *not* the case in our republic that one man is born a *prince*, and the other a *peasant*. I was inured to farming to the age of twenty; have worked in the black pines two weeks at a time; was familiar with all kinds of agricultural labors. Farmers are indispensable to a community; prosperity cannot attend us without them. Professional men must look to them for their bread. I wish this to be borne in mind by gentlemen, as well as by coxcombs. The *American* farmer is the most independent man on the globe. He is the *lord* of the soil. Taxes are trifling here in comparison with countries where there is a *crowned head*, a nobility, and an established priesthood to support; and the greatest of all curses is the tithe system. The clergy assist the *despot* to keep the peasantry in ignorance and servitude. Their *teachings* are, *fear God and honor the King*—his *sacred* Majesty—his most *gracious* Majesty—the *divine* right of kings—I would as lief say *divine right of devils!* The farmer is dependent on many of his fellow-men. He cannot begin his work until he is furnished by the smith with an axe to fell his forest; and as he progresses with his labor, he must draw more largely on the smith and other mechanics, who are all useful in their sphere, and we cannot dispense with their services. The farmer must exchange his bread for the implements he needs; and thus he feeds the mechanic, which is a mutual benefit. We all may be of use in some station, and each be of benefit to another. I must consider agriculturists the most useful of men. They enjoy the best health, being nearly exempt from sickness; and would he study the laws of his being, and practise them, he would seldom lose a meal or an hour's labor from indisposition. Inhaling the pure air impregnated with the delicious effluvia of the thousand blossoms whose fragrance conduces to health and longevity, the out-door laborer is the most healthy and long-lived of any class of men. My grandfather was a farmer, and lived to his ninety-fourth year; my father is a farmer, is now living in his ninetieth year, retaining a good degree of health and intellect. The farmer is also the most moral class in community. There is no other calling whose ethics will compare with those of the tillers of the soil. It is *seldom* a farmer is convicted of gambling, libertinism, or any heinous crime. It is not common for them to practise tippling and drunkenness. There are ten men of other callings that are guilty of those and other misdemeanors, to one farmer. Well informed farmers would form for us a better code of laws than professional men; but with due deference, and *great* regret, I am compelled to say that, as a body, they are deficient in the science of agriculture, and have not that general knowledge they can and ought to possess. There are many honorable exceptions, and these are fast multiplying; but there are many *now* who "carry a stone in one end of the bag," because their fathers did, and aver they want no book-farming. They need *chemical* and *agricultural* knowledge: and if they neglect to obtain this for themselves, let us urge them to secure it for their children. Convince the farmer that it is of *greater* utility to put money into the heads of the young than into their pockets, and the work is nearly accomplished. I have a great desire that the rising generation shall cultivate their minds, become familiar with the sciences, have a general knowledge of themselves and that which surrounds them, be capable of doing their own thinking, and have the full exercise of the reasoning powers which the God of nature has bestowed on them. Then the earth will be a paradise. Astronomy, Botany, Geology, Chemistry, and all the departments of natural history are important, but a knowledge of chemistry is indispensable to the farmer. He cannot cultivate his farm to advantage without it; but it is lamentable that so few are imbued with this necessary knowledge, and the number is still smaller that would pay one dollar for an analysis of their soils, which to them, in many cases, would be an advance of fifty dollars. They should know what soil requires lime, and what plaster, &c., &c.

I occasionally read an interesting communication from Professor Mapes. God bless him, and every other *man* who, by his labors, is attempting to benefit the human family! Farmers frequently complain they are not noticed by the people as they ought to be; that professional men, more especially attorneys, hold the offices. Let us look around and see where the difficulty lies. In New-England there are some twenty farmers to one professional man. Then you have the *power* in your own hands. Why do you not use it? Have you no *confidence* in your own class? You may answer, It is in part diffidence. The ostensible cause is lack of qualification or information, which you can and ought to possess. Many of you say, I have no time read. I think it is not so. How do you spend your long winter evenings? Sitting idly by your fire, or, what is far worse, at the public-house and shops in your villages. I know there are many honorable exceptions.

Should you spend the evenings of one winter in study, you might store a vast amount of information in your mind, which would be of vast benefit during your life; and this knowledge you can impart to others for their benefit, and not impoverish the original stock. By applying yourselves in this manner, and the wet days in summer, you may qualify yourselves for agriculture, legislation, or other useful employments. A well-informed "yeomanry is our country's pride." The State of Vermont has been very democratic. Our *Governors*, a majority of them, have been tillers of the soil ever since we have been a State. Our Legislature has usually had a majority of farmers, and it would be *greater* if you were better qualified. In that case, the artifice of sycophants and designing knaves would not influence you. I wish you to cast about and see where your power lies. It does not lie in your *hair* or *muscles*, but in your intellect; you will bear in mind, "*knowledge is power*." My advice and entreaty is, that you set about so noble a work immediately. Books and periodicals are plenty and cheap, and time in abundance to read them. No man at this time has any valid excuse for ignorance. Qualify yourselves for legislators, then you are capable of judging of the acts of legislation—their merits or demerits.

Seven years ago last January, the citizens of Lamoille county organized an Agricultural Society. The first two years I served as President, and was more pleased, and experienced more gratification in serving the Society in that capacity, than any other offices I ever held, which have been but few; for I can safely say, I never was an aspirant for office. Our Society has been the means of improving all our domestic animals. *Good* breeders have been sought, and the value of the animals has nearly doubled. The value of fowls has quadrupled. Attention is aroused to the whole routine of husbandry. In the formation of our Society, I regret to state, not one half of the farmers could be induced to engage in the enterprise.

More agricultural papers are taken in the county than when the Society was organized, but not one half the farmers take them now. Every one should take some paper. Take the *Plough, Loom, and Anvil*, all who feel able; those who do not, take a cheaper paper; but take some one. I respect the farmer; I will encourage him by any means in my power; I *will* remember I obtain my bread by the sweat and labor of the industrious husbandman.

ARIEL HUNTON, A.M., M.D.

Hyde Park, Lamoille county, June 20th, 1853.

THE COTTON PLANT.

WE find a very lucid article on this subject in the last number (July) of *De Bow's Review*. The writer (E. U. S., of Charleston) had examined three varieties of soil, supposed to illustrate the average cotton soils of the Sea Island plantations. There were two specimens of each, one from the surface, and one from eleven or twelve inches below the surface. Of these soils, the writer says:

"The basis, and, indeed, almost the sole mineral constituent, is a fine siliceous sand, precisely identical with that which forms the sand beaches of our sea-coasts. They are enabled to support vegetation by the presence of a trifling proportion of aluminous earth, of oxide of iron and vegetable matter, to which are added small quantities of the carbonates of lime and magnesia, and traces of phosphates and sulphates of the same basis, and of alkaline carbonat s; all of which, taken together, fall considerably below 10 per cent. The alumina, the oxide of iron, and the organic matter, perform an important service in the soil, by rendering it binding, and retentive of the moisture and gaseous matter which are essential to the nutrition of plants; while the salts enumerated, either wholly or in part, enter also into the general circulation of the vegetable growth, and are more or less there detained, as indispensable constituents of the same. But it is also clear that a soil thus constituted would be unfit for supporting vegetation, except for the fact that it is situated directly contiguous to the sea, and in a temperature nearly tropical, thus giving rise to an atmosphere perpetually loaded with moisture.

"Compared with inland and river-alluvion soils, the character of the Sea Island soil is very remarkable. The former rarely have more than .65 per cent. of silica, while their alumina and oxide of iron together often mount up to 10 or 12 per cent., and the proportion of organic matter and hygrometic moisture to 12 or 15 per cent.

"This contrast will indicate the direction in which the efforts of the planter should be made for the improvement of the Sea Island soils. Every addition he can afford to make of alumina, oxide of iron, and organic matter will raise the character of his soils."

The soluble matter in these soils consists of the chlorides of potassium, sodium, and calcium, and of the sulphates and carbonates of potash, and the sulphate of lime; all of which, however, will not equal one part in a thousand of the soil.

The following table gives the entire analysis, each column expressing the contents of one of the three varieties:

	A.	B.	C.
Silica, in the form of sand,	92.85	91.73	87.53
Water,	2.50	2.50	3.50
Organic matter, mostly vegetable	2.75	2.75	7.50
Alumina and peroxide of iron, with traces of phosphoric acid,	1.40	2.30	0.12
Carbonate of lime and magnesia,	0.50	0.72	0.75
Peroxide of iron, probably the carbonate of iron,			0.60

The third variety, containing an excess of organic matter, possesses a much greater power for retaining moisture. Of this variety the author says:

"I should suppose that this soil is not at present adapted to the cotton plant. The organic matter is in excess, and in quality it is too nearly allied to that found in peaty land. Thorough drainage, successful cropping with corn, with the addition of the marsh mud and artificial manures, might prepare it for cotton. This opinion, however, is advanced with reserve, being wholly suggested by chemical theory, and may, therefore, require considerable modification in practice.

"I notice that the carbonate of magnesia is more abundant in this soil than in A. and B. This suggests the idea that magnesia may be an important ingredient in the cotton plant, even when compared with its sister element, lime; for soils which have been under long cultivation in cotton, although they still contain magnesia, nevertheless contain less of it than this newer and more unexhausted soil presents. It occurs to me, also, that one peculiarity of the Sea Island cotton may be owing to the larger proportion of magnesia in sea shore soils, this element being ever plentifully derived from the waters of the ocean, in which, in one form or another, it is ever found dissolved."

A careful analysis of the cotton plant and the cotton seed, which were proved to consist of the same elements and nearly the same proportions, and also of marsh-mud, leads the writer to recommend the use of marsh-mud, for the reasons following:

"In the first place, the carbonate of iron, when blended with the soil, (in considerable quantity,) slowly turns into peroxide of iron, with the extrication of nearly one third its weight of carbonic acid, (which, it will be kept in mind, is the chief aliment of vegetation,) the peroxide of iron acting together with the alumina as a cement or binder to the loose grains of sand, and as an attracter of moisture and a retainer of nutritious gases. In the next place, the soluble substances present in the marsh manures are all of essential consequence to vegetable life; not to omit the organic matter, which is very considerable, and, in the case of the marsh-turf, very abundant, thus giving, as might be supposed, a preference to this over the marsh-mud, unless the difficulty of reducing it to a powder, and of incorporating it with the soil, presents an obstacle which overbalances the advantage arising from this superabundance of organic matter. Finally, it may be added that the silica or sand in the marsh manures is in a more comminuted condition than that in the soil, and therefore serves an important purpose in rendering the land to which it is added closer and more retentive of moisture.

"The question may now arise, Can the planter with advantage substitute any artificial manure or mixture for that of the marsh soils? The quantity of saline matter in it is certainly small—only about six pounds of common salt to the ton, about one pound chloride magnesium, and one of the sulphates of lime and magnesia; of insoluble constituents, twenty-three of carbonates of lime and magnesia to the same weight, and not far from 250 lbs. of good white clay. Of these ingredients, all but the clay could be cheaply obtained; nor would this be very expensive, as it exists in great quantity near Augusta, contiguous to the Savannah river; but I apprehend the great difficulty would still remain, and which would be nearly fatal to the use of the mixture. This would consist in its uniform application to the soil. In some cases it would be in excess, and in others in a corresponding deficiency; whereas, applied as at present, in a copious vehicle of fine sand, its good effects are every where visible. It may be concluded, therefore, that the Sea Island planter is in no danger of using the marsh manures to excess, nor have we any intelligent grounds for thinking that any substitute will ever be discovered which shall render their employment superfluous."

All the elements that are found in plants being essential to their growth, however small in proportion to other elements they may be, the writer concludes that the following kinds of artificial manures may be recommended to the cotton planter, viz.:

"First of all, the superphosphate of lime mixture of Prof. Mapes. It is composed of 100 lbs. bone-dust, 56 lbs. sulphuric acid, 36 lbs. Peruvian bark, 20 lbs. sulphate ammonia.

"Secondly, wood ashes; and the more these are mixed with charcoal, (if in a somewhat pulverized condition, in which state it is a valuable condenser of moisture and nutritive gases,) the better.

"Thirdly, compost, formed, as far as possible, of the following materials: stable manure, forest leaves, straw, (small quantities, perhaps, of rice chaff,) saw-dust, sweepings of houses and cabins, rubbish of old clay and plaster walls, lime, refuse of gas-works from Charleston, soot, drainings from stables and gutters, soap-suds, and refuse saline liquids of all kinds.

"It does not appear to me that the cotton lands require either quick-lime, common salt, or gypsum. They certainly will not need the last-mentioned fertilizer, if the improved mixture of Prof. Mapes is employed.

"The more perfectly the compost is worked up together, and reduced by decomposition to the character of a powder, the better will be the effects it is capable of producing. If it could be treasured up for years, partly under the protection of a roof, and guarded from the action of the sun, its value would still be more highly enhanced."

FARM-WORK FOR AUGUST.

The farmer of a few acres may have a little space between his harvest of grass and that of grain, although with many the seasons interfere with each other, and one or the other is allowed to suffer. On our sea-coasts, access is had to the salt meadows, and the labor of cutting and curing this grass immediately follows that of the upland. Salt grass is much cheaper by the ton than fresh, although there is usually much more labor in getting it.

Thistles should be attended to without delay. Look again at an article on this subject in our last number.

Weeds may be pulled in large quantities for your hog-pen and compost-heap. Other offal should be collected for the same purpose. If this is *omitted*, do not complain, by and by, of lack of manure.

Cucumbers, and other plants for pickling, may still be sown, but they should be planted in a mellow soil, deeply dug, and kept carefully from drought.

Keep beds free from weeds, and in good condition for the growth of roots. Such plants cannot grow if compressed by a hard soil which will not be moved.

This is also a season for draining wet lands, and the muck which is thus dug out is wanted in your barn-yard.

Budding may also be done now and onwards, at the farmer's leisure.

Plant ruta bagas, or other turnips, in ground from which your peas or other early crops have been taken.

See that no weeds go to seed on your manure-heaps or in your barn-yard, else you will cultivate some crops that will not be profitable.

HISTORY AND CULTIVATION OF THE LUPINE.

We have given our readers an excellent account of the Mignonette, from the pen of Mr. Dennis Murray, a practical gardener of Boston, which appeared in the *Journal of Agriculture*. We find another, on the Lupine, from this writer, in the same journal. It is so rich in historic interest that we give it entire:

"The lupine, which we cherish as an ornament in our gardens, formed an important article in the husbandry of the Romans, who cultivated it not only as a subsistence for their cattle, but as food for themselves also. Pliny says he could not recommend any diet more wholesome and lighter of digestion than the white lupine when eaten dry. Their bitterness was taken off by soaking them in hot water, or covering them with hot ashes. The same author says that this food gave those who ate it generally with their meals, a fresh color and a cheerful countenance. The eating of lupines was also thought to brighten the mind and quicken the imagination. It is related of Protogenes, a celebrated painter of Rhodes, who flourished about three hundred and twenty-eight years before Christ, that during the seven years he was employed in painting the hunting-piece of Talysius, who was supposed to be the founder of the state of Rhodes, he lived entirely upon lupines and water, with an idea that this aliment would give him greater flights of fancy. It was in this picture that he wished to introduce a dog panting, with foam at his mouth; but not succeeding to his satisfaction, he threw his sponge upon the painting in a fit of anger, when chance brought to perfection what the utmost of his art had failed to accomplish; for the sponge, falling upon the wet paint which he had intended to represent the foam, gave it so much the appearance of reality that the piece was universally admired. Another anecdote of this lupine-eating painter may be related, to show in what reverence the artists were held in those days: When Demetrius besieged Rhodes, he refused to set fire to a part of the city which might have made him master of the whole, because he knew that Protogenes was then working in that quarter. When the town was taken, the painter was found closely employed in a garden, finishing a picture; and upon being asked by the conqueror why he showed no more concern at the general calamity, he replied that Demetrius made war against the Rhodians, and not against the fine arts.

"The lupine is a plant that loves a poor, light, sandy soil, and it was much employed by the Romans as a manure for such situations, being ploughed or dug into the ground just as it began to blossom.

"Mr. Swinburn observes that lupines are still sown in the neighborhood of Naples, to manure the land, which are hoed up before they begin to fructify. This is also practised in the South of France, in poor, dry soils, as a meliorating crop to be ploughed in where no manure is to be had, and the ground is too poor for clover and other better crops.

The ancients named this plant lupinus, from *lupus*, a wolf, on account of its voracious nature, because these plants were thought to devour the fertility of the soil; and the name of lupinus is of great antiquity, and the seeds are said to have been used by the ancients in their plays and comedies, instead of pieces of money; hence the proverb, *Nummus lupinus*, a piece of money of no value; as that also of Horace: *Nec tamen ignorat, quid distent æra Lupinis.*

"To procure a succession of these flowers, they should be sown at two different seasons, that is, in May and June. The best mode of sowing them is by forming small clumps of them; but they should not be sown too thick, and they seldom succeed when transplanted. The following would make a good show in a flower-garden, viz.: *Albus*, white; *Varius*, blue and white; *Pilosus*, flesh; *Nanus*, blue and variegated; *Texensis*, deep blue; *Luteus*, yellow—all annuals. There are some very fine perennials of this family, which are *Lupinis polyphillus*, and variety alba; *Lupinus nootkatensis*, *Lupinus mutabilis*, *lucophyllus*, &c., that should be in every garden.

GOOSEBERRY CULTURE.

This fruit seems not to be appreciated. We regard it as one of the finest of our climate. It is sometimes found to fail from mildew or other causes, but by consulting nature, good success in their cultivation is almost certain.

The gooseberry requires a cool situation, considerable shade, and a moist soil. Salt has a good effect upon its growth. There is a great choice in the varieties, but the poorest is better than none, and amply repays its cost of cultivation.

BUDDING ROSES.

Look attentively at any rose branch, and you will find at the bottom of *every leaf* a small, scarcely perceptible swelling or protuberance, looking altogether as innocent of growth as a cup of cream. Remember, at the bottom of every leaf. Find another bough which has had its extremity injured or amputated. Do you not see with what eagerness this little "bud" has shot forward to conceal and repair the damage? This modest little "bud" is the epitome of a rose tree, and though nursed in the bosom of the lordliest rose that ever bore a title, if you will detach it gently and apply it to the freshly peeled surface of the thorniest, scraggiest old dog of a rose, it will soon repay you for your trouble by turning "bright leaves to the air, and a dedication of its beauty to the sun."

I think those buds grow best which have already taken a start on the parent stem. I have certainly put in La Marques of half an inch in length, which are now masses of buds and foliage.

Take a limb of the current year's growth, which has become firm; slice off the bud with a little of the wood; detach the bark with the bud on it by a little handling; cut off the leaf, but leave the stem to hold it by; place it between your lips while you prepare a place for it.

Select a similar limb on any other bush; if thorny, knock them off; draw a sharp penknife downwards *through the bark*, an inch or less; cross it with another cut, shorter, but always through the bark. Carefully raise the little corners thus made from the wood; hold firmly on each side, and you can raise with the knife without breaking or tearing. Now put your little bud under these corners, and press all together; confine firmly with soft cotton thread, which may remain until it produces an evident indentation. Cut off the branch a few inches above, and keep down the original buds as they show themselves.

This is the whole matter. The finest roses will grow without any subsequent care. Indeed, I have inserted many, and forgotten them until they forced themselves on my attention by their elegance and vigor.

Any bush will do to bud on. Some are merely preferable, as the "Pride of France," "Daily," and "Multiflora." I am very partial to the last, as it is common, affords a stock from cuttings in a few months, is vigorous, smooth, and easily backed. Well manured, one stock will support a great many varieties of the finest roses.

The rose bush requires an annual spading, and of course a *rich* soil. For heavy micaceous loams, nothing is better as a manure than rotten chips, spaded in and spread an inch or more in depth on the surface.

VERBENAS.

The different varieties of the verbena afford many shades of color, from the most brilliant to the most delicate, and no family of plants better pays the labor bestowed upon them. Some of them, too, possess a fine odor.

The proper mode of cultivation is as follows: Prepare a bed of convenient size by digging it thoroughly to a good depth. Lift the plants from their pots, and set them into this bed, a distance of one and a half or two feet from the edge of the bed, and about two feet from each other. They multiply by sending down roots from their joints. The species that are not creeping should have their twigs fastened to the earth by hooked or forked pegs. In the fall they must be placed in pots and protected from the frost.

TABLE OF MANURES, WITH THE QUANTITIES TO BE USED, AND MODE OF APPLICATION.

We take the following table from one of our English papers, and give it to our readers as we find it. It cannot be taken as an exact statement of the wants of land for the purposes named, but may be useful as a general guide. The quantities required will vary with the nature and condition of the land on which the manure is to be used.

Name of Manure.	Nature and Composition.	For Farm Crops.	For Garden Crops.	Weight per Bushel.
GUANO,	The dung of sea birds, imported from Peru, &c., and containing various salts of ammonia and phosphates.	3 to 4 cwt. mixed with its own weight of ashes or mould, and drilled, or sown broadcast, for grass, turnips, mangold-wurzel, or other green crops.	3 lb. per square rod, equal to 30¼ square yards. This, and all soluble salts, are best applied in solution, containing not more than 5 ozs. in 2 galls. of water.	80 lbs.
NITRATE OF SODA,	Nitric acid and soda, a natural product imported from Peru, &c.	1½ cwt. per acre, sown broadcast with half its own weight of ashes or mould, for wheat, oats, grasses, &c.	1 lb. per square rod, in solution, like guano.	80 lbs.
NITRATE OF POTASH, SALTPETRE,	Nitric acid and potash, a natural product, imported from the East Indies.	1 cwt. per acre, sown broadcast, in the same manner as nitrate of soda, for wheat only.	1 lb. per square rod, in solution, like guano.	80 lbs.
PETRE SALT,	Common salt and nitrate of potass, the residuum of a manufacture.	5 cwt. per acre, sown broadcast, as a purifier of grass land.	4 lbs. per square rod. in solution, like guano.	75 lbs.
GYPSUM, SULPHATE OF LIME,	Sulphuric acid and lime, an abundant mineral in several parts of England.	2½ to 3 cwt. per acre, sown broadcast on clover, trefoil, sainfoin, and other grasses.	3 lbs. per square rod.	80 to 84 lbs.
SULPHATE OF AMMONIA,	Sulphuric acid and ammonia, the residuum of a manufacture.	2 cwt. per acre, mixed with a little mould, and sown broadcast, for clover, oats, &c., and drilled for turnips.	1 lb. per square rod.	70 lbs.
BONE DUST AND ½ INCH BONES,	Phosphates of lime and magnesia, carbonate of lime and animal matter yielding ammonia.	1½ quarter to 20 bushels drilled, or sown broadcast, mixed with ashes, for turnips, vegetables, wheat, &c.	19 to 20 lbs. per square rod.	42 to 45 lbs.
CALCINED BONES,	The same constituents as the above, with the exception of the animal matter.	For mixing with farm-yard dung, and other manures containing ammonia.		
PHOSPHATE OF LIME,	Phosphoric acid and lime.	This manure is easily blended with farm-yard litter, &c.	3 lbs. per square rod.	
SUPERPHOSPHATE OF LIME,	Phosphoric acid and lime in a more soluble state than in bones, prepared by dissolving bones in sulphuric acid.	For mixing in composts, fixing the ammonia of dung-heaps and urine-tanks, and forming phosphate of ammonia.	For garden culture, ½ lb. to the square rod.	
PHOSPHATE OF AMMONIA,	Phosphoric acid and ammonia.	For mixing in compost, and furnishes from its constituents much nutriment to vegetation.	1 lb. to the square rod.	
MURIATE OF AMMONIA,	Muriatic acid and ammonia.	Applicable in the same manner as sulphate of ammonia.	1 lb. to the square rod.	65 to 70 lbs.
MURIATE OF LIME,	Muriatic acid and lime.	For mixing with compost-heaps.	2 lbs. per square rod.	65 to 70 lbs.
SULPHATE OF MAGNESIA,	Sulphuric acid and magnesia.	Mixed with night-soil for potatoes, 1 cwt. per acre, or to 8 loads of stable-dung.	¾ lb. per square rod.	
SODA ASH,	Lime, magnesia, alumina, charcoal, silica, and a few other ingredients in smaller proportions.	For destroying wire-worms and other predacious insects, 1 cwt. per acre. This quantity must not be exceeded.	....	60 lbs.

WONDERFUL TREES.

AMONG the remarkable trees in the world, the following, of which we have compiled brief descriptions, are some of the most curious. We take it from the *Journal of Education:*

The Great Chestnut Tree.—On the one side of Mount Etna there is a famous chestnut tree, which is said to be one hundred and ninety-six feet above the surface of the ground. Its enormous trunk is separated into five divisions, which give it the appearance of several trees growing together. In a circular space formed by these large branches, a hut has been erected for the accommodation of those who collect the chestnuts.

The Dwarf Tree.—Captains King and Fitzroy state that they saw a tree on the mountains near Cape Horn, which was only one or two inches high, yet had branches spreading out five feet along the ground.

The Sack Tree.—There is said to be a tree in Bombay called the sack tree, because from it may be stripped very natural sacks, which resemble "felt" in appearance.

The Ivory-nut Tree.—The ivory-nut tree is properly called the Tagua plant, and is common in South America. The tree is one of the numerous family of palms, but belongs to the order designated as screw pine tribe. The natives use the leaves to cover their cottages, and from the nuts make buttons and various other articles. In an early state the nuts contain a sweet milky liquid, which afterwards assumes a solidity nearly equal to ivory, and will admit of a high polish. It is known as ivory-nut, or vegetable ivory, and has recently been brought into use for various purpcses.

The Brazil-nut Tree.—The Brazil-nut tree may justly command the attention of the enthusiastic naturalist. This tree thrives well in the province of Brazil, and immense quantities of its delicious fruit are annually exported to foreign countries. It grows to the height of from fifty to eighty feet, and in appearance is one of the most majestic ornaments of the forest. The fruit, n its natural position, resembles a cocoa-nut, being extremely hard, and of about the size of a child's head. Each one of these shells contains from twelve to twenty of the three-cornered nuts, nicely packed together. And to obtain the nuts, as they appear in market, these shells have to be broken open. During the season of their falling, it is dangerous to enter the groves where they abound, as the force of their descent is sufficient to knock down the strongest man. The natives, however, provide themselves with wooden bucklers, which they hold over their heads while collecting the fruit from the ground. In this manner they are perfectly secure from injury.

The Cannon-Ball Tree.—Among the plants of Guinea, one of the most curious is the cannon-ball tree. It grows to the height of sixty feet, and its flowers are remarkable for beauty and fragrance, and contradictory qualities. Its blossoms are of a delicious crimson, appearing in large bunches, and exhaling a rich perfume. The fruit resembles enormous cannon balls, hence the name. However, some say it has been so called because of the noise which the ball makes in bursting. From the shell, domestic utensils are made, and the contents contain several kinds of acids, besides sugar and gum, and furnish the material for making an excellent drink in sickness. But, singular as it may appear, this pulp, when in a perfectly ripe state, is very filthy, and the odor from it is exceedingly unpleasant.

The Sorrowful Tree.—At Goa, near Bombay, there is a singular vegetable—the sorrowful tree, so called because it only flourishes in the night. At sunset no flowers are to be seen; and yet, half an hour after, it is quite full of them. They yield a sweet smell, but the sun no sooner begins to shine upon them, than some of them fall off, and others close up; and thus it continues flowering in the night all the year.

The Cow Tree.—This tree is a native of Venezuela, South America. It grows in rocky situations, high up the mountains. Baron Von Humboldt gives the following description of it:—On the barren flank of a rock grows a tree with dry and leathery leaves; its large woody roots can scarcely penetrate into the stony soil. For several months in the year, not a single shower moistens its foliage. Its branches appear dead and dried; yet, as soon as the trunk is pierced, there flows from it a sweet and nourishing milk. It is at sunrise that this vegetable fountain is most abundant. The natives are then to be seen hastening from all quarters, furnished with large bowls to receive the milk, which grows yellow and thickens at the surface. Some drain their bowls under the tree, while others carry home the juice to their children; and you might, as the father returned with this milk, fancy you saw the family of a shepherd gathering around and receiving from him the production of his kine. The milk, obtained by incisions made in the trunk, is tolerably thick, free from all acidity, and of an agreeable and balmy smell. It was offered to us in the shell of the calabash tree. We drank a considerable quantity of it in the evening before going to bed, and very early in the morning, without experiencing the slightest injurious effect.

The Bread-Fruit Tree.—This tree is found on the islands in the Pacific Ocean. The trunk rises to the height of thirty to forty feet, and attains the size of a man's body. The fruit grows to about the size of a child's head. When used for food, it is gathered before it is fully ripe, and baked among ashes, when it becomes a wholesome bread, and in taste somewhat resembles fresh wheaten bread. This is a very useful tree to the natives; for, besides its fruit, its trunk furnishes timber for their houses and canoes; the gum which exudes from it serves as pitch for their vessels, and from the fibres of the inner bark, a cloth is made to cover their persons.

The Upas Tree.—For some ages it was believed that a tree existed in the East Indies which shed a poisoning, blighting and deadly influence upon all animals that reposed under its branches; and that so fatal were its effects, that birds attempting to fly near it, fell to the ground and perished. For several years past, there being no reliable authority that such a tree really existed, it has generally been supposed among the intelligent to be fabulous, and hence termed the "fabled Upas tree." But, a few years since, a tree was discovered in a peculiar locality in the East Indies, which it is believed gave rise to the wonderful accounts of the Upas tree. In the location where this modern Upas tree was discovered, there is a constant and dense collection of carbonic acid gas; consequently, all animals that come near it, die by breathing the poisonous gas. The cause of such an abundance of gas being collected in the locality of these trees is unknown. A few months since, a tree was discovered on the Isthmus of Darien, which appears to have a similar influence on animal life. The Panama *Star* says:—"A man named James Linn, being tired, laid down under a tree to sleep, and on waking, found his limbs and body swollen, and death soon followed." Cattle avoid eating and ruminating under this tree.

The Tallow Tree.—This tree is found in China. It is called the tallow tree, because a substance is obtained from it resembling tallow, and which is used for the same purposes. It grows from twenty to forty feet in height.

Lace Bark Tree.—In the West Indies is found a tree, the inner bark of which resembles lace, or net-work. This bark is very beautiful, consisting of layers which may be pulled out into a fine white web, three or four feet wide. It is sometimes used for ladies' dresses.

BASKET WILLOW.

Much has been written in our agricultural journals on the cultivation of the willow for the market, and much light has been thrown upon the subject where before but little was understood. It is no doubt a profitable crop in almost any section of the country. In some districts, convenient to a good market, perhaps no crop pays better for the labor bestowed upon it than this. It requires no attention after the first year, and will last twenty years without renewal.

Several species are cultivated for baskets, hoops, &c., and practical men are not agreed always in respect to the qualities of the different kinds. We are inclined to believe that soil and climate may have an influence in modifying the qualities of the tree.

The species most generally approved as the best, is the *Salix viminalis*. There are two varieties of this, the *narrow-leafed* and the *broad-leafed*, (*sangustifolia* and *latifolia*,) which in Europe are extensively used for these purposes.

But a Southern writer, of considerable experience, says, that these varieties are "coarse," and mostly used for hoops. He has grown the *Salix vitellina*, and commends it as the best basket-willow. The twigs are not so long and slender as those of the species before named, but this is the only point in which they are inferior. The *viminalis* is of quick growth, and the shoots are long and very strong. An acre of the growth will produce annually 1½ tons of material for the market.

The *S. Fabenira* is cultivated in England for fine baskets, and also the *S. Rubra*. Mr. Chisholm, of Beaufort, S. C., (before referred to,) recommends the *Golden Willow*, (*S. vitellina*,) after several years' experience, as well suited to the South, and giving more tough twigs than either of the other varieties.

Michigan, it is said, abounds with the osier willow, which is already extensively used for these manufactures. In the winter the branches are cut off, and new shoots appear in the spring, which are gathered at the proper season.

When the willow is planted for cultivation, the twigs should be set out late in the fall, or in the early spring. Ten thousand to fourteen thousand are required per acre. They should be set about three feet apart, and be eighteen inches long. The land should previously be well ploughed. The cuttings should be growths of three or four years old.

The soil may be mire or clay, but should be wet by a running stream. The plants do not succeed so well in stagnant water.

If the twigs are intended for home use, they may be dried a few days, and stowed away in bundles. If intended for market, they should be scalded with boiling water or steam, after which the bark may be stripped off, and the twigs dried and preserved as before. Before working them into baskets, they should be soaked about two hours.

An ingenious implement is used in the West for stripping the bark from the twig. It consists of a round stick of hard wood, about an inch in diameter, quartered about half its length, and having the two *diagonal* quarters removed. This leaves a sharp edge on two opposite sides. The stick is held in the right hand, and the twig inserted with the left, when the two quarters are pressed together by the thumb and finger, and the twig is drawn through. Some modification of this tool is in general use.

EXTENT OF COTTON LANDS.

A LETTER from Mr. E. Emmons, civil engineer or surveyor, we believe, to His Excellency, Governor Reid, appears in one of our Southern exchanges, in which he uses the following encouraging language:

"I am often surprised at the amount of excellent land which I meet with every day. The cotton lands are not confined to Edgecombe, Wayne, or exclusively to the eastern part of the State; the valleys of the Yadkin and Catawba are equally good for cotton, equally fertile and productive in all the great staples of this latitude. From the Jersey Settlement to Salisbury, from Salisbury to Charlotte, and then south to the State line, excellent and productive lands are never out of sight for any length of time. With attention and cultivation but little beyond the ordinary routine, large tracts may be made to produce continuously 2,000 lbs. of seed cotton to the acre. This is the product of the plantation of Mr. D. B. Peebles, of Providence District, in Mecklenburg county. The expense of cultivation to produce this result is by no means great; in this yield of seed cotton there is 600 lbs. of lint. This result appears still more remarkable when it is known that there are no natural fertilizers; no marks of lime; and also that these lands belong to the oldest cultivated lands of the State. Indeed, one is almost inclined to fall into the common opinion that they will never wear out. This idea, however, is delusive. When we find such results may be obtained with ordinary skill in cultivation, or with ordinary tillage, we are led to surmise what might not be effected by additional attention and skill, combined with a free use of such fertilizers as the successive crops require. These lands are distinguished from others by their dark brown color—they are called mulatto lands. I have spoken of their adaptation to cotton. Now, it would not be right to regard them as adapted only to this crop, for if there are soils which are universal in their adaptation, these dark red soils of Cabarrus, Mecklenburg, and Rowan are of this description. It is true that there are degrees of excellency with those which bear the color I have spoken of. The Providence soils are looser than those of some other tracts, for the latter are stiffer and more liable to bake under the sun than the former. It is not, however, to be concealed that these red soils are impatient under droughts. The crops are liable to fail when the rains fail: in this respect they rank below the sandy soils of the Union. The latter are based upon and derived from the slates, while the former are based upon and derived from certain varieties of granite. This granite contains a large amount of iron in the shape of a protoxide, which on exposure to the air becomes a peroxide, which has the red color of the soil. The iron, however, may be in combination with sulphur, which in decomposing passes into a state of peroxidation. This latter condition of the iron appears from the color of the soil where the roots of the oak are found, and especially when they are wounded. In this case, the gallic acid exuding from the wounded roots finds in the soil sulphate of iron. Ink will, therefore, be formed by this combination, and the purple or black streaks which often appear in the railroad cuts are due to the formation of ink. Ink soils require for correction lime, inasmuch as any considerable quantity of this astringent salt of iron is poisonous to vegetation; yet this salt (sulphate of iron) is useful in small quantities in the soil. It seems to act upon vegetables as it acts upon animals, viz.: as a tonic. These astringent soils are very common throughout the State. They are in this condition from the great abundance of the proto-sulphuret of iron which is disseminated through the rocks from which the soils are derived.

Wake county is remarkable for astringent soils. In the dry parts of the season the efflorescence of this salt is a common occurrence; and any one may satisfy himself of the fact by tasting the soil. I have already said that the corrective for such soils is lime. This substance, however, is not only a corrective, but it becomes, under these circumstances, an active fertilizer. Gypsum is the product formed by this application. In this connection I may be allowed to say that the most important results of the internal improvement system will reach the planter. It must give him the fertilizers—it will also open the door to the market which has, up to the present hour, been closed upon him. The time is not far distant when North Carolina will become one of the great producing States, and the taunt which has often been thrown into her teeth, 'Alas for poor North Carolina! she has nothing to sell,' will pass away. It is a remarkable fact that the mining lands of this State are usually as productive and valuable for plantations as the lands of oth States. She has, therefore, a double source of wealth, extending over large tracts of country. In other countries mining lands are mostly poor and unproductive under the best systems of tillage. I have collected many samples of the soils peculiar to this part of the State, and I believe that the agriculture is equally interesting with that of the eastern part of the commonwealth.

TREATMENT OF SANDY SOILS.

The term "sandy soils" may mean very different things. It includes a great variety of states and conditions. It may describe a dry sand or a clayey sand. Some "sands" are little else than silex, and the clays which others contain may also be of various character. Hence the term conveys no very precise idea. They all agree, however, in one thing: they contain an excess of siliceous matter. If the silex is nearly pure, like that on a large extent of our northern sea-shore, it may be thrown into water without producing much effect upon it, for it speedily settles at the bottom, leaving the water as clear as before. If the water is left muddy, it may be poured off into another vessel, leaving the silex at the bottom, and allowed to settle gradually. The nature of the deposit can then be examined, and may be found to be clay, lime, vegetable mould, etc. The character of this sediment and the proportion it bears to the silex or pure sand may also be estimated with some accuracy. Portions of the soluble matter, however, may be dissolved in the water, and only general results, therefore, can be reached by any such process. The evaporation of the water is one step onward towards accuracy, and may sometimes be desirable. The addition of an acid to the solution may also determine with certainty as to the presence of lime and other alkaline bases, by the presence or absence of effervescence when the acid is poured into it.

Some sandy soils produce good wheat. For this, there should be from fifty to eighty per cent. of clay, ten or twenty per cent. of lime, and a similar proportion of *humus*, or vegetable mould.

Some sandy soils contain over ninety per cent. of silex. These, of course, must be extremely barren. But although sixty or seventy per cent. may be silex, if clay is present in considerable quantities, with some lime and vegetable matter, decent crops may be obtained.

This view points out the mode of determining what is required by a "sandy soil." It will, however, be perfectly safe to apply bone manures, and other forms of lime mixtures, in connection with barn-yard manure. Bones supply not only lime, but phosphorus, which is often wanting in soils from which wheat and other grains have been gathered.

The best manure for sandy soils is found in the compost-heap. Peat, turf, weeds, etc., mingled with ashes or bones treated previously with acid, and with barn-yard manure, will be found very effective. If clay can be had conveniently, this too should be added. Ten loads of stable-manure, five to ten loads of clay, thirty bushels of ashes, and ten bushels of lime may be mixed together. It should be allowed to remain a few weeks before it is applied to the land. These proportions may be varied according to the condition of the soil. It is also of great service to sandy land to haul clay upon it in the fall. After it is spread over the surface, the frosts of winter will prepare it for the plough in the spring. This stratum and proper cultivation will secure a thorough mingling among these elements, after which the addition of the manures described (omitting the clay, perhaps) will insure an ample return for the labor and cost bestowed upon it.

But, better than this, most sandy soils have a clay subsoil. This may be ploughed up, and by proper cultivation mixed with the sand without the cost of transportation.

MULES.

The following statement of the history of mules in this country is from an exchange—we know not what; but we commend the subject to our Northern farmers. Our opinion of mules has been changed of late, and we believe that the substitution of mules for oxen or horses, in the ordinary work of a farm, would result in a great saving of expense. They endure great labor, and are kept at much less cost than horses.

"Few of the farmers of this country are aware what a debt of gratitude they owe George Washington for the introduction of mules into general use for farm purposes.

"Previous to 1783 there were but very few, and those of such an inferior order as to prejudice farmers against them, as unfit to compete with horses in work upon the road or farm. Consequently there were no good jacks, and no disposition to increase the stock; but Washington became convinced that the introduction of mules generally among Southern planters would prove to them a great blessing, as they are less liable to disease, and longer-lived, and work upon shorter feed, and are much less liable to be injured by careless servants than horses.

"As soon as it became known abroad that the illustrious Washington desired to stock his Mount Vernon estate with mules, the King of Spain sent him a jack and two jennies from the royal stables, and Lafayette sent another jack and jennies from the island of Malta.

"The first was of a gray color, sixteen hands high, heavily made, and of a sluggish nature. He was named the Royal Gift. The other was called the Knight of Malta; he was about as high, but lighter made, black color, and lithe and fiery, even to ferocity.

"The two different sets of animals gave him the most favorable opportunity of making improvements by cross-breeding, the result of which was a favorite jack which he called Compound, because he partook of the best points in both of the original jacks. The General bred his blooded mares to these jacks, even taking those from his family coach for that purpose, and produced such superb mules that the country was all agog to breed some of the same sort, and they soon became quite common. This was the origin of mules in the United States, now about sixty-five years since the first start, and no doubt there are now some of the third and fourth generations of Knight of Malta and Royal Gift to be found in Virginia, and the great benefits arising from their introduction to the country are to be seen upon almost every cultivated acre in the Southern States. Notwithstanding the enormous increase of late years, arising from a systematic course of breeding in the Northern States for the Southern market, mules were never more valuable than at present, or more ready of sale at high prices."

WASHING BY STEAM.

Many of the mechanical inventions and improvements of the present day are of practical utility in the every-day business of life; so that the labor of individuals or of families is materially diminished. One of this character is that denoted by our title.

The following account is a description of the wash-room of the St. Nicholas Hotel of this city, from a personal examination by the editor of the *Tribune:*

"A strong wooden cylinder, four feet diameter, and four and a half feet long, is mounted on a frame, so as to be driven by a band on one end of the shaft. This shaft is hollow, with pipes so connected with it that hot or cold water, or steam, can be introduced at the option of the person in charge. The cylinder being half full of water, a door at one end is opened, and 300 to 500 pieces of clothing are thrown in, with a suitable quantity of soap, and an alkaline fluid which assists in dissolving the dirt and bleaching the fabric, so that clothes after being washed in this manner increase in whiteness without having the texture injured.

"When the cylinder is charged, it is put in motion by a small steam engine, and made to revolve slowly, first one way a few revolutions and then the other, by which the clothes are thrown from side to side, in and out and through the water. During this operation the steam is let through a double-mouthed pipe, which has one mouth in and one mouth out of water; the steam entering the water through the immersed end and escaping through the other, by which means it is made to pass through the clothes, completely cleansing them in fifteen or twenty minutes. The steam is now cut off, and the hot water drawn through the waste pipe, and then cold water introduced, which rinses the articles in a few more turns of the cylinder. They are now suffered to drain until the operator is ready to take them out, when they are put into the drying machine, which runs like a millstone; and its operation may be understood by supposing that millstone to be a shallow tub, with wire net-work sides, against which the clothes being placed, it is put in rapid motion: the air passing in a strong current into the top and bottom of the tub and out of the sides, carries all the moisture with it into the outside case, from whence it runs away. The length of time requisite to dry the clothes depends upon the rapidity of the revolving tub. If it should run 3000 revolutions a minute, five to seven minutes would be quite sufficient. When there is not sufficient steam to run the dryer with that speed, it requires double that. In washing and drying there is nothing to injure the fabric. Ladies' caps and laces are put up in netting bags, and are not rubbed by hand or machine to chafe or tear them in the least, but are cleansed most perfectly.

"It can readily be imagined what a long line of wash-tubs would be required to wash 5,000 pieces a day, and what a big clothes-yard to dry them in; while here the work is done by four persons, who only occupy part of a basement-room, the other part being occupied by the mangle, and ironing and folding-tables. Adjoining are the airing-frames, which are hung with clothes, and then shoved into a room steam-pipe heated, when they are completely dried in a few minutes.

"*Small Family Machines.*—Almost the first thought, after witnessing the operation of this machine, was, can washing be done upon the same principle in small families? To our inquiries upon this point, we have received the following satisfactory information:

"For common family use, hand-machines are made to cost from $40 to $50, with which a woman can wash 50 pieces at a time, and complete 500 in a day without laboring severely. For the purpose of washing, without driving the machinery by steam, a very small boiler will be sufficient. It is not necessary to have a head of water, as that can be found in the cylinder, which can be turned by horse or any other convenient power. The plan of cleansing clothes by steam is not a new one, but it is contended by the inventor that his process is an improvement upon all heretofore applied to that purpose."

The washing of this hotel varies in amount from 3,000 to 5,000 pieces a day. It is all done by one man and three women, with less work for each than two dozen pieces in the ordinary mode of hand-rubbing, or by washing-boards.

RAILROAD OPERATIONS.

Cleveland and St. Louis Railroad.—An air-line railroad, under the name of the "Cleveland and St. Louis Railroad," according to *The Toledo Blade*, is in contemplation. The road, according to the programme, is to run direct to Paris in Indiana, where it will unite with the Terre Haute and Alton Railroad. A Company under the General Railroad Law is already formed in Indiana, and stock taken, sufficient in amount to secure the construction of the Indiana portion of the work. This road will cross the State of Ohio almost midway between the Bellefontaine and Indianapolis Road on the south, and the Toledo, Wabash, and St. Louis Road on the north, and will intersect with the Dayton and Michigan Road at Lima, making the distance between Toledo and St. Louis by this route 390 miles. At Tiffin it will intersect with the Mad River and Lake Erie Road, thus furnishing a connection between Sandusky and St. Louis over a route of 418 miles, and the length from Cleveland to St. Louis will be 460 miles. It will also intersect with the Toledo and Norwalk Road, and the Sandusky and Mansfield Road.

Pittsburgh and Connelsville Railroad.—This extends from the city of Pittsburgh to Cumberland, Md., 150 miles, where it intersects the Baltimore and Ohio Railroad, forming a direct line from Pittsburgh to Baltimore. The estimated cost of the road is about four millions of dollars. Its grades are quite favorable, the maximum through the mountains being less than 70 feet. The low cost of this line, and the very large amount of freight and other traffic which now passes to Baltimore from Pittsburgh over the Pennsylvania Railroad, will, it is believed, make it a very profitable work. Gen. Wm. Larimer, Jun., of Pittsburgh, is the President of this Company, in whose energetic hands it is likely to progress with great rapidity, he being one of the most popular, able, and public-spirited men in that community. The means of the Company already secured are large, amounting to considerably over two and a quarter millions of dollars, including the guaanty of one million from the city of Baltimore, recently secured.

The consolidation of the different railroads composing the Central Line from Albany west was recently confirmed by the unanimous vote of the shareholders of the different Companies.

CONSOLIDATION.—The basis of the arrangement between the Toledo, Norwalk and Cleveland, and the Junction Roads, is understood to be that the latter is put into the consolidation at cost, while to the stockholders of the former a new issue of stock is made of $300,000, distributed as a bonus before the connection is made. This is equal to about 45 per cent. on the old stock. The Toledo, Norwalk and Cleveland then stands $950,000 stock, $900,000 unconvertible bonds. This is to receive the earnings up to 1st September, equal to a dividend of 10 per cent.

SAVANNAH.—The railroads which transport cotton to Savannah are 13 in number, and in length, 1,053 miles. Eight of these roads are completed and in operation, and the remainder are in the process of construction.

LEWISTON AND TOPSHAM RAILROAD.—We learn that the surveys on this road will be completed very speedily. The prospect for an eardy commencement on the work of grading is flattering. The people of Bath are in earnest, and will doubtless do all in their power to have the road built. The people living on the proposed line certainly have as much at stake as Bath, and we see no reason why the work should not commence as soon as the necessary arrangements can be made.

WISCONSIN has given charters for fifteen thousand miles of railroad, that will require $300,000,000 to construct.

JEFFERSONVILLE RAILROAD.—The Directors have taken steps for the immediate construction of the road between Edenburg and Indianapolis, a distance of 30 miles.

SOUTHERN INDIANA.—As regards railroad facilities, and the consequent proximity to markets, Southern Indiana will be unsurpassed, as soon as the various lines projected and in course of construction are completed. No less than four lines of railroad, commencing at points on the Ohio river, and running into the interior, are already in operation, while two or three others are contemplated. Here we have the Madison and Indianapolis Road, connecting those two points, and passing nearly through the county north and south. But the Ohio and Mississippi (six-foot guage) Road, connecting the cities of Cincinnati and St. Louis, (and which passes through the country from east to west, crossing the other near the centre,) is destined to be the great commercial channel through which the resources of Southern Indiana and Illinois are to be opened up. This will be the longest continuous railroad in the West, and, with two or three exceptions, in the world; and it must eventually become an important link in the iron chain which, we trust, is soon to unite the Atlantic sea-board with the golden regions of the Pacific.

VINCENNES AND EVANSVILLE RAILROAD.—The grading of this railroad between the former place and White river has been completed for some months, and is ready for the iron, which is being laid down as fast as possible.

We are able now to add, that the railroad from Burlington to Peoria is in a state of forwardness, and its eastward extension from Peoria to the Indiana State line (in the direction of Logansport) has just been contracted for by New-York and Boston Companies—the whole to be completed by December 31, 1854. At a late meeting at Knoxville, Ill., subscriptions were announced by Tazewell and Iroquois counties, and the city of Peoria, of $250,000, and $300,000 by the contractors—5 per cent. being paid in. By January, 1855, the Air Line will be in operation to the Mississippi, at Burlington; and from thence some considerable portion of the distance towards the Missouri, at the mouth of the Platte! But this will not be the first railroad connection of the south of Iowa with the commercial metropolis. At Galesburg, Ill., the road to Peoria strikes the Central Military Tract Railroad, the speedy completion of which through the best agricultural section of Illinois to Chicago, is urged forward by the means and energy of the Michigan Central Railroad Company. From Burlington to Galesburg, the grading is done, except four miles opposite Burlington, and the track dressed off, ready for the ties and rails. Two hundred tons of iron and eight freight-cars arrived at Burlington a few days since, and twelve hundred tons, and two locomotives, (built at Taunton, Mass.,) are expected in a few days. An arrangement was made at Knoxville, by which freight and passengers from Chicago, *viâ* the Military Tract Railroad, will be passed from Galesburg to Burlington, at the same rates as from Peoria.

Effect of Railroads.—A citizen of this county sold recently a body of piney woodland at the rate of ten dollars per acre. The land lies near or on the line of the New-Orleans and Jackson Railroad, and previous to the contemplation of that project, was valued at very little, if any, more than Government price. This is one of the many beneficial effects produced by the construction of railroads.—*Gallatin* (*Copiah co., Miss.*) *Argus, 3d inst.*

In the above little paragraph as strong and, at the same time, as *practical* an argument in favor of railroads can be found as could be drawn from a volume of elaborate discussions on the subject.

Railroad Tunnels.—There are some pretty extensive holes in the ground on the line of the Covington and Lexington (Ky.) Railroad. Grant's tunnel, 10 miles from Covington, is just finished. It is 2,167 feet long, and about 300 feet below the surface of the earth. Anderson's tunnel, on the same road, is 763 feet long, and 100 feet below the surface.

Middletown Railroad.—The work on that section of the railroad between Middletown and New-Haven is progressing with considerable rapidity.

Remarkable Railroad Management.—Late statistics of the Albany and Schenectady Railroad show that during the last eleven years, 2,882,457 passengers have passed over the road, and not one, while in the cars, has been injured, and only two slightly injured while standing on the platform. Ezra Foster, Esq., has had the immediate superintendence of the road during this time.

PORK AS FOOD.

In giving our views of the proper mode of fattening calves and other animals, on page 111, we have introduced some suggestions in reference to pork, and other excessively fat meats. Since that paper was given to the printer, we have received a copy of *The Boston Medical and Surgical Journal*, which contains a striking confirmation of our views, chiefly experimental, and worthy of more consideration than many people, perhaps, will be inclined to give it. We only add here, that the mere fact that any article has been used as food for many years and even to old age, comes far short of demonstration on this point, so long as so many diseaes abound in persons of all ages and both sexes.

"For many years past, [says that journal,] the Shakers of Massachusetts and perhaps those of other States, have wholly abandoned swine-raising, although an acknowledged source of profit to farmers like themselves. Some very wise men may be found among those excellent agricultural broad-brims, who on many subjects, supposed to require the exercise of very elevated intellectual endowments, exhibit powers and acquirements which would command respect in any society. They make no display of their knowledge beyond turning it to a practical account on their own industrial territories. In medicine there are individuals among them who are vigilant students, and prescribe, when occasion requires, with a clear understanding of the symptoms and the value of the medicines they may give. Their village health is proverbial. They seem scarcely liable to the prevailing maladies in their vicinity. . . . *Pork is not eaten by them*, because they find satisfactory evidence that the flesh of domesticated swine is more or less diseased."

"Again, a prominent Shaker recently stated to the editor of that journal 'that the children in his community never had measles, and stranger still, they could not take the disorder.' A few weeks since, an experiment was instituted which confirmed the truth of this alleged immunity. In order that the disease might be contracted by their children while young, upon the supposition that they were destined, of course, to undergo that specific suffering, as others did, they were sent to see some children 'among the world's folks' who were then sick with measles. But the little Shakers did not imbibe the sickness, having remained perfectly well ever since. The reason given by the Shakers themselves, why their children did not contract *rubeola* in this case, and why they are not liable to its invasion, is, *that they have never eaten pork.* Whether this be the only cause, or whether it be the effect of the general hygienic regulations of their community, we will not undertake to decide, but leave the subject for the consideration of others."

IMPROVED DUMPING WAGON.

THE accompanying engravings represent an improved Dumping Wagon, patented August 3, 1852, by Mr. Thomas Castor, of Frankford, Philadelphia county, Pennsylvania.

This valuable improvement possesses many advantages over all other wagons of the kind hitherto invented. It is becoming a great favorite among farmers and teamsters, and will eventually, in a great measure, take the place of carts and the ordinary farm wagon. It combines all the properties of a Burden wagon, with the facility of dumping its load with much more ease than the ordinary cart. It is simple in its construction, and therefore not so liable to get out of repair. The facilities of dumping its load are not at all affected by an increase of weight. Mr. William W. Smedley, of Whitehall, Pennsylvania, who has been using it for some months, says, that his team can haul (and teamster dump) with as much ease 6,500 lbs. on the wagon, as 5,000 lbs. on an ordinary cart. And Mr. Minor Rogers, of Aramingo, Pa., after having given it a fair trial in hauling lumber, coal, wood, stone, lime, and various other heavy materials, recommends it to the public as having exceeded his expectations in many respects: particularly in the ease with which heavy loads can be discharged. And all who have yet tried it, recommend it for usefulness and economy. The principle can be applied to burden-cars for railroads, heavy ox-carts, or to burden-wagons for any purpose, at a small additional cost. Farmers and others are requested to examine its construction and try it for themselves.

Figure 1 represents a perspective view, and figure 2 a side elevation of the wagon.

Fig. 1.

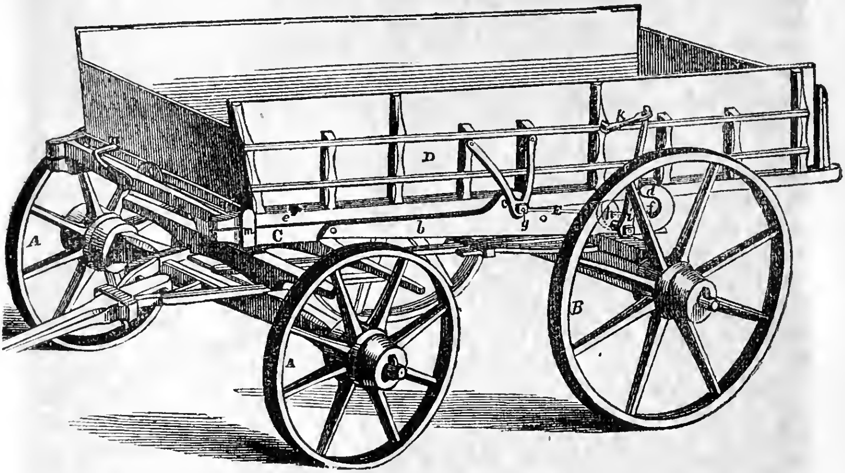
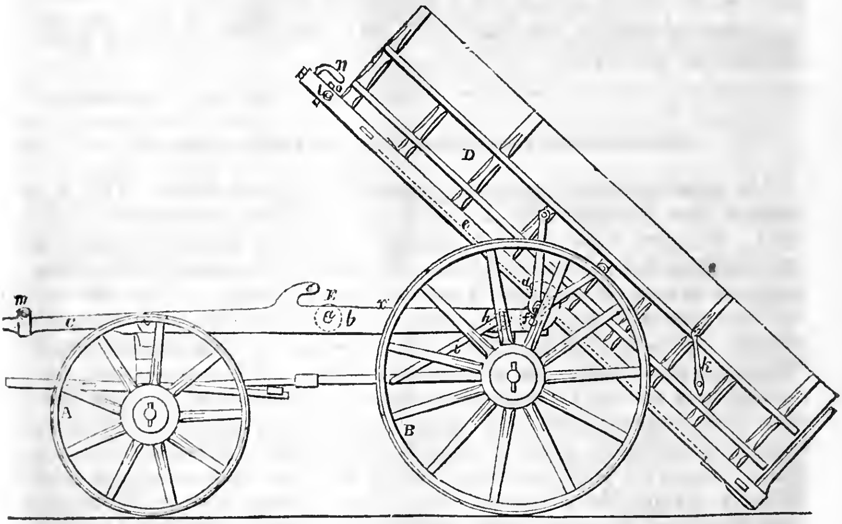


Fig. 2.



AA are the front wheels, and BB the hind ones, CC being the side timbers of the frame; D is the body, which is balanced on anti-friction rollers, E, which turn on a rod extending across the frame, C; the said rollers form a fulcrum and bearing for the wagon body to rest upon and slide over, as heretofore shown, and they are so situated in relation to the length of the wagon, that the body is balanced upon them in the manner of a scale-beam, so that a small weight upon either end will tip or tilt the other end of the body. An outside plate, *b*, is bolted to either side of the frame or pieces, C, and is formed with hooks and stops, *c d*. The side timbers, *e*, are faced with metal, forming runners or rails for balancing the wagon body upon, and on which it moves over the rollers. An anti-friction roller, *f*, is hung in the back extremity of both the side-pieces, C, projecting slightly above their top surface. Upon either side of the body, D, is a braced stop-pin, *g*, which projects from the side timber, *e*, and when the body, D, is brought home for loading, as in fig. 1, serves to determine its proper position by striking and bearing against the hooks, *c*. These pins also form trunnions for the body to turn upon, in dumping the wagon, by catching within the lower hooks, *a*. A cam, *h*, is fitted to work through either side piece, C; these cams are mounted on a shaft extending across the frame, which shaft is operated by the lever, *i*, so that on turning the lever upward, as in fig. 1, and securing it by a strap or catch, H, the cams, *h*, slightly lift the back end of the wagon body, and support it; but when the lever, *i*, is turned down, as in fig. 2, the cams permit the wagon body to descend and run backward; *l l* are lock-rods attached to disks or double cranks, *o*, which are turned by the lever, *n*, and work longitudinally to lock and unlock the body by sliding through *c*, within catches or openings formed on the standards, *m*, as represented. When it is desired to unload the wagon, the lever, *n*, is turned, unlocking the body of the carriage, and the lever, *i*, brought down so as to permit the body to fall upon the rollers, when a slight pressure by the hand will carry the body backwards, and prepare it for unloading, which is easily done by the hand. When unloaded, depress the body at *n*, and bring it to its place; then raise the lever, *i*, and lock the standard, *m*, and it is again ready for reloading.

Further information may be obtained by letters addressed to the patentee, Frankford, Philadelphia Co., Pa.

THE PROPER TREATMENT OF CERTAIN ANIMALS.

All animals require treatment corresponding to their habits. This is so evident that it sounds like a truism, and yet some need advice of this kind. No man would think of feeding carnivorous species on vegetables, nor cows and horses on animal food. But perhaps the management of some people is as essentially unwise, if not so obviously absurd. We do not refer to those few and despicable persons, like one whom we have seen, who actually fed his skeleton of a horse on rum, but to those who seem to do well while they are violating the primary laws of life.

Milk from still-slops is universally condemned, and the milk produced from such feed is pronounced unwholesome, and even poisonous. That it is unhealthy, is obvious from the fact that cows thus fed rapidly become diseased, losing their teeth, becoming thin in flesh, &c., while a very few years of such keeping destroy their lives. But we know many families that give their cows the same thing, under the name of kitchen-slops or swill. If hogs are kept, they usually monopolize these choice condiments, while the cow is required to practise *total abstinence*. Whether or not much harm is done by such *diet*, we will not affirm, but we do know that sour swill is very like the slops of the still. That is, it contains the same objectionable elements, and very little that can be called nutritive food. Whether such "moderate drinking" ought to be utterly abandoned, perhaps it is not necessary to inquire at present; but we do say that it is a partial adoption of the still-slop system.

Again, we have recently seen in the *Genesee Farmer* the following remarkable advice:

"In fatting calves for the butcher, they should be suckled regularly, have as much milk as they can take, after they are ten days old; they should be *tied up* in a dark, clean stable, and have a little fresh, clean straw given them every day. Much depends on their being kept clean and quiet.

"For rearing calves, of course, a different treatment is necessary. You must have an eye to *health and the development of muscle*, and not, as in the other case, to the accumulation of fat. They should be allowed more light and exercise."

We must be allowed to say that we prefer the meat of healthy animals to that of fat ones which are diseased; and though the learned doctor would not admit that he has other preferences, he has certainly given different advice: "If you are intending to kill, keep dark and quiet; but if to rear, you must regard the health of the animal, and give more light." Trees and all plants are found to illustrate the same principle. Cover your grass from the light, and it grows rapidly, and even *monstrously*, but it is weak and without color. Every farmer knows, or may know, that such food is almost worthless for his stock. But it is probably *very tender*.

All excess of fat is abnormal, whether in men or animals. An excessively fat man is never found to be a very vigorous man. He cannot endure severe labor, even of the more sedentary kind. He is not in a healthy condition. Neither is the excessively fat animal. No wild animal accumulates an excessive amount of fat, save those which are torpid in winter, and those only in the fall. Ere the spring arrives, the excess of fat disappears.

"But is not fat pork wholesome?" We answer by referring the inquirer to the *facts* already noticed, and call upon him, in our turn, for his answer. That many eat it and thrive, is very certain. Whether they are made *strong* by fat is another matter. How much weight of muscle can be organized from 1000 lbs. of pure fat? We answer, *not a fraction of an ounce*. There is no nitrogen in it, and not a single fibre of muscle can be made without that element. You might as well make atmospheric air without oxygen.

An excess of food destitute of nitrogen—that is, of fat-producing food—does not promote the health of biped or quadruped; and such culinary preparations ought to be indulged in with moderation, both at the table and the crib. We should prefer also healthy meats, the flesh of healthy animals. The laws of Moses were not merely arbitrary commands, and, apart from these considerations, why were these kinds of food prohibited by his code?

Thousands of children are killed every year by the use of still-slop milk, as the statistics of some of our cities abundantly show. How many of various ages are injured by the use of animal food, "tender," no doubt, but fed in the "dark," and "tied," so as to forbid all exercise, during its whole life, we do not know.

Our counsel is, Give calves moderate exercise, clean and pleasant quarters, and liberal feed, and our veal will not only be tender, but healthful.

Do not kill calves too young. The flesh of a calf is not in a good condition before it is at least a month old. It is soft, slimy, and unsubstantial, or else equally objectionable in other respects. We would as soon eat the substance of a premature birth, as of an animal soon after it first sees the light.

Calves that are to be reared may be allowed more severe exercise. No matter if their muscles are made tough and hard. They will be the stronger for it. Let them run through the pastures and take as much exercise as they please.

We know not why the same principles should not be applied to all animals that are under our care, whether intended for the table or for other use. Were they universally applied, we believe that animal food would less frequently be found hurtful, and that the various kinds of food, in suitable quantities, would be found alike healthful for all ages.

All animals, especially those designed for the table, should be kept clean. Cleanliness will be a defense against divers afflictions to which animals are liable, and which tend to produce disease. Even a hog is not an exception. They seek the mud, perhaps, because they are diseased. They are so kept that they are feverish in their habit, and need the cooling effect of the gutter. Daily ablution might put an end alike to the desire and to the cause of it.

PRESERVING BUTTER.

The farmers of Aberdeen, Scotland, are said to practise the following method for curing their butter, which gives it a great superiority over that of their neighbors:

"Take two quarts of the best common salt, one ounce of sugar, and one ounce of common saltpetre; take one ounce of this composition for one pound of butter, work it well into the mass, and close it up for use. The butter cured with this mixture appears of a rich and marrowy consistency and fine color, and never acquires a brittle hardness, nor tastes salty. Dr. Anderson says: 'I have eaten butter cured with the above composition that has been kept for three years, and it was as sweet as at first.'"

It must be noted, however, that butter thus cured requires to stand three weeks or a month before it is used. If it is sooner opened, the salts are not sufficiently blended with it, and sometimes the coolness of the nitre will be perceived, which totally disappears afterwards. The above is worthy the attention of every dairywoman.

MANUFACTURE OF PAPER.

It is well known that paper which is very white when first made, often becomes yellow some time after being used. The yellow color is not always uniform, but often comes out in spots more or less large, of a circular outline and a rusty tint. In some Paris manufactories, this defect (which is incorrectly attributed to an alteration of the fibre) is remedied in a simple manner; and as the process of decoloration may not be commonly used in America, judging from some paper I have seen, I make a brief mention of the subject.

The researches were made here by a manufacturer who combines in a high degree science and technology. M. Gélis recognized at first that the change of color was not due to any alteration in the ligneous fibre, and was owing to iron. But what the source of the iron? and how is it introduced? An examination of the manufacture, through its process, shows that there is less iron in the pulp than in the paper made from it. The origin of the iron is hence not in the preparation of the pulp, but it must be attributed to the drying-cylinders of steel under which it is passed while yet moist. The chlorine contained in the paste, and which it is very difficult wholly to remove by the washing process, becomes suddenly vaporized under the heated cylinders, attacks these cylinders, and forms the protochloride, (Fe Cl,) which thence impregnates the paper. Colorless itself, this chloride gradually absorbs oxygen on exposure to the air, and thus the coloration takes place.

It is therefore not a remedy against iron but against chlorine that is required. The hyposulphite of soda is the simple antidote, and a very small quantity suffices to eliminate a large quantity of chlorine, since one equivalent of hyposulphurous acid requires four equivalents of oxygen, and therefore four equivalents of chlorine, to transform it into sulphuric acid.

For testing the complete removal of the chlorine, M. Gélis uses a liquor made of iodide of potassium and amidon, (starch.) This liquor becomes instantly blue if there is the least trace of chlorine.

The above is from Silliman's *Journal of Science and Art*, a work unequalled in this country, and unsurpassed in real merit in any country, in the higher departments of science.

COATING IRON WITH COPPER.

A PATENT has been granted to Theodore G. Bucklin, of Troy, N. Y., for a new and improved mode of coating iron with copper, which promises to be an invention of no small importance to the arts. It has long been a desideratum to coat iron with some other and less oxidizable metal, in order to render it more durable in exposed situations. It is more essential to have sheet and plate iron than any other kind covered with copper. For example, sheet iron covered with copper would be cheaper than tinned iron for roofs of buildings, &c.; and plate iron, if covered with copper, would be excellent for making steam-boilers so as to prevent incrustations, &c. Cheapness is an important item in the process. If the process is expensive, then it can be of no general benefit, for pure copper would be preferable; if cheap, it is a most important discovery. A method of covering iron with brass, copper, &c., has long been known; but to cover it and make the copper unite with the iron, like tinned iron, has hitherto been considered problematical. The invention of Mr. Bucklin promises to fulfil every condition desired in making coppered iron. Cast, malleable, and wrought iron can be coated with copper by the new process.

The process consists in first removing the oxide from the iron to be coated, then covering it with a medium metal which has a great affinity for the iron, and afterwards dipping the iron so prepared into molten copper, which, by the galvanic action of the medium metal, makes the copper intimately combine with the iron, and form a complete coating. The oxide is removed from iron by means of diluted sulphuric acid, in which the castings or sheets are rubbed with sand; after this they are washed and dipped into a solution of the muriate of ammonia, dissolved in a suitable vessel, when they are ready for the next process. This consists in dipping the sheets or plates into molten zinc, immediately after they are lifted out of the sal ammoniac solution. The surface of the molten zinc should be covered with dry sal ammoniac, to prevent the evaporation of the metal. The iron is soon covered with a coating of zinc, and forms what is termed galvanized iron. At hand the operator has a crucible or pot containing melted copper covered with some incombustible substance as a wiper, and he at once dips the zinked iron into this, in which it is kept until it ceases to hiss, when it is taken out and found to be covered with a complete and durable coating of copper. By dipping the iron thus coppered into the solution of sal ammoniac, then into the zinc and the copper, repeating the process, coat upon coat of the copper will be obtained, until it acquires any degree of thickness. The black oxide is prevented from forming on the copper by dipping it afterwards in the sal ammoniac solution, and then washing it in pure water.

LOCOMOTIVE TRIAL TRIP.

An experiment made on the 18th ult., upon the Delaware, Lackawanna, and Western Railroad, seems to challenge the world for its equal in the capacity and draught of locomotive engines:

The Ontario is a ten-wheel engine, six drivers, 4 feet 6 inches in diameter, connected; cylinders 17 inches in diameter, 24-inch stroke; manufactured by Rogers, Ketchum & Grosvenor, Paterson, N. J.

Weight on drivers, - - - - - -	50,000 lbs.
Weight on trucks, - - - - - - -	17,000 "
Total weight of engine, - - - - -	68,200 lbs.
Weight of tender with wood and water, - -	40,400 "
Weight of engine and tender, - - - - -	108,600 "

The Wyalusing is a ten-wheel engine, six drivers, 4 feet 6 inches diameter, connected; cylinders 17 inches diameter, 24-inch stroke; manufactured by Danforth, Cooke & Co., Paterson, N. J.

Weight on drivers, - - - - - -	48,200 lbs.
Weight on trucks, - - - - - - -	17,600 "
Total weight of engine, - - - - -	65,800 lbs.
Weight of tender, wood, and water, - - -	40,000 "
Weight of engine and tender, - - - - -	106,200 lbs.

The first experiment was made with a train composed of 100 four-wheel cars of coal,

Whose gross weight was - - - - -	706 tons	1,100 lbs.
Deduct weight of cars, - - - -	300 "	100 "
Total weight of coal, - - - - -	496 tons	1,000 lbs.

The Ontario, T. Duncan, engineer, I. T. Puterbaugh, conductor, attached to the above train at Tunkhannock Station, and started up a grade of 21 feet in the mile, at the rate of five miles an hour for one mile, and came to a stand on a reverse curve; cut off nine cars, leaving ninety-one cars, weight 725 tons, with which she went to Hopbottom Station, a distance of about six miles, at the rate of seven miles per hour, the grade continuing the same.

The Wyalusing, John Warren, engineer, A. Hunt, conductor, was then attached to the whole train of one hundred cars, at 10.28 o'clock, and arrived at Oakley's Station at 10.55, making the run up a grade of 21 feet, through continuous curves of about 1,000 feet radius, at four miles an hour.

The Ontario again attached to the same train of one hundred cars at Oakley's, and drew the train at the rate of six miles an hour, under circumstances similar to the Wyalusing, grade and curves continuing the same.

At New-Milford another hundred cars were added to the train, making a train of two hundred cars, 2,652 feet long, or over half a mile.

Total weight of train, including engine, tender, &c.,	1,653 tons 400 lbs.
Deduct weight of engine, tender and cars, - -	655 " 1,300 "
Total weight of coal, - - - - -	997 tons 1,100 lbs.

The Ontario, attached to the above train, started the whole train on a level, out of a switch, both ends of the train being on the curve at the same time. The trip was made from New-Milford to Great Bend, a distance of six miles, in thirty minutes, being at the rate of twelve miles an hour, overcoming in the distance a grade of fifteen feet to the mile, for about three fourths of a mile.

CONDENSED HISTORY OF STEAM.

About 280 years B. C., Hiero of Alexandria formed a toy which exhibited some of the powers of steam, and was moved by its power.

A. D. 450, Anthemius, an architect, arranged several caldrons of water, each covered with the wide bottom of a leathern tube, which rose to a narrow top, with pipes extended to the rafters of the adjoining building. A fire was kindled beneath the caldrons, and the house was shaken by the efforts of the steam ascending the tubes. This is the first notice of the power of steam recorded.

In 1543, June 17, Blasco D. Garoy tried a steamboat of 200 tons, with tolerable success, at Barcelona, Spain. It consisted of a caldron of boiling water, and a movable wheel on each side of the ship. It was laid aside as impracticable. A present, however, was made to Garoy.

In 1660, the first railroad was constructed at Newcastle-on-Tyne.

The first idea of steam engines in England was in the Marquis of Worcester's "History of Inventions," A. D. 1663.

In 1710, Newcommon made the first steam engine in England.

In 1718, patents were granted to Savary for the first application of the steam engine.

In 1764, James Watt made the first perfect steam engine in England.

In 1736, Jonathan Hulls set forth the idea of steam navigation.

In 1778, Thomas Paine first proposed this application in America.

In 1781, Marquis Jouffry constructed one on the Saône.

In 1785, two Americans published a work on it.

In 1789, William Symington made a voyage in one on the Forth and Clyde Canal.

In 1802, this experiment was repeated.

In 1782, Ramsey propelled a boat by steam at New-York.

In 1787, John Fitch, of Philadelphia, navigated a boat by a steam engine on the Delaware.

In 1763, Robert Fulton first began to apply his attention to steam.

In 1793, Oliver Evans, a native of Philadelphia, constructed a locomotive steam engine to travel on a turnpike road.

The first steam-vessel that crossed the Atlantic was the Savannah, in the month of June, 1819, from Charleston to Liverpool.—*Hunt's Merchants' Magazine.*

THE POLYTECHNIC COLLEGE OF PENNSYLVANIA.

This institution, recently chartered by the Pennsylvania Legislature, has secured an edifice in Philadelphia, and will soon be in active operation. This college is designed to include in its organization a College of Mines, of Agriculture, of Arts, and of Manufactures, and to afford those destined for these important branches of industry, a thorough scientific education. The application of science to the arts is daily rendering them more powerful sources of national progress, and demanding increased intelligence in those engaged in their prosecution. The civil and the mining engineer, the architect, the manufacturer of chemicals, of sugar, and of glass; those engaged or interested in the productions of the plough, the anvil, the furnace and the loom; all these have, under the stimulus of modern science and of modern competition, assumed a new and nobler position; and hence their proper education has become an object of deep public moment, and one closely affecting national prosperity.

The plan of organization will comprise the following departments:

1. Mathematics and Civil Engineering.
2. Mechanical Philosophy and the principles of Machines.
3. Metallurgy, and Industrial, Agricultural, and Analytical Chemistry.
4. Mining Engineering, Mineralogy, and Geology.

A well-supplied analytical laboratory, sections and models of mines and machinery, a geological and mineralogical cabinet, field operations, and architectural and mechanical drawing, will afford ample facilities for thorough and practical instruction. Students will be enabled to pursue one or more studies for a year, term, or less period, and after examination, will be granted certificates of capacity accordingly.

EUROPEAN MANUFACTURES.

France.—The mortgage debt of France as recorded is 12,500,000,000 francs; deduct from this questionable debt 2,500,000,000, it leaves 10,000,000,000; interest yearly at 9 per cent. is 900,000,000; net annual revenue of all the real estate in France is 1,600,000,000; interest on mortgage is 900,000,000; direct land tax is 160,000,000; additional tax is 80,000,000—making 1,140,000,000—balance left in the hands of owners is 460,000,000 francs. Divide that sum by 20,000,000, representing 4,000,000 families at five persons each, and it leaves in the hands of each twenty-three francs; but as the mortgages are not all paid, call it fifty francs, or ten dollars a head.

Germany now manufactures about sixty million pounds of native wool in addition to what she imports. Formerly she exported her wool to England, and paid 12 per cent. duty in addition to expenses. She has learned better since. In 1834, the population of the States having the Zollverein was 23,478,120; in 1847, 29,461,381, showing an increase of $25\frac{1}{2}$ per cent. in fourteen years, notwithstanding famine and emigration. The late census showed a population of 30,009,639. The customs duties per head in 1834, 18.5 silver groschen; 1845, 29.4; 1845, 23.5; 1852, 26.1. The chief cause for the decline in duties is the diminution of sugar imports, owing to home manufacture. If the home-made sugar had paid the same taxes as the imported, the receipts from customs would have been 27.9 per head, or little less than in 1845.

Russia presents an example of progress with most of the European States. By a system of protection she has largely augmented her wealth and resources. In 1812, Russia had 136 cloth factories; in 1824, 324; in 1812, 129 cotton factories; in 1824, 484. From 1812 to 1839, her manufacturing establishments more than trebled, and since then in a much greater ratio. In 1843, but one sixth of her manufactured articles were imported. Imports, exports, and revenues are all increasing. Her imports of indigo from England increased from 3,225 chests in 1849 to 5,175 in 1852, an increase of 60 per cent. in three years. These figures show forcibly her industrial tendencies, which must in time, and with the help of favoring internal political changes, transform the nation from a warlike and barbarous nation into a civilized and peaceful one.

Portugal, Turkey, and the Papal States are the only countries in Europe that are not increasing in wealth.

SCIENTIFIC EXPERIMENTS.

The Chromatype.—The Chromatype, discovered by Mr. Hunt, consists in washing good letter-paper with the following solution:—Bichromate of potash, 10 grs.; sulphate of copper, 20 grs.; distilled water, 1 ounce. Papers prepared with this are of a pale yellow color: they may be kept for any length of time without injury, and are always ready for use. For copying botanic oil specimens or engravings, nothing can be more beautiful. After the paper has been exposed to the influence of sunshine, with the objects to be copied interposed between them and it, it is washed over in the dark with a solution of nitrate of silver of moderate strength; as soon as this is done, a very vivid positive picture makes its appearance; and all the fixing these photographic pictures require, is well washing in pure water.

Magic Lantern.—*To paint the Glasses.*—Draw on a paper the subject you desire to paint. Lay it on a table, or any flat surface; then draw the outlines with a very fine pencil, dipped in varnish mixed with black paint, and when dry, fill up the other parts with their proper colors. Transparent colors must be used for this purpose, such as carmine, lake, Prussian blue, verdigris, sulphate of iron, tincture of Brazil-wood, gamboge, &c.; and these must be tempered with a strong white varnish, to prevent them from peeling off. Then shade them with black, or with bistre, mixed with the same varnish. Movements of the figures are easily made by painting the subject on two glasses, and passing them at the same time through the groove.

Amusing Transmutations.—Have in one vessel some sulphuric acid, and in another an infusion of nut-galls; they are both colorless and transparent: mix them, and they will become black and opaque. Put into a wine-glass of water a few drops of prussiate of potash; and into a second glass of water, a little weak solution of sulphate of iron in water; pour the colorless mixture together into a tumbler, and they will be changed into a bright, deep-blue color. Mix a solution of prussiate of potash with that of nitrate of bismuth, and a yellow will be the product. Mix a solution of prussiate of potash with that of sulphate of copper, and the mixture will be of a reddish-brown color. Put a drachm of powdered nitrate of cobalt into a phial containing an ounce of the solution of caustic potass; cork the phial, and the liquid will assume a blue color, next a lilac, afterwards a peach, and lastly a light red.

The visibly-growing Acorn.—Cut a circular piece of card to fit the top of a hyacinth-glass, so as to rest upon the ledge and exclude the air. Pierce a hole through the centre of the card, and pass through it a strong thread, having a small piece of wood tied to one end, which, resting on the card, prevents its being drawn through. To the other end attach an acorn, and having half filled the glass with water, suspend the acorn a little above the surface. Keep the glass in a warm room, and in a few days the steam which has generated in the glass will hang from the acorn in a large drop. Shortly after, the acorn will burst, the root will protrude and thrust itself into the water, and in a few days more a stem will shoot out at the other end, and rising upwards, push against the card, in which a hole must be made to allow it to pass through. From this stem small leaves will be observed to sprout, and in the course of a few weeks you will have a handsome oak plant, several inches in height.

SELF-REGISTERING COMPASS.

M. Deleuil has presented to the French Academy a self-registering compass of his own construction. Its object is to register the changes in the course of a vessel for every three minutes during the twenty-four hours. The marking is made on a compass-card, and it enables the captain to overlook most effectively the manœuvres of the steersman and pilot.

This self-register consists (according to *Silliman's Journal*) of three principal parts: 1, a clock-movement placed at the centre of the apparatus, for causing the point or pivot carrying the needles to move up and down at regular intervals; 2, an endless screw, furnished with a nut carrying the point for piercing the paper; 3, the compass-card, made of three needles fixed to a sheet of mica, a material as little hygrometric as possible. The mica is covered with a disk of velvet firmly glued to it by means of strong glue, and whose tissue has been saturated by a kind of glue that is soft when cold; on cooling, the glue has an even surface, pierced with an infinity of pores, into which the point will readily penetrate after having pierced the paper compass-card. Owing to this addition, the process of puncturing does not stop the movement of the needle—a principle essential to the success of any method of self-registering.

When the needle is fixed towards the north, the axis or diametral line of the compass-card is placed in the line of the axis of the ship, and the punctures, made every three minutes, will indicate the deviation of this axis with reference to the magnetic needle; the succession of points, or the nearly continuous line which they trace, shows to the eye the course of the route.

MECHANICAL AND AGRICULTURAL RECORD, ETC.

COFFEE.—There are about a dozen species of the genus to which coffee belongs, but all of them are inhabitants of tropical countries. The *Coffea arabica* alone is cultivated, and yields the article known in commerce. Its favorite locality is on hill-sides, at an elevation of from 1,000 to 3,000 feet above the level of the sea. The following is an estimate of the coffee produced in every part of the world at the present time:

Brazil,	176,000,000 lbs.
Java,	126,000,000 "
Cuba and Porto Rico,	30,000,000 "
St. Domingo,	35,000,000 "
Laguayra,	35,000,000 "
Costa Rica,	9,000,000 "
British West Indies,	8,000,000 "
Ceylon,	40,000,000 "
Malabar and Mysore,	5,000,000 "
French and Dutch West Indies,	2,000,000 "
The Philippines,	3,000,000 "
Sumatra,	5,000,000 "
Celebes,	1,000,000 "
Arabia,	3,000,000 "
Total,	476,000,000 lbs.

The cost of all this to the consumers is not less than one hundred millions of dollars a year. The yearly consumption of coffee in the United States is 5.57 lb. per head, five times more than in Great Britain. It is thought that the introduction of coffee and tobacco have conduced to the promotion of sobriety, and that the enormous sums expended in these commodities would without them be thrown away in buying intoxicating drinks.

MR. SAMUEL C. DOWNES, a pattern-maker at the Acushnet Foundry, has invented a machine for punching copper, which is said to be a great labor-saving affair.

A RAILROAD FACT.—A North Carolina correspondent of the New-York *Times* makes the following statement:

"The advantages offered by railroads to the farms of inland districts are strikingly shown by the following, which was narrated to me as a fact: A gentleman near Raleigh, who had a quantity of wheat to dispose of, and seeing it quoted at high prices in a paper of Petersburg, Va., and seeing at the same time the advertisement of a commission-house there, wrote to the latter, making an offer of it. The next day he received a reply by mail, and by the train a bundle of sacks, in which he immediately forwarded the wheat, and by the following return mail received his pay at the rate of $1.20 a bushel, the top price of the winter. At the same time, forty miles from where he lived, off the line of the railroad, wheat was selling at 60 cents a bushel. There was one county, during the time I was in North Carolina, to and through which the roads were absolutely impassable, and which had not been heard from at the capital for a month. It is not, therefore, incredible that it should cost 60 cents to move a bushel of wheat forty miles."

A CHEAP FILTER.—As efficient a filter as can possibly be constructed may be made in a few minutes by any person, and at the cost of a very few pence. Procure a clean flower-pot of the common kind; close the opening of the bottom with a piece of sponge, then place in the inside a layer of small stones, previously well cleansed by washing; this layer may be about two inches deep, the upper stones being very small; next procure some freshly-burnt charcoal which has not been kept in a damp or foul place, as it rapidly absorbs any strong smells, and so becomes tainted and unfit for such purpose; reduce this to powder, and mix it with about twice its bulk of clear, well-washed, sharp sand: with this mixture fill the pot to within a short distance of the top, covering it with a layer of small stones; or, what is perhaps better, place a piece of thick, close flannel over it, large enough to tie round the rim of the pot outside, and to form a hollow inside, into which the water to be filtered is to be poured, and which will be found to flow out rapidly through the sponge in an exceedingly pure state. The flannel removes the grosser impurities floating in the water, but the filter absorbs much of decaying animal and vegetable bodies actually dissolved in it. When it becomes charged with them, it loses this power; hence the necessity for a supply of fresh charcoal at intervals.

Railway Axles.—Mr. D. Cokley, of Pittsburgh, Pa., has shown us the model of a new compound axle invented by him, designed to obviate the mischief and perils now encountered on railroad curves, where the wheels on one side of the car must necessarily travel farther and faster than those on the other, producing a tremendous strain on the axle, and frequently breaking it. We consider the object sought by this invention an important one, and trust it is attained. Whether this invention is preferable to others, especially that of Mr. P. G. Gardiner, of our city, is a question not for editors but for practical engineers, to whom we earnestly commend it. The old-fashioned axle is clearly vicious and dangerous. Let the best attainable substitute be designated and adopted forthwith.

Machine for tunnelling the Alps.—A very ingenious apparatus has been devised to facilitate the progress of the Piedmontese railroads, in which tunnels have to be cut under mountains. The excavating machine cuts the channels in the rock by means of several series of chisels placed one beside the other, in straight lines; these lines of cutting tools are so arranged as to be capable of a slight motion in the direction of the grooves after every stroke; the object of this is to bring the chisels to bear upon all the spaces lying between the several cutting tools situated in the same line, so as to produce not a succession of holes, but a continuous channel similar to a very wide saw-cut. This lateral shifting of the lines of chisels, which takes place alternately from right to left and from left to right, is caused by a corresponding motion given to the frames in which they are fixed. Each chisel is driven against the rock by a spiral spring coiled around it. This spring, driving the chisel forcibly against the rock, obliges it to act efficaciously, notwithstanding the slight inequalities at the bottom of the channel, arising from a want of uniformity in the resistance of the stone. When the machine is in operation, the several lines of chisels are all drawn back simultaneously, by means of a species of cam, or movable bar. The apparatus is so arranged as to enable each chisel to strike 150 blows in a minute. The machine at the same time sets in motion a pump which forces a constant supply of water into a reservoir, the upper part of which is filled with compressed air. By this means the water is driven out in jets, through small pipes placed between the chisels, and is thus made to play upon the grooves, where it performs the double office of preventing the cutting instruments from becoming heated, and removing the dust and broken stone which would otherwise accumulate in the grooves, and thereby prevent the effectual working of the excavator.

The Cotton Gin.—Whitney, the inventor of the cotton gin, placed one upon his plantation in Georgia, the first that was used in Wilkes county, and perhaps the first in the State. He and his partner, Durkee, erected a gin-house, into which women only were allowed to enter. Mr. Lyon, who lived a few miles distant, by dressing himself in women's clothes, obtained an entrance, and after viewing the machinery made his improvement, the saw gin. Mr. Whitney got his first idea of the invention from a gin used to prepare rags for the manufacture of paper.

Horticulture at Boston.—At one of the weekly exhibitions of flowers and fruits of the Massachusetts Horticultural Society, early in July, which was reported as "very meagre," we notice FLOWERS by several contributors; fine CHERRIES, by six contributors; GRAPES, "noble specimens," by Mr. Nugent; "magnificent specimens" of various varieties of do., by Mr. Durfee, Fall River, and also by three others; PEACHES, "splendid," from Otis Johnson; GIANT RASPBERRIES, by another contributor; POTATOES, "fine," by another; and VEGETABLES by another, making in all about twenty contributors. They do this up in capital style in the "city of notions."

LIST OF STATE FAIRS FOR 1853.

Indiana,	———,	Sept.	———
Vermont,	Montpelier,	"	13, 14, 15.
Kentucky,	Lexington,	"	13, 14, 15, 16, 17.
New-York,	Saratoga,	"	20, 21, 22, 23.
Ohio,	Dayton,	"	20, 21, 22, 23.
Pennsylvania,	Pittsburgh,	"	27, 28, 29, 30.
Michigan,	Detroit,	"	28, 29, 30.
Wisconsin,	Watertown,	Oct.	4, 5, 6, 7.
Illinois,	Kane co.,	——	———
Massachusetts Horticultural Society,	Boston,	Sept.	21, 22.
North-western Fruit-Growers' Asso.,	Chicago,	Oct.	4, 7.

The following table gives the time for holding county fairs in Massachusetts:

Worcester County Society,	Sept. 21 and 22.
Norfolk County Society,	Sept. 27 and 28.
Essex County Society,	Sept. 28 and 29.
Housatonic Society,	Sept. 28 and 29.
Worcester West Society,	Sept. 30.
Bristol County Society,	Oct. 4 and 5.
Middlesex County Society,	Oct. 4 and 5.
Berkshire County Society,	Oct. 5 and 6.
Plymouth County Society,	Oct. 6.
Franklin County Society,	Oct. 6 and 7.
Barnstable County Society,	Oct. 7.
Hamden, Franklin, and Hampshire County Society,	Oct. 11 and 12.
Hamden County Society,	Oct. 13 and 14.
Hampshire County Society,	Oct. 26.

WATER-PROOF FROCK.—The following is recommended by Mr. Johnson, of Louisiana, as a cheap mode of providing water-proof sacks or frocks for negroes. The quantities named are for a plantation of fifty or one hundred negroes: 20 gallons linseed oil, into which mix 3 lbs. of litharge, well pulverized, after the oil has boiled a few minutes, which should be well stirred in. Into this, when boiling hot, dip a sack or over-coat, &c., well made of common cotton cloth, wring as dry as possible, and then hang in the sun a few days. It costs less than sixty cents, and will last a year or two.

CHINAMEN IN CALIFORNIA.—In Yuba county, by a recent State census, there are 2,100 Chinese; in Nevada county, 3,886; in Placer county, 3,019; and in Sacramento county, 804. It is estimated that there are at least 25,000 Chinese in the State.

VINEYARDS IN CALIFORNIA.—In Los Angelos county are 105 vineyards, containing 450,000 vines, each of which produces, on an average, five pounds of fruit. Most of this is manufactured into wine and brandy, of each of which there are produced about 2,000 barrels. The grapes are of the most delicious quality, and the wine is said not to be inferior to the "sparkling Catawba." This growth is also found in other counties.

STATISTICS OF FRANCE.—Present population is 35,781,821. The number of marriages is constantly decreasing, the number of births is little more than that of deaths, so that the increase of population is considerably less than formerly. About $8,000,000 is annually appropriated to the support of religion, of which, all but about half a million is bestowed upon the Roman Catholic Church. The number of Protestants is about one and a half millions.

Remarkable Growth.—A correspondent, who gives no name, writes us that on the land of Mr. Duncan Hood, Stockport, N. Y., is a tree, grown from the stone of a rare-ripe, given him by a friend, on which are to be seen both nectarines and peaches. He says the tree is four or five years old. Not having any responsible voucher for these statements, we publish them in this form. When their truth is ascertained, it will become a subject of examination by the curious.

Industry of Philadelphia, &c.—In Philadelphia and vicinity, in 1831, was estimated as follows:—104 warping-mills at work, sufficient to employ about 4,500 weavers, more than 200 dyers, 3,000 spoolers, 2,000 bobbin-winders. The wages of these operatives amount to $1,470,000; 81,000 yards a day are manufactured, or $24,300,000 per annum, of the estimated value of $3,888,000. The capital now invested in manufactures is $33,737,911, and number of hands employed is 59,106.

According to an official statement, it appears that we raise annually $143,000,000 in wheat; $391,200,000 in Indian corn; $490,275,000 in oats; $74,125,000 in Irish potatatoes, and $129,000,000 in cotton; the whole crop being $1,209,480,000.

The Railroads in France, now completed, are twenty in number, and 1,531 miles in extent. The longest is the Northern, which is 368 miles, including branches. Five other lines are to be constructed, and are already commenced, extending 843 miles. All the railroads have received aid from the State, which, in all, has disbursed more than $66,000,000 in money on works, and $11,000,000 in loans.

Carrots for Horses.—The stable-keepers are beginning to find that these vegetables form a cheap and nutritious food to mix with grain for their horses. It is better to give a working horse a peck of carrots and four quarts of oats or corn-meal a day, than to give him six quarts of meal.

Glass Pens.—It is reported that glass pens are now made, possessing the requisite qualities to write with, and that they will soon supersede all others. They are anti-corrosive by the most impure ink, at least as much as gold, and their cost will be but that of the making.

A practical mechanic and engineer of high standing in this city suggests, as a preventive of accidents at drawbridges, that, in addition to the usual signal, a gate should be erected across the track at a distance of a quarter of a mile from the bridge. This gate could be so arranged as to be closed by the draw-tender when the draw is open. It could be made high enough to strike the funnel of the locomotive, and would, in case of carelessness on the part of the engineer, give the brakemen ample warning of the danger, and would give time to stop the train before reaching the bridge. The expense of such a gate would not exceed $500, and as a mere matter of economy, something of the kind should be adopted by every railroad. The recent accident on the New-Haven road will cost the corporation more than it would require to erect and perpetually maintain a dozen such gates.

The Geology of the Sierra Nevada.—Professor Trask has made a report to the Legislature of California on the geology of the great mountain range forming the eastern boundary of the State, which is not yet published, but which promises to supply a great deal of interesting information. It would seem that the earth of the country is almost as rich in platinum, silver, and copper, as it is in gold. Chromium, too, a most valuable pigment, abounds in many places, sometimes in large amorphous masses of sixty pounds weight.

There arrived at the port of New-York during the month of May, 30,234 emigrant passengers, of which number 12,179 were Irish, 10,986 German, 2,388 English, 1,214 Scotch, 1,072 French, 857 Swiss, and the remainder were from several other countries of Europe. During five months of the present year, 80,031 emigrants were landed at that port; the year previous, 100,225; in 1851, 100,560; and in 1850, 79,402.

Iron in Tennessee.—From tables published in *Hunt's Merchants' Magazine*, we learn that there are now in operation on the Cumberland river, Tennessee, nineteen furnaces, nine forges, and two rolling-mills, which produce 44,500 tons of iron per annum, valued at $1,673,000. The capital invested is $1,216,000. There are employed in the works 1,395 white laborers, and 1,810 negroes, who consume 1,460,000 pounds of pork, and 35,000 bushels of corn per year. The iron interests of Tennessee are rapidly growing into importance, and we have no doubt will constitute a large element in that wonderful prosperity which the State seems destined to enjoy.

New Compound Rail.—A new rail for roads has been invented by Wells & Serrill. It is compound, consisting of an interior and exterior rail, so arranged that the joints are broken, that is, that the parts lap over one another. No rivets or bolts are used, and an ordinary workman can lay or repair it. The rail may be used with or without chairs. When the exterior rail is worn out, it can be renewed, whilst at least two fifths of the entire bar, which is not subject to wear, is saved. It will be patented. The plan strikes us as a good thing, and is at least worth the attention of railroad men.

Fall River—Additional Boat.—The travel on this route has become so great that the Company has been compelled to put on the "State of Maine," as a day-boat to Newport. Leaving New-York at 8 A. M., on Tuesdays, Thursdays, and Saturdays. Returning, it leaves Newport at 7 A. M. on the alternate days.

Another Potato Secret out.—The country gentleman is informed that the secret of E. C. Roberts in regard to the prevention of the potato disease, is to leave the potatoes in the ground all winter. For this he asks a dollar, with a pledge not to *tell of it*. The secret is neither new nor good. It was thoroughly tried years ago in England and Ireland, and, like most other prescriptions for the disease, was found ineffectual.

Sugar in Ireland.—The manufacture of beet-root sugar has been introduced into Ireland with great success. The produce of last year amounted to 142 bags, containing from three to four hundredweights each. These have been sold; and it is now contemplated to start two other establishments, on which 40,000 tons of the root may be produced in a year. At present 240 persons are employed in the manufacture; but if the project be carried out, this number will be largely increased, and a great addition made to Ireland's industrial resources.

Special Manure for Grapes.—The Wine Committee, at the exhibition of the Cincinnati Horticultural Society, reported that of two specimens of wine, one from grapes to which a special manuring of potash had been given, the wine from the manured grapes was "bright, clear, and mellow, like an old wine." The other was declared to be less matured in all its qualities, nor was it clear. The grapes themselves from the two portions of ground were also presented to the Committee. "Both were delicious and well ripened, but it was considered that those from the manured land were sweeter, and that the pulp was softer."

Improvement in Cultivators.—An improvement in these useful implements of husbandry has been made by Samuel Churchill, of West Henrietta, N. Y. The nature of the invention consists in a peculiar manner of elevating and depressing the frame which holds the shares, and the shares themselves, by means of which they may be made to penetrate the earth the required distance, and make deep or shallow furrows as desired, or be raised and kept entirely from the earth when the implement is being drawn from one locality to another. The mode adopted by Mr. C. to accomplish this object is by means of levers and connecting rods or stirrups attached to the frame, which are under the immediate control of the driver. Measures have been taken to secure a patent.

Manufacture of Bohemian Glass.—A French Company, of ample means, have purchased a tract of land at a short distance east of the Crystal Lake, near New-Rochelle, where they have commenced the erection of a magnificent establishment for carrying on the manufacture of Bohemian glass-ware. The *Westchester News* states that the buildings will be of brick and stone, and put up in the most substantial manner. The principal building will be upwards of 300 feet long, and four or five stories high; while there will be several other buildings of smaller dimensions, adapted to the wants of the various branches of the business. One furnace alone will occupy a space of 50 feet square. The whole work is to be pushed most vigorously; as soon as finished, quite a colony of workmen and their families are to be brought from France to carry on the business, which is expected to be very extensive. For the accommodation of the French families who are expected to be employed in the establishment, about fifty dwellings will be erected by the Company. New streets are being laid out around the works.

Making Paper in North Carolina.—There are five paper-mills now in operation in North Carolina, and another, with a capital of $25,000, is in process of erection, about six miles from Raleigh. The two mills near Raleigh (the "Manteo" and the "Neuse" mills) consume annually about one million and a half pounds of old rags; and the other four mills, viz.: at Fayetteville, Shelby, Lincoln and Salem, as much more; making 3,000,000 pounds of stock used annually in North Carolina.

A New Mode of Manufacturing Paint-Brushes.—A very simple and effectual mode of manufacturing paint-brushes, without involving the necessity of driving the handle through the centre of the brush, has been invented by Adonijah Randel, of Williamsburg, N. Y. The nature of his invention consists in placing the hair of which the brush is to be made in a metal ring, and securing it therein by cementing or sizing the roots, so as to prevent the escape of the hairs, and then uniting the back end of the ring, by riveting or otherwise, with a back plate which receives the handle. The hair is most effectually secured in this manner, and it forms a solid brush; it is easily constructed, durable, and more convenient than those in use. Measures have been taken to secure a patent.

A New Apple Tree Enemy has made its appearance in Maine. It is a slender worm, about half an inch long, striped with greenish-white and dark stripes. When jarred, they spin down and hang by a fine thread. They move about by rapid crawling. They eat leaves, buds, and fruit indiscriminately. They are unlike the canker-worm or any other known to the oldest inhabitant.

The latter worm has done a great deal of damage this year in Connecticut and Massachusetts. In a recent trip through portions of these States, we saw many apple trees that looked as brown as though killed by fire. They also attacked many other trees, particularly elms.

The Shingle Trade of Chicago is enormous, amounting last year to over 77,000,000. The increase this year has thus far been 25 per cent., and it is quite safe to estimate this year's business at over 100,000,000. They are shipped to the West and South in great quantities, thus furnishing freights for canal-boats, and increasing the canal revenue.

The River Amazon is likely to be opened to steam navigation much sooner than was expected; and if it is freely opened, it will be the great event of the day. General Echenique, the President of Peru, has already taken steps, on behalf of that Government, to put on the Amazon two iron steamers, each to cost about $100,000, whose business is to be the exploration of the river and its branches. All nations are to enjoy the benefit of this trade and commerce. The Emperor of Brazil, we are gratified to learn, so far from resisting this Peruvian movement, is coöperating with it. He has conceded a national Company the right of navigation, with certain privileges, in conjunction with Peru. The Company was to commence its work in May last; and although we have no definite information that it has really begun, yet there seemed to be no doubt that it was intended to go into operation either in June or July.

The Potato Rot.—Professor Bollman, a Russian Councillor of State, has published a work on the prevention of potato rot. He discovered accidentally, and has subsequently verified by experiment, the fact that seed potatoes thoroughly dried will produce a sound crop. The *Courier*, which gives an account of this discovery, says:

"The temperature required to produce the desired result is not very clearly made out. Mr. Bollman's room in which his first potatoes were dried was heated to about 72°, and much higher. By way of experiment, he placed others in the chamber of the stove itself, where the thermometer stood at 136°, and more. He also ascertained that the vitality of the potato is not affected, even if the rind is charred."

Cherokee and Beaver Copper Mines.—Mr. J. D. Whitney, the geologist, has made a report upon the Cherokee and Beaver copper mining locations, situated in Polk county, Tenn. The distance of these mines from market has thus far prevented the working of them, but this difficulty is about to be obviated by making a road to Cleveland, on the East Tennessee and Georgia Railroad, when the ores will have but 35 miles of carriage by wagon. The deposit of black oxide of copper on these locations Mr. Whitney says he has never seen equalled in any other location. At the Hiwassee Mine this black ore is said to be 45 feet in width, and averages about 2 feet thick. Beneath this is the undecomposed ore. Should this black oxide prove to average 10 feet only in width, it would yield 6,300 tons to the mile, worth $750,000. Mr. Whitney's report says:

The *Cherokee Company's* location is the one next south of that of Tennessee, and has the same vein extending through it for a distance of about three quarters of a mile. The tract contains about 400 acres. The outcrop of *gossan* is as well defined as any where on the vein, and appearances indicate that the vein is as well developed on this location as on those farther north. These are very favorable situations, where the work of mining can be carried on with small cost by driving in levels on the side of the ridges at right angles to the course of the vein. Such a one has been commenced near a small saw-mill at the base of the ridge, and has been carried in about 80 feet, but not sufficiently extended to develop the character of the vein.

Agricultural Premiums in Vermont.—The amount of premiums offered by the Vermont State Agricultural Society, at its next annual Fair in Montpelier, Sept. 13, 14 and 15, 1853, is $3,401: On horses, $721; cattle, $638; sheep, $414; swine, $146; poultry, $24; dairy, $93; maple sugar, $35; honey, $13; manure, $25; field crops, $187; fruit and fruit trees, $76; vegetables, $26; ploughing, $136; farm implements, $100; domestic manufactures, $37; essays, $101; discretionary premiums, $600.

Reducing Bones for Manure.—The *American Farmer* gives the following method of reducing crushed bones without sulphuric acid:—Mix two bushels of ashes and one of salt with each bushel of crushed bones; moisten the bones first, and leave the whole in pie four or five weeks before using the mixture, shovelling it over two or three times during that period.

The above process will answer very well for soils deficient in soda, chlorine, potash, and phosphate of lime; but for soils deficient in sulphuric acid, as most soils are, we should prefer dissolving the bone, and then adding the other constituents if required.

Charcoal for Swine.—It is perhaps not generally known that one of the best articles that can be given to swine, while in preparation for the tub, is common charcoal. The nutritive properties are so great, that they have subsisted on it without other food for weeks together. Geese confined so as to deprive them of motion, and fattened on three grains of corn per day and as much coal as they can devour, have become fat in eight days. The hog eats voraciously after a little time, and is never sick while he has a good supply. It should always be kept in the sty, and be fed to the inmates regularly, like all other food.

How to make Crayons.—Every school room has, or should have, black boards. On these, chalk is almost universally employed. There are many objections to the use of chalk, not the least of which is, that after a problem is performed, the fingers and clothing present a *dirty white* appearance. Crayons are far preferable. Could they be generally employed, it would be a favor done to some delicate hands, to say nothing of a large amount of wearing-apparel.

White crayons may be made of Paris white or Spanish white, which are nearly the same, and wheat flour and water. The correct proportions are: five pounds of Paris white, one pound of flour, and sufficient water to make a dough of these materials, hard enough not to crumble, and soft enough to roll. Little balls of this are then rolled out into cylinders about the size of a pipe-stem, and laid away in a warm place, or in the sun, to dry; the drying will generally require from 12 to 24 hours.

The process of rolling may be performed upon a table, or any flat board. This article is far superior to chalk.

Fattening Animals.—The Shakers of Lebanon, N. Y., say, after an experience of thirty years, that in fattening swine upon Indian corn, one third is saved by grinding into meal, and that one fourth is saved by cooking—boiling it. This, as we understand it, makes a saving of one half, which is probably somewhat exaggerated, but the saving is no doubt considerable. There can be no doubt that, on all farms where there are considerable numbers of cattle and swine to be fed, a mill and boiling apparatus, though they may be a little costly at first, would ultimately, and soon, indeed, reimburse all the expense. Grind and boil, we say, therefore, to all farmers. The apathy that prevails upon this point in general is very strange. Farmers are generally slow in adopting improvements in agriculture and agricultural implements, and comparatively few feed their cattle on cooked food, while some kinds of it are almost as grateful to the quadruped as to the biped, his lord and master.

Illustrated Record of the Industry of all Nations. Nos. 1 and 2. Large quarto. G. P. Putnam & Co. pp. 20. 25 cents.

A double number of this elegant journal is now issued. It is filled with well-engraved illustrations (forty-two in number) of objects of interest to be found in the Crystal Palace, with remarkably good descriptions of each. Every thing about it is in good taste, and is worthy of the publishers and worthy of the Exhibition. Subscribe for it at once, and encourage a commendable object, while you enable the publishers to present a permanent memorial of this great collection, that shall itself do honor to the artists engaged upon it, and at the same time secure a volume that will be an ornament to your library and to your table, and a fund of entertainment in years to come. There will be twenty-six numbers and a supplement. Mr. Putnam's address is 10 Park Place. Mr. P. has also a Catalogue of the various articles to be found in the Crystal Palace, so arranged and numbered that any one of them can readily be found. It is of great convenience to any one who wishes not to overlook that in which he has especial interest, and which he might otherwise pass by without noticing its presence.

NEW-YORK IN THE SUMMER OF 1853.

For the benefit of our friends from a distance, we give below a list of a few of the more prominent and interesting features presented by our city. We cannot begin better than by referring to Castle Garden and Madame Sontag. The corps of operatic artists which Madame Sontag has engaged is of the very highest order. In herself she is a host, as we have often repeated. But her assistants form a host seldom equalled in any country. Signora Steffanoni is the best operatic soprano we ever had in this country before the arrival of Madame Sontag. Madame Patti Strakosch has lost none of her power in her temporary absence from the stage. Salvi is the most wonderful tenor. He was one of the chief attractions in the celebrated Havana company that so delighted us a few years since; and no man on the continent pretends to be his equal in that department. Badiali wears his honors alike untarnished. Rossi and Benevantano would be distinguished in any other company, and the minor parts are represented with uncommon ability.

Madame Anna Thillon, at the Broadway, attracts crowded houses as ever, but we cannot speak of her from our own knowledge.

The Dusseldorf Gallery of Paintings presents attractions unrivalled in that department. The pictures are numerous, and the entertainment suited alike for the day or evening.

Sattler's Cosmoramas, near Union Park, are admirably painted representations of the most striking views on both continents. Here is something for an entire half day, which will insure perfect satisfaction.

The Bryan Gallery of Christian Art is a collection of paintings, forming an historic series from the commencement of the Christian Era. Such is the description given us by friends who have seen it, and who pronounce it abundantly worthy of attention.

The Velasquez is one of the best specimens of portrait-painting to be seen in this or any other country.

Latting Observatory.—The view from this, the loftiest tower on the continent, we believe, is admirable. The whole of New-York and the adjacent country, the North and East rivers, with the cities and villages which almost cover the adjoining territory, lie before you as on a map. The view is assisted by two or three telescopes.

The Hippodrome, the Circuses and Theatres, and Barnum's Museum, *last but not least*, open their doors for the entertainment of the citizen and the stranger.

The view from Trinity Church Spire is perfect in its way; Broadway, extending under your feet, like a ribbon, for two and a half miles, to Union Square, being seen at a glance.

The Cemeteries, especially that at Greenwood, present attractions of a different character, but not inferior nor less worthy. Stages run the whole distance, and carry and return you for a shilling, after crossing the ferries.

High Bridge, near Harlem, is well worth a visit.

The public institutions of the city are worthy of notice, according to the tastes and the time to be devoted to such objects.

List of Patents issued from June 21 to July 5, 1853.

Barnabas H. Bartol, of Philadelphia, Pa., for Improvement in Refrigerators for Cooling Liquids. Patented in Cuba.

Horatio Clarke, of Dedham, Mass., for Improvement in Bobbins.

Christopher Duckworth, of Thompsonville, Conn., for Improvement in Shuttle-box Motion in Looms.

Horatio N. Goodman, of New-Haven, Conn., for Improvement in Melodeons.

Daniel H. Hovey, of Kilborn, Ohio, for Improvement in Machines for Twisting Waxed-ends.

Edmund Morwood and George Rogers, of London, England, for Improvement in Coating Lead with Zinc. Patented in England.

Levi S. Reynolds, of Indianapolis, Ind., for Improvement in Bran Dusters.

Christian Sharps, of Hartford, Conn., for Improvement in Percussion Pellets. Patented in England.

E. E. Shepardson and Edwin Lucas, of New-Bedford, Mass., for Improvement in Tuning Melodeons and other Reed Instruments.

Lauren Ward, of Naugatuck, Conn., administrator of Richard Ward, deceased, of same place, for Improvement in Machines for Turning Irregular Forms.

James Foster, Jr., and Platt Evans, Jr., of Cincinnati, Ohio, for Improvement in Metallic Boxes for Presses, &c.

Amzi C. Semple, of Cincinnati, Ohio, assignor to William C. Semple, of same place, for Improvement in Presses.

Napoleon B. Lucas, of Otter Creek, Ill., for Improvement in Threshers and Separators of Grain.

Alanson Abbe, of Boston, Mass., for Improvement in Instruments for correcting Lateral Deviations of the Spine.

J. Cross, of New-London, Ohio, for Improvement in Brushes.

A. M. Day, of Bennington, Vt., for Improvement in Clavicle Adjusters.

George H. Hazlewood, of Boston, Mass., for Improved Cradle and Tête-à-Tête.

Chas. W. Lancaster, of New-Bond st., England, for Improvement in the manufacture of Cannon and other Fire-arms. Patented in England.

Thos. L. Mitchell, of Birkenhead, England, for Improvement in Propelling Vessels. Patented in England.

John North, of Middletown, Conn., for Improvement in Trusses.

Wm. Porter and Edward A. Tuttle, of Williamsburg, N. Y., for Improvement in Lanterns.

Amzi C. Semple, of Cincinnati, Ohio, for Improvement in Paddles for Vessels.

Noah J. Tilghman, of Salisbury, Md., for Improvement in Crow Killers.

The Plough, the Loom, and the Anvil.

PART I.—VOL. VI. SEPTEMBER, 1853. No. 3.

FREE TRADE AS AN EXPERIMENT.

WE must confess that our veneration for the principles of trade which are advocated and acted upon by Great Britain is becoming less and less, as our reading and observation are more extended. In her journals, and in conversation, we have often met with the remark, that "England has proved the exellence of free trade by actual experiment." She has proved the excellence of free trade, sure enough, but where, in what sense, and to whose advantage, and with what results? She has proved this: that when she has crowded her cities and towns with spindles, and mules, and looms, and other forms of mechanical inventions, and, by a series of measures planned and contrived for that end, has lowered the prices of manual labor, at home and in her colonies, and has restricted and even utterly prohibited the right, and taken away even the ability, to manufacture from all her dependencies; then she "has proved" that free trade, either in the rough product, in her own ports, and in breadstuffs, which are so essential to her starving thousands, will produce a favorable result *to herself* at home; the one in increasing the importation of raw materials, which can be wrought into various fabrics, and the other in enabling those starved thousands to buy moderately of the flour of this and other countries at a price not quite so far beyond their reach as it otherwise would be. This, we admit, is proved, and this is all that is proved, in respect to the benefits that have in fact resulted from free trade in England.

Were our mills, and furnaces, and forges, and other appliances of manufacturing industry, in successful action, our laborers in those departments thoroughly taught in their several trades, and abundantly supplied with raw materials for manufacture, while they were almost starved for want of bread, we too might be disposed to open our ports, and invite the wheat, and rice, and sugar, and other kinds of food produced in other countries, into our harbors, and by the reduction of duties do what we could to place these articles within the reach of the sufferers. We should then do just what England has done—no more and no less.

We are sure that our countrymen are too intelligent to be duped by names and forms while things constitute the essentials. "Free trade" upon the statute book is one thing among nations and tribes who have ability to engage in it, and quite another thing when the local administrations, under the resistless power of the Imperial Parliament, actually forbid them to keep in their possession the machinery which is indispensable in engaging in any trade. For example: Of what benefit to the poor East Indian that the ports of Great Britain are free for all the manufactured goods he can send there, provided they tax his materials and his tools for making the requisite machinery, and then tax the machinery so exorbitantly as entirely to consume all possible profits that can be anticipated by his labor and traffic? And is it not "adding insult to injury" thus to tie up a man's hands, and then, with an air of self-complacency for his own unexampled generosity, bid him work in any way that may suit his inclination? Such will be found an essential element in the boasted liberality of British free trade.

Are there any of our intelligent readers who suppose that there is a real and available liberty among the colonial people of Great Britain to carry on free trade in looms and in spinning-jennies, or in exporting from their own soil and importing into England wrought goods and manufactures? Can the people of India manufacture for themselves or procure from "home," from Birmingham, or other city of England, such implements for their own use, so that they could manufacture the cotton they grow into cloth for their own consumption, for their own wives and children; still less, so as to compete with English manufacturers on English soil? Can the people of Jamaica expend profitable labor on their own sugars? Can Ireland manufacture and export cloth and glass at her pleasure?

Mr. Carey observes on this subject:

"The negroes of Jamaica have never been permitted to apply their spare labor even to the refining of their own sugar, *nor are they so at this day.* They must export it raw; and the more they send, the lower is the price and the larger the proportion taken by the Government—but the poor negro is ruined. Spain, on the contrary, permits the Cubans to engage in any pursuits they may deem most likely to afford them a return to labor and capital; and, as a necessary consequence of this, towns and cities grow up, capital is attracted to the land, which becomes from day to day more valuable, labor is in demand, and there is a gradual, though slow, improvement of condition. The power to resort to other modes of employment diminishes the necessity for exporting sugar, and when exported to Spain, the producer is enabled to take for himself nearly the whole price paid by the consumer, the Government claiming only a duty of 15 per cent.

"The Hindoo, like the negro, is shut out from the workshop. If he attempts to convert his cotton into yarn, his spindle is taxed in nearly all of the profit it can yield him. If he attempts to make cloth, his loom is subjected to a heavy tax, from which that of his wealthy English competitor is exempt. His iron ore and his coal must remain in the ground, and if he dares to apply his labor even to the collection of the salt which crystallizes before his door, he is punished by fine and imprisonment. He must raise sugar to be transported to England, there to be exchanged perhaps for English salt. For the sugar, arrived in that country, the workman pays at the rate perhaps of forty shillings a hundred, of which the Government claims one third, the ship-owner, the merchant, and others, another third; and the remaining third is to be fought for by the agents of the company, anxious for revenue, and the poor ryot, anxious to obtain a little salt to eat with his rice, and as much of his neighbor's cotton, in the form of English cloth, as will suffice to cover his loins."

See too what was quoted on the position of Ireland, in reference to this point, on the 71st and 72d pages of our August number.

Many of our public men have urged a "tariff for revenue," in distinction from a "tariff for protection." The unsoundness of this distinction, as a matter of *principle*, is admitted by a writer in a recent number of Hunt's able journal; but if any one wishes to see the effect of free trade carried out, in taking away from a nation its resources, and demanding heavy direct taxes, he may see it in the well-ascertained effects of this "British free trade," as carried out in Turkey. We again quote from p. 120 and onward of Mr. Carey's new work on the Slave Trade:

"By the terms of the treaty with England in 1675, the Turkish Government bound itself to charge no more than 3 per cent. duty on imports,* and as this could contribute little to the revenue, that required to be sought elsewhere. A poll-tax, house-tax, land-tax, and many other direct taxes, furnished a part of it, and the balance was obtained by an indirect tax in the form of export duties; and as the corn, tobacco, and cotton of its people were obliged to compete in the general markets of the world with the produce of other lands, it is clear that these duties constituted a further contribution from the cultivators of the empire in aid of the various direct taxes that have been mentioned. So far as foreigners were interested, the system was one of perfect free trade and direct taxation.

"For many years Turkey manufactured much of her cotton, and she exported cotton-yarn. Such was the case so recently as 1798, as will be seen by the following very interesting account of one of the seats of the manufacture:

"'Ambelakia, by its activity, appears rather a borough of Holland than a village of Turkey. This village spreads, by its industry, movement, and life, over the surrounding country, and gives birth to an immense commerce, which unites Germany to Greece by a thousand threads. Its population has trebled in fifteen years, and amounts at present (1798) to four thousand, who live in their manufactories like swarms of bees in their hives. In this village are unknown both the vices and cares engendered by idleness; the hearts of the Ambelakiots are pure and their faces serene; the slavery which blasts the plains watered by the Peneus, and stretching at their feet, has never ascended the sides of Pelion, (Ossa;) and they govern themselves, like their ancestors, by their protoyeros (primates, elders) and their own magistrates. Twice the Mussulmen of Larissa attempted to scale their rocks, and twice were they repulsed by hands which dropped the shuttle to seize the musket.

"'Every arm, even those of the children, is employed in the factories: while the men dye the cotton, the women prepare and spin it. There are twenty-four factories, in which yearly two thousand five hundred bales of cotton-yarn, of one hundred cotton-okes each, were dyed, (6,138 cwts.) This yarn found its way into Germany, and was disposed of at Buda, Vienna, Leipsic, Dresden, Anspach, and Bareuth. The Ambelakiot merchants had houses of their own in all these places. These houses belonged to distinct associations at Ambelakia. The competition thus established reduced very considerably the common profits; they proposed therefore to unite themselves under one central commercial administration. Twenty years ago this plan was suggested, and in a year afterward it was carried into execution. The lowest shares in this joint-stock company were five thousand piastres, (between £600 and £700,) and the highest were restricted to twenty thousand, that the capitalists might not swallow up all the profits. The workmen subscribed their little profits, and uniting in societies, purchased single shares; and besides their capital, their labor was reckoned in the general amount; they received their share of the profits accordingly, and abundance was soon spread through the whole community. The dividends were at first restricted to 10 per cent., and the surplus profit was applied to the augmenting of the capital, which in two years was raised from 600,000 to 1,000,000 piastres, (£120,000.)'

* Equivalent to light port-charges, the anchorage being only sixteen cents per ship.

"'It supplied industrious Germany, not by the perfection of its jennies, but by the industry of its spindle and distaff. It taught Montpellier the art of dyeing, not from experimental chairs, but because dyeing was with it a domestic and culinary operation, subject to daily observation in every kitchen; and by the simplicity and honesty, not the science of its system, it reads a lesson to commercial associations, and holds up an example unparalleled in the commercial history of Europe, of a joint-stock and labor company, ably and economically and successfully administered, in which the interests of industry and capital were long equally represented. Yet the system of administration with which all this is connected is common to the thousand hamlets of Thessaly that have not emerged from their insignificance; but Ambelakia for twenty years was left alone.'*

"At that time, however, England had invented new machinery for spinning cotton, and, by prohibiting its export, had provided that all the cotton of the world should be brought to Manchester before it could be cheaply converted into cloth."

It is useless to multiply words upon such a topic. These facts stand out palpably, and are not denied. There are, indeed, other reflections which the facts connected with this subject are calculated to excite, and one among these the moral effects, we purpose to elucidate at an early day. But for the present, and in reference to the *economical* bearings of the subject, we beg leave to copy a very important question propounded by the London *Times* in reference to Ireland, from which all mechanic and manufacturing arts are prohibited by enormous taxes or else by direct legislation:

"How are the people to be fed and employed? That is the question which still baffles an age that can transmit a message round the world in a moment of time, and point out the locality of a planet never yet seen. There is the question which founders both the bold and the wise."

What will be the ultimate result of the FREE TRADE which is permitted to the people of this country in competition with English manufactures, when such reforms are introduced into that country as the condition of her working classes imperatively demands, yet remains to be seen. We have recently stated, and more than once, that at this day British soldiers, in Calcutta, are clothed with Lowell cottons. In our view this is at least ominous.

How any one can persuade himself that English diplomatists can have one object and aim in their system of *colonial* trade, and another and antagonistic aim in their policy towards foreign governments, we are not wise enough to discern; and if England's commercial policy is to build up domestic industry at the price of the ruin of her own colonies, much more must this be her intent in her foreign policy! We only add that it is not often, in individual contests, we hear those parties which have the advantage in position, and are thereby peculiarly *protected*, calling out for "a fair field and equal rights."

We append to these statements of Mr. Carey and others, a recent account given by the Bombay *Times*, in reference to the present condition of India, and its causes. The editor says:

"We have famines occurring almost decennially, some of which, within our time, have swept their millions away. In 1833, 50,000 persons perished in the month of September in Lucknow; at Khanpoor, 1,200 died of want; and £500,000 were subscribed by the bountiful to relieve the destitute. In Guntoor, 150,000 human beings, 74,000 bullocks, 159,000 milch cattle, and

* Beaujour's Tableau du Commerce de la Greece, quoted by Urquhart, 47.

300,000 sheep and goats died of starvation. Fifty thousand people perished in Marwar; and in the North-west Provinces, 50,000 human beings are supposed to have been lost. The living preyed upon the dead. Human imagination could scarcely picture the scenes of horror that pervaded the land. In twenty months' time, 1,500,000 persons must have died of hunger, or of its consequences.

"The direct pecuniary loss to the Government, by this single visitation, exceeded £5,000,000 sterling—a sum which would have gone far to avert the calamity from which it arose, had it been expended in constructing thoroughfares to connect the interior with the sea-coast, or districts where scarcity prevailed with those where human food was to be had in abundance; or on canals to bear forth to the soil, thirsty and barren for want of moisture, the unbounded supplies our rivers carry to the ocean.

"Nearly seventy years since, Burke, in one of his speeches, said, in substance, this:

"'The Barbarians and Mussulman conquerors of India have left behind them some monument of their glory or munificence; but if the English Government should be withdrawn from India this hour, it would leave behind it once fertile and populous provinces, fit residences only for the tiger and ourang-outang.' Matters have grown worse since the time of Burke.

"The policy of the India Government has been remorselessly cruel and selfish: that Englishmen might grow rich, and go home before an Eastern climate should break them down; that a monopoly for English goods might be established in the India markets; that Christians in Manchester and Calcutta might thrive at the expense of the East India Pagan, the commerce of the East Indies has been annihilated, her manufactures destroyed, the importation of machinery prohibited, the artisan and mechanic driven from the side of the ploughman, and the whole people forced into the single pursuit of agriculture. The taxes have been without parallel for enormity: the land-tax takes from 50 to 80 per cent. of the produce of the land, and the aggregate of taxes has not diminished since Burke charged that it amounted to eighteen shillings in the pound.

"Under this revenue and commercial system, the same system in part which made a wholesale slaughter of the West India negroes, India has gone down lower and lower in physical, moral, and intellectual being. Towns and cities, once populous, busy, and thriving, are in ruins, overgrown by the jungle; lands once yielding a handsome income have been abandoned; the comforts which the Barbarian and Mussulman spared are unknown in the records of the present generation; and provinces yielding two harvests annually have been cursed with famines increasing in intensity and frequency.

"According to the English authorities, one famine in one province of India swept 500,000 victims to the grave. Corpses lined the roads and swelled the waters of the rivers; mothers threw their children into the Ganges rather than that they should stiffen in their arms; the dead and the dying were moved from under the wheels of the Governor-General's carriage as he went on his progress of investigation; carrion-birds gathered by tens of thousands to the horrid carnival; and this was in the reign of Victoria the First! Misery, ignorance, and crime in the British East Indies are in proportion to the time the country has been held by British arms. The older the province, the more profound the degradation, the more intense the wretchedness.

"The poverty of the country diminished the revenues: the revenues must be kept up, no matter the cost. Hence new provinces are conquered and annexed; hence the infernal trade in opium. The best lands were appropriated to this purpose; their owners were told they must abandon the land or raise the poppy. They were forced to sell at the prices and to the traders the Government designated. The traders were in their turn taxed so much a chest. The Government gathered in about £15,000,000 revenue; and the opium, forced on China, killed and still kills 400,000 Celestials annually.

"Such is British India. God alone is powerful enough to raise her up from that profound depth where cupidity has sunk her. It is a task too great for Mrs. Sutherland, the reason probably for the inaction of that philanthropic lady."

We add but one more extract, and that is by Sir Thomas Moore, (Rambles, vol. 1, p. 4,) quoted by Mr. Carey on p. 164 of the work already cited. It shows what India was and might still be, but for the principles and practices of the British Government:

"I do not exactly know what is meant by civilizing the people of India. In the theory and practice of good government they may be deficient. But if a good system of agriculture,—if unrivalled manufactures,—if a capacity to produce what convenience and luxury demands,—if the establishment of schools for reading and writing,—if the general practice of kindness and hospitality,—and above all, if a scrupulous respect and delicacy towards the female sex are amongst the points that denote a civilized people,—then the Hindoos are not inferior in civilization to the people of Europe."

This eminent author has furnished numerous proofs of the general order, neatness, and thrift of the people of India at the time he wrote. We omit them here for want of room. Let these descriptions be contrasted with those given by residents and travellers at the present time.

AMERICAN CLOCKS.

The manufacture of clocks in this country has grown into a business of vast magnitude. We have recently seen in the Boston *Traveller* an historical sketch of this business, which is interesting in various particulars, not the least of which is the exhibition which it gives of *individual* enterprise. This, of course, must always underlie every important enterprise, or it will come to naught. We give below a pretty full abstract of the account referred to. The writer, Dr. William Alcott, says:

"Forty-five years ago, a plain man, of few words, but great mechanical ingenuity, purchased an old grist-mill in Plymouth, at the south-eastern extremity of Litchfield county, Connecticut, and converted it into a wooden clock factory. Wooden clocks had indeed been made long before that time, by Leonard Harrison of Waterbury, Gideon Roberts of Bristol, and perhaps others. They were, however, few in number, and sold at enormous prices. It was even said that the parts of some of those which were first made were cut out with the penknife. They were, many of them, inserted in long cases, reaching from the floor almost to the ceiling, and were at best made very slowly.

"The name of our taciturn Plymouth adventurer was Eli Terry. He proceeded to manufacture clocks, at his new factory, at the rate of several hundred, perhaps a thousand, a year. His *stream*, however, had many *tributaries*. All the forest hills and valleys for many miles around, in some directions from twelve to twenty, were ransacked by his neighbors for hard wood, such as laurel, (popularly *ivy*,) box-wood, sugar-maple, &c., whereof to make the wheels, pinions, and pillars; and from remoter regions they procured cherry and pine for other purposes. The fields also, far and near, were laid under contribution to furnish flax, whence the cords were made by which the weights were suspended. And then, again, the price of labor on the farms around was raised because so many young men were employed in connection with the factory, or in selling them in adjacent towns when made. Of these last individuals, ycleped clock-pedlars, some of the more bold and enterprising ventured abroad with their one-horse wagons fifty or one hundred miles from home, and sold their clocks at the amazingly low price of twenty-five or thirty dollars!

"The business now rapidly increased, and Mr. Terry was ere long able to manufacture more than a thousand clocks a year. The public mind in a Yankee county was not content that Eli Terry should make his thousands of dollars a year, while they only got an old-fashioned living at one dollar a day or so; and one after another, in the contiguous towns above mentioned, they found their way into the same business. The mania spread farther even than Bristol and Waterbury. It extended to Watertown, Litchfield, Harwinton, and Southington.

"Mr. Terry soon sold out his establishment to two enterprising young mechanics, who, after making such changes and adopting such improvements as enabled them to manufacture several thousand clocks yearly, at length separated, and each had a factory of his own. Mr. Silas Hoadley, one of the two, remained in the business several years, and also engaged in the manufacture of cutlery, but met with only partial success in his business. His former partner, Mr. Seth Thomas, in his new location, at a place called Plymouth Hollow, not only made himself extremely rich, but built quite 'a city.' He has done more good, as well as gained more money, than almost any other mechanic in that region. He has manufactured his thousands of clocks yearly, and, it is believed, in some years his tens of thousands, besides much cotton-cloth and other goods. The pioneer in the business, Mr. Terry, with his sons and other associates, continued to make clocks till the time of his death, which happened only a few years since, when at an advanced age. In a pecuniary view, he was more fortunate than most pioneers, though he was never so wealthy as some of those who succeeded him.

"Thirty years ago, Chauncey Jerome, of Plymouth, a young man of enterprise, also engaged in the business. Mr. Jerome, with his coadjutors, was destined, as a clock-maker, to eclipse all his predecessors. The price of clocks had indeed somewhat fallen before he commenced the business, but it was reserved for this gentleman to reduce it to three or four dollars.

"Mr. Jerome moved from Plymouth to Bristol nearly thirty years ago, where he remained till nine years ago, when he removed to New-Haven, where he still resides. He has had many reverses of fortune; but, like the fabled phœnix, that rises again from its own ashes, each reverse in his affairs has seemed only to increase his energies. He has probably manufactured as many wooden clocks as all the world besides. Of late, however, the material of his clocks has been of brass; but he *began* with wood, as did his predecessors and coadjutors. Besides his factory in New-Haven, which employs nearly a hundred and fifty hands, he employs another hundred in Bristol, Derby, and elsewhere; and his clocks are found all over the civilized world. He has a dépôt for them in Hanover street in Boston, as well as another in each of the cities of New-York, Liverpool, and London. Some of these are exceedingly beautiful.

"Mr. Jerome has for the last three years manufactured clocks at the rapid rate of more than five hundred a day. At this rate yearly, the product of his efforts would be *one hundred and fifty thousand clocks.*

"It is truly wonderful to observe what results sometimes follow from the efforts of a single individual. How many social circles in the older United States, California, Oregon, Peru, England, Continental Europe, Turkey, China, Hindostan, and even Australia, have been enlivened by the ticking of Jerome's clocks! Had but half as many circles been made mourners by his efforts; had he been, like Napoleon or Cæsar, the means of destroying hundreds of young men, the flower of their respective families, he might, ere now, have been lauded as a hero, if not crowned as an emperor. But to no such honors does he aspire. He seeks not his own glory in desolating the earth, but rather in making it a cheerful abode of cheerful men. May we not hope the time will come when the lives of such men as Terry, Thomas, and Jerome will attract more interest, whether written out or preserved by tradition and memory, than the lives of our warriors and conquerors?"

SHOE MANUFACTURE.

This has became a great business, and though every body is aware of this, very few are aware of the actual extent to which it is carried on.

In the State of Massachusetts, it is the second in importance, agriculture being the first. It has not only a greater number of persons engaged in it than any other handicraft, but it probably pays better. The Andover *Advertiser* has an article giving the statistics of this business, from which it appears that the aggregate value of boots and shoes manufactured in the State is estimated at $37,000,000; which equals the manufacture in all the other States combined, and exceeds that of any other manufacture in this Commonwealth, the item of cotton goods of all kinds amounting to but $12,103,449. Of the above value, $12,000,000 worth are annually shipped to New-York, where there are 250 boot and shoe warehouses, many of which sell from $100,000 to $1,000,000 a year, and three of them even exceed the highest sum named. The remainder, that are not used at home, are sent to the South and West, to California, the West Indies, South America, Australia, the Sandwich Islands, to England and the continent of Europe.

The sale of "findings," which does not include leather, employs thirty-eight firms in New-York city, and amounts to $600,000 a year. Most of the pegs used in this immense business are made in New-Hampshire, and one firm, it is said, manufactures fifty bushels daily. The pegs are cut by machinery. A machine has been invented recently to drive them in an incredibly short space of time, and another machine for sewing and stitching has come in use.

Lynn is engaged in this business more extensively than any other town. With a population of 14,257, the number of manufacturers is 144, and of operatives, 3,787 males, and 6,422 females; and the number of pairs made annually, 4,633,900; from 1840 to 1850, there were 707 dwelling-houses built, and the number of ratable polls almost doubled. Danvers, population 8,109; manufacturers, 35; operatives, 1,184 males, 693 females; pairs made, 1,123,000; dwelling-houses increased from 479 to 1,020, from 1840 to 1850, and the number of ratable polls in a similar proportion. Stoneham, population 2,885; manufacturers, 24; operatives, 415 males, 376 females; 850,000 pairs of children's shoes made annually. There is more than one male shoemaker to each family. In Grafton, one manufacturer uses 100 bushels of shoe-pegs per year.

The whole number of persons engaged in the business within the State, by the census of 1850, is 34,944.

WHOLESOME FOOD.

We took occasion, in the August number, to make some suggestions in reference to the treatment of calves and other animals, as having an effect upon the healthfulness of their flesh as food. We have since met with an article in the New-York *Tribune* bearing upon the same point, which we publish almost entire. With regard to its special references to Aldermen, &c., we have no immediate concern as agricultural journalists, but fear that no one has a right to complain of them while others, in all parts of the country, partake more or less in the same sin.

"Cattle Market Abuses.—The Grand Jury of Kings county are occupied with the discussion of a question of vast importance, which should be brought at once before the same body in this city. It is on the maltreatment of cattle by the drovers during their long peregrinations from the West, and by the butchers after they have arrived here.

"It is truly said, 'One half of the world do not know how the other half live,' and it is equally true that if one half knew what sort of food they eat, they would cease to live, through very disgust at what they feed upon. What think the beef-eaters of this city of the condition of their favorite food under these circumstances: First, they are confined in a crowded space five days on a steamboat, tossing over the waves of Lakes Michigan, Huron and Erie, with but little opportunity or disposition to eat or sleep, though in stormy passages with no lack of chances to drink. Then, by way of change, they are shut up in a railroad car three or four days longer, until almost exhausted in the hot sun, and, as has been proved, in some instances fifty-seven hours without water. Then they are allowed to drink till they look full and fat enough to stand another day in the cattle market, and endure all the hooking and pushing of infuriated beasts. Then they suffer all the punching and beating with clubs of their unfeeling owners and half-savage boys, who drive them through the streets, until they finally reach the pens of the abattoirs, either excited to madness, or so exhausted with want of food and rest, and consequent fever, that bullocks, once as lithe as deer, go like lambs to the slaughter, without resistance.

"We have, in fact, repeatedly stood by and seen them bow their heads to the fatal noose, with which they had just seen their prison-mates drawn up to the bullring, with looks and actions seeming to show that they understood their fate as well as the butcher could tell them, but deemed it a relief to their misery. After having been put up in the shambles, snuffing the blood of their fellows for three or four days without tasting food or water, their sufferings may be imagined.

"We have read of savage nations who fit their beef for eating by baiting the cattle to death with ferocious dogs. By this they are thrown into a state of high fever much more rapidly, and hence humanely, than by our steamboat, railroad, and butcher-pen process. But they were savages—we are civilized. They were heathen—we are Christians. Other nations fit their beef for human food by first binding the animal neck and heels, and then beating him to death with clubs. *This makes the meat tender. We have a different process of producing the same effect.* Theirs is barbarous—ours belongs to an enlightened and humane people, who live in the nineteenth century, and boast of their intelligence, and make laws to 'prevent cruelty to animals.'

"We do not allow a man to beat and misuse his horse, because, if he dies, the dogs may eat him. But we do eat beef, and we do not ask the question how it is prepared for our delicate stomachs.

"If such a singular phenomenon should ever happen in this city, that a Grand Jury should be disposed to ask whether cattle are treated quite as humanely as would be altogether acceptable in the sight of Him who made both man and brute, we hope they will send us a polite invitation to attend their investigation. In such case let them not be contented with mere hearsay evidence. Let them personally visit some of the places we can point out to them, where beef is prepared for a people so refined that they would be horrified at the public exhibition of cruelty to animals in the *plaza de toros*, but who pander to worse cruelties every day inflicted upon the animals whose flesh, after being duly prepared and spoiled, will be served up as their own daily food."

If any of our readers partake of these sins, in any form, we hope they will repent forthwith, and amend their ways. Something more than mere taste is concerned in these matters.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

NOTES FROM WISCONSIN.

[Our friend, who is already well known to our readers, has furnished us with an account of his new home in the West, with other useful information, which we give below.—Ed.]

"Vegetation here is more rapid, and matures in less time than in the Jerseys, where I had resided some sixteen years. I found plants in my new garden here even more forward than I had left at my residence there; and that although the spring does not commence perhaps quite so early here, yet when it has arrived, every thing runs to maturity almost at once. This spring has been one of great productiveness. Heavy showers at intervals have pushed forward the crops in an extraordinary manner; indeed, many of the old settlers tell me they do not recollect a season so promising and so fruitful. In some parts we have heard of the wet damaging the wheat, and a few spots are affected by it around us, but, I believe, not to any considerable extent in this vicinity.

"We are now extremely busy with our hay, which is a heavy crop with us. I have about thirty acres of marsh meadow, which will mow about two and a half tons per acre, and perhaps more. Some of it is intermixed with timothy and red-top grass, so that instead of having to buy hay, or grass to make into hay for the winter, as in Jersey, I have almost double what I want to mow for my own use. The winter grain, as also the barley, will be fit for cutting wi hin a few days, but the summer wheat does not ripen quite so early..

"We have all the extremes from heat to cold that I have ever experienced in any part of the States. The thermometer has been up to 100°, and then a few mornings afterwards the air has been bordering upon frosty, reminding me very much of the climate of Upper Canada, where I had formerly resided. Still the country here is healthy, and the heat by day is generally moderated by a cooling breeze, although heavy rains never leave the ground long wet, but are soon evaporated. The soil generally is of a dark, rich, and light nature, and although the surface soon becomes dry, yet the moisture is retained below, which prevents the crops from suffering. Our roads are beautifully smooth and soft, free from those rugged stones and rocks which jolt and rack a traveller so much in the more eastern States.

"This is a fine section for rearing and fattening all sorts of cattle, particularly sheep, which have now risen in price, owing to the value of wool, which this season has sold as high as fifty cents per pound. This rise in wool doubtless is occasioned by the short supply of that article from Australia, as numbers there have neglected their flocks and repaired to the gold mines. Horses and cows are now with us high in price, I hardly know why, while swine are comparatively cheap. A great deal of pork is raised here and put down for New-York and other markets.

"There are two things in which new States abound, namely, game and snakes. The former are a blessing. We have the quail in abundance, the snipe, the plover, and the rabbit. The prairie or Indian hen is a fine bird, and broods of them are now visible. The young ones have all the appearance of a young chicken, and can hardly be distinguished from them. Attempts have been made to hatch these eggs under a common hen, but it does not succeed, as they partake too much of a wild nature, and go off, as soon as they get an opportunity, and join their wild compeers upon the prairie.

"As it regards the snake tribe, there is no need to be apprehensive of them: some are venomous, and we meet with them in the hay and by the water-side, but most of them are small, and their numbers are diminishing every year, in the fulfilment of that enmity which the Creator has put between man and the seed of the serpent. The rattlesnake and the pilot are becoming scarce. It is said that the hog tribe devour greedily all they can get hold of.

"Of course society here is of all hues, but there is an abundance of pleasant, intelligent, and even city-like companions. Among the working classes you have Irish, Dutch, and the Norwegian, and yet we have a scarcity of hands, as all aim to get occupations of their own.

"Our residence is upon a bluff, at the foot of which flows the Catfish stream, which empties itself into the Rock river, both of which abound with fish, such as the pickerel, bass, pike, and the catfish, with other varieties. We have also the wild raspberry and the blackberry, also an excellent plum and the crab-apple; but at present I have not seen the wild cherry nor the whortleberry. There is also a species of black currant, and a small gooseberry which appears to be indigenous. We have many beautiful specimens of flowers growing wild upon the prairies, which would adorn our Eastern gardens. Among them are the tiger lily, Indian moccasin, wild sweet pea, and several varieties of the dwarf prairie rose, from the deep red to the pale white. There is seldom an evening that we do not hear the whip-poor-will's plaintive note, and in the daytime that of the moaning dove. There appears to be as much mystery about the former as there is about the English cuckoo, and no one appears to be able to describe it to you. The general opinion is, that it is a sort of hawk." R. S.

Fulton, Wis., July 16th, 1853.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

USEFUL PROBLEMS, &c.

Rules *for finding the quantity of water in any pipe of any length or diameter in gallons and lbs.:*

Feet High.	Contents in Inches.	Pounds Avoir.	Wine Gallons.
1	9.42	5.46	.0407
2	18.85	10.92	.0816
3	28.27	16.38	.1224
4	37.70	21.85	.1632
5	47.12	27.31	.2040
6	56.55	32.77	.2423
7	65.97	38.23	.2448
8	75.40	43.69	.3264
9	84.82	49.16	.3771
10	94.25	54.62	4.080
20	188.49	109.24	.8160
30	282.74	163.86	1.2240
40	376.90	218.47	1.6300
50	471.24	273.09	2.0400
60	565.49	327.71	2.4480
70	659.73	382.33	2.8560
80	753.98	436.95	3.2640
90	848.23	491.57	3.6700
100	942.48	546.19	4.0800
200	1,884.96	1,092.38	8.1600

This table only gives the contents of a pipe one inch in diameter, yet it will answer as a standard for pipes of any other dimensions, by observing the following rule:

Multiply the number found in the table against any height or length by the square of the diameter of the pipe of which you wish the contents, and the product will be the number of cubic inches, avoirdupois ounces, and wine gallons of water that given pipe will contain.

Examples.—How many wine gallons of water are contained in a pipe 6 inches diameter, and 60 feet long?

I find 2.4480 in the table against 60 under wine gallons, which multiplied by 36, the square of the diameter of the given pipe, I have 88.1280 wine gallons, the answer. Also for the solid contents, $565.49 \times 36 = 20357.64$ inches.

The wine gallon contains 231 cubic inches, and the imperial gallon 277.274 cubic inches; therefore, to reduce the wine to the imperial gallon, divide by 1.20032, which is obtained by dividing the cubic inches in the imperial by the cubic inches in the wine gallon; and for a like reduction of the ale, which contains 282 cubic inches, divide by 0.98324.

Recipe: Varnish for Toys.—Dissolve two ounces of gum mastic and eight ounces of gum sandarac in a quart of alcohol; then add four ounces of Venice turpentine. The addition of a little of the whitest part of gum benzoin will render the varnish less liable to crack.

A Cement for Iron Pipes or Wooden Logs used for Aqueducts.—Take 12 or 14 lbs. of fine cast iron filings or borings or turning chips, put them in a vessel with as much water as will just wet them through; mix with them half a pound of sal ammoniac, and two ounces of flour of sulphur; mix all well together, and let it stand three or four days; it is then ready for use: if not used immediately, cover it with water till used.

An Excellent Salve for a Green Wound.—Take one and a half ounces olive oil, two ounces white dracula, and two ounces bees' wax; let these ingredients be dissolved together, and the salve is formed.

Estaban.

THE HORSE.

THE NERVOUS SYSTEM—URINARY ORGANS—BREEDING, FRACTURES, AND SHOEING.

We add another to the series of reports of the lectures of Dr. Slade, at Boston, as given in the Boston *Traveller :*

"The nervous system of the horse, the lecturer remarked in opening, is the grand motive-power of the animal. It is centred in the brain and spinal marrow. The brain is very small in proportion to its bulk, contrasted with that of man. From the brain proceed cords called nerves, by which he receives pleasurable or painful feelings. To the eyes, the nose, the ears, we find these cords extending. Nerves of involuntary motion are those which are kept in action although the animal may be asleep. From the brain is also given off the spinal marrow, running through the spine and sending out into various parts of the body branches known as spinal nerves. Sympathetic nerves surround the heart and other vital parts.

"Neurotomy, or division of the nerves, has for years been practised on men, but only lately in veterinary science. The nerve is divided just above the fetlock joint often, to relieve pain in the foot.

"The urinary organs the lecturer next described. The kidneys are employed in separating the watery substance, and drawing from the blood the urine, which would prove highly injurious if allowed to remain. Dietetic medicines are often applied with great success in removing water from the chest, abdomen, &c. When applied, the horse should be allowed to drink all the water he pleases. Inflammation of the kidneys often occurs. The horse looks at his loins, separates his legs, and will not lie down. He also desires to urinate continually. Over-exertion, strains on the parts, exposure to wet, and the eating of burnt mown hay, or kiln-burnt oats, cause the disease. Sufficient care is not taken in this country to protect the loins of the horse when exposed in bad weather. The secretions of the horse differ very much at times.

"The urine, after being secreted by the kidneys, passes into the bladder, a small vessel, having a neck through which it escapes. The bladder is sometimes inflamed, both the body and the neck. Sometimes we find stone in the bladder and kidney, and sometimes by skilful physicians they are removed.

"The breeding of the horse is a subject of great importance. Nature has provided for the reprodution of the species, and from the month of April to July we find the female in 'heat,' when the genital organs experience a change which peculiarly fits them for breeding.

"The period of going with foal is from eleven to twelve months, although the time varies much in different mares. The mare is capable of reproduction at three or four years of age, and should not be used before that age. The animal also should not be too old, as the colt inherits much of the weakness of the mother, and lacks that stamina so requisite for a good horse. The peculiarities of both parents are inherited by the colt, and attention should be paid to the breed of both animals.

"'Breeding in and in,' or the production of colts from blood relatives, is favored by some, and by others deemed a depreciating process. The lecturer thought that breeding in and in did not deteriorate the good qualities of the horses, although there are often hereditary evils which crossing will remove.

The English blood-horse, the best in the world, is a cross between the native English and the Arabian. Crossing, when properly conducted, improves the animal, but when abused produces poor horses.

"Fractures, caused by blows, falls, and external violence, may sometimes be relieved by man. There are three kinds of fractures—simple, compound, and complicated. If old horses have their limbs fractured, it is of no use to attempt any relief. Horses with fractures, if rendered useless for work, can be sometimes profitably used in breeding. In most cases of fracture the animals should be killed.

"The shoeing of the horse was first introduced into England by William the Conqueror. Shoes are necessary, and yet subject the foot to the liability of many injuries. The removal of old shoes is a most important part of the process of shoeing. The clinched nails should be removed with care, and not wrenched out, as is often the manner pursued by our blacksmiths. Rasping is the next process, and removes all pieces of nails.

"Paring is a most important part of the operation, and few blacksmiths understand how to pare out skilfully. The heel should not be much pared, and good care should be taken of the bars. They should not be cut away, but should be respected. The portions between should be cut out. The frog should always be left on a level with the edge of the shoe. The selection of the shoe is also an important point, and often the foot is made to fit the shoe instead of the shoe the foot. The shoe should be bevelled out on the outer surface, and should fit exactly to the parts of the hoof, and for this purpose the shoe is applied hot, to show the parts necessary to be pared off to make it fit."

SWISS MODE OF MAKING CHEESE.

THE high reputation of Swiss cheese is well known. The following is the first of a series of articles on this subject, by Mr. C. L. Fleischmann, one of the editors of the *American Polytechnic Journal*, published in that work:

"The general mode of making cheese is nearly the same throughout Switzerland, with the exception of the Schabzeiger. The difference in quality and flavor of the various kinds of Swiss cheese is principally produced by the milk used for it. They make over-fat, fat, half-fat, and lean or dry cheese. The most celebrated throughout Switzerland is the Emmerthaler. The ordinary Swiss cheese, as it is brought into market, is made more or less of skimmed milk; we must not, however, forget that the milk of the Alps is of such a superior quality, that cheese made from skimmed milk after twelve hours' standing, is better than in many other places made from fresh milk. But it is an erroneous idea that the pastures of the Swiss mountains are of such excellent and extraordinary quality that it is impossible to produce Emmerthaler cheese any where except in Switzerland. Swiss cheese is now made in the south of Germany, and in some places in the north of that country, which is equally as good as the genuine Swiss cheese. It is true that the different kinds of fodder and management of the cows influence the character and peculiarities of the cheese; it varies even in Switzerland according to the locality of the mountains, and according to a higher or lower position of the pastures.

"The following is a description of the manufacture of *fat Swiss cheese*, which contains also the variations which must be observed in the manufacture of the over-fat, lean, or dry cheese:

"The fresh milk, after it has been strained over a bunch of rushes, (*equiseto palustre,*) is put in the caldron, and in summer gradually heated to 90 to 100 deg. Fah.; in cold weather the temperature is raised higher. The Swiss dairyman ascertains the right degree of heat by immersing the upper part of his arm into the milk. He is not always correct as to the exact degree of temperature; but a few degrees, more or less, does not affect the quality of the cheese. It is, however, a fault to make the milk too warm, because it causes the cheese to get hard. The milk fresh from the cow has the right temperature for making cheese. The richer the milk, the higher must the temperature be raised; for lean cheese the milk requires less heat. For over-fat cheese, cream is added, or evening milk with its cream is mixed with morning milk. The cream is taken from the evening milk and is heated separately, and carefully mixed with milk already in the caldron. For *half-fat* cheese, the evening milk is skimmed on the following morning, and also the morning milk, after it has been standing for two or three hours; both the evening and morning skimmed milk is made into cheese. For *lean* cheese, the Swiss take milk of which one half of it has been skimmed after twelve hours', and another half of it after twenty-four hours' standing. As soon as the milk has reached the proper degree of heat, the necessary quantity of rennet is added, well mixed with the milk, and the caldron removed from the fire and left quiet.

"The quantity of rennet depends upon its quality, as well as upon the quality of the milk, and the temperature which the latter has obtained; and it is consequently difficult to determine the exact quantity. The richer the milk is in cream or cheese, the greater must be the quantity of rennet; therefore more is required in summer than in winter; the warmer the milk, the less rennet is necessary. It may be that a quantity of rennet equal to the five-hundredth or thousandth part, or thereabouts, of milk is required. Experience is the only guide in this operation. When the dairyman is not sure of the efficiency of the rennet, he must try it in the following manner: some milk is taken from the caldron and mixed with a few drops of rennet, and watched if it curds within five minutes; if it requires longer time, or it does not coagulate at all, more rennet must be added, and continued until it is ascertained how much is necessary. But in all cases care should be taken that not too much rennet is employed, because the cheese obtains a bitter taste, gets brittle, and swells. It is much better to take less rennet; and should the milk not curd within a proper time, it requires only a weak addition of rennet to effect the perfect coagulation; yet it must be understood that too small a quantity of rennet does not curd the milk at all, and that in hot weather, and especially when the atmosphere is much charged with electricity, or at the time of a thunder-storm, the operation ought to be hastened, so that the milk does not get sour before the artificial separation of the curd takes place. After ten or fifteen minutes, the milk should be perfectly coagulated. The Swiss, immediately after the rennet is put into the milk, place a wooden trowel upon the surface of the milk, and after five or six minutes the trowel is removed; and when it leaves a distinct hollow mark, it is a sign of a perfect coagulation; but if the milk has not coagulated after twenty minutes' time, there must be one third or one fourth of the original quantity of the rennet added, and the temperature of the milk raised a few more degrees. When the milk is properly coagulated, the Swiss dairyman describes near the rim of the caldron, with a long wooden knife, a circle, and passes the knife down perpendicularly through the whole curd. The distance from the rim where the circle is to be made, is about one third of the whole diameter of the caldron. When the curd is cut through in the manner described, the middle portion, separated from the outer part near the sides of the caldron, is gradually turned with a wooden trowel in such a manner that the bottom part comes to the top. This operation, simple as it may appear, requires much practice and a powerful arm to accomplish it; the object of it is to bring all impurities which settle on the bottom during the time the coagulum forms, to the top to remove them. The curd is then carefully broken up, first with the curd-sword and afterwards with the trowel; he continues this operation with the hand, and at last uses the cheese-breaker. This simple instrument is made of a young pine stem, on which the limbs are left at a convenient length, and the bark nicely taken off. It is very important that the curd be divided into as many particles as possible, because the more it is broken up, the better will be the cheese; this operation must be continued at least for a quarter of an hour. About the time when the cheese-breaker is to be used, the mass gets somewhat cold; the caldron is again placed over the fire and the breaker diligently applied, in the beginning slow, but faster as the heat increases; it is continued about five minutes, or till the mass has acquired a temperature of about 100 deg. to 120 deg. Fahr. The dairyman then continues the breaking up with the hand, to make the division of the curd as perfect as possible.

"The increase of temperature has also the object to make the curd somewhat tougher, in order to be easier formed into a ball."

ROOT-GRAFTING.

The subject discussed in the article below is a very important one, and few have had more experience in it than Mr. Hovey. He had elsewhere expressed an unfavorable opinion of root-grafting, and being called upon by Mr. Barry, of the *Horticulturist*, for the reasons of this opinion, he expresses himself in his magazine as follows:

"First, let us say a few words in regard to the means we have had of making up our opinion. In 1840 we commenced purchasing apple trees, with a view to forming a collection of every variety in the country. We continued to buy, and are still buying when we can get a new kind, and we now have in bearing upwards of one hundred sorts, and about two hundred more which, to use a common phrase, promise well. We had trees from various parts of Western New-York and Ohio; nearly all of them were root-grafted; the others, from our own State and from New-Jersey, were stock-budded or grafted, but mostly budded, and they now form our finest trees; but of the Western ones, about one half of them look, to this day, in poor condition, not yet able to stand up straight without a stake, and if that is taken away, some of them will fall over almost of their own weight. Buds taken from trees the first year after receiving them, and put into good stocks, are three times as large in five years. In fact, some of the former have come to a stand-still, and are not worth transferring from the nursery row where they were put when first received, to gain strength. These are facts which any one who will take the pains to look can see at any time.

"The explanation we take to be this—that many kinds of apples are naturally weak or slender growers; they are root-grafted, and, when transferred to their own roots, which they will be in a year or two, they still remain weak. Mr. Barry knows the theory of this very well. How long is it since he found out the value of a *new fastigiate* or *upright quince*, which was to make the best stock in the world for the pear? it grew so rapidly, propagated so readily, &c. Why the best stock? Because, as he said, it imparted vigor to the scion. Mr. Barry knows that cultivators always take thrifty-growing camellias for cuttings on which to march or graft the weaker ones; root-grafted would be no better than cuttings, as the plants would soon establish themselves. Some azaleas, like *Indica variegata*, are hard to keep alive on their own roots, but grafted in the *Phœnicea*, they thrive almost as well as the stock. The practice of making standard trees of small shrubs is on the same principle. A root-graft of a weeping elm would never make a good tree; but a stock-graft soon produces one. The explanation is so simple that we are surprised at the question. The R. I. Greening and Roxbury Russet are slow-growing, low-headed trees—hence they do not do well root-grafted. The Baldwin, on the contrary, is a very rapid grower, and soon establishes itself, and grows away rapidly enough. There is in all seedlings an inherent vigor which many hybrid or choice varieties do not possess. This may be seen wherever seedlings of any kind are grown. The plant once established, and then budded or grafted, receives no check. Root-grafting, by taking the whole of the root, is nothing more than stock-grafting at the surface of the ground, and Mr. B. don't certainly intend to call it by any other name. What is meant and what is practised by every body is, to take a root of a seedling and cut it into pieces, four or six inches long, which are then whip-grafted; or pieces of roots of old trees are just as good. It is done to save time and expense. To take up a whole root, then graft it, and set it out again, would be the most expensive way of getting a tree, for nothing would be gained and much lost, as there would be the cost of resetting and the loss of time in reëstablishing the plant.

Our theory, therefore, is, that a great many varieties of apples, as well as other fruits, are so different in habit from the original species, that they do not grow freely on their own roots; and that root-grafting, from not imparting a growth to the young scion, induces a weakness in the young tree, from which it will not quickly recover; just as a tree grown on a poor and stinted soil makes its first sap-vessels so small and contracted that no after-treatment will enable it to acquire a vigorous condition.

Such is our explanation of the superiority of stock-budded or grafted trees; and whether our theory is the correct one or not, of the facts there is no doubt. If we are wrong, it will give us pleasure to be set right. Our friend Barry is "very confident" we don't speak from experience. If he means by this that we have not root-grafted one apple tree to his thousand, he is quite right. We own up. But if he means experience in observing the effects of his own root-grafted trees, as well as those of other cultivators, *we* "are very confident" he is entirely mistaken.

We will mention one particular case. We had some melon apple trees of Messrs. Elwanger & Barry, in the spring of 1849 or '50. When we received them, we cut off a few scions. The trees were set out carefully, in a good situation, and the scions were grafted into stocks set in the nursery rows one year. The latter are now more than twice as large as the former, with the promise of being ten times as large in two years more.

What Mr. Barry says about the Western nurserymen using "spongy, pithy wood" for scions, and "abusing root-grafting," we shall turn over to our agreeable friend, Dr. Warder, the champion of all clever fellows."

BREEDING STOCK.

This subject is less understood by the people of this country, or indeed of any country, than is almost any other which falls under their daily observation. Few have taken the pains to examine it, and of those, still fewer have understood the proper mode of arriving at satisfactory results. We find the following in the *American Veterinary Journal*, and commend it to the notice of all interested in the subject:

ON AN INFLUENCE AFFECTING THE PURITY OF BLOOD IN STOCK.

The breeding and rearing of stock, especially animals of high and pure blood, is daily attracting an increased attention from the scientific and enlightened agriculturist; and when the farmer succeeds in obtaining animals possessing the qualities sought for, there is no branch of his business that *pays* more generously in dollars and cents than this; but so many failures are met with, and so many are disappointed in the progeny of animals of even the purest and most renowned pedigree, that even among the enlightened, it is not seldom that we hear the advantages of *blood* questioned, if not denied; and it is more than intimated that animals possessing superior qualities owe their excellence mainly to the care that has been bestowed upon them in regard to their feed, &c. In regard to other departments of agriculture, similar discrepancies of opinion do not obtain; and it would seem of importance to determine *why* this difference of opinion in this regard.

All are accustomed to rely upon *experience*, and it must be allowed that in this matter, many who have been to considerable trouble and expense in their endeavor to improve their stock of horses, cattle, or sheep, by breeding from animals of the improved breeds, have *experienced* a grievous disappointment, in not finding the young to resemble the sire or the dam, as the case may be, as closely as they had hoped; and without being able to account for this fact, in accordance with any laws that are known to them, and only knowing that *they* have failed of the expected improvement in their animals, they have naturally come to deny, or at least to doubt, what others have told them. This has been one, and perhaps the main reason why so little attention has been paid by the majority of farmers to the introduction of imported and other improved races of animals.

But the English agriculturists seem to understand the causes of these failures, and, of course, how to avoid them; and it would be well if this information were more generally disseminated in this country.

The reason is this: *The mother's system is influenced and changed by the young she carries in her womb; and if the male parent be of a different breed, her blood is contaminated, and she rendered similar to a mongrel for the remainder of her life.*

This assertion may startle many who have given the subject no thought; but it is believed that no physiological fact is better established, or more susceptible of proof, than this; and, as proof, I shall cite a few instances that have been noticed by Dr. A. Harvey, physician to the Aberdeen Royal Infirmary. He speaks of a young chestnut mare, seven eighths Arabian, that belonged to the Earl of Moreton, which was covered in 1815 by a quagga, which is a species of wild ass from Africa, and marked somewhat after the manner of the zebra. The mare was covered but once by the quagga, and after a pregnancy of eleven months and four days, gave birth to a hybrid which had distinct marks of the quagga, in the shape of its head, black bars on the legs, shoulders, &c. In 1817, '18, and '21, the same mare (which had, in the meantime, passed into the possession of Sir Gore Ousely) was covered by a very fine black Arabian horse, and produced, successively, three foals, all of which bore unequivocal marks of the quagga.

Another case, similar to the above, is mentioned. A mare belonging t Sir Gore Ousely was covered by a zebra, and gave birth to a striped hybrid. The next year this mare was covered by a thorough-bred horse, and the next succeeding year by another horse. In this instance, also, both the foals were striped, and in other regards partook of the characteristics of the zebra. It is a matter of common observation, that when a mare has borne a *mule*, she is never after fit to breed colts, as they will have large heads and otherwise resemble mules.

In the above-mentioned instances the mares were covered by animals, in the first instance, of a different *species* from themselves; but others are recorded, where they had bred only from *horses*, but by horses of different *breeds* on the separate occasions; and yet the offspring partook of the characteristics of the horse by which the *first* impregnation was effected.

Mr. M'Gillivray, in an article published in the *Aberdeen Journal*, speaks of several colts in the royal stud at Hampton Court, that were sired by the horse *Actæon*, that did not resemble *Actæon*, the paternal parent of the foals, but did bear a *near* resemblance to the horse *Colonel*, from whom the mares had brought colts the year previous to their being covered by the horse *Actæon;* again, of a colt, the property of the Earl of Suffield, which was got by the horse *Laurel*, that it was strongly intimated by the jockeys at Newmarket, that he *must* have been got by the horse *Camel*. This resemblance was, however, satisfactorily accounted for, by the fact that the mare had been previously impregnated by Camel.

Many instances of a similar character are recorded in regard to dogs: in fact, the breeders of dogs all seem well aware, if the bitch has been impregnated by a mongrel dog, that even if the father of her next litter is of pure blood, the puppies will be liable to be mongrels.

Similar instances have also been observed in regard to swine, and the breeders of cattle have recorded similar facts. Mr. M'Gillivray mentions several instances, and among them the following: "A pure Aberdeenshire heifer was served with a pure Teeswater bull, to whom she had a *first-cross* calf. The following season the same cow was served with a pure Aberdeenshire bull; the produce was a cross calf, which, at two years old, had very long horns, the parents both hornless. A pure Aberdeenshire cow was served in 1845 with a cross-bull, i. e., an animal produced between a first-cross cow and a pure Teeswater bull. To this bull she had a cross-calf. Next season she was served with a pure Aberdeenshire bull; the calf was quite a *cross* in shape and color."

After citing other examples with a similar result. Mr. M'Gillivray says, "Many more instances might be cited, did time permit. *Among cattle and horses they are of every-day occurrence.*"

Dr. Harvey also records many instances of similar results as having occurred in the *human* family; but it is not thought best to include them in this paper. This mode of impairing the purity of the blood of animals has been styled *crossing the system* of the mother; and it is supposed that the reason why so many inferior animals are to be met with, the progeny of parents of pure lineage, is almost wholly owing to the blood of the mother having been previously contaminated by the cross-bred young she has carried.

Of the *modus operandi* of this contamination, there is no explanation given which is generally satisfactory: but it seems probable to the writer of this, that, inasmuch as the *same blood* must circulate through the veins of both mother and offspring, the system of the dam becomes *thus* modified, and rendered in a greater or less degree similar to her mongrel young.

ROTATION—EXHAUSTING CROPS, &c.

In our August number we took occasion to refer to this subject, but we now purpose to suggest a few things which we there omitted. While there is no such thing as *good farming* that does not include a judicious and thorough system of manuring, he is a *good farmer* who does his best with the means at his command. If his supply of manure is but half what it ought to be, it may be that he deserves great commendation for his skill in turning to the best account what he has. Still, his system is not good in itself, it is only the best that his circumstances will permit him to adopt.

Good farming requires that crops be well adapted to the nature of the soil. It also has a tendency to produce similar conditions in all soils; that is, the compact clay should be converted into a good soil by the mingling of other elements, perhaps of inferior value by themselves, while sandy soils should be solidified and strengthened by the addition of clay, &c. We do not specify here the means of doing this, as our purpose lies in another direction. We would simply affirm, that by means of the compost-heap, or some other agency more desirable, the light and the heavy, the wet and the dry, the cold and the warm, should be made to assimilate more nearly. There is a proportion among the elements of a soil that is best adapted to each crop, and though this is not the same for all the products of the farm, there is a limit to their differences. The planets do not all revolve in the same plane, but the orbits of all are within a few degrees of the equator. Such should be the unity of character in all soils. The analyses of the various crops, presenting a general resemblance, with specific differences, both illustrate and enforce our position.

Good farming, scientific farming, does not forbid the laborer to pay regard to the comparative facility of culture with which the different crops may be raised in his diversified soils. A pasture which has remained a long time untilled cannot be placed at once in a suitable condition for a strawberry bed. The sods will not yield thus readily to the plough, the hoe, or the harrow. They may be removed, and the soil be deprived of their valuable elements; but this may not be desirable. Some crops, admitting a ruder style of culture, will be, of course, better fitted for it, while no law forbids it.

"Exhausting crops" are obviously suited to vigorous soils. The rich and new lands of the West are capable of producing the most abundant harvests without apparent detriment. But even in Ohio, so recently settled, we now see that those exhausting processes which have proved so destructive to the lands of the older States retain the same characteristics when transferred to other and distant regions.

But what are EXHAUSTING CROPS? This is a relative term, and is used in several senses. First, it is applied to those crops which contain the greatest amount of mineral or inorganic elements. Such elements are drawn exclusively from the soil, while the organic or gaseous elements are obtained from the atmosphere. Those plants, of course, which contain the greatest amount of mineral matter, as lime, and soda, and silex, &c., are the most exhausting. They use up the available elements of a soil most rapidly, and it then becomes barren. It may be, however, that those elements which compose the chief part of a given crop are the very elements which the soil has in excess. In such case, that crop does not exhaust the soil; for it has still all necessary elements, and in due proportion; and in such case, that crop is not an exhausting, but a FALLOW CROP—a resting crop. The soil is as able to bear wheat and corn, &c., as it was before. Thus silicious plants may be cultivated successive years on silicious soils without injury to them.

These suggestions present to us a second application of the term "exhausting," or its opposite, fallow, or non-exhausting; those crops being termed "exhausting" which use up particular elements, leaving the soil destitute of them, and of course barren; while they are termed "fallow crops," if they use freely those elements only which are in excess.

Again, certain growths act the part of *cultivators*, and hence are "fallow crops." Thus, clover, lucerne, &c., under favorable circumstances, send down their roots to a great depth below the surface, and draw up nutriment which most crops could not reach. This nutriment, in part at least, is expended in the growth of the root nearer the surface, and these roots are afterwards left to decompose and improve the superficial soil where they are accessible to the short roots of the cereals. They also improve the soil by making it more porous, forming channels through which moisture is drawn up from below in time of drought. Hence these crops also are termed "fallow." They bring to the surface substantial nutriment for the succeeding crop, while they tax but lightly the superficial soil for their own growth.

This view sufficiently illustrates the nature of fallow crops; and the great practical inquiry of the farmer is, *What are properly called "fallow crops?"* Nor is the inquiry easily or concisely to be answered; for, as shown in the preceding remarks, the answer is essentially dependent on the condition of the soil. If *lime* is in excess, plants which abound in *lime* will not exhaust. If *silex* is in excess, plants which only absorb *silex* freely will not exhaust. Again, peas require but little silex, hence they will not exhaust a soil, though not eminently silicious; but they do require potash, magnesia, and phosphoric acid, and hence these must be found in the soil or be supplied in manures, or more or less exhaustion must ensue.

Beans consume little except the alkalies and phosphoric acid. Potatoes exhaust, by their tubers, the potash, and by their stalks, the lime of the soil. Turnips abound in potash, beets in potash and soda, carrots and parsneps in potash and in lime. Hence it is that wood-ashes are so serviceable to these crops; and hence also these crops *are not* exhausting where these elements are abundant. Otherwise, they *are* exhausting. Buckwheat will grow on soils capable of producing but very little of other crops. It contains but about *four per cent.* of mineral matter, and nearly half of this is lime. Its roots too penetrate the soil deeply. The straw is of some value as fodder or as litter; and if ploughed into the soil in a green or dry state, it improves its physical condition by its supply of *vegetable humus.*

Buckwheat is also peculiarly serviceable as a green crop to be ploughed in, on account of its rapid growth. It can be planted and ploughed in three times in a single season, and thus be made to impart a large quantity of vegetable matter to the soil.

In this connection it occurs to us to observe that all the necessary elements may exist in a soil, but that soil still be barren. For example: the soil may be hard and impervious to the root, or those elements may not be in a soluble form. Magnesian limestone, for instance, may abound in it, while so combined in the rock as to be insoluble by the water or acids in the soil, and entirely beyond the influence of all the vital forces of the plant, and the crop may fail for want of magnesia. The growth of a fallow crop is important in such cases to give opportunity for these necessary changes to be wrought out by natural agencies. The processes of disintegration, solution, &c., are constantly going on in all soils, and time alone would render some fields fertile that are now barren. Fallow crops furnish the time which nature requires, though at the same time the farmer avails himself of what is even now at his disposal. But he may also expedite these processes by the use of lime or other substance suited to hasten the chemical action that must be secured ere the soil becomes fertile.

The view we have here presented shows very clearly why clay soils are not suited to the growth of the cereals. They demand a large proportion of silex, and clay contains none. But if those clays are calcareous, they will produce large crops of clover, or of ruta-bagas, &c. These points present themselves to us whenever we are called upon to adapt our crops to our soils, or to apply manures.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

THE ROLLER AND ITS ADVANTAGES.

There is no agricultural implement so seldom met with in this country, perhaps, as the *roller*, and yet it is one of the most useful of utensils. Where your ground is soft and loamy, if you have not time to pick up the stones upon it, you can roll them in, and produce, at little expense, a smooth and clean surface, rendering your fields free from small hummocks, and fitting them for ploughing and mowing. And it has been mentioned by some that the roller is a useful implement upon ground in which the frost has heaved out the grass and clover roots. It may possess an advantage in this respect, and no doubt would be a fine thing to level and press down damp land where clover is sown, and would be likely to heave.

The roller which I would recommend for general use, and one which we have used with great advantage, is made with two *separate* rollers, each one being four or four and a half feet in length, with strong iron bands around their ends to prevent splitting, and a good wooden or iron shaft running directly through them, to which is attached the frame work, &c. The rollers can be made out of large hollow elm logs, or of separate pieces put together. A good, straight, hollow log is, however, preferable, particularly if the outside of it is sound. You can work it down to your liking, and put strong cross-arms in the ends of the rollers, through the centres of which the shaft should run. Some farmers, I believe, use iron rollers, but probably on the whole wooden ones are better, as they can be made large without incurring much expense.

The roller is an admirable implement to pass over barley ground after harrowing it, or even after you have drilled in the barley; for when the grain ripens, if you do not care to cradle it, or even if you do, you possess the advantage of cutting it low to the ground, and in this way secure a greater amount of straw, not to mention the clean rface which close mowing makes, thus leaving your barley lot in the finest condition to plough. We invariably roll our barley ground; we think it pays in three or four ways: first, the small stones are rolled into the ground out of the way, so that they will not dull scythes; second, you can rake up your barley with a horse-rake, and not run the risk of collecting stones in the winrows to be ultimately threshed; third, you create a smooth surface either for ploughing or mowing; and fourth, you get more straw, and make your work look better where the field is rolled than where it is not.

I therefore recommend *double* rollers. Roll down your grass and barley and wheat lands; save money and labor in picking up stones; and, in a word, make your lots appear smooth and handsome by using an implement which is both cheap and simple. W. Tappan.

Baldwinsville, N. Y., August, 1853.

HORTICULTURAL.

Fuchsia.—This is a beautiful genus, and contains a great number of species and varieties which well repay the labor of cultivation. It flowers profusely, and remains a long while in bloom. It is also of easy culture. Large, well-formed specimens are more easily grown from cuttings than from old plants. These come in very useful for autumn flowering; but the symmetrical form, luxuriant foliage, and increased display of blossoms which young plants furnish when properly managed, can hardly be expected from old plants.

The same principles apply to the growth of this as of other plants which are propagated by cuttings. Young wood should be chosen, and these should be set in a light sandy soil, and placed where they are sheltered from the sun. The moist atmosphere secured by covering them with a bell-glass greatly promotes their successful growth. It also tends to check a too-hasty bloom. A temperature of 45° to 55° is best for them. With this and a free supply of water, and a liberal amount of pot-room, they seldom disappoint the grower. Where a sufficient number can be obtained, select the most vigorous growths, and throw away the rest. Replant these in a pot of 12 or 15 inches, syringe the tops frequently, keep free from insects, and occasionally supply the roots with manure-lye, and your plants will thrive and grow till they acquire a size and vigor and beauty never witnessed by those who bestow no care upon them. When the plants are repotted, give them a soil composed of sandy loam and peat, with some leaf-mould and well-rotted dung.

The top will require cutting. A pyramidal form is the best for display, and most in accordance with the natural habit of the plant. We have seen them ten feet high. Support the more vigorous branches with strips of matting, if necessary.

In the fall, cut down closely, repot in sandy soil in a smaller pot, place in a dry situation, and protect from frost and from the sun.

Kalmia Latifolia—Mountain Laurel.—The few attempts that we have seen to cultivate this splendid shrub, the most beautiful in our Northern woods, have been so unsuccessful, when the flower is compared with that of the shrub in its native soil, that we scarcely know whether to commend the attempt to others. In June and July it is the king among all our indigenous shrubs.

We have often seen it grow beyond our reach. The flowers form large *corymbs*, with a variety of hues, white, pink, deep red, &c., all intermingled sometimes in the same cluster.

The natural soil for the laurel is a loose, light sand, mingled with a little leaf-mould or peat. It should be partially shaded, and have a northern exposure, on a side hill, if practicable.

The shrub may be transplanted in the ordinary way. October, in the fall, and March and April, in the spring, in the Eastern States, are the proper times for this work.

EXPERIMENTS IN FEEDING PIGS.

We find an account of some experiments on the feeding of pigs, in the *Irish Farmers' Gazette*, which bear upon them the impress of accuracy and of judgment. It is not every man who is competent to commence and carry out experiments for elucidation of a given topic. Some important points are suffered to pass unnoticed, and the reader is left in almost as much doubt upon the subject as he was before. And although in these experiments nothing is said of the degree of restraint imposed upon either lot; whether they were shut up in sties or suffered to roam at pleasure; we are bound to infer, no doubt, that their treatment in this respect was the same, whatever that might be. This is sufficient for the object the experimenter had in view, to wit: the comparative value of these two kinds of feed, raw and cooked. We want, however, one more, to wit: whether the smaller amount of the steamed or cooked turnips would not have resulted in nearly the same amount of fat as the larger. We do not believe that the amount of accumulation is in exact proportion to the amount eaten. Hence, if the steamed food had been fed in the same quantities as the raw, it might appear that the accumulation of fat would be nearly the same as with the larger amount actually given.

Experiment made at Glencairn.

Eight pigs were selected and divided into two lots, as evenly as could be, and put in to fatten on the 27th November, 1852.

Lots.	No.	How Fed.	Weight on Nov. 27th, 1852.	Weight on Jan. 4th, 1853, when sold.	Increase of each pig in 39 days.	Quantity of cooked and raw turnips used by each lot in 39 days.	Quantity of bran and barley meal used by each lot.	Quantity of coal used for steaming.
			cwt. qr. lbs.	cwt. qr. lbs.	cwt. qr. lbs.	cwt. qr. lbs.	cwt. qr. lbs.	cwt. qr. lbs.
1	1	Fed three times a day, and	1 3 0	1 3 21	0 0 21	..	..	..
	2	consumed daily 2 cwt.	1 3 17	2 0 14	0 0 25	..	..	..
	3	2 qrs. of steamed Swede	1 3 25	2 1 0	0 1 13	..	..	..
	4	turnips, mixed with 12	1 2 18	1 3 16	0 0 26	..	..	..
		lbs. of bran and barley meal.	7 1 4	8 0 23	0 3 19	97 2 0	4 0 20	20 0 0
2	1	Fed three times a day, and	1 3 4	2 0 4	0 1 0	..	..	..
	2	consumed daily 1 cwt.	1 3 16	2 0 16	0 1 0	..	..	..
	3	1 qr. of pulped Swede	1 3 0	2 0 2	0 1 2	..	..	..
	4	turnips, mixed with 12	1 2 16	1 3 12	0 0 24	..	..	..
		lbs. of bran and barley meal.	7 0 8	8 0 6	0 3 26	48 3 0	4 0 20	

SAVING ON LOT 2 IN COMPARISON WITH LOT 1.

	cwt.	qr.	lb.
Turnips, ...	48	3	9
Coal, ...	20	0	0
Difference of increase of weight of pigs, ...	0	0	7

Besides the difference of labor, a quarter of an hour three times a week being sufficient for a boy and girl to grate and mix the raw food. Both lots were sold together on the 4th of January, for the sum of £25 10*s*.

The turnips for lot 2 were pulped and mixed with bran and meal three times a week, and put into tubs. In three or four days, the food, having become warm by fermentation, was used.

Each tub had an orifice near the bottom, to allow the liquor to escape into troughs, which otherwise was found to check the fermentation. The liquor received by the troughs was given to young pigs.

The quantity of coal consumed in steaming for lot 1 may be thought excessive; however, such was the quantity actually used, although, doubtless, twice the quantity of food might have been steamed with less than twice the quantity of fuel.

PLOUGHING IN GREEN CROPS.

One of the mistakes of those who imagine that they are carrying out the doctrines of an improved system of farming, is forcibly stated in the following paragraph from a writer in the *Genesee Farmer:*

I am becoming every day more satisfied that the science of farming must look "upwards;" that the air we breathe is the great fountain that sustains animal as well as vegetable life; and that the great primitive source of all the richness in our soil is from the air. Nothing is destroyed. No sooner does the animal and vegetable die, than it commences its round of change until it returns to its original elements, and is prepared to be remodelled into new animals and vegetables. Let man do his worst, and he cannot destroy one jot or tittle of substance; neither can he impoverish the earth so that skilful agriculture cannot restore it. My neighbor, an intelligent man, has collected all the barn-yard manure he could buy, and has mingled with it caustic lime, and has made an immense heap, which is now a perfect crater almost on fire. Think you, if he could see the wheat, corn, and grass, that is continually ascending from that heap, he would continue the fire? Far from it. He can smell at a great distance the ammonia and enriching gases arising, of course. Now, if, as I have said, we could *see* the enriching gases arise, and knew their value, the world would have been convinced long ago; for "to see is to believe."

Well, I hear you say, what a destruction! Not so; not a particle is destroyed; it floats off in the air over your farm, and any farm, ready to be brought into the harness by the skilful farmer, who has his *clover* and other ammonia-absorbing plants in his broad fields ready to catch and devour it. I hold that air above is and has been for all time charged with all the organic properties of plants, and that it is a fountain that will never fail, ever ready to respond to the demands of science. Yet we must, of course, properly cultivate the soil. I believe fully in Tull's theory. If I had the means of retaining all the ammonia and visible nourishment for plants that is foolishly expelled from my neighbor's farm, I am satisfied that I should have the lion's share.

TREATMENT OF GRASS LANDS.

This important subject is ably treated by the *Mark Lane Express*, whose opinions we endorse to the *full*. The abuses to which such lands are subject in England are alike common in this country, and the cure for them is substantially the same:

The majority of parties who take the utmost pains with their tillage, seem to think that their grass is a different matter, and that it may very well take care of itself. Nor is it often better treated when first laid down. Land is by far too frequently first cropped as long as it will produce seed again, and then laid down to become permanent pasture. Great credit is taken if the land is made summer-fallow before the close of the corn-cropping; but too often a fallow crop is also taken, to *protect* the seeds, for fear they should grow too luxuriantly.

Others take greater care. They grow no crop of corn; they pay a high price for well-selected and carefully-grown grass seeds, and possibly they sow the land in fine mechanical condition; still they are sometimes disappointed, and blame the seedsman if they do not find his finer grasses grow as plentifully or luxuriantly as they could wish. The fact is, the wonder ought to be that any should grow at all.

Sometimes grass land is taken out to improve and lay down again to pasture. But the process adopted is one of depletion, and not of nutrition. They crop away with corn so long as crops are obtainable, and then take great credit if the land gets a dose of lime when it is laid down to grass. And often the grass, after the *improvement*, is worse than that which preceded, carries less stock, and maintains them in a manner far inferior to what it did before.

The old grass land of the farm is seldom acted fairly by. It must give up all, and receive nothing in return. If it is mown, a little rotten chaff, or waste scrapings, is a liberal allowance. If not, it is considered that no manure is necessary. Though milking cattle and store stock are depastured upon it, and carry all off year after year, no addition of manure of any value is made to the soil for this serious abstraction. In rich alluvial feeding pastures it is unnecessary; but where store cattle of any kind are depastured, the land must inevitably deteriorate.

To begin with the beginning, land to lay down with grass should be as carefully prepared as for any other green crop; the one being permanent, however, and the other only temporary, the greater care should be taken of the preparation, this being of *more* consequence than seeds. There are always natural grass seeds in every soil, lying ready for germination as soon as the manurial or feeding elements of the soil are ready for their development. On this principle it is that a dressing of mountain lime will bring into action seeds of white clover where a white clover plant was never known to have existed before. So on a very rich stubble, on almost any soil, there will be found the finest grasses growing in rich luxuriance, after the corn crop is taken off, without a single seed being sown. In like manner, one year will bring a vast smother of trefoil on land where none was ever sown.

Hence, to be rich—to have abundance of phosphoric acid in a free state—to have a full supply of ammoniacal matter, are of more importance than being particular to a shade in the selection of grasses. It is only a question of time. If the land be rich and fertile, there will be found a growth of the finest grasses which are adapted to the soil, and these will soon eat out those which are poorer and less suitable.

So, in improving a pasture, it is not always necessary to take it out into tillage. If hide-bound, a good heavy loaming, a few fresh seeds, and a compost dressing will soon recover it. If mossy, the moss will soon disappear before good cultivation. *It is nature's covering for land too poor to grow grass;* and on stone walls, rocks, and similar places, the moss appears for simply the same reason—it is a covering preparatory to the production of more nutrient material.

Rushes and similar plants, due to the prevalence of stagnant water, are to be disposed of in another way, namely, by proper and efficient drainage.

But a ready mode of transferring pasture from one field to another has been adopted, and not without success. A field properly levelled and prepared has had a cover of turf or sods, pared some two and a half inches thick, and so placed upon it, at a cost not exceeding fifty shillings per acre, including cartage; this has been slightly manured and well rolled—an advantage to the turf, and a rapid accession of permanent grass pasture to the arable. This is a mode far preferable to that of inoculation. Grass will be had at a much earlier period, and, if well followed up by dressings of manure, it will soon become a pasture as permanent in appearance as if it had been lying in that state for ages. In fact, it will have acquired the age of its surface.

For grass land it is not always necessary to apply farm-yard manure. Guano will have the most powerful and speedy effects on a pasture if applied before rain. If that does not pretty rapidly follow, there will be great loss by the application. Bones produce a wonderful effect on the Cheshire pastures, denuded of their phosphorus by the cheese sold away from the farms, which it so supplies; but the majority of clay grass lands will require the bones to be dissolved before any very striking effect can be produced. The light grass land—the greatest difficulty of all, which the Scotchman would say ought always to be converted into arable, and only allowed to lie down for two or three years—may be dressed with a compost of clay and dissolved bones with the greatest advantage. If the house bones of most of our farmers were from time to time to be put in an earthenware jar half full of sulphuric acid, and this poured from time to time on a heap of clay, a vast quantity of the most valuable manure would be made from materials at present wasted.

FARM AND GARDEN WORK FOR SEPTEMBER.

Be prompt in sowing winter grains, so that the roots shall be well set before the frost. Gather your crops according to their condition. Bud your trees, if you select the fall for this service.

Ploughing should also be attended to in this and the following month, so as to bring the substance of the soil into contact with the chemical agencies that may improve it, and to place it more thoroughly within the power of the frost of winter and subsequent thawing, to pulverize and disintegrate it.

Sandy soils should be ploughed in in the fall; but ere this work is done, do not omit to spread upon it the clay mixtures spoken of last month.

Select your earliest and best ears of corn for seed for the next year.

Horticultural.—This is the time for preparing your beds for bulbous roots. The crocus, hyacinth, fritellaria, and other bulbs, may be set out in beds deeply cultivated, and well mingled with the requisite fertilizers. They need a light, rich loam.

Secure your dahlias with proper stakes, to defend them from being broken by the winds. When the flowers are faded, select only the choice specimens for seed, which may be planted in boxes and kept in the house till spring. Reset your strawberry beds, giving ample room to each root. Lift your wall-flowers and stocks, and set them in five or seven-inch pots.

MULES vs. HORSES.

We find that our opinion on this subject, as expressed in more than one of our recent numbers, is becoming the opinion of many intelligent agriculturists, who have been convinced, by their own experience or observation, of the superiority of mules, so far as economy is concerned. An estimate has recently been made by a writer in the *Southern Planter*, who supposes that each costs the same price originally, and the saving being in the feed exclusively, as follows:

Ten horses will consume each 12 bbls. of corn per annum, say for twenty years, which is equal to 2,400 bbls., worth, on an average, $2.50 per barrel, - - - - - -	$6,000
Shoeing ten horses will cost $30 per annum, ($3 each, or more, which we have to pay,) say for twenty years, - - -	600
Cost of feeding on corn and shoeing ten horses for twenty years,	$6,600
Ten mules will consume each 6 bbls. of corn per annum, say for twenty years, which is equal to 1,200 bbls., worth, on an average, 2.50 per barrel—*no expense of shoeing*, - -	$3,000
Amount saved in twenty years by mules, - - - -	$3,600

According to this estimate we save $3,600 in twenty years, or about $200 per annum, by having mules instead of horses; but this sum can be fairly augmented to upwards of $4,000, by taking into the calculation the greater longevity and exemption from diseases of the mule, which items are not set down in the above statement. If so, at the end of the twenty years, how will the matter stand? In all probability, the horses will all, or nearly all, be dead, while all, or nearly all, the mules will be living, and be good for service some five or ten years longer.

Mules have commanded a high price on account of their scarcity. Hence the breeding of mules would be a source of considerable profit, as they can be raised for a mere trifle, and come into working condition at an early age. The writer already referred to is of opinion that the mule can do as much and as efficient work as the horse, especially if the mule have size and weight, which should be the case. Three *good* mules will draw a three-horse plough, and do as good work as three horses; and in the heat of summer fallow, which is fatal to so many horses, you never hear of any injury to the mule.

PRICKING HORSES.

This is a process which we always regard with aversion, and wish it might never be practised. Still it is infinitely better than docking, which is positively inhuman. We would leave the tail as nature leaves it; thinking not only that the comfort of the horse is thereby promoted, but also his appearance. But if the former practice is to prevail, the following suggestions by Mr. S. W. Jewett, of Vermont, are appropriate. He says:

"There are four cords, or tendons, in the tail of the horse. The two upper ones are used to raise it, and the lower ones to depress it. When the tail is raised, the muscles of the under cords are relaxed, and the muscles of the upper ones at the same time contracted. The lower ones only are to be cut in setting up the tail; and sometimes the pulley will give a good set to the tail when it follows docking alone.

The severing of the under cords, near the body, leaves the muscles of elevation to act unopposed, and the setting up of a good tail is secured. Short-tailed carriage-horses are very fashionable in the Eastern cities. They are often preferred for safety and convenience, as well as gayety and good appearance.

Many horses, after pricking, carry very poorly; indeed, it would have been better if nothing had been done. The fault, I think, is the manner in which the operation is performed. The operator generally makes two, and sometimes three incisions on each side of the tail. That is wrong; there should be one and *only one* cut on each side, and that at the point where the turn or elevation is to commence, which is usually about two inches from the body. If you cut the same cord twice, the separated part is very liable to drop down by its own weight and the natural attraction towards the body, uniting again at the lower incision without extension; consequently, the lower cut has been of no service, as no curve is, at this point, realized, but at the farther end of the tendon, which, in healing, may be extended, in order to unite with the upper and separate part; and by this double cut a handsome curve is defeated.

The more times the cords and tail are cut, the greater chance for inflammation, and the losing of the hair. Therefore the one cut of the tendon, on each side, has much the advantage, by healing in half the time, and a greater certainty of carrying well."

THE SCIENCE OF STORMS—THE STORM OF JULY 1st.

Aerology is a great science, if estimated by its importance; but if by the actual knowledge of it which we have, it belongs side by side with astrology and animal magnetism. Messrs. Redfield & Company will differ from us on this point, but we are sure this difference between us is scarcely greater than the differences among themselves. Hence we are safe in our position. When doctors disagree, other men cannot really be supposed to know any thing.

Certain facts, however, are well established. The differences alluded to arise from the question, whether the acknowledged facts are enough to form the basis of a scientific principle. Many storms are whirlwinds, the plane of their motion being either horizontal or vertical. In some respects, all winds must be whirlwinds, since they must at last return to the place whence they came, or they would produce a vacuum. In reducing these matters of detail to system, Messrs. Redfield and Espy, two leading writers, come to very opposite conclusions, and by very different processes.

We have stated that certain facts are well established. For example: the great and sudden changes of temperature which produce hail-storms like that of July 1st in New-York, &c., are an established fact; but what produced this marvellous change? The chemistry of it is not certain. Again, the violence of the storm was within very narrow limits. What is the explanation? We have surveyed the track of a tornado, where every thing was prostrated at a given place, when, within five rods, every thing was unharmed.

But this science is in a state of progress, so far as practical matters are concerned, and we may lay before our readers, in subsequent numbers, some things of interest in that connection.

Our present business, however, is to give our readers a sort of abstract of a valuable scientific paper read by Professor Loomis, of New-York University, before the Scientific Convention now in session in Ohio, in reference to the tornado of July 1st, 1853:

After giving a long account of the storm and its results, he proceeds to inquire:

" What was the cause of the hail?

The hail was caused by a violent upward movement of the air, carrying along with it an unusual amount of vapor, which was suddenly condensed, and at so low a temperature that it was frozen in large semi-crystalline masses.

That there was a violent upward movement of the air, I infer from the following considerations:

1. Rev. J. W. McLane, of Williamsburg, was in the street, near his house, and noticed the coming up of the storm. He says the cloud was very dense and black, moved rapidly forward, and under the main sheet the clouds boiled up in a violent and angry manner, which led him to anticipate a severe blast. Other observers have testified to substantially the same facts.

2. It appears impossible that two currents, in close juxtaposition, should blow from nearly opposite quarters with sufficient violence to prostrate large trees, unless there is opportunity for the air to escape by an upward movement. This conclusion is also in perfect harmony with what we have frequent occasion to observe in small sand-whirls and water-spouts.

How was the cold which formed the hail produced?

According to the observations of Pouillet, the temperature of hailstones, when they fall, is sometimes as low as 25° Fahr. They must, then, have been formed at a temperature considerably below that of melting ice—a temperature probably as low as 20° Fahr. How can so low a temperature be produced in the hottest weather of July? The temperature of the air diminishes as we ascend from the earth, and at the height of 8,800 feet above New-York, is estimated at 32° in summer. At the height of 12,000 feet, the temperature is reduced to 20°. Were the hailstones in the present case formed at an elevation of 12,000 feet? I think not. In the summer of 1835, several violent hail-storms passed over the southern part of France, where there were insulated peaks of mountains, which afforded precise means of measuring the elevation of the hail. In the storm of July 28, 1835, no hail fell on the summit of the Puy du Dome, an elevation of 4,800 feet above the level of the sea; but a few stones fell at the height of 3,700 feet, while at the foot of the mountain the ground was covered to the depth of three inches, and some of the stones weighed eight ounces. On the 2d of August of the same year, a hail-cloud enveloped the summit of the mountain, rising to the height of at least 5,000 feet.

It does not, therefore, appear to be safe to assume that the hail of July 1st was formed at an elevation exceeding 5,000 feet; and here the summer temperature may be estimated at 46°. This cold is, of course, insufficient to form ice.

It is believed that during the passage of a hail-storm, the temperature of the upper air is considerably below the mean. The simple presence of clouds in the lower atmosphere would tend to produce such an effect. The atmosphere derives its heat from the earth, and is but little affected by the direct passage of the solar rays. The heat which the earth imbibes from the sun is continually thrown off by radiation; but when the surface of the earth is covered by a cloud, this radiant heat is intercepted, and the temperature of the lower air is thereby elevated. On a still night the presence of clouds sometimes causes the thermometer to stand ten or fifteen degrees higher than it would otherwise. But if by the interposition of a cloud the lower atmosphere becomes unusually hot, the atmosphere above the cloud must become unusually cold. Moreover, in the storm of July 1st, the hail was formed in a current blowing violently from the north-west, which came, therefore, from a higher latitude, and of course brought with it a diminished temperature. I have no data sufficiently precise for estimating the effect to be ascribed to this cause, but I think we may conclude that, at the time of the storm in question, at an elevation of 5,000 feet above New-York, the temperature could not have differed much from 32°. We have not, however, yet reached the temperature necessary to the production of hail. Another source of cold is to be found in the evaporation from the surface of the hailstones. If we tie a piece of thin muslin upon the bulb of a thermometer, and then, having dipped the bulb in water, swing it rapidly through the air, the thermometer will sink below the temperature of the air several degrees—sometimes ten or fifteen. This cold is due to evaporation. During a hailstorm, the hot air from the earth's surface is carried by the upward movement to a considerable elevation; by expansion it is cooled, and a portion of its vapor condensed. The drops thus formed, at a temperature not far from 32°, are still further cooled by evaporation from their surface, (the evaporation being promoted by this rapid motion;) the remainder of the drop is congealed, and as new vapor is precipitated, it is congealed upon the former, thus forming concentric layers round the nucleus. Since water, like nearly every other substance, in passing to the solid state inclines to crystallization, the ball, as it increases, does not retain the spherical form, but shoots out irregular prisms.

How does the hailstone remain suspended in the air long enough to acquire a weight of half a pound?

This difficulty is not, to my mind, a very formidable one. I conceive that hailstones are formed with great rapidity. The vapor is condensed with great suddenness, and almost instantly frozen. I think very large hailstones may be formed in five minutes. In a vacuum a stone would fall from the height of 5,000 feet in less than twenty seconds, but drops of water and hailstones fall with only a moderate velocity. From my own observations of the hailstones of July 1st, I could not possibly estimate the velocity of their fall at more than 40 feet per second, and I should be disposed to put it even less than this. At a velocity of 40 feet per second, a stone would be two minutes in falling 5,000 feet; and if we suppose it to start from rest, and its rate to increase uniformly to the ultimate velocity of 40 feet, the time of fall would be four minutes. The strong upward movement which is known to exist in the neighborhood where hail is formed, is quite sufficient to sustain hailstones of the largest kind as long as they can be kept within the influence of this vortex. As soon as they escape from it, they would, of course, commence falling. I see no difficulty, therefore, in supposing the great mass of hail to remain in the air five minutes before reaching the earth, and that, in peculiar cases, stones may remain supported for ten minutes, and even a great deal longer. This period appears to me sufficient to account for the hail which fell at New-York.

Why did the hail in the present case attain to such immense size?

Because the circumstances were unusually favorable to its formation.

The temperature of the air before the storm was 90°, and it is my opinion that the dew-point could not have been less than 80°; in other words, the atmosphere contained about as much vapor as it is ever known to contain in this latitude. This vapor was suddenly lifted to a region of great cold, and rapidly condensed and frozen. The strong upward movement helped to sustain the crystals as they increased in size, until the upward force was no longer equal to gravity, or till they escaped from the influence of the vortex. Most of the stones would fall in five minutes, and be of moderate size; others might be sustained ten or fifteen minutes, and attain enormous dimensions.

How did the hail in this storm compare with that of the most remarkable ones on record?

There are well-authenticated cases of hailstones having fallen in England and France weighing half a pound, and even more than this, but I do not know of any satisfactory account of hailstones weighing as much as one pound. A mass of ice of the specific gravity 0.93, weighing eight ounces, must contain nearly fifteen cubic inches, or would make a cube whose edge was nearly 2.5 inches. I have selected a piece of ice which was estimated to be about the size of the largest stone which I saw fall on the 1st July, and found it to weigh eight ounces. But these large stones of July 1st appeared to me unusually white, and may therefore be conjectured to have had a spongy nucleus, which would have reduced the weight to perhaps six ounces.

The hail, therefore, in the present storm, was smaller than has been observed to fall in France, but I question whether any larger hail has ever been seen in this country."

THE LAKE SUPERIOR COPPER MINES.

A correspondent of the New-York *Tribune* gives the following account of these important mines:

The Evergreen Bluff, of which so much has been said during the last three years, is east of the Minnesota, on the mineral range. It presents a most decided metalliferous appearance, but whether the copper is continued in belts of epidote or regular veins, remains to be proven. The title to these lands has been in dispute for several years. The Land Office, under the late Administration, decided against the prëemptions, but Secretary McClelland sustains them.

At the Ridge Mine they are working on what is supposed to be a vein; but though it has been sunk upon for 330 feet, and levels extended on its course, its present appearance does not indicate a paying mine. They have shipped this year 22,657 lbs of copper.

At the Bohemian they have been working an epidote vein or belt, but Mr. Dickinson has suspended operations for the present. He has shipped 5,086 lbs. of copper.

The Adventure Company have done much towards proving up the belts of epidote in this region. Five levels have been driven into their bluff, one or more 160 feet in length. Three shafts have been sunk to connect the levels, and immense cavities stoped out. The openings have yielded about fifty-five tons of copper, but it is evident that the copper is not sufficiently concentrated to make a paying mine. This Company are now working a vein on a bluff to the east of the Old Diggings. It looks rather favorable, the veinstone being of a good character, accompanied with small sheets of copper. They have sunk a shaft thirty feet, and are driving in an adit from the south, which will prove the vein and explore the country. Shipped this season about 24,000 lbs. of copper.

The Aztec was one of the first companies that commenced work in the epidote belts, and that under the advice of some of the most experienced men in the country. This Company has expended a large amount of money without proving any thing, except that copper may be found in large quantities out of veins as well as in them. The tract of land is a good one, and well worthy of an exploration. Shipped this year about 20,000 lbs. of copper.

The Ohio has been working in the vicinity of the Aztec, but not so successful in getting copper. They have recently found a vein on the south side of the bluff that looks as though it might make a mine, but they have only sunk eight or ten feet, and it will require time to prove it. Shipped this season about 1,000 lbs. of copper.

The Piscataqua are judiciously driving an adit into their bluff, to prove up two veins seen on the surface. This is the best and cheapest manner of proving up bluffs where the veins are numerous, or where no strong one appears upon the surface.

At the Douglass Houghton they are working with much success. Although the vein is not large, it produces good barrel and stamp ore, and appears to be regular. Three shafts have been sunk, two levels extended, and considerable ground stoped out. Stamps have been erected to be driven by water. About 9,000 lbs. of copper have been shipped this season.

The "Toltec Consolidated" is the old Farm and Toltec united. They worked at this mine on what was supposed to be the main vein, until last October, when in diving east, in the ten-fathom level, the main vein was cut; and as all of the work done had been on a feeder or side vein, it was virtually abandoned, except cross cutting from the level to prove the main vein. No. 2 shaft is 140 feet deep, the vein looking very well in the bottom. In the twenty-fathom level, east of this shaft, the vein is about 20 inches thick, and too strong to be thrown out with a sand-blast. No. 3 shaft is down 100 feet, the vein filled with barrel work, and small masses from the surface to the bottom; it is 30 inches wide at the lowest point. Another feeder has come into the vein 70 feet east of feeder No. 1; two others are seen upon the surface, which must come in as they drive east. This vein looks as though it would make one of the profitable mines of the country. Mr. Sayles, the Agent, is a most energetic man; he has shipped this year 12,000 lbs. of copper, a portion of which has been sent to the World's Fair.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

EDUCATION FOR THE FARMER—HIS POSITION.

In the August number of the *Plough, the Loom, and the Anvil* is an article on "Agricultural Education," which we presume is by the Editor. As a whole we think the article is well read and perfectly understood by the writer.

On reading over the Charter for an Agricultural College, in New-York, we are inclined to think that the foundation for the institution is well laid, and shall look to it as being a great help to farmers in educating their sons for practical labor on the farm.

Every student must have a fair English education, a good moral character, and be sixteen years of age, to gain an admittance into the college. The charges for tuition, and all other expenses, such as board, lodging, lights, fuel, washing, &c., will be $300 a year, payable, one half each term, in advance. After the college has become endowed with funds from the State, or individuals, the charges for tuition, &c., may be reduced perhaps to some extent. As a whole we think the charges are moderate. Still there are a great many farmers in every town in the State who cannot send their sons to this college on account of the expense, and who would be glad of such advantages had they the means. There is still a large class of farmers who are well to do in the world; but, from a want of knowledge and disposition, they will not send their sons to such a college for instruction. And yet we hope and expect to see the college filled to its utmost extent with farmers' sons, all anxious for instruction in a business which they have been more or less familiar with during their whole lives.

It is plain to all that only a small fraction of young farmers in the State can have access to this instruction until schools of this kind become more common throughout the country. For one, we are satisfied that the majority of all farming improvements must begin with the farmers on their farms at home. If, in the next ten years to come, one or two young farmers of the right stamp could be scattered throughout every town in the State, it would be as much as we shall expect from the influence of agricultural colleges or schools. The greater part of agricultural improvements must come from influence and example, and this may be brought about in time, as we have named.

There is also an article in the same number on the "Character and Position of the Farmer," by Mr. Hunton. He gives the American farmers the credit of being the real nobility of the land, (if we have any such,) and that they are more correct in their moral habits than the other classes as a body, which we believe to be correct as a general thing. But he says—"Well-informed farmers would form for us a better code of laws than professional men; but with due deference, and *great* regret, I am compelled to say that, as a body, they are deficient in the science of agriculture, and have not that general knowledge they can and ought to possess. There are many honorable exceptions, and these are fast multiplying; but there are many men who 'carry a stone in one end of the bag,' because their fathers did, and aver they want no book-farming," &c. Now this may be all very well, but the farmers are not the only class of men who "carry a stone in one end of the bag." Manufacturers, merchants, mechanics, artisans, and professional men, too, have "lugged their share of stone," to our certain knowledge. Again he says—"Farmers frequently complain they are not noticed by the people as they ought to be; that professional men, more especially attorneys, hold the offices. Let us look around and see where the difficulty lies. In New-England there are some twenty farmers to one professional man. Then you have the *power* in your own hands. Why do you not use it? Have you no *confidence* in your own class? You may answer, It is in part diffidence. The ostensible cause is lack of qualification or information which you can and ought to possess." Now, as Mr. Hunton is a "professional man," we tell him what he already knows, that the farmers are not left out of "offices, &c.," on a lack of qualifications. But Mr. Hunton knows well that this whole thing is managed by "wire-pullers" and "log-rollers" of the parties. So that when you go to the polls it is to vote the "regular nominations," or vote nothing. Farmers not being "impudent talkers," the "professionals," &c., have the "offices," and every thing else, all their own way. But these farmers, working-men, artisans, &c., complain that they are not noticed as they should be. Whatever qualifications the farmers may lack, yet this is as true to-day as it ever was.

The State of Vermont is probably more strictly agricultural than any other in the country. So that mere farmers would more naturally be governors and legislators than in most other States where mercantile and commercial interests come in for a share of honors. We believe that Mr. Hunton is a real friend to the farmer and the farmer's interest. His advice to them is good, and is what ought to be remembered by them and put in practice; but, in candor, we ask Mr. Hunton why it is that so many young men, who have been brought up farmers, give up the business and seek the "professions" for a living, if they do not think that an A.M., or M.D., attached to their names is of more consequence to their future elevation and greatness than the simple name of farmer alone. It must be that there is something in "titles" after all, or else so many young men who have chances for farming would not turn their backs upon the business. And would it not be well for us all to look into this subject, and see if there is not some other cause than want of capacity, knowledge, or confidence in themselves, which prevents them from attaining that position in society which Mr. Hunton so justly complains is withheld from them by their own neglect.

Yours truly, L. DURAND.

Derby, Ct., August 4th, 1853.

THE PALMER-WORM.

THIS insect, which after an absence of many years has returned and renewed its depredations upon our apple, cherry, and plum trees, and also upon some of our forest trees, is thus described by the well-known and learned entomologist, Dr. T. W. Harris, of Cambridge, Mass. :—

"In its early stages, this worm, or caterpillar, though varying somewhat in color, is mostly pale green, with two slender brown lines along the top of the back, and a pale brown head. It has sixteen feet, six of which, near the head, are jointed, and end with a single claw; the others are merely fleshy protuberances without joints, the terminal pair being the longest. When fully grown, the insect measures half an inch, or rather more, in length, and resembles the common bud-worm of the apple-tree; the back assuming generally a darker color, and the sides of the body being marked with black points, arranged three together on each side of every ring. Two blackish semicircular spots or marks may also generally be observed, *at* this period, on the top of the first ring. A few short hairs may be seen on the body by means of a magnifying glass. On my own trees, these insects have confined themselves mostly to the terminal leaves and buds; on others, in places where they have been numerous, they have spread over all the leaves, and have devoured the whole green substance, leaving only the net-work or veins untouched. They are exceedingly active in their motions, moving either forwards or backwards at pleasure, with a kind of impatient jerking motion which renders it difficult to hold them. When the trees are shaken, these worms drop, and hang suspended by threads, like canker-worms. Whether they leave the trees in the same way, when they have finished their course—if indeed they do leave them at this time—and where they undergo their final transformations, I have not ascertained, being prevented by other engagements from watching their farther progress. One of my correspondents has informed me that these worms mostly disappeared after a late hail-storm; and another one states that they all took leave during a heavy shower on Monday last. A few that were kept for observation in a glass jar, have covered themselves with a thin web of silk, and some of these have already taken the chrysalis form within their webs. More than half of my specimens have been stung by ichneumon flies, which have deposited a single egg in each one of their victims. The maggots bred from eggs are now leaving the lifeless worms, and are spinning themselves up in white, oblong oval, silken pods or cocoons. If the palmer-worms elsewhere have suffered the same fate in the like proportion, we have little cause to fear for their ravages next year. The chrysalis is about one quarter of an inch long, of a pale yellowish-brown color, and differs from that of the bud-worm in not having transverse rows of teeth, or little notches, around its body. The final transformation remains to be observed; and until the insect is obtained in the winged or moth state, its scientific name cannot be determined.

On the morning of the 28th of May, I saw in the cemetery at Worcester, immense numbers of gray or whitish moths, about twice the size of the common clothes' moth, flying about almost in swarms, being disturbed from the grass and trees by my passing. Two days afterwards, a few of the same little moths were seen in my garden; and Dr. Sanborn informed me that his garden was alive with them on the 23d of May. They were also very numerous about the same time at New-Haven, and in other places since visited by the palmer-worms. But whether the latter were, or were not, the descendants of these little moths, it would not be safe now to say. The moths, though not wholly unknown to me by sight before this spring, have heretofore been so rare that my collection contained only a single specimen, and that in too poor a condition to enable me satisfactorily to investigate its scientific character, and ascertain to what modern genus it belonged."

WASTE OF MANURE—URINE.

This subject is too important to be lost sight of for a day. Were it not that too frequent repetition wearies and disgusts, on every topic, we would have every farmer reminded, daily, of his constant exposure to material loss, through neglect of this one branch of his business, the preparation of manures.

So far as our own city operations are concerned, we have most emphatic testimony, in a recent presentment of its abuses by the Grand Jury, in the month just passed. They say, "among the things brought to the attention of the Grand Jury, was the practice under the existing laws, of emptying the contents of privies, sinks, &c., into our public docks. In one instance we learn that 770 loads were deposited in a single night, in one slip." Here is a waste, perhaps of $1000, "in a single night in one slip." And when we add that the water-closets all empty, as we suppose, into the common sewer, it must be obvious that the waste of fertilizing material in this city is immense.

But we invite attention in this paper to the general waste of liquid manures. It is now well understood, that a given weight of urine is worth more than the same weight of solid excrements. There is however a difference in the liquid as in the solid excretæ of different animals. While the essential elements are similar, the proportions of each differ. Disease also affects these results.

The value of Peruvian Guano consists principally in its ammoniacal salts and its phosphates. Mr. C. W. Johnson's analysis of it gives 7 to 9 parts of water, 56 to 66 of ammoniacal matter, and 16 to 23 of earthy phosphates.

Careful analyses have also been made of human urine. The urine voided by four persons in 24 hours, was made the subject of careful examination in Prof. Liebig's laboratory, and also that of individuals under different circumstances, and with the following results. 1000 cc. of urine gave, on the average, 2317 grammes of phosphoric acid; or 24 hours gave 1610 cc.* of urine, containing 3,732 grammes of phosphoric acid. Another experiment upon "an individual who drank much water," resulted as follows: 1000 cc. of urine gave 2,027 grammes of phosphoric acid; 24 hours gave 2,086 cc. of urine and 4,228 grammes of phosphoric acid.. Another experiment upon the urine of "an individual who drank very little water," resulted in the following average: 1000 cc. of urine gave 4,062 grammes of phosphoric acid; or 24 hours gave 2,988 cc. of urine and 4,015 grammes of phosphoric acid.

Other experiments upon the same product, discharged after sleeping, and also that of waking hours, by four persons, resulted as follows: 1000 cc. of urine, after sleeping, gave 2,284 grammes phosphoric acid; and during waking hours, 2,763 grammes of phosphoric acid.

These experiments were varied also, so far as regards the time during which the urine was voided, whether before or after dinner, (that is forenoon or afternoon,) and the products presented similar differences. We have made a general average of all these experiments, and find the following results:

The smallest amount was 1,743 grammes of phosphoric acid in 1000 cc. of urine, voided by a person "who drank much water." The highest amount was 4,511 grammes, from the same amount of urine of a person "who drank very little water." That voided before dinner in each of nine experiments, was richer in phosphoric acid "before dinner" than "after dinner." The "hours of sleep" were excluded from both these experiments.

The general average of all the experiments is this: 1000 cc. of urine gave 2,883 grammes of phosphoric acid, This is an average of nearly a hundred experiments, about half of which included the urine of four persons.

Such facts as those hereby brought to light cannot fail to satisfy any person of the importance of carefully and skilfully preserving the urine both of the house and stables. The modes of doing this are as follows:

1. If privies are made water-tight, as they should be, all the value of what is deposited there may be preserved by a daily sprinkling of charcoal dust, peat dust, or lime, in quantities that shall keep the air free from its odor. If an excess of these substances is used, no harm is done, as each is valuable in itself. At proper times the entire contents may be removed to the compost heap. This should be done *without fail*, at some time, as it is never well to apply these concentrated fertilizers directly to the soil, without a divisor.

2. Daily additions of whatever may be at command may be made to the compost heap, and the substances already named, with an indefinite amount of turf, leaves, straw and other litter, may be added. But either the lime, charcoal, or peat should be used without fail.

* We confess ourselves in doubt how to read the "cc" of the author cited. No such abbreviation is acknowledged in French weights. It probably means *hundreds of grammes*. A gramme is about 15½ grains, Troy.

3. There may be drains, so arranged as to pour the contents of the privy, with all the wash of the house, into a large reservoir in the barn-yard, where the solid materials may be thrown from time to time, which will be constantly saturated by the liquid received from the drains. If any odor arises from it, it is certain that one or more of the substances before-named should be applied without delay.

Should some system like what we have sketched above, be adopted by any one of our readers, he will be astonished to find the increase of fertilizing matter which will be placed at his command, and the consequent increase of his crops.

RAILROAD OPERATIONS.

The Railroad Interest.—It is gratifying to find that this interest, in which Massachusetts has so many millions of dollars, is gradually recovering from the depression which has for several years reduced the income of the old roads very materially, and almost destroyed the original investment of several millions of dollars in others.

The roads in New-Hampshire and Vermont, which have been built mainly with Massachusetts capital, have a fair prospect of yielding a fair remuneration for the capital employed in them.

In Massachusetts, the Western, the Worcester, the Boston and Maine, the Providence and others, are slowly approaching with their dividends towards the rate which they were enabled to pay in former times, before competition had increased their expenses and diminished their income.

The Lowell and the Eastern are all which now remain depressed, and after the projected improvements of these companies are completed, the stock will no doubt advance. The new track of the Eastern into Boston runs through a neighborhood which will be thickly covered with dwellings in a few years, being eligible building land, and is already in the hands of a company of wealthy capitalists, who are erecting many buildings. We understand the Eastern has a handsome surplus of nearly $60,000, after making the July dividend. The travel on this road must always be large, and the population along the whole line will increase rapidly with a few prosperous years for business in Massachusetts and Maine.

The Newburyport Railroad is also doing a handsomely increasing business. The income for the last four months has averaged $2,500 a month, which, if continued through the year, ought to be ample to pay its running expenses, and six per cent. on the cost. The upper roads, as far into the country as Lake Champlain, send so much down over this road that they all express a wish to see it carried to the deep water of the Merrimack. This will probably be done next year.

Erastus Hopkins, of Northampton, has been chosen President of the new Railroad Corporation in Ohio and Indiana, which is about to construct an air-line road from Cleveland, O., to Terre Haute, Ind., connecting with a line straight thence to Alton, Ill. The one first mentioned is to extend 375 miles.

Some very favorable reports have been received from the engineers who are surveying the route of the Hoboken and Canandaigua Railroad, and easier grades than were anticipated have been found. Considerable enthusiasm is apparent on the line of the road, and offers of large subscriptions have been made.

East Tennessee and Georgia Railroad Stock.—So far as we have observed, says the Knoxville *Register*, there is not a single railroad company in the South whose road is completed, that cannot boast of the fact, that its stock is above par. Of all the southern roads, none can compare in point of geographical location with the East Tennessee and Georgia road. It is a line into which are converged, from south and west, the Nashville and Chattanooga, Memphis and Charleston, Selma and Tennessee River, Georgia, South Carolina, Macon and Western, Central and Western and Atlantic, and, indeed, all the roads south of Tennessee; and, on the other hand, it is to have a place in the great lines from New-York to New-Orleans, and from the lakes and the valley of the Ohio at Louisville and Cincinnati, to the south Atlantic seaboard and the Gulf of Mexico, at Pensacola and Mobile.

Union of Railroads.—The Mobile *Tribune* learns that an arrangement has been made between the Mobile and New-Orleans Railroad Company, of Mobile, and the Pontchartrain Railroad Company of New-Orleans, by which a continuous road will be constructed from city to city.

Blue Ridge Railroad.—The Common Council of Charleston, S. C., have passed resolutions in favor of subscribing $549,000 to the stock of the Blue Ridge Railroad. It is understood that the several companies interested have been consolidated, and a contract entered into with Messrs. A. Bangs & Co., for the construction and equipment of the road. The whole length of the line to Knoxsville, Tenn., is 180 miles.

Illinois Central Road.—The contractors are pushing on this work with energy. At present matters are about as follows: There are over 10,000 men engaged on it. Over 100 miles is already in operation, viz., from Chicago to Kankakee, and from Lasalle to Bloomington. About two-thirds of the distance from Cairo to the Junction is graded and ready for the rail. This includes the First and Second Division, upon both of which the track-layers are about commencing their labors. Within a year from this time the road will be opened its entire length between Chicago and Cairo.

New-York and New-Haven Railroad.—It has been decided to pass the usual semi-annual dividend of the New-York and New-Haven Railroad, in consequence of the heavy payments for damages to parties injured by the Norwalk accident.

Baltimore and Ohio Railroad.—Fifty miles of the double track of the Baltimore and Ohio Railroad is in process of construction, and an additional fifty miles are to be immediately contracted for.

Williamsport and Elmira Railroad.—About one thousand men are at work upon the Williamsport and Elmira Railroad.

New-York Central Railroad Company.—The Directors of the New York Central Railroad Company have resolved that the amount of 90 per cent. remaining unpaid on the capital stock issued by the late Mohawk Valley Railroad, on the capital stock issued by the late Syracuse and Utica Direct Railroad, and on the increase of the capital stock of the late Buffalo and Rochester Railroad, may be paid by stockholders electing so to do, on the 1st of August next, with interest from the 1st day of May last, (three months,) at the rate of 7 per cent. per annum, pursuant to the terms of the consolidation agreement. On all payments made subsequent to the said 1st day of August, interest from that day will be charged in addition.

Railroad Results.—The Eastern roads coming into the city of Chicago, says the *Prairie Farmer*, have had the effect to add an increase of value equal to 10 and 25 per cent., to every useable animal with four legs among us, and all else saleable that animals produce. They have given a cash value to a hundred things which, though they might be used to a local extent, could not be sold. Of course, if animals are worth more, the grass and grain they eat is also worth more, and the land they grow on is also worth more. All the different parties then reap a portion of the benefit. The Company prospers by the carriage of men and produce and merchandise; the farmer, by the increased value he gets for his produce; the mechanic, by the increased demand and ready pay for his implements or work; the professional man and the merchant, by the like growth and remuneration of their business; while all are benefitted by being able to go any where and get any thing from any distance.

Eastern Railways.—A note on the present state of railway enterprise in the Eastern Empire will interest some of our readers. Beyond the Danube, along all the lines of ancient romance, the railway is as yet unknown, with the sole exception of a spot or two on to which the locomotive Saxon has lately carried his own wants and the means of meeting them. In the Presidency of Bengal, and on this side of Bengal—for example, at Bombay and at Suez—preparations are being made for the speedy introduction of the iron horse. The first line of railway in Hindostan is just about to open between Bombay and Tannah for general traffic; and the wondering natives of that legendary country will soon be whirled along at a speed to leave behind the slow-paced anger of their ancient gods. In the district of Calcutta, the works of the great trunk line are rapidly progressing, the second section of the line, that to Rajmahl, having been commenced. Ere long, those wealthy cities will be wedded with the iron link, and the field operations pushed on towards Allahabad, Agra and Delhi. The completion of this grand line, with its several branches to Benares, Patna and Meerut, will throw open the whole of Upper India to the commercial activities of Calcutta and the seaports. The "navvies" are at work near Madras also; and it appears probable that in a few years, should peace continue, the vast public works which now peep out here and there like specks on the immense spaces of the country will cover and connect it from the mouths of the Ganges to the north-eastern frontier, from the coast of Coromandel to the shores of the Arabian Sea. Nor does the mere material activity and probable moral results of these great enterprises exhaust their interest. The natives themselves have begun to feel the communicated inspiration, and one native ruler, the Guicowar, has already prepared the plans for a railway through his dominions.

The Pacific Railroad was opened thirty-nine miles from St. Louis, a few days since, with imposing ceremonies.

The Cleveland, Columbus, and Cincinnati Railroad declared a dividend of five per cent., payable on the 1st of August.

Cleveland and Pittsburgh Railroad.—Allegheny county, Pa., has subscribed $300,000 to the stock of the Cleveland and Pittsburgh road, for the construction of the extension from Wellsville to Beaver. Beaver county subscribed $100,000.

The Iron Mountain (Mo.) Railroad has called for proposals to build about eighty-four miles of this road. The work on this road is heavy including three tunnels, and much rock work and masonry. About twenty miles of the road shows "side-hill" work, and the balance heavy thorough work. The Iron Mountain is 700 feet above the river at St. Louis; but two principal depressions are to be crossed before reaching that height. The country passed through is healthy and well watered. The road will hereafter be extended to the Arkansas line, to connect with the Cairo and Fulton road, and a branch to the Mississippi river, at Cairo or New-Madrid, is also contemplated.

MEMPHIS AND CHARLESTON RAILROAD.—The work is progressing finely on the section of this road beyond La Grange. There are about eight hundred men at work now on the first twenty-three miles, and additional laborers go up from Memphis with almost every train. The iron is laid down on the Sommerville branch for a distance of about four miles, and the work is progressing well. The cars will be running over it about the middle of September.

FREMONT AND INDIANA RAILROAD.—The stockholders of the Fremont and Indiana Railroad held a meeting at Rome, Seneca county, on the 18th inst., and elected their officers for the ensuing year. The contract for constructing thirty-eight miles of the road has been let to Messrs. Shoemakers and Doolittle. They intend to have the road completed in twelve months.

MILWAUKEE AND MISSISSIPPI RAILWAY.—The Directors of the Milwaukee and Mississippi Railroad Company, at a special meeting, held on the 22d, and by a unanimous vote of the Board, closed the contract for the completion of their road to the Mississippi, at $25,000 per mile, thoroughly equipped. The contractor is Mr. A. L. Catlin, of Burlington, Vermont, a gentleman of ample means and great energy. He takes the entire route from Rock River to the Mississippi, assuming the Cook and Sherwin contract from Rock River to Madison, and engages to complete the whole from Prairie du Chin by the first day of January, 1855.

CHERAW AND DARLINGTON RAILROAD.—The sections of the road between Darlington C. H., and the terminus on the Wilmington and Manchester road, were on the 6th ult. let out for grading, &c.

MARIETTA AND CINCINNATI RAILROAD.—The $150,000 subscription promised by the city of Wheeling to the Marietta and Cincinnati Railroad Company, has been duly made. This makes the entire available stock-subscription to this road about $3,500,000. That part of the line lying between Marietta and Wheeling has been put under contract on advantageous terms. About one hundred miles of this road, on the west end, will be completed at an early day this fall or winter.

INDIANA CENTRAL RAILROAD.—There are now less than twenty miles of iron to lay down on this road, and the track-layers are busily engaged at three or four points. The whole work will be completed by the 1st September.

EVANSVILLE AND CRAWFORDSVILLE RAILROAD.—That portion of this road between Vincennes and Terre Haute on the Wabash, has been let out to contractors. The distance is fifty-seven miles.

TURNIPS AND GRASS SEED.

A NEW experiment has been tested by Mr. H. F. French, of Exeter, N. H., which we give in his own words, as detailed in the *New-England Farmer*. He says: "I sowed herds'-grass and red-top, at the rate of about half a bushel of the former, and a bushel of the latter to the acre, with the turnip seed, all mixed together, on the 28th day of July. The ground was so dry when I ploughed that no moisture was perceptible at the bottom of a deep furrow. It was sowed, brushed and rolled, and left literally *in dust and ashes*. (One barrel of bone-dust to twenty-five bushels of ashes.) We had very little rain till the last week in August. The grass seed came up well in the fall. I sowed clover seed on the snow in spring. The grass was cut last week, a heavy crop, more than half clover, at the rate of about two tons to the acre. This fact about the clover deserves notice. No clover seed was sowed last summer, the land had not been in grass for six years, and the clover did not grow from the seed sowed in the spring. Sowed in spring, it does not head before haying time, and this clover was of full size, so as to *lodge* in spots. It must have grown from seed which had long lain in the ground, or what perhaps is more probable, which had been carried on in manure the year before I sowed it. No manure except *the dust and ashes* was applied in 1852, and there probably was no clover seed in that! One fact seems to be indicated by this experiment, namely, that clover sown in July does not always winter-kill. I sowed one acre of new land with herds'-grass seed and turnips, on the first day of the present July, with two bags of superphosphate of lime, putting on at the same time six pounds of clover. The turnips and grass seed are up and promise well. I omitted the red-top because it could not be procured at a reasonable price. Hay is worth $16 a on here from the field, and turnips are valuable. Try the experiment. Any ime before the middle of August will be in season."

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

POETRY AND AGRICULTURE.

MESSRS. EDITORS: It would afford a variety in your useful publication, and without doubt gratify the taste of some of your readers, if you would insert n your work occasionally a few selected extracts from standard poetic works, showing how much the labors of the field, the various changes presented by he country, and the charms of rural life have added to and enriched our stores of real poetry.

It has often been a pleasing idea to my mind that nature and agriculture have formed the subjects of the most sublime and fascinating poetry. Whatever has beeu the theme upon which masters in that divine art have written, their episodes, illustrations, and comparisons have been drawn from these sources, even from the old Greek writer, Hesiod, to those of the present time.

In divine writ some of the most important truths are illustrated by the products of the forest or the field. Witness the parable mentioned in 2 Kings xiv. 9:

"The thistle that was in Lebanon sent to the cedar that was in Lebanon, saying, Give thy daughter to my son to wife; and there passed by a wild beast that was in Lebanon, and trod down the thistle."

The following extracts I have made, prove the truth of the above remarks, and may perhaps refresh the minds of some with the impressions they received in their younger days when studying the authors from which they have been selected.

To begin with Homer, who is one of the most ancient and the most successful devotees of the muses. His description of a moonlight scene has perhaps never been equalled, and certainly does not suffer in the hands of his translator, Pope:

"As when the moon, refulgent lamp of night,
O'er heaven's clear azure spreads her sacred light;
When not a breath disturbs the deep serene,
And not a cloud o'ercasts the solemn scene,
Around her throne the vivid planets roll,
And stars unnumbered gild the glowing pole;
O'er the dark trees a yellow verdure shed,
And tip with silver every mountain's head;
Then shine the vales: the rocks in prospects rise,
A flood of glory bursts from all the skies;
The conscious swains, rejoicing in the sight,
Eye the blue vault and bless the useful light."

Virgil's description of the appearance of evening is truly natural:

"Jam summa procul," &c.—Ecl. i., line 83.

"The smoke ascends from yonder cottage walls,
A longer shadow from the mountain falls."

Also his approach of spring:

"Et nunc omnis ager," &c.—Ecl. iii., line 56.

"A vernal beauty clothes the fruitful land,
And forests robed in leafy verdure stand,
The year's most beauteous season's now at hand."

Again we have a luscious painting of rural fruits, the ripening corn and flowing honey:

"Molli paullatim," &c.

"The swelling corn now ripens in the field,
And the wild grapes their blushing produce yield,
And sturdy oaks from off their moving tops
Honey distil, which falls in luscious drops."

Horace, the great master of lyric song, gives us a view of snow and frost, and then transports us to the comforts of the domestic fireside:

"Vides, ut alta stet," &c.—Book i., ode 9.

"See now Soractes mountain clothed in snow,
And frosts forbid the icy stream to flow;
The woods beneath the fleecy burden bow.
Now with unsparing hand the fuel ply,
And thus we shall stern winter's cold defy."

I have sometimes wondered how any one pent up in cities, and hedged in by bricks and mortar, can read the following description which Milton gives of Eden, without starting at once, on some fine summer's morning, to enjoy the bracing air and exhilarating scenes of the country, and thus imbibe a modicum of those elevating feelings which are left us in spite of the fall:

> "Between them, lawns, and level downs, and flocks
> Grazing the tender herb, were interposed;
> Or palmy hillock, or the flowery top
> Of some irriguous valley spread her store;
> Flowers of all hue, and without thorn the rose.
> Another side umbrageous grots and caves
> Of cool recess, o'er which the mantling vine
> Lays forth her purple grape, and gently creeps
> Luxuriant, meanwhile, murmuring waters fall
> Down the slope hills, dispersed, or in a lake,
> That to the fringéd bank with myrtle crowned
> Her crystal mirror holds." Book iv., line 252.

Cowper had a mind tuned most sensitively to all the beauties of the country, and has well said, "Man made the town, but God made the country." Horticulture, and his observations of the habits of wild animals, renewed the alacrity of his mind when too much absorbed in his literary pursuits. How naturally, in the following lines, does he describe the laborer proceeding to his daily calling:

> "Forth goes the woodman, leaving unconcerned
> The cheerful haunts of men, to wield the axe
> And drive the wedge in yonder forest drear,
> From morn to eve his solitary task.
> The sturdy swain
> Moves right toward the mark, nor stops for aught,
> But now and then, with pressure of the thumb,
> To adjust the fragrant charge of a short tube
> That fumes beneath his nose; the trailing cloud
> Streams from behind him, scenting all the air."

Thomson's Seasons are graphic descriptions of the country, its scenery, labors, and changes; and perhaps are more extensively read by the lovers of nature than any other of the English poets. His genius, if it might be said, ennobled agriculture, and gave it its proper exalted character in the circles of wealth and intellect. Of which the following lines are evidence:

> "Nor ye who live
> In luxury and ease, in pomp and pride,
> Think those lost themes unworthy of your ear.
> Such themes as these the rural Maro sang
> In wide imperial Rome, in the full height
> Of elegance and taste, by Greece refined.
> In ancient times the sacred plough employed
> The kings and awful fathers of mankind;
> And some
> Have held the scale of empire, ruled the storm
> Of mighty war, then with unwearied hand,
> Disdaining little delicacies, seized
> The plough, and greatly independent lived."

Goldsmith's Deserted Village has some beautiful strains of a thriving country spot, and the desolation caused by aristocratic wealth; and his descriptions of the effects of luxury and pride have rekindled the fire of patriotism in many a heart. His warnings have at the present age, we fear, in some instances been realized, as when he sings in the following strains:

"Ill fares the land, to hast'ning ills a prey,
Where wealth accumulates and men decay;
Princes and lords may flourish or may fade,
A breath can make them as a breath has made;
But a bold peasantry, their country's pride,
When once destroyed, can never be supplied."

The poetry of Burns, and that of Bloomfield, though not of so high a character as the foregoing, are studded with rural gems, and are read extensively among a rural population. The former's Saturday Night is a beautiful description of the value of the Sabbath, even independently of another world. The latter composed the "Farmer's Boy," and "Rural Tales," with some other poetic effusions, while laboring as a mechanic on a shoemaker's bench. When but a youth he worked as a boy upon a farm, and the impressions he then received of life in the country never forsook him as long as he lived. His rural tales give us a beautiful insight into the simplicity and comforts of a rural life, and are related with great delicacy and modesty, and in whose religious sentiments we will close this paper:

"Eternal Power, from whom these blessings flow,
Teach me still more to wonder and to know;
Seed-time and harvest let me see again,
Wander the leaf-strew'd wood and frozen plain;
Let the first flower, corn-waving field, plain, tree,
Here, round my home, still lift my soul to thee."

Wisconsin. R. S.

CHINA, OR PORCELAIN WARE.

Three centuries ago, such ware was not manufactured in all Europe; the few specimens that were to be found having been imported from China. In 1518, as a reward for destroying the pirates of the Ladrones, the Portuguese were allowed to establish a settlement at Macao, and thence came the first importations of China ware into Europe. Specimens of porcelain, in the time of Augustus, were very costly, the Etruscan vases competing in price with similar sizes of gold and silver.

The first introduction of enamelled ware into France, from Italy, was in 1565. It was in this latter country where the modern history of the art began. A crusade was undertaken from Pisa to Majorca, which, in 1115, was taken. Among the spoils were many specimens of Moorish pottery, which the Pisans stuck into church-walls as ornaments and trophies. These plates are still to be seen in some of the old churches of Pisa.

The early specimens of Italian manufacture were arabesque patterns, yellow and green, upon a blue ground—mere copies from the Moorish.

The Italian discoverer of enamel was Zuca della Robbia, the Florentine sculptor, who died 1481, about thirty years before the birth of Palissy, the man to whom Europe is most indebted for the elegant specimens of this ware now to be seen. For enamels, he used tin, lead, iron, steel, antimony, sulphate of copper, sand, ashes of tartar, litharge, manganese. He spent fifteen or sixteen years in his experiments, or, till about 1557, ere he met with any success; and became so poor that he was forced to take the fuel for his furnaces from the doors and timber of his humble dwelling. His figures were chiefly wild animals, reptiles, plants, &c., tastefully combined, and in color copied with great nicety. With the exception of a few leaves, all his figures were moulded from nature, and so accurately were they represented that the species of each can be accurately determined. His fish are those of the Seine, and his reptiles and plants those of the environs of Paris.

There is also an elegant ware which was made in France, under the patronage of Henry II. and Diana of Poitiers, which was called *Fayence*. It differs from that of Palissy, but is quite as beautiful. It is made of true pipe-clay, very fine and white, and does not require any enamel, the ornaments being covered only with a thin, transparent varnish. The ornaments themselves are engraved patterns, of which the grooves are filled with colored paste, making a smooth surface when finished, of which the decoration is inlaid. Some of the patterns, however, are ornamented in bold reliefs, in which pink is a predominant color. The name of the originator of this kind of ware is unknown. It must have been made during the reign of Francis I., and was continued under that of Henry II., when it again disappears. No other ware can claim affinity to the Fayence of Henry II.

PATENT HORSE-SHOE MACHINE.

We find a description of a machine for making horse-shoes, in an English paper, the Leeds *Intelligencer*, which seems worthy of attention:

"Every one must admit that the completeness of a horse-shoe is no insignificant matter; as Poor Richard says, 'for want of a nail, the shoe was lost; for want of a shoe, the horse;' &c., and so on to the rider himself being lost. The horse-shoe has been made by a very primitive method through many ages, with little variation beyond the suggestion of rude empiricism to meet certain circumstances, or to qualify peculiarities in the horse's foot; and though individual sagacity and manual dexterity may avoid the more palpable errors, much uncertainty and frequent mischiefs pervade the art of shoeing. It is rare, says this paper, that so many qualifications are combined in one mind as have been so successfully employed in the invention of the horse-shoe machine, patented by our fellow-townsman, Dr. Hobson, the inventor. Being fond of the horse, and a good judge of its properties, the doctor has not disdained to apply his professional knowledge of human physiology to that of an inferior creature, and by the aid also of mechanical science and ingenuity, has not only devised what is wanted in the formation of a horse-shoe, but has invented the mechanism which should unerringly produce it. We had the pleasure of seeing this machine at work a few days ago, and, without making pretence to technical knowledge of the subject, we must acknowledge both obvious advantages in the process and great beauty of operation. The iron is rolled in bars in a peculiar manner. They are cut into suitable lengths, and the superfluous parts cut off by machinery, and the ends of each piece rounded. Any harsh edges left by the cutting-machine are then ground down, and the pieces are put on a moveable rack, which drops them one by one at the mouth of the furnace, and they are carried gradually through the flame and radiating heat of the furnace without touching the coals. By a new movement, at the other end of the furnace, the pieces are passed successively to the block or anvil, where each is bent and stamped by a very beautiful combined action of the machine, and the horse-shoe, perfectly shaped, drops into the trough to be cooled. The nail holes are afterwards punched in the cold metal, and it is not necessary again to heat the shoe, so that the hardening effect of hammering (or stamping) the shoe is not lost. The advantages of the patent horse-shoe machine, in addition to the economy of labor, (for the apparatus for heating and bending would turn out shoes for one hundred and fifty to two hundred horses an hour,) are, that the shoes are formed exactly to a predetermined shape, which can be varied, but always with certainty, to particular requirements. Dr. Hobson insists upon the advantage of a 'level tread' for the horse, and the patent shoe is made to that purpose (exceptional cases omitted.) It is much lighter than the hand-made shoe, but in no respect inferior in strength; and it is so formed that the nail-heads are protected, and by this means, and the support of the 'clips,' the liability to cast a shoe is diminished. In a paragraph we cannot attempt a full description of this invention, but it appears to us to be well worthy of public attention, which we invite to it."

EGYPTIAN AGRICULTURE.

The people have a knowledge of a few domestic mechanic arts, such as the making of a coarse pottery, the weaving and coloring of cloths, boat-building, and the making of bricks. They mingle straw with the mud or clay from which their bricks are made, as was done in the time of the Pharaohs. But they find their principal support in the cultivation of the soil, and in the keeping of flocks and herds. The soil, formed by the overflowings of the Nile, is of great depth and richness. It is irrigated by water drawn from the Nile. The fields, waving with wheat, barley, lentiles, and the other products of the country, are not enclosed by fences. Each man distinguishes his land from his neighbor's by the large stones placed in the ground, which serve as permanent marks and boundaries. The soil and climate are favorable for the raising of cattle. The camels and oxen and sheep, which we daily saw in great numbers, reminded us of the days of Jacob, and his descendants, who occupied portions of this land. The sheep look like those which are seen in England and America; but the wool is coarser. The goats and sheep are not separated from each other, but go in flocks together, and are generally watched by little children, aided by a dog. I noticed that the sheep and goats are sometimes, during the night, penned together in a fold in the open field. But generally the sheep and other animals, cows, goats, donkeys, and camels, are driven into the villages at night. Each house has an enclosure attached to it formed of mud or of stalks and reeds open at the top, in which they are shut up. Sometimes they seem to be otherwise provided for. A number of times in the morning I saw the sheep and goats walking complacently about on the flat roofs of the houses. The houses are commonly made of unburnt bricks hardened in the sun.

The oxen of Egypt, those which we first met with, and which are much the most frequent, are of a large size, resembling somewhat in shape the Buffalo of America, black in color with scarcely an exception, and with large, crooked horns, reaching back and depressed almost horizontally with the neck. I often saw them patiently turning the wheel of the Sakhia, or drawing the plough through the fields. The plough is very simple in its construction, being hardly more than a hard, sharpened stick of wood, though sometimes pointed with iron. It could not easily have been more simple in the days of the Patriarchs. The oxen are very tractable. I have seen them with a string round the horn or neck, led home from the fields at night by little children.

At one time I noticed a herd of the animals, which may be said to make a part of an Arab's family, on the brink of the Nile, under the care of two boys. It was just as the sun was setting. They belonged to a village on the western side, and were on their way home from a pasture-ground, where they had been feeding during the day. I noticed their appearance, because they stood crowded together, about twenty in number, silent and thoughtful, as if meditating some act of importance. The boys took off their clothes, tied them in bundles, and fastened them on their own heads. They then mounted the backs of two of the animals, gave the word of command, and the whole herd plunged into the river. They passed directly in front of the boat at a place where the Nile was running more rapidly than common. The boatmen suspended their rowing. Nothing was seen of the cattle but their black heads and horns moving towards the other shore. The boys sat upright with the bundles of clothes on their heads. They made a singular appearance, moving rapidly over the Nile, and apparently without any support, as the backs of the cattle were concealed under the water. They reached the other shore in safety. The boys put on their clothes. The cattle shook their wet sides on the sands, and they went together up the bank.—*Prof. Upham's Letters to the Congregationalist.*

PLANK ROADS.

A DESCRIPTION of the materials for building plank roads and their cost, with the model of laying the same, by Mr. O. M. Stowey, of Belfast, civil engineer, is published in the *Working Farmer.*

According to his statement, the road-bed for plank roads should be so formed, either by embankment, turnpiking, or side ditches, as to admit of thorough drainage.

That part which is to be planked must be prepared so as to leave a uniform bearing for the sills and planks. The planks must be eight feet long, and four inches thick, where there is much travel or traffic of heavy loads; or three inches where the travel is light or the loads small, laid on one side, instead of centre of road, inclining a little downward towards the nearest ditch.

For roads constructed on lands which descend across its line, the plank should be laid on that side of road-bed next the low ground. The plank should lie crosswise of the road, resting on four sills six inches wide—one inch thick for three-inch plank, or two inches thick under four-inch plank. The inside sills should be four and a half feet apart in the clear, and the outside sills so placed as to leave six inches space from the inside sills; the outside sill to be laid so as to break joint with the inside sill adjoining. The planks should be pine or hemlock, preference being given to pine at the same prices.

The cost of turnpiking a road and laying planks, he estimates from 75 cents to $1 25 per rod on cleared lands, depending on the stiffness and other qualities of the soil.

Wheels with wide tires would undoubtedly be less injurious to planks than narrow tires; but greater wear is made by the corks of horses, which cut and split the planks. Still a more serious damage is done by neglect of a proper drainage. On many roads water is allowed to remain under the planks, causing them to float and acquire an uneven bearing, permitting the planks to spring and break before they are half worn.

COUP DE SOLEIL.

We publish with pleasure the following short paragraph furnished us by one of our regular physicians. It is peculiarly appropriate to the present season. Within three or four days from our writing, (August 16th,) we have had reported over two hundred cases of deaths in this city and vicinity from this sole cause.—Ed.

"This is a French term or phrase, the literal signification of which is, a blow or stroke of the sun. It is thought by many that there is a peculiar or specific disease or affection known by the above appellation. This is a popular error. The disease produced by heat, and by exposure to the sun's rays, is apoplexy, pure and unmixed, and nothing else. Apoplexy is a disease characterized by a sudden loss of consciousness, sensation and voluntary motion, without a suspension of the circulation of the blood, and without a suspension of respiration. It originates within the cranium, and depends entirely on pressure upon the brain. This pressure is produced either by congestion, hemorrhage, or an effusion of serum. In enumerating the causes of the lesion or lesions which constitute apoplexy, we may mention hereditary predisposition, old age, plethora, organic diseases of the heart and lungs, various diseases of the brain and its vessels, strong muscular effort, position causing the accumulation of blood in the brain, compression of the neck by cravats, or the waist by stays, external stimulation, either by the heat of a fire, or *by the direct rays of the sun*, internal stimulation, either by emotion or alcohol, excessive cold, the hot bath, indulgences of the table, &c., &c. The person attacked by apoplexy should be placed in a recumbent position, with the head and shoulders elevated, the clothing should be loosened, the crowd not concerned in the treatment dispelled, so as to allow the sufferer fresh air. If the strength of the pulse will permit, blood must be taken from the arm by a large opening, for the purpose of producing a retrocession of blood from the brain. Cups or leeches should be applied to the back of the neck; cold must be applied to the head by means of cloths wet in iced water, or by means of bladders filled with pounded ice. The feet and lower extremities should be immediately immersed in hot water rendered stimulating by the addition of mustard. By the time the above treatment has been instituted, it is probable the physician will have arrived, into whose hands we deliver the patient."

THE CULTIVATION OF THE TEA-PLANT.

Our readers are already apprised that the cultivation of this important article of luxury and of trade is commenced in our own country:—not only the true Canton tea, but sundry substitutes for it, which enable our dealers to imitate the foreign manufacturers in a most extensive and most shameful adulteration of it. Whether this plant will find here a congenial soil and climate is not yet proved, although it seems an established fact that the plant will thrive here. Whether it will fully develope all its peculiar properties, as in China and India, the evidence, as yet, is incomplete.

In the ninth century certain Arabian doctors mentioned a fragrant and fascinating Chinese beverage, prepared from a plant called schah. After the lapse of some six hundred years, in 1663, Olearius discovered that tea was domesticated as a luxury among the higher ranks of society in Persia. Now, all through the wastes of Central Asia, the Calmucks, the Bashkira, &c., tea is supreme.

Travellers or residents in China have given the following statements in reference to this growth, and the sources whence we draw them are no doubt perfectly reliable. The information comes chiefly from Messrs. Fortune and Warrington. The former of these adopted the Chinese costume, and being familiar with the language, travelled through the country for the purpose of obtaining the finest varieties of tea for the East India Company.

The plant in cultivation about Canton, from which the Canton tea is made, is the *Thea bohea*, while the more northern variety found in the green tea country has been called *Thea viridis.* The first appears to have been named upon the supposition that all the black teas of the Bohea mountains were obtained from this species; and the second was called *virid s*, because it furnished the green teas of commerce. These names seem to have misled the public; and hence many persons, until a few years ago, firmly believed that the black tea could be made only from *Thea bohea*, and green tea only from *Thea viridis.* In his Wanderings in China, published in 1816, Mr. Fortune has stated that both teas could be made from either plant, and that the difference in appearance depended upon manipulation, and upon that only.

In eight years the leaves of the tea-plant are fully charged with their peculiarities. In the ninth year they begin to lose them. Yet the plants are stripped sometimes to the eleventh and twelfth year, and hence the endless varieties of tea. Each year there are four harvests, of which, that in February is the least in quantity and the best in quality. The April harvest is a kind of rowen, the second cutting is the best. That of June yields mainly large leaves, and that of August is of the inferior quality. A careful bath completes the preparation for picking, and then, with gloved hands, the work is commenced. An industrious workman may collect from ten to fifteen pounds in a day. But on the same day he must strew them on a heated platter, and on the same evening wrap them in a cloth, and dip them for some moments in hot water. After they have dripped during the night, they are spread the next morning in hot iron pans, in which they are constantly stirred. They are laid upon mats, rolled with the open hand, completely cooled with large fans during the process, then skilfully packed in chests.

The two kinds of tea, indeed, are rarely made in the same district; but this is a matter of convenience. Districts which formerly were famous for black teas now produce nothing but green. At Canton, green and black teas are made from the *Thea bohea* at the pleasure of the manufacturer, and according to the demand. When the plants arrive from the farms fresh and cool, they dry off a bright green color; but if they are delayed in their transit, or remain in their confined state for a long period, they become heated from a species of fermentation, and when loosened and spread open, emit vapors that are sensibly warm to the hand. When such plants are dried, the whole of the green color is found to have been destroyed, and a red brown, and sometimes a blackish brown result is obtained.

The green trees when wetted and re-dried, with exposure to the air, are as dark as black teas.

In these statements both Messrs. Warrington and Fortune agree, and the latter remarks that the same changes may be seen by every one who has a tree or bush in his garden. Mark the leaves which are blown down from trees in early autumn; they are brown or perhaps of a dullish green when they fall, but when they have been exposed for some time in their detached state to air and moisture, they become as black as our blackest teas. Without detailing the whole process in the manufacture of either kind of tea, it may be stated in reference to green tea:

1st. That the leaves are roasted almost immediately after they are gathered, and

2d. That they are dried off quickly after the rolling process.

In reference to black tea, on the other hand, it may be observed,

1st. That after being gathered the leaves are exposed for a considerable time.

2d. They are tossed about until they become soft and flaccid, and are then left in heaps.

3d. That after being roasted for a few hours and rolled, they are exposed for some hours to the air in a soft and moist state; and

4th. That they are at last dried slowly over charcoal fires. Genuine green tea is an article less artificial than black. There is at the same time too much foundation for the suspicion that the green teas so much patronized in Europe and America are not so innocently manufactured. Mr. Fortune witnessed the process of coloring them in the Hung Chow Green Tea country, and describes the process. The substance used is a powder consisting of four parts of gypsum and three parts of Prussian blue, which was applied to the teas during the process of roasting.

The introduction of tea culture into India, says Bayard Taylor, is an interesting experiment, if, indeed, it can still be considered an experiment. The Government, within the past ten years, have devoted much attention to it. All the principal varieties of the tea-plant have been imported, experimental gardens laid out at different points of the Himalayas, from Assam to the north-western frontier of the Punjaub, and Chinese workmen procured to teach the preparation of the leaves. Mr. Fortune, whose travels in China on his mission to effect these objects have excited considerable notice, is now on his way to that country to procure fresh supplies of plants and workmen. The tea-plant was first introduced into Assam, a district north of Bengal, and lying on the Brahmapootra River. A company was formed about fifteen years ago for the cultivation and manufacture of tea; but through ignorance and inexperience it was for some time a losing concern. At present, however, it has so far succeeded as to produce 300,000 pounds of tea, and to pay 10 per cent. annually to the Company. The experimental gardens in the northern and western parts of the Himalayas have been established more recently, and the natives are now beginning to take up the cultivation of the plant.

One of the gardens is at Kaologir, about three miles from Dehra; and I visited it in company with Mr. Keene. Mr. Fortune considers that a level alluvial soil, like that of the Dhoon, is not so well adapted for tea as the hilly country about Almorah and in the Punjaub, and if he be correct I did not see the plant in its greatest perfection, though I should think it difficult for any plantation to present a more flourishing appearance than that at Kaologir. It consists of 300 acres of level ground—a rich, dark loam, mixed with clay—and contains plants in every stage of growth, from the seedling to the thick bushy shrub, six feet high. It is now (February 15th) blossoming season, and the next crop of leaves will be gathered before May. The plant bears some resemblance to the ilex, or holly, but the leaf is smaller, of a darker green, and more minutely serrated. The blossom is mostly white—in some instances a yellowish-brown—and resembles that of the wild American blackberry. The plants were set about three feet apart, in rows four feet from each other, with small channels between for the purposes of irrigation. Mr. Fortune, however, considers that irrigation is rather injurious than otherwise.

Mr. Thomson, the Superintendent of the plantation, assured me that the average yield of the plants, after they had reached a proper growth for plucking, might be set down at 1 cwt. per acre, though, under favorable circumstances, it might be increased to 200 lbs. At present the Dehra and Almorah teas sell for purely fancy prices, being bought up with avidity at the annual sales for from two to three rupees a pound. Dr. Jameson, who has charge of all the tea-plantations in the north-west, estimates that when the culture shall have become general, tea can profitably be produced at six annas (eighteen cents) the pound.

THE EXHIBITION OF THE INDUSTRY OF ALL NATIONS.

This project, which has been so long before the world, is now a reality. The Crystal Palace is erected, and its elegant proportions and artistic arrangements seem almost to defy improvement. It has received, and will no doubt receive, all the attention it can justly claim; and yet, it can not be denied that very strong prejudice exists, and to a very great extent, against this exhibition, because it is believed to be a private speculation. But suppose it is; what then? What are all our railroads and steamboats but organized means of individual profit? Take away this feature, and they would all disappear even now that they are established. So would our banks, insurance offices, and the whole list of incorporated societies, with very few exceptions.

"But it is the plan of *New-York* speculators." Very well, suppose it is. May not New-Yorkers have an equal chance with others? "But it is intended to make New-York prominent as the centre of business." Very well, again, New-York has been alluded to in our geographies, &c., before the conception of the Crystal Palace; and that admirable dome, unequalled on the continent, and looming up in the midst of her crowded streets, proves that New York is not a mere fiction, nor destitute of some enterprise. It is useless to pretend that any deception has been practised, or that there is or has been any thing dishonorable in the management of this matter from the beginning to the present day. If the Directors will *sow their seed liberally*, in all sections of the country, and enkindle the thousand centres of light and heat, which will reach every city and town in the country, they will have a harvest to reap which it will require years to gather, and the "private speculation" will prove to be a substantial reality, while the ideas of the masses touching the great industrial pursuits of the country will receive an impetus that will not cease to be felt while our country exists, or even while the world stands.

THE OPENING.

We have witnessed this imposing spectacle. We have sat under that splendid dome, with the President and other officers of the Government of the United States, and other gentlemen of distinction before us, and the products of the art and the industry of all nations around us. The day was glorious; the occasion was glorious, and the results of the plan, so far, quite satisfactory to those concerned. On the 14th of July, at a few minutes before 2 o'clock P. M., the procession entered the Crystal Palace, already densely filled at every point from which the stage was visible. The President was greeted enthusiastically on his entrance. The exercises were opened with prayer by Bishop Wainwright. Then followed an occasional hymn, sung to the tune of Old Hundred. Theodore Sedgwick, Esq., the President of the Association, then addressed the President in an admirably appropriate speech, to which President Pierce made a short reply, both apt in character and graceful and effective in manner. The Harmonic Society then gave the Hallelujah Chorus from the Messiah, and the exercises of the inauguration closed. The whole occupied one hour.

OF THE EXHIBITION.

It is impossible to present in one view any thing like a description of this extensive collection, brought from all parts of the world, and embracing every variety of product that ingenuity can devise. Our readers will not expect any such service. The most that we can do is to give, in each monthly issue, as complete an account of some section or department as the circumstances and the character of the articles exhibited will permit. For those who wish the best and most satisfactory idea of the show, next to the actual vision, we commend the subscription list of our good friend Mr. G. P. Putnam, who publishes semi-monthly his Journal of the Exhibition, expressly devoted to it, and full of engraved illustrations of the more interesting articles.

There are, of course, in so large a collection, a thousand articles that possess no interest to ordinary minds. Yet these may be specially sought for by others. There are, however, some articles which we could have wished excluded. Among these are hundreds of bottles of hair-oils, pomades, lotions, &c., corked, sealed, tied, so as to prevent the possibility of knowing their contents but from the labels. We cannot test their qualities or worth. We can do nothing more than if they were in a shop-window. Hence their presence is a mere advertisement, of no possible use to the visitor beyond what the card of the dealer would be. In the same list are barrels of flour, unopened, but *presumed* to be what they are labelled and marked. How do such exhibitions promote national industry?

Again, there are scores of piano-fortes, shut, locked, and covered, so that they cannot be examined by visitors in any respect, either as specimens of cabinet-work, or as musical instruments. They ought to be accessible to every visitor who knows how to use them, or else should have an attendant to exhibit their qualities to all who wish to know them. This list of advertising articles might be greatly extended, provided the object is in fact what it is professed to be. Who, for example, would undertake to judge of the merits of broad cloths and other woven goods, if not allowed to touch them? If they are liable to injury from being *thus* handled, then the exhibitor should have taken this into account before he brought them there, and be governed accordingly. Other exhibitions alike are exposed to these criticisms, as that which we are now about to examine; but this was designed for a special purpose, and it would have been well, in our judgment, to have admitted nothing, in the dearth of space really wanted, that would not contribute to this end.

The most prominent objects which arrest one's attention as he enters are those which occupy the floor under the dome, and the space between the entrance and the centre.

Directly beneath the dome is the equestrian statue of Washington, two and a half times larger than life, executed by Baron Marochetti of Piedmont. It is of plaster, in imitation of bronze. This statue has been severely criticised, and in some points no doubt deserves it. The fore and hind legs are indicative of two distinct conditions, the former of rapid or powerful motion, the latter of comparative rest. The posture of the rider, too, partakes more of the sternness of official dignity than of the ease which characterised the great prototype. Other criticisms also may be deserved, but it is still an object of interest, and is not unworthy the place it holds till a better one can be found to supplant it.

On both sides the open naves or spaces, between the entrances and the centre of the building, are marble and bronze statues, chiefly the work of foreign artists, while their central portions are occupied by articles prominent at least for their size.

Among these are the Amazon on horseback, attacked by a tiger; a wretched statue of Daniel Webster; Genin's show-case of goods which he sells, a capital advertisement; an elegant hose-carriage from Philadelphia; a coach from Paris, &c., &c. Of these we shall have occasion to speak again. The various parts of the building are appropriated by the several countries in which the articles exhibited were manufactured. Articles from the United States occupy one-fourth of the building, France and the German States one-fourth, Great Britain and Ireland one-fourth, while the remaining fourth is occupied by Italy, Denmark, Austria, and other foreign states. The number of articles from our own country, exclusive of machinery, is about 2,000; from Great Britain and Ireland, about 500 entries; from German States, about 650; from France, about 400; from Austria, about 300; and from Italy more than 100; in each instance, exclusive of fine arts, sculpture, paintings, and engravings, which form the 31st class of the official catalogue, the publication of which is deferred till the picture-gallery is completed. From other countries the articles are less numerous.

In the foreign departments, we shall refer to such as have come under our observation, and are deemed of sufficient interest to receive especial attention, without any attempt at system, and without professing to give the most deserving the earliest notice. We describe them nearly in the order in which we examine them.

France.—One of the most elegant shows in the Crystal Palace, and by far the handsomest in this department of art, is that of elegant painted porcelain ware by M. Lahoche, from Paris. Our readers will remember our remarks upon the manufac ure of Sevres ware, in our number for April, and also a notice of Bernard Pallissy, the Potter, in our number for June, of the present year. M. Lahoche exhibits true Sevres ware of the time of Louis XIV.

The ancient Sevres ware is not now made, although it is imitated; and the wares manufactured by M. Lahoche, and exhibited on his tables, are exceedingly beautiful. Some, too, are very cheap, even as low as $3 per dozen of plates. But the true Sevres ware is far beyond the reach of any modern artist. We can conceive of nothing more elegant than many of the pieces in this large collection of Lahoche. The paintings upon the plates, &c., are miniatures of various persons of distinction, either royal or something less aspiring. These elegant specimens include plates or other wares, with likenesses of the following well-known personages:

Diana de Poitiers, Henriette de France, Marie de Medicis, Marie Stuart, Sophie de Noailles, Marie de Savoie, Marie Antoinette, Odette de Champdevers, Mathilde reine de Danemarc, Gabrielle d'Estrées, Christine de France; PRINCESSES de Bourbon Conti, des Ursins, de Soubise, de Crecy, and de Lamballe; COUNTESSES d'Armagnac and de Gregnan; DUCHESSES de Berry, de Bourbon Conti, de Lude, d'Orleans, d'Aumont; MESDAMES de l'Etang, de la Tremouille, d'Etragues, d'Etaing, Elizabeth, de Bourbon Conti, de la Chartre, de Fontanges, de Tencin, de Cossé, DuBarry, and Duplessis Belliere; MADAMOISELLES de Beaujelais, de Sombreuil, and de Lafayette.

Some are landscapes and are worthy of all praise for the perfection of the art displayed on them. The price of the plates, we are informed, is $25 each, and some of the larger pieces, vases, &c., are of course very much more expensive. Ornamental lamps, an elegant time-piece, several tea-sets packed in small cases, &c., are especially beautiful. The manner in which the coloring of these works of art is produced can be seen at all times in the extensive and elegant rooms of Messrs. Haughwout & Dailey, at 561 and 563 Broadway, where the manufacture of a similar kind of ware, and that too very handsome, is carried on quite extensively.

The imitations of gems in the collection of M. Lahoche, such as pearl, turquoise, &c., are very exact. Some thing more than a mere novice might be deceived by them. The show of M. Lahoche is upon your right as you enter from the Sixth avenue, midway from the door to the centre.

A carriage meets your eye as you approach this collection, manufactured by Alexis Moussard, of Paris. It is of rare workmanship, and its finish is in equally good style. Its appearance is unlike that of an American coach, although perhaps it is no better for service, and might not be considered by many as more elegant than some of our own manufacture. There is, however, an air about it unlike what we see in our own models, and perhaps a more desirable general effect. Here, however, tastes differ.

There is also some very handsome porcelain in the gallery, nearly over the collection of M. Lahoche, which is very handsome. It is from the house of Haviland & Co., Lemoges; some of the specimens are exceedingly beautiful. There is an agency for this house at 47 John street, in this city.

Near by stands a piece of workmanship of great interest. It is a tree, in the branches of which are eight birds, all but one of them in motion, and some of them sing; two or three hop from bough to bough, others move without quitting their position; one of them is on her nest, and very accurately imitates the motions of the living bird. Indeed the whole is an admirable specimen of imitation. At the root of the tree is a time-piece. This is exhibited by Bontems, de Paris.

A short distance from the locality last alluded to, in the section of THE GERMAN STATES, a very simple affair attracts very great attention: it is *Gulliver in Lilliput.* Those who have read the story at once recognize this illustration of it. Our hero fell asleep among the miniature specimens of humanity, who are in great alarm at the appearance of so huge a monster. The civil, religious, and military are all called into requisition, to consult how they can free themselves from this dangerous presence. After a while, however, they become more bold, and as he sleeps, they fasten ropes round his fingers, which are manned by large numbers of them, who exert themselves in vain upon so huge an object; others, who are soldiers, fasten scores of arrows in his coat, which adhere to the nap; others, more daring, climb up, by means of a ladder, &c., and reconnoitre his huge proportions; some enter his pockets; one bold spirit climbs up on his nose and another on his toe, though several unhappily meet with dangerous and perhaps fatal falls, as they prosecute these bold attempts. The mothers and grandmothers of our readers are all familiar with the story, which we have not seen for many years. This exhibition is by Fleischmann, Sonneburg.

Near by stand some exquisite cuttings in wood and ivory, of miniature size. One of these is a girl standing before a glass, combing her hair. As you look at her through the mirror, every feature of her face is perfect. By her side is a girl at a linen wheel. Beautiful flower-pots belong to the same collection.

Other specimens of carved wood, very handsome, by J. G. Lange, Erben, are next at hand. Proceeding on, we have a handsome collection of paintings, some twenty-five or thirty in number, of various sizes. They all are evidently German, and of course, (almost) all good. These are exhibited by Mr. Ph. Böhrnländer, Nürnburg.

Next we notice an elegantly wrought cloak, specimens of raised worsted work, and very handsome straw work by C. L. Weppler, Wurtemburg.

Going on to the gallery towards Fortieth street, we find a collection of statuettes which to a merely casual observer will present no especial points of interest; but a slight attention convinces you at once that here is the workmanship of a master. We passed this collection several times without stopping to examine it. When we began to look at the articles, we spent one or two hours over them; and shall probably spend much more in future visits. We refer to the collection of Parian marble statuettes, by W. T. Copeland, of London. The collection is extensive and all the specimens are good. But some are of especial interest; among these are Sabrina; Rebecca; Paul and Virginia, Paul being represented as just returned to his sister, bearing a bird's nest in his hand; an Indian girl; Nubian girl; the Silent Cupid (the little fellow's face has something very much like a pout); Ino and Bacchus; the Love Story Vase; the Return from the Vintage, a beautiful design, admirably executed; antique Vase, of great value, the price being $63, for what you could put in your pocket without inconvenience; the Prodigal's Return; the Struggle for a Heart, two Cupids exerting themselves to the utmost to gain possession of it; the Etruscan Vase, also of great value, the price being $148; the Four Seasons; Queen Victoria and four of her children; the Piper and companion; the Conchologist; and the Four Seasons, after the Dutch style. Others are worthy of mention, but these are peculiarly noticeable. All are graceful in posture, ingenious in design, and of admirable workmanship.

On a table, side by side with this, is handsome porcelain, or imitation of Sevres ware, by John Rose & Co. It is of very superior quality.

We have thus made a beginning, though scarcely a drop in the bucket, but yet a beginning of our report of this exhibition. The mechanical department is not yet in operation, and the agricultural needs more minute description and illustration than we are yet prepared to give. The whole exhibition is immense and admirable, infinitely beyond any thing ever before seen in this country. About the time our readers receive this, all will be ready for their examination. The statues and pictures may each occupy an entire day, and the whole cannot be examined with any degree of particularity without consuming several days. There are, however, prominent objects, which may be selected, for special notice, while others are merely glanced at, and it is this list which we have here commenced. We shall continue it in future numbers, while we shall also commence a methodical and full examination of the agricultural and mechanical departments. Our pages now are full, and we must wait another opportunity ere we proceed further.

MECHANICAL AND AGRICULTURAL RECORD, ETC.

Lateral Car Motion.—Mr. J. M. Smart, of the Harlem railroad, has constructed an arrangement to save the lateral strike of the lateral motion of cars. His arrangement consists in the inserting of a spring of proper size and tension in each end of the hanging beam. The arrangement is much admired.

Safety Platform.—Mr. J. M. Smart has invented and constructed such a platform now used on the small cars of the Harlem railroad. It consists of a table suspended on proper wires under the usual platform. Besides being a safety to brakemen, and others, it protects the passenger against much dust and noise, produced by the running motion. Patent pending.

The Equalizing Beam is another improvement by Mr. Smart, of the Harlem road. designed for small cars. In this contrivance the box is in the middle of a beam, on each end of which are springs, upon which the car rests. Hence the car rests on four springs per side, and not on two as is commonly the case.

Ruggles's Rotary Fan-Blower.—Solomon W. Ruggles, of Fitchburg, Mass., has invented some improvements in the Rotary Fan. One improvement is, that it has more fans than are commonly used. Another is, that the fans on the face-plate are circular, the circle having a radius to conform to the circumference of the face-plate. Another improvement is, that each fan diminishes in depth at the point of external termination; a lip also is constructed on the edge of the fan, which has a width increasing with the decrease of the width of the fan. The advantage claimed for the above peculiarities are: 1st, a steady blast; 2d, a saving of half the power needed to secure a given amount of wind. Patent pending.

Whitney's Supporter.—Mr. George L. Whitney, Fitchburg, Mass., Superintendent of locomotion on the Vermont and Massachusetts Railroad, has invented an ingenious support for welding iron on to the top surface at the end of a railroad rail, which has become flattened by use. It consists of two dies, one stationary and the other movable, fixed in a substantial frame, one face of each die being made to suit the shape of the side of a T rail. The heated end of the rail is up between the dies, which are made to hug up the rail, and keep it in its original form, while the process of welding on the addition is carried forward. The plan works well, and is economical.

New Steam Gauge.—Mr. D. T. Briggs, engineer on the Harlem railroad, has invented a new gauge for the locomotive. It is constructed with a square-inch tube inserted into the boiler. To the inner cavity of said tube a movable plug is fitted, steam tight. This plug is kept in place by the pressure of a spiral spring on the outer end, by which spring the pressure of the steam in the boiler is counterbalanced. The motion given to the steam-tight, yet movable plug, is communicated to a bar and an index on a dial-plate, thus indicating the pressure of the steam in the boiler. The contrivance is simple, easily and economically applied, and we hope may prove of great utility.

New-York and Erie Railroad. Charles Minot, Superintendent.—The repairs are made in four shops, one shop to a section. The eastern division is at Piermont, Rockland Co., N. Y. Harvey Rice, Superintendent of motive-power. At this shop they make and repair cars and locomotives. The iron shops have nineteen lathes, from 12 to 29 inches sweep; one double car-axle lathe; one spliner; five power, two compound, and two hand planers; eight upright drills; three driving-wheel lathes, from 5 to 8½ feet sweep; two driving-axle lathes; one quartering machine; three bolt-cutters; two borers for car-wheels; and other tools in proportion. J. P. Lewis, D. M. Robertson, W. W. Willett, John Wood, M. B. Harrington, and others, are foremen in these shops. In the wood shops, having all the common machines, M. D. Strickland is foreman of construction, with fifty-two hands; L. Gardner, foreman of repairs, having seventeen hands. Forge shop has twenty-two fires and one trip-hammer, J. W. Denton, foreman. E. E. Roberts is foreman of copper shop; Chauncy Barnes, pattern-maker; J. D. Browen, upholsterer. Foundry attached, R. E. Falkenbury, foreman. The road has 143 locomotives, David L. Halstead, Charles Stott, and others, engineers.

Railroad Tunnels.—There are some pretty extensive holes in the ground on the line of the Covington and Lexington Railroad. Grant's Tunnel, ten miles from Covington, is just finished It is 2,167 feet long, and about 300 feet below the surface of the earth. Anderson's Tunnel, on the same road, is 763 feet long, and 100 feet below the surface.

The Great Ship Canal.—It is stated that the projected canal, uniting the Delaware and Chesapeake Bay, will commence at Chester River, and terminate at Bombay Hook, passing close up to the town of Smyrna. It will be 100 feet wide on top, and 20 feet deep, or large enough to pass any vessel that can now visit the ports of Philadelphia or Baltimore. Its length will be from twenty to thirty miles. The Agents of the Company express their determination, if there is any difficulty, to buy all the land along the routes. The *Blue Hen's Chicken* says that the citizens of Smyrna, who are extremely desirous of seeing the work in operation, talk of applying to the Governor to call an extra session of the Legislature.

Barron, the Chinese traveller, computes that there is more material in the great wall of China than in all the houses of England and Scotland.

Cotton in Africa.—Thirty varieties of cotton have been found growing spontaneously in Africa. A missionary says he has stood erect under the branches of a cotton tree in a Goulah village, so heavily laden with bolls, that it was propped up with forked sticks to prevent it from breaking under its own weight. The cotton was equal to that of any country. The natives manufacture cotton goods extensively.

Flax Culture and Flax Cotton in Indiana.—Mr. R. T. Brown, of Crawfordsville, in a communication to Governor Wright, President of the Indiana State Board of Agriculture, says:

"I send you enclosed a few samples of 'Flax Cotton,' presented to me by the Hon. H. L. Ellsworth, of Lafayette. Mr. Ellsworth has secured the machinery necessary for the manufacture of cotton, and will have it in operation early in the season. He has on hand the 'stem' grown on 120 acres last season, which, from experiments already made, will, he supposes, yield about 300 lbs. per acre of cotton, similar to No. 2 of the enclosed specimens. The expense of reducing the fibre to this state, after the stem is produced, is about two cents per pound, which at the usual price for cotton, (ten cents,) will leave eight cents per pound, or $24 per acre for the farmer who produces it. To this must be added the value of the seed, which will range from $6 to $8 per acre, giving a final result of $20 at least for each acre. This is Mr. Ellsworth's calculation; it may be too high; but if we allow for the magnifying effect of his zeal one-third, or even one-half, still flax would be as profitable a crop, in proportion to the amount of labor required to produce it, as any one of the staples of the country."

Lumber Trade in Alabama.—Getting out spars for the navy is a profitable business in Alabama, and the pine forests furnish the finest kind. They are principally obtained for the French navy. The lumber trade generally has become a very important one, and the exportation of it from Mobile is quite extensive. Steam saw-mills are found all along the two rivers and elsewhere.

Preserving Posts.—The Agent of the Copperas Companies, in Vermont, gives it as his experience that timber which has been saturated with copperas, and exposed to all weather for forty years, is perfectly sound and hard, and has become something of the nature of stone.

Timber that has been soaked in copperas water, say one pound copperas to one pail of water, will last more than twice as long as that which has not been thus prepared. Copperas is $1\frac{1}{4}$ cents per pound.

Horses and Tobacco.—The *Home Journal* gives the following hint whereby trees may be saved from being gnawed by horses, from which they suffer so much in exposed situations, when used as hitching-posts:

"Strangers *will* tie their horses to the trees from which I can least spare the bark they eat off, while their masters are rambling about, and I have just been washing the trunks of two or three evergreens with tobacco-juice, (said to be a six months' disguster for the worst kind of crib-biter,) when neighbor S——, with his white locks flowing over his shoulders, and his calmly-genial face beaming from under his broad-brimmed hat, drove down the avenue, a moving picture among the beautiful cedars and hemlocks that made them more beautiful than before. We tied his horse to one of the tobaccoed cedars, which the fine animal, a splendid bay, opened teeth upon, and immediately backed off to the length of his halter, taking an attitude of repugnance, in which we found him on our return."

Purifying Oil.—J. P. Wilson, of London, patentee. This improvement consists in depriving oleic acid of its objectionable smell, so as to render it fit for preparing wool for manufacturing. He is evidently not acquainted with the American invention of using steam for the same purpose. The bad odor of the oleic acid is dispelled by heating it in a vessel heated with high-pressure steam, and kept at a temperature of 400° Fahr., for about four hours. It is afterwards cooled down by the introduction of cold water, when it is fit for use.

Another of the Same.—George Hutchinson, of Glasgow, patentee. This invention consists in imparting additional fluidity to lard or tallow oil, or other oils of a naturally viscid character, by combining them with chloric ether, so as to give them a character resembling sperm oil. The chloric is found to produce the best effect when used in the proportion of one part to two parts by measure of neutral tallow oil.

A Paint for Brick Houses.—A correspondent of the *Ohio Farmer* has used a cheap and very durable paint for the exterior of brick dwellings, which has already stood several years, and is now quite as fresh as when first applied. It consists simply of lime-wash, with sulphate of zinc as a fixing ingredient. Any requisite shade is given by adding the colors used by house-painters. A clear and rich cream color may be obtained by applying yellow ochre to the common new brick; a livelier and warmer shade will be added by a little Venetian red. Burnt senna may likewise be used. This paint is far cheaper than oil-paint, and costs but little more than common whitewash.

Texas Salt.—The New-Orleans *Picayune* has received a sample of Texas salt, taken from a salt-lake seven miles from Corpus Christi. It is said the supply is inexhaustible. Small boats can run up to the beds, and 100 bushels is the average product to the boat per diem.

Railway in Asia.—The first railway in Asia was opened at Bombay amid a vast concourse of people, and unprecedented rejoicings, on the 16th of April.

North Carolina Copper Company.—The advices from the North Carolina Copper Company's Mines continue to be very favorable. The vein grows richer the deeper it is opened, and the force on the location are now taking out about six tons per day of 20 and 25 per cent. ore.

The New-London and Willimantic Railroad has just been connected with the Worcester and Norwich road, by an Act of the Connecticut Legislature.

Geological Calculation.—In a paper read by Sir Charles Lyell, a short time previous to his arrival in this city, before the Royal Society in London, on the coal-fields of Nova Scotia, says the *Scientific American*, he entered into speculations respecting the solid matter contained in the carboniferous formation of that country. He believes it was once a delta like that of the Mississippi, and that the formations were produced by river inundation drifts. The average thickness of the whole of the coal measures is three miles, and the area, including the fields of New-Brunswick, &c., may comprise 36,000 square miles, or 108,000 cubic miles; but taking the half of this, it would be 54,000 cubic miles of solid matter. It would take more than two millions of years for the Mississippi River to convey to the Gulf of Mexico an equal amount of solid matter at the rate of 450,000 cubic feet per second, as calculated by Mr. Forshey. This is a subject for deep reflection and examination by all Biblical geologists especially. Sir Charles Lyell found fossil reptilian remains, and a land-shell in the interior of a fossil tree in a Nova Scotia coal-field.

Cherry Stains.—These can easily be removed from white fabrics, by dipping the stained parts in a pretty strong solution of saleratus. The stains of most other fruits may be eradicated by the same process.

A Monster Cherry Tree.—There is in the town of Shawangunk, Ulster county, on the premises of John Bruyn, Esq., a cherry tree of such size, beauty, and productiveness, as cannot, perhaps, be excelled in our country. This tree measures 13 feet in circumference around the trunk immediately under the limbs, and 50 feet across the extreme point of one limb to that of another immediately opposite. It cannot be less than 45 feet in height. It is in full bearing, and is estimated to produce a wagon-load of fruit in one season.

Ancient Pear Tree.—The pear tree standing near the corner of Twenty-third street and Third Avenue, in this city, and known as the "Stuyvesant pear-tree," which is nearly 250 years old, is now in fruit. The tree was planted by the hero of "Knickerbocker," the well-known Governor Stuyvesant.

Remarkable Clock.—The following is a description of an ingenious and elaborately-finished clock, manufactured by E. Henderson, LL.D., of Liverpool, Eng. It is said that it will not vary one minute in a thousand years:

The clock will show the minutes and hours of the day; the sun's place in the ecliptic; the day of the month perpetually, and take leap-year into account; the moon's age, place, and phases; the apparent diurnal revolutions of the moon; the ebb and flow of the sea in any port in the world; the golden number, epact, solar cycle, Roman indiction, Sunday letter, Julian period; the mean time of the rising and setting of the sun on every day of the year, with its terms and fixed movable feasts. The day of the week will be indicated, and the year will be registered for ten thousand years past and to come:—the quickest wheel revolving in one minute, the slowest in ten thousand years from the date. To show the very great accuracy of the motions in this complicated clock, a few of the periods may be noted, namely: the apparent diurnal revolution of the moon is accomplished in 24 hours, 50 minutes, 58 seconds, and 379,882,268 decimals of a second, which makes an error of one minute too fast, at the end of 1,470 years. The stars will make a revolution in 23 hours, 56 minutes, 4 seconds, and 09,087,284 decimals of a second, which gives an error of one minute too slow, at the termination of 589¾ years. The synodical revolution of the moon is done by the wheels in 29 days, 12 hours, 3 minutes, 2 seconds, and 872,544,288 decimals of a second, and this will give an error of one minute too fast in 1,167 years. The sidereal year is done in 365 days, 6 hours, 9 minutes, 11 seconds, and 53,322,496 decimals of a second, which will make an error of one minute too slow in 1,806 years. The clock will go one hundred years without requiring to be wound up, which is unequalled in horological science. It contains about one hundred and seventy wheels and pinions, and upwards of three hundred distinct pieces.

New Rock Drill.—George Stancliff and Robert J. Gaines, of Middletown, Conn., have made an improvement in the construction of drills for drilling rocks, &c. The drill is made in the form of a chisel with a long vertical square stem, which has ratchets upon each side of it, by which it is raised. Two clutches or inverted palls, hung in a clutch-box, which is operated by a long forked lever, catch the stem of the drill where it passes through the said clutch-box, and raise it until the opposite end of the clutches meet the incline of a wedge-shaped recess projecting below a cross beam in the frame of the drill. Upon the top of this beam is a ratchet wheel, and the drill-rod passes through a square opening in its centre. Motion is given to the drill by means of a pall, which is operated by a vertical rod, worked by the lever which raises and lowers the drill. Measures have been taken to secure a patent.

Machine for Cutting and Sawing Bevels.—A machine for cutting and sawing bevels of every description has been invented by Alfred C. Cook, Russelville, Ky. The nature of Mr. Cook's improvement consists in making the bed or platform upon which the plank or board to be cut is placed, so that it will vibrate to give the required bevel. If it be desired to adjust the position of the platform to any particular mitre or incline, it is readily done by means of an index plate set vertically at the end of the platform. By means of a metallic pointer upon this index a bevel of any required number of degrees may be given to the platform taken in connection with the saw, which is hung in the stationary part of the frame which supports the bed-piece. Any required taper, lengthwise, may at the same time be given to the board cut, by adjusting guide pieces, or side rails, attached to the saw-bed. The inventor has taken measures to secure a patent.

Machine for Making Nuts and Washers.—D. Howell, of Louisville, Ky., has invented a machine for this work, for which he has made application for letters patent. The mandrel in this machine is moved by eccentrics upon the driving-shaft of the machine; it works very rapidly, and cuts the nuts and washers, and punches the holes by the same operation or motion to the mandrel. The iron is fed to the machine in a heated state, and the nuts are deposited by the action of the machine in a receptacle provided for the purpose.

Improvement in Machines for Harvesting Grain.—A new machine for harvesting grain has been invented by James N. Wilson, Isaiah Marsh, and George Kirk, of Waukegan, Ill., in which several new and important features have been introduced. Among them is a mode of preventing the teeth or cutters from becoming clogged by leaves of grass, &c.; this is effected by making the fingers, through which the sickle or cutter-bar slides, open upon the top, and adding a set of small clamps to keep the cutter-bars in their proper place. Measures have been taken to secure a patent.

Unloading of Hay.—We have lately seen a method of unloading hay with very great rapidity, which may sometimes be of much service, and if barns are constructed with reference to such operations, it will always be valuable.

This method consists in preparing a sort of net-work, made of strong cords or ropes, one of which is laid on the floor of the hay wagon. When half or other convenient portion of the load is pitched on to the wagon, another similar netting is laid over the top of the load, and more hay is pitched on, as it may be desired. Pulleys suspended from the ridge-pole are attached to these ropes, when the wagon has been driven into the barn, and by such purchase as may be necessary, the contents of the several nets are hoisted and thrown into the mow in a few seconds. The cost of such contrivances is said to be about fifteen dollars.

Franklin Co. (O.,) Fair.—We have received from Mr. Brush, the President of the Agricultural Society of this County, a list of premiums for the approaching fair. Premiums are offered for farms, farm-crops, cattle, sheep, swine, horses, (blood and roadsters, and draft,) poultry, farm-implements, domestic manufactures, butter, cheese, vegetables, apples, peaches, quinces, pears, and flowers.

The fair is held on the 28th, 29th, and 30th September.

They have, for their fair grounds, "a beautiful site, of eight acres, within two miles of the centre of the city of Columbus, well enclosed, and two-thirds of it clear of timber and stumps, with offices, two halls, one 125 and the other 75 feet long, and each 30 feet wide; stalls for horses, cattle, &c. A dining-hall and kitchen are about to be erected. The whole cost of this is about $4,000, and the Society is not in debt.

To Purify a Stable.—Besides the means alluded to on another page of this number, in an article on Manures, a mixture of Epsom salts and plaster of Paris is very efficient in destroying the effluvia.

Hudson River Railroad.—Edmund French, Superintendent of road; E P. Gould, Superintendent of repairs. Road has one hundred and forty-four miles of track, and fifty miles of double track. Locomotives, fifty. New-York Repair Shop, iron, has eight lathes, two planes, two drills, and other tools in proportion. Wm. Buchanan, foreman. Forge-shop has ten fires, one trip-hammer. Wood-shop has one hundred and fifty men employed to watch the track and lift the signals.

Back Numbers Wanted.—For the following numbers of the *Plough, the Loom, and the Anvil*, first cost will be allowed. Please forward:

Volume 1, - - - - - - - - -	Nos. 4, 5, and 7.
" 2, - - - - - - - - -	" 3, 6, and 12.
" 3, - - - - - - - - -	" 1 and 2.
" 4, - - - - - - - - -	" 7.

NEW-YORK AS IT IS.

Sundry places and objects of interest in and around New-York were described in our last journal, and we need not repeat. Inadvertently, however, we made one mistake:

Madame Thillon is at Niblo's, and has appeared only in that favorite place of amusement. She alternates from day to day with the Ravel Family, who, three times each week, go through their wonderful performances. Theirs is the only exhibition of that kind which we have ever witnessed with decided satisfaction. Madame Thillon is as attractive as ever, so that every evening the house is crowded.

Madame Sontag and her admirable troupe, while we write, are just closing a triumphant series of operas at Castle Garden. Never has New-York witnessed the like. Sontag, Steffanone, Patti Strakosch, Salvi, Badiali, Marini, Pozzolini, Rovere, Rosi, and others, form a company that never has had an equal on this continent.

She is to be succeeded by the "Monstre Orchestre" of Jullien, Paris, said to be the best in the world.

NEW BOOKS.

The Opera of Norma. By V. Bellini, with Italian and English words. Boston: Oliver Ditson, 115 Washington street. 4to, 165 pages.

Mr. Ditson has here given the musical public a real gem, in a setting worthy of the composer and of his beautiful work. In this edition, there is an occasional transposition of the key, to bring the music within the range of voices of ordinary compass, opera music often extending much higher in the scale than most of that arranged for the piano-forte. In the preparation of this work, the highest musical talent has been employed, and so far as we can perceive, with very satisfactory results. This is the first of a series of operas, to be published in uniform style.

Bertini's Piano Method Abridged. Boston: O. Ditson, 115 Washington street. 115 pages.

The original of this standard work was a cumbersome volume. This abridgement, which is by the author himself, contains all that is really valuable; is of a more convenient size; in fact, just what was needed.

1. *The Cloud with a Silver Lining,*
2. *The Star in the Desert.*

These two admirable stories are by the author of "A Trap to catch a Sunbeam," &c., and are published by James Munro & Co., Boston. They are among the very best of the works of this popular writer. No one need hesitate a moment about buying either of them. Of these two, while both are so exeellent, probably the latter has more to interest than the former.

The Emigrants; or, First and Final Step. A True Story. By ALMIRA SEYMOUR. Boston and Cambridge: James Munro & Co., 1853. 122 pp.

This is an interesting little volume, ealeulated to exert a good moral influenee.

Historic Doubts, Relative to Napoleon Bonaparte. 4th edition, from 11th London edition. James Munro & Co. Boston: 1853. 75 pp.

A very readable little work, *doubting*, with more or less reason, some of the historical statements eurrently believed in reference to this most remarkable man.

WM. HALL & SONS have reeently published an exeellent assortment of music, some of whieh we ought to have noticed before this. Of these the following may be safely purehased though unseen:—

"L'Heliotrope Waltz," and also six elegant waltzes, by Vincent Wallaee; "Sailor Prinee Polka," by Chs. D'Albert; "Parade Polka," by E. Boulanger; "Friendship Polka," arranged by Chs. Heffert; "Quadrilles, from the opera of the Peri of the Enchanted Fountain," arranged by Dressler; "Les Clochettes," by Chs. O. D'Albert; "The Wellington March," (the "Gypsy Song" being heard in it,) by the same. Among the songs are, "Home is where there's one to love us," by Henry Goold; "The Right of Loving Thee," by W Stephen Rooke; "Mary of the Glen," by G. F. Root; "Song of the Breeze," and "Cottage Rose," both by L. Lavenu; "The Springtime of the Heart," by C. W. Glover. All these are good.

E. H. Wade & Co. have published "Beauties of Rossini's Opera," "Moses in Egypt," arranged as a fantasie, by G. F. Hayter, 50 cts.; and the "Bird Song," performed by Jael, and composed by Rudolph Williams, 38 cts. These are diffieult to play, but are worth a very long praetice. Whoever does not delight in them has no musie in his soul—our word for it.

List of Patents issued from July 5 to August 12, 1853.

E. H. Ashcroft, of Boston, Mass., for Improvement in Percussion Gauges.

C. W. Camp, of Hartford, Conn., for Improvement in Shot Charges.

E. H. Dickey. of Hopewell Cotton Works, Pa., for Improvement in Butter-workers.

G M. Dimmock, of Springfield, Mass., for Apparatus for Illustrating the Motion of a Pendulum on the Earth's Surface.

J J. Fulton, of Allegheny City, Pa., for Improvement in Mode of Tanning.

Smith Groom, of Troy, N. Y., for Improvement in Hose Coupling.

Richard Montgomery, assignor to Elizabeth Montgomery, of New-York City, for Sheet Metal Beams.

Meyer Phineas, of New-York City, for Improvement in Metallic Pens.

H. G. Robinson, of Schuylkill Haven, Pa., for Coin Safe and Detector.

S. T. Sandford, Fall River, Mass., for Improvement in Boring Machines.

E. B. Wells, Uniontown, Pa., for Machine for Adjusting Dishing Saws.

J. P. Smith, of Rochester, N. Y., and O. W. Seily. (assignor to O. W. Seily, of Albany, N. Y.,) for Improved Straw-Cutters.

N. T Coffin, of Knightstown, Ind., for New Mode of Forming and Filing Teeth of Mill Saws.

Charles F. Brown, of Warren, R. I., for Improvement in Adjustable Screw Propellers.

Linus Yale, Jr, of Newport, N. Y., for Lock for Banks.

C. P. Baily, of Muskingham, O., (assignor to Union Patent Sofa and Railroad Car Seat Manufacturing Company of New-York City,) for New Railroad Car Seat.

S. T. Barnes, of Columbus, O., for Improvement in Press Mould Candlesticks

J. C. Booth, of Philadelphia, Pa., for Improvement in the Processes for Obtaining Chromates. Patented in England, Nov. 9, 1852.

A. H. Brown, of Washington City, D. C., for Feathering Paddle Wheels for Steamers. Patented in England. March 5, 1853.

Isaac Brown, of Baltimore, Md., for Improvement in Driving Saws.

N. T. Coffin, of Knightstown, Ind., for Improvement in Hanging Saws.

C. J. Conway, of New-York City, for Improvement in Lamps.

J hn Jackson, of Lawrence, Mass., for Improvement in Spinning Jacks.

Edmund Munson, of Utica, N. Y., for Improvement in Eyes for Millstones.

R. C. Pratt, of Canandaigua, N. Y., for Improvement in Machines for Ditching.

John Farrel, of Philadelphia, Pa., for Improvement in Lining for Fire-proof Safes.

Bradford Rowe, of Albany, N. Y., for Improvement in Gripes for Holding Leather.

George B. Salmon, of Elmira, N. Y., for Improvement in Grain Winnowers. Ante-dated July 6th, 1853.

Ephraim Treadwell, of New-York City, for Improvement in Ovens.

William H. Thompson, and William H. Plummer, of Biddeford, Me., for Improvement in Compressors for Flyers.

P. P. Travser, of Baltimore, Md., for Improvement in Spike Machines.

S. J. Sherman, of New-York City, for Improvement in Mounting Spirit Levels.

T. C. Weildon, of Hartford, Conn., for Improvement in the Manufacture of Wigs.

Charles Williams, of Philadelphia, Pa., for Improvement in Bristles for Brushes.

Leonard Westbrook, of New-York City, for Improvement in Gutta Percha Stereotype Compositions.

A. O. Wilcox, of Philadelphia, Pa., for Improvement in Caloric Air Engines.

Frederick Hesse, (assignor to H. J. Oerter,) of Bethlehem, Pa., for Improvement in Paper Cutting Machine.

Cyrus C. Bisbee, of Rochester, N. Y., for Improvement in Shower-bath Tables.

Richard C. Bristol, of Chicago, Ill., for Improvement in Rotary Steam Engines.

William V. Burton, of Orange, O., for Improvement in Ploughs.

F. B. Hunt, of Westfield, Ind., for Improvement in Mills for Grinding Apples and other substances.

David A. James, of Cincinnati, O., for Improvement in Processes for Making Glue.

Owen Redmond, of Rochester, N. Y., for Improvement in Lamps.

Milton Satterlie, of Louisa, Ill., for Improvement in Seed Planters.

Wm. M. Warren, of Watertown, Conn., for Improvement in Railroad Car Seats.

Ezra R. Benton, of Cleveland, O., for Improvement in Bran Dusters.

Jacob H. Carothers, of Davidsburgh, Pa., for Improvement in Corn Planters.

Sylvester Davis, of Claremont, N. H., for Improvement in Bee-hives.

Ziba Durkee, of Alden, N. Y., for Improvement in the Beaters of Smut Machines.

F. O. Deschamps, of Philadelphia, Pa., for Improvement in Omnibus Lanterns.

John A. Elder, of Westbrook, Me., for Improvement in Curving the Backs of Books.

Daniel P. Hinman, of Philadelphia, Pa., for Improvement in Dying Yarn Parti-colored.

Levi Pitman, of Tom's Brook, Va, for Improved Plotting Theodolite.

Jackson A. Rapp, and Edward S. Wright, of Buffalo, N. Y., for Improvement in Straining Saws by Compressed Air.

Frederick G. Vettercke, of New-York City, for Improvement in Dying Compounds.

Henry Lee Norris, of New-York City, (assignor to Samuel T. Armstrong, of same place,) for Improvement in Preserving India Rubber in the Liquid State. Dated July 26, 1853 Patented in England, Feb 24, 1853; do. in France, March 13.

J. A. Bazin, of Canton, Mass., for Improvement in Reed Musical Instruments.

G. W. Brown, of Tylerville, Ill., for Improvement in Seed Planters. Ante-dated Feb. 2d, 1853.

Lebbeus Caswell, of Harrison, Me., for Improvement in Seed Planters.

S. R. Cline, of Philadelphia, Pa., for Improvement in Water Regulator for Steam Boilers.

H. B. Conant, of Geneva, Wis., for Improvement in Abdominal Supporters.

T J. Eddy, of Waterford, N. Y., for Improvement in Railroad Car Wheels.

C. S. Boynton, of New-York City, for Improvement in Paper Ruling Machines.

J. R. Miller, of Jersey City, N. J., for Improvement in Submarine Tunnels.

J. A. Scholfield, of Westerly, R. I., for Improvement in Temples for Looms.

John M. Reeder, of Memphis, Tenn., for Improvement in Steam Boilers.

J. R. Rich rdson, Jas. Waterman, and Ebenezer Wilder, of New-Castle, Pa., for Improvement in Machines for Making Sp kes.

I S. Richardson, of Boston, Mass., for Improvement in Atmospheric Telegraph and Railway. Patented in England, Dec. 7, 1852.

S. P Ruggles, of Boston, Mass., for Improvement in Printing Presses. Ante-dated Feb. 2, 1853.

Nathan Thompson, Jr., of Williamsburgh, N. Y., or Improvement in Indicating the Height of Water in Steam Boilers.

William Van Anden, of Poughkeepsie, N. Y., for Improvements in Machinery for Making Railroad Chairs.

Stephen Waterman, of Williamsburgh, N. Y., for Improvement in Obviating the Danger from Steam Boiler Explosions.

Jesse Young, of Franklin Furnace, O., for Improvement in Arrangement of Pipes for Hot Blast urnaces.

J. T. Coupier and M. A. C. Mellier, of Paris, France, for Improvement in the Manufacture of Paper Stuff.

Julios Herriet of New-York City, (assignor to J. Gaylord Wells, of Hartford, Ct., for Improvement in Elastic Type for Printing on Irregular Surfaces.

A. O. Wilcox, of Philadelphia, Pa., for Improvement in Hot Air Engines.

G. T. Parry, of Spring Garden, Pa., (a signor to John Rice, of Philadelphia, Pa.,) for Improvement in Anti-Friction Boxes.

The Plough, the Loom, and the Anvil.

Part I.—Vol. VI. OCTOBER, 1853. No. 4.

FREE TRADE AS AN EXPERIMENT.

In our last number we gave some exhibitions of the nature and effect of British Free Trade, as illustrated in some of the British colonies, and else where. We propose now to extend this exhibition.

It is true that the English operative, through some cause, buys a loaf of bread now at almost half the price paid for it a few years ago; and the advocates of the British system, in view of this fact, toss up their caps, and shout at the top of their voices. They do not seem disposed to inquire into the real causes which induced this state of things, nor at the inevitable and ruinous consequences that result to other operatives, as needy as he. It matters not whether the Irishman or the Indian gains or loses by this curious mixture of prohibitory taxes and "Free Trade;" taxes which shut out millions from the power to manufacture, and compel them to depend on agriculture, while the door of "Free Trade," for the introduction of agricultural products from all countries, is thrown wide open, thereby diminishing their price in the market, and making the work of farming a profitless business at the best. The result in England is a constant decrease in the number of landholders. The price of crops is not remunerative, and hence the condition of agriculture is unfavorable; and the system which produces such results is, most probably, in the light of this fact alone, unsound in principle. To cheapen labor, in any useful branch of industry, below a healthy, paying rate, is not to the advantage of any community. Could the colonial laborer turn his hand to any other employment, or find a community at home able to buy, it would be comparatively well. But where all are producers, in a small way, and of the same commodity, there can be no purchasers. Hence profitable labor is actually and inevitably an impossibility. This gain in the price of bread, in England, is but an apt illustration of the Irishman's blanket, which, being too short at the top, he cut off at the bottom, and sewed the piece on to the top. This policy may be gain, for the time being, to one class of British operatives "at home," but it is death to many British subjects else where.

So it must be under such a system. If the blanket covers the laborer in England, the Irish laborer is left unwarmed. The only cure that we know of is to get a larger blanket. Change the policy, and the results will change. The consequences of this system on the colonies, as shown in the preceding number, are not accidental, nor temporary. If there is not demand for labor, so as to give profitable employment to a community, it will not be an industrious community. Where a comfortable support is even doubtful, we shall only witness disaffection, and anxiety, and despair, where there should be cheerful hope, courage, and confidence.

Let us now go on with our illustrations; and first we will take a short view of the state of things in Portugal, as they are related to this policy.

"It is now," says Mr. Carey in his last work, "a century and a half since England granted her what were deemed highly important advantages in regard to wine, on condition that she should discard the artisans who had been brought to the side of her farmers, and permit the people of England to supply her people with certain descriptions of manufactures. What were the duties then agreed on are not given in any of the books now at hand, but by the provisions of a treaty made in 1810, cloths of all descriptions were to be admitted at a merely revenue duty, varying from 10 to 15 per cent. A natural consequence of this system has been that the manufactures which up to the date of the Methuen treaty had risen in that country, perished under foreign competition, and the people found themselves by degrees limited exclusively to agricultural employments. Mechanics found there no place for the exercise of their talents, towns could not grow, schools could not arise, and the result is seen in the following paragraph:—

'It is surprising how ignorant, or at least superficially acquainted, the Portuguese are with every kind of handicraft; a carpenter is awkward and clumsy, spoiling every work he attempts; and the way in which the doors and woodwork even of good houses are finished would have suited the rudest ages. Their carriages of all kinds, from the fidalgo's family coach to the peasant's market-cart, their agricultural implements, locks and keys, &c., are ludicrously bad. They seem to disdain improvement, and are so infinitely below par, so strikingly inferior to the rest of Europe, as to form a sort of disgraceful wonder in the middle of the nineteenth century.'—*Baillie.*

The population, which, half a century since, was 3,683,000, is now reduced to little more than 3,000,000; and we need no better evidence of the enslaving and exhausting tendency of a policy that limits a whole people, men, women, and children, to the labors of the field. At the close almost of a century and a half of this system, the following is given in a work of high reputation, as a correct picture of the state of the country and the strength of the Government:

'The finances of Portugal are in the most deplorable condition, the treasury is dry, and all branches of the public service suffer. A carelessness and a mutual apathy reign not only throughout the Government, but also throughout the nation. While improvement is sought every where else throughout Europe, Portugal remains stationary. The postal service of the country offers a curious example of this, nineteen to twenty-one days being still required for a letter to go and come between Lisbon and Braganza, a distance of $423\frac{1}{2}$ kilometres, (or a little over 300 miles.) All the resources of the state are exhausted and it is probable that the receipts will not give one-third of the amount, for which they figure in the budget.'—*Annuaire de l'Economie Politique*, 1849, 322.'"

Contrast with this description the flourishing condition of Belgium. Here is a small country, about one third the size of Ireland, with a population comparatively larger, and with a soil naturally inferior to that of the Emerald Isle. We are informed that all classes of the people there are prosperous. In the language of Mr. Carey, "the 'Crowbar Brigade' is here unknown, and it may be doubted whether any term conveying the meaning of *eviction* is to be found in their vocabulary." And what is the cause of this great prosperity? It is emphatically stated by the same eminent writer, that "these people have employment for every hour in the year, and they find a market close at hand for every thing they can raise. They are not forced to confine themselves to cotton or sugar, tobacco or wheat; nor are they forced to waste their labor in carrying their products to a distance so great that no manure can be returned. From this country there is no export of men, women, and children, as we see in Ireland."

"With every advantage of soil and climate, the population of Portugal declines, and her people become more enslaved from day to day, while her Government is driven to repudiation of her debts. Belgium, on the contrary, grows in wealth and population, and her people become more free; and the cause of the difference is, that the policy of the former has always looked to repelling the artisan, and thus preventing the growth of towns, and of the habit of association: while that of the latter has always looked to bringing the artisan to the raw material, and thus enabling her people to combine their efforts for their improvement in material, moral, and intellectual condition, without which there can be no increase of freedom."

There is a vast deal of difference between bringing the artisan to the raw material and carrying the raw material to the artisan. This difference is almost, if not quite, as great as between asking, *Who will buy my goods?* and having our ears greeted with the question, *Will you sell me?*

The German States furnish another illustration of our doctrine. We again cite from Mr. Carey.

"In 1825, Germany exported almost thirty millions of pounds of raw wool to England, where it was subject to a duty of twelve cents per pound for the privilege of passing through the machinery there provided for its manufacture into cloth. Since that time, the product has doubled, and yet not only has the export almost ceased, but much foreign wool is now imported for the purpose of mixing with that produced at home. The effect of this has, of course, been to make a large market for both food and wool that would otherwise have been pressed on the market of England, with great reduction in the price of both; and woollen cloths are now so cheaply produced in Germany, that they are exported to almost all parts of the world. Wool is higher and cloth is lower, and, therefore, it is, as we shall see, that the people are now so much better clothed.

At the date of the formation of the Union, the total import of raw cotton and cotton-yarn was about 300,000 cwts., but so rapid was the extension of the manufacture, that in less than six years it had doubled, and so cheaply were cotton goods supplied, that a large export trade had already arisen. In 1845, when the Union was but ten years old, the import of cotton and yarn had reached a million of hundred weights, and since that time there has been a large increase. The iron manufacture also grew so rapidly that, whereas, in 1834, the consumption had been only *eleven* pounds per head, in 1847 it had risen to *twenty-five* pounds, having thus more than doubled; and with each step in this direction, the people were obtaining better machinery for cultivating the land and for converting its raw products into manufactured ones.

In no country has there been a more rapid increase in this diversification of employments, and increase in the demand for labor, than in Germany since the formation of the Union. Every where throughout the country men are now becoming enabled to combine the labors of the workshop with those of the field and the garden; and, says Mr. Kay in his "Social Condition and Education of the People of England and Europe," vol. i., p. 256:

'The social and economical results of this cannot be rated too highly. The interchange of garden labor with manufacturing employments, which is advantageous to the operative in his own house, is a real luxury and necessity for the factory operative, whose occupations are almost always necessarily prejudicial to health. After his day's labor in the factories, he experiences a physical reïnvigoration from moderate labor in the open air, and, moreover, he derives from it some economical advantages. He is enabled by this means to cultivate at least part of the vegetables which his family require for their consumption, instead of having to purchase them in the market at a considerable outlay. He can sometimes also keep a cow, which supplies his family with milk, and provides a healthy occupation for his wife and children when they leave the factory.'"

Among the results of this policy, agriculture is constantly making progress, and is carried on with energy and skill. Nearly every man, including shopkeepers, laborers, &c., has his little garden, and as many as possible, a small farm. The consumption of iron has increased from 11 lbs. per head in 1834, to 25 lbs. in 1847.

Where land is valuable, and markets are accessible, there alone can men be free and independent. Elsewhere they are entirely at the control of the capitalists and land-owners, who will exact from them the utmost farthing. Proprietorship is of itself an honorable position, and tends to create energy and excite activity. It is a fountain of light, at which hope is kindled. It guarantees, under the circumstances described, a good reward for labor. The owner of the soil has a home, where he is happy, and he has a country which secures him in the peaceful possession of it. Hence this policy tends to produce good morals in individuals, families and neighborhoods; and this alone can make contented and patriotic citizens.

And what is the inference from the short sketch of facts and results now before the reader? We do not claim that it proves the importance of tariffs, high or low; but it does prove this: that the prosperity of English manufactures is the result, in part, at least, of an almost entire monopoly of the right to manufacture, or a monopoly created by high taxes on machinery, throughout the British colonies, while breadstuff being almost the only thing left the poor and oppressed colonist, he, of necessity, cultivates and sells this to the English merchant at barely living prices, or at higher rates, through agents, and commission houses, who use up all the profit.

He must of necessity supply the raw material or the food for the English manufacturer, who grows rich on his penury. The English operative, while he supports himself and his family on very low wages, adds many fold to the value of the raw material which the colonist has produced but on which he is not permitted to expend any labor, and buys for himself and his family at low prices, the food raised by the same colonist, who is, perhaps, scantily fed and clad, because British policy forbids his applying his strength and skill to those forms of labor which give to England much of her strength, and very much of her resources. This is not the kind of *free trade* advocated in parliaments, nor that contended for in the books.

HISTORY OF THE CATAWBA GRAPE.

As this fruit promises to become one of great importance in the Ohio Valley, it may not be uninteresting to many of our readers to know something of its origin and history. We find the following account of it in an exchange:

My article on the history of the Catawba Grape, published in the first number of the *Western Horticultural Review*, has elicited a lengthy communication from Col. William Murray, of Caloosa Springs, Walker county, Georgia, a brother of the Murray therein alluded to, which fully corroborates the statements there made by Dr. Beach, and now finally settles the question in regard to the origin of this grape. From this communication of Col. Murray, it appears that his father emigrated from Pennsylvania, and settled in the woods on old Kentucky and Warm Spring trail as early as 1801. At that time there were no roads in that country. The farm then settled, and afterwards called Murrayville, is now about ten miles south-east of Ashville, in Buncombe county, N. C., and embraces the forks in the roads, correctly described by Dr. Beach, the locality, as well as the character of the country, it being nearly on the summit-level of the Black Ridge, in latitude 35° 30'., mountainous, thinly timbered, soil poor, with many loose stones and gravel.

At that place, in 1802, Col. Murray says, these grapes were found growing in great abundance; also, another variety, with very long bunches, crowded, and of a dark purple color, but not so delicious as the first, which grew in more open clusters, were larger, and of a more reddish color. After the trees were cut down which shaded them, he says, they were better and grew larger, and have very much improved by cultivation since, and are at this time considered the best grapes in the country.

In 1803, commissioners met at Murraysville to settle a question of disputed boundary between North Carolina and Georgia. On this occasion, these grapes were tested and pronounced good. In 1805, he states that the Friends, or Quakers, from Newbury District, N. C., emigrated to Ohio, and as they passed through this place, took these grapes with them. It would be interesting to learn where they settled in Ohio, and whether they ever succeeded in propagating them there.

In 1807, Gen. Davy, a Senator in Congress, then living at Rocky Mount, on the Catawba river, in the bounds of the Catawba nation of Indians, transplanted some of these grapes to his residence; and sometime between the years 1807 and 1816, he took some of them with him to the city of Washington, gave them the name of the Catawba grape, and disseminated them among his friends in Maryland. From this source it is probable they fell into the possession of Mrs. Schell, from whom Major Adlum obtained them, and made wine of them in 1822. In 1825, he sent the vines with some of the wine to Mr. Longworth, of Cincinnati.

To Mr. John Adlum, then of Georgetown, District of Columbia, are we indebted for its discovery and early reputation as a wine grape, and to N. Longworth, Esq., of Cincinnati, for its introduction in the West, and for the impetus given to its cultivation and the fabrication of wine, which bids fair soon to become an important staple of our country, and to supplant many foreign wines in our market.

For pure, dry, and sparkling wines, the Catawba grape is likely to become to the valley of the Ohio what that celebrated grape which yields the best

Hock wines, those of Johannisberg and Steinberg, are to the Rhine; which grape, it is said, was introduced into that country from Orleans, in France, by Charlemagne.

It may seem to be a matter of minor consideration to be thus particular in endeavoring to trace the origin of a particular variety of vine. But, as thus far it stands without a rival in America in yielding a pure, dry wine, it is a matter of paramount interest and importance to become acquainted with its nature, locality, or habits, especially with a view to understand its nature, habits, and proper cultivation.

From the experience we have had in cultivation, it appears that the soil and situation best adapted to its productive and healthy growth is that which approximates most nearly to its native elements.

On the sides and tops of dry, stony hills, where the soil is loose and porous, it seems perfectly at home, and is little subject to rot or other diseases; the greater the departure from these, its native elements, the more uncertain its culture and perfection of fruit.

In rich alluvial bottoms, the growth is rank and luxuriant, but the fruit is liable to rot, and the vines, in a few years, to decay and become unproductive; clayey uplands, retentive of moisture, are equally uncongenial. In choosing a location for a vineyard, therefore, these points are of much importance, and should be well studied. In the organization and allotment of vegetables, it is a well-known principle of economy that every species and every individual variety of plants have been placed and adapted by nature to a particular soil and atmospheric condition, and very many will not bear a change with impunity. Scientific cultivators are now so well acquainted with these facts, that in transplanting, their chief endeavors are to reduce the condition of things as nearly as possible to their primary elements. The vines of Europe, for instance, will not succeed in the climate of America, when exposed to the variable changes of our atmosphere; hence our intelligent horticulturists are erecting their crystal vineries to shield them from these changes, and to restore to them artificially a climate more in accordance with that of their native home. S. Mosher.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

INSECTS OF THE SEASON.

The season has thus far been noted for the number and variety of insects preying upon vegetation. First came the cut-worm, devastating corn-fields. He acted without partiality, and set at variance the supposed remedy of fall ploughing to enable the frost more effectually to destroy his eggs. Indeed, the fields which have suffered most from the vexatious gnawings of this worm were those ploughed in September previous. One field we have seen, ploughed at that time, was so injured that it will not produce more than two thirds the amount it would have done if the corn had stood well. Other fields similarly managed have suffered essentially; so we take it for granted that fall ploughing possesses no advantage in this matter. We think it an evil that will show itself under favorable circumstances, let the ploughings take place when they may; and an allowance of seed should always be made, so that the worms may have their portion, and have enough to stock the land.

A careful farmer, who ploughed a part of his field last autumn, and a part of it this spring, who suffered as little from the depredations of this worm as any one we know of, informs us that he attributes his successful escape to the fact that he soaked his seed in saltpetre and copperas water, a strong solution, previous to planting. There can be no doubt but such a remedy might be successfully employed against insects that prey upon the kernel, and we don't know but it would impart a loathing quality to the blade in the succulent and tender stage, when the worm feasts upon it. This we know, he has a beautiful, even field of corn, while his next-door neighbor, who ploughed all his land in autumn, in consequence of the loss he sustained, will have but a meagre crop. If the solution is a remedy, it is certainly a simple one, and can be tested without much loss of time or money.

The borers, apple, quince, and pear, have threatened for a few years past to destroy as fast as the cultivator could plant. When we first found ourselves the subject of their visitations, our indignation waxed so hot, that we fell upon them with a sharp knife, thinking our trees might as well die from our efforts to save them, as by the invidious borings of a mischievous worm. Our struggle was rather a severe one, but we begin to think we have obtained the mastery; for, where in previous years we have slain scores, we have this year found but three or four. Cut them out, using all care to mutilate the tree as little as possible, and cover the wound you make closely and firmly with grafting-wax. Examine the tree often, and as often as you find evidence of the existence of a borer, *cut it out.*

The Caterpillar.—These are mischievous pests on fruit trees; and they too once opened upon us a war which threatened extermination. We took the hint from their persevering industry, and opened a warfare too, by demolishing their nests until they became tired of building them. Although they have been mischievous as ever to some of our neighbors, even defoliating their trees, we have seen indications of only two nests on our premises, which were destroyed in embryo, while yet the inhabitants were *very young folks.* Yet they were wise enough not to waste strength in making unnecessary repairs, and had respect enough for the value of our time, not to make encroachments upon it for further warfare. It may be that tradition informed them that our forbearance was not without bounds, and they had better yield in an unavailing controversy.

Black knots on Plum trees.—Does any one suppose these are not the work of an insect? If so, whence originates the little grub now to be found in all the excrescences of this year's formation? Our own and nearly all the trees in this region were entirely free from these destructive pests for many years, so that we thought we had a fine plum-growing region, and choice varieties were introduced in rich numbers, when, lo! the summer of 1852 brought the intruder, and in spite of knife and unfailing panaceas, many of our best trees were destroyed. Those that survived did so only to lead to blighted hopes this year, for the plague-spots come out not only on the branches, but on the trunks also; and present appearances indicate a total extermination of all plum trees.

We say we commenced with a hearty good-will a thorough warfare in this business. But of how little use is battling of one or half a dozen individuals on an army of insects, when nine tenths of community fold their arms and say, "It's of no use," and thus give "aid and comfort to the enemy"? If the war of extermination would be waged by every one, and daily carried into the enemy's camp, what hosts of insects would be destroyed, so that the very name of their tribe would be blotted out. But, with the indifference too many manifest, they go on until they deprive us of comfort, destroy our trees, and die out because they have no more mischief to do.

Yours truly, W. B.

Richmond, Mass., August 15, 1853.

SUPERPHOSPHATE OF LIME.

We are aware of only one opinion in respect to the use of the phosphates as fertilizers, and the superphosphates are of still greater value. These fertilizers are to be had in the markets, and are no doubt worth buying even at high prices. But farmers can manufacture them on their own premises at a much cheaper rate than they can purchase them of regular dealers. Besides, we believe in the doctrine of INDEPENDENCE. We would have all our citizens as little as possible at the control of others, in all their business operations. We would have them able to manufacture all the manures, and carry on their farm operations by their own scientific and physical resources. It may not be unwise, but highly expedient, in the preparation of some of these artificial manures, for neighbors to go in company or in shares, especially where much cost or trouble in the way of preparation for the work is required. So a partnership, to some extent, in the trying of experiments may sometimes relieve one party from loss, if unsuccessful, and create an interest in the subject on the part of his neighbor, who would not otherwise *meddle* with such matters.

In the preparation of bones for these uses, the following simple mode will be found convenient and effective:

Provide a couple of large tubs, by sawing into two parts a large barrel or hogshead. These should be placed in a situation where the fumes of the sulphuric acid will not be likely to enter the dwelling-house, or incommode any animals. The fumes should always be avoided, as, if inhaled into the lungs, they are highly injurious, producing an extensive inflammation of the inner membrane of the windpipe and the organs below it.

In the tubs thus provided, the bones, previously broken into small fragments, are to be placed after their weight has been ascertained. They may be filled within fifteen inches of the top. Then moisten with about one fifth their weight of hot water, from a watering-pot, stirring them thoroughly. After a short time, they become uniformly and completely saturated. As soon as this is done, add the sulphuric acid, in quantity from forty to forty-five per cent. of the weight of the bones. The acid must be very cautiously handled, to avoid danger to the person and clothes. Then stir up the bones with a fork, and in doing this, stand to the windward of the tub, so as to lessen the danger from the effervescing liquid. After the bones have been carefully turned over, the tub may be covered with an old cloth to preserve the heat, and left twenty-four hours, by which time the process will be completed.

If raw bones are used instead of bones that have been boiled, ten per cent. less of acid will be sufficient. It is of importance to attend to this, as the acid is much the greatest ingredient, and when more than enough is used, it is completely lost—its only use being to render the phosphate soluble. Oil of vitriol is commonly used, but brown acid is more economical. The strength of the oil of vitriol and of brown acid, or, in other words, the amount of pure sulphuric acid which either of them contains, is known by their specific gravity. In Professor Way's calculations, he reckons their weight as one seventh compared with one of water. If brown acid be used, about a fourth more quantity is required than of oil of vitriol.

Any dry absorbent substance which does not contain much carbonate of lime will do for mixing with the superphosphate after it has been a day in the tub. A layer of ashes, or dry saw-dust, may be laid on the floor beside the tub, six inches deep. Upon this layer place a quantity of dissolved bones with a spade, then another layer of ashes or saw-dust, alternating with the bones until the tubs are empty. "The compound heap is now sliced down with the spade, a little at a time, and thoroughly mixed and made small with an iron rake. After having gone over it once, the same process should be repeated immediately, at any convenient time thereafter, adding more ashes or saw-dust if it is not dry enough, after which it will be in a fit state for sowing."

In calculating the amount to be applied to the crop, if the compound contain, say a ton of bones, it may be regarded as equal to twenty-eight cwt. of Peruvian guano. When the bones are prepared for light land, it is advisable to use a rather less proportion of acid. The process is thereby cheapened; and if small fragments of bones remain undissolved, they are highly useful in that state for sustaining the autumn growth of the crop.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

CHEMICAL ANALYSES OF SOILS.

Messrs. Editors:—I have frequently noticed statements in your journal, as well as in other periodicals, that farmers are not willing to expend a dollar for the analysis of their soils.

The reason of this is, in many cases, that they do not understand the proper steps to take, to effect this analysis.

There are many fine farms on the Androscoggin river, and farmers here are beginning to feel the need of practical agricultural knowledge. Perhaps this may be obtained by frequent experiments with crops, and close observations. But the directions for the proper analysis of our intervale soils would be thankfully received by A Subscriber.

Oxford Co., Maine.

Remarks.—We had designed to give our views somewhat in detail on the subject referred to in this note, but have deferred it to the present time. The above inquiry from our friend may be properly used to give these views with some particularity.

1. Accurate chemical analyses, in our view, are often of great value to the farmer. In former numbers we have given illustrations of this, and repeat one here, by way of sample. A field of an eminent farmer of this State was carefully cultivated and sown with wheat, but did not produce enough to replace the seed. A chemical analysis exhibited an entire absence of phosphoric acid. This, and this alone, was furnished, and the next crop of wheat was thirty or forty bushels per acre. Such facts might be multiplied indefinitely.

On the other hand, it is obvious that actual analysis is not the only mode of ascertaining the capacity of the soil. As in bookkeeping, a trial balance may be made out, when some of the entries, ordinarily used for this purpose, are lost, so the farmer is not confined to a single process. For example:—

Suppose you have a field, like one of the *sandy soils* spoken of on page 103, August number, containing fifty to eighty per cent. of clay, ten or twenty of lime, and a mixture of humus; and suppose the crops that have been raised are well known, with the treatment it has meanwhile received. The intelligent farmer will see at once what elements must have been used up, by those crops, and of course what manures are required.

"But how shall we know that the field in question ever was in the state above described?"

We answer, each section of our country has its known geological character. In one wide section, perhaps, the sands are almost entirely silicious; in others well mixed with clay. If there is a "State Report" on this subject, it will, no doubt, contain the information required. And again, by dissolving a portion of the soil, as described on page 103, just referred to, the result may be sufficiently exact. So, too, the process there described may detect the presence of carbonate of lime.

But another test is perfectly obvious. Suppose the soil is chiefly sand, and has never produced good crops. Recurring to the fact we have heretofore explained, that certain crops exhaust certain elements (see page 149, September number,) and that all the elements required are few in number (see July, 1852, page 22, and August, page 100,), and that silex, at least, and perhaps some other elements, obviously remain; the missing ones, within certain limits, are a matter of necessary inference.

But another remark is also obvious. The matter, in time, may be practically tested, and the process referred to may be used after the manner of some of the problems in bookkeeping. If the soil is of uniform quality, divide it into narrow sections, and sow seed of opposite characteristics. The comparative growth of clover seed, peas, oats, &c., being plants which require different elements, would test the presence or absence of potash, soda, and lime; phosphoric acid, magnesia, &c., and be a guide for future action.

So, too, the character of the spontaneous growth is often indicative of the character of the soil. This fact was explained on page 23 of our number for July, 1852, and, within the limits there implied, is one of unquestionable value.

But why so many suggestions, some of which are so uncertain and indefinite, in their results? Because we add, as an important suggestion on this subject, another fact, equally important, in considering how we shall test the composition of our soils, to wit:

We have very little confidence in the entire accuracy of a large proportion of the pretended analyses, even when made by professed chemists. One of our most learned and practiced chemists, who is also an eminent geologist, once remarked to us that he could not make an analysis of soil, at all reliable, in less time than six weeks. No authority is more frequently appealed to on kindred subjects than this gentleman. We know the assertion will be laughed at by scores of chemists, who can tell you *all about it* in a few hours; but we are quite willing to put the laugh side by side with the observation, and let each go for what it is worth.

We do not mean to condemn as worthless those analyses that are not very accurate. Those processes which we have pointed out for the farmer himself to attempt are of substantial value, and really worthy of frequent experiment, and sometimes as valuable as the report of the professor of chemistry, while "five dollars" will buy many pounds of *guano* or of *poudrette*, or of the *improved superphosphate.*

The result of all our own reflections and observations is, that it is best for the farmer with limited means to use his money in buying manures, and making composts, and in improving his lands, under such examinations of his soil as we have described, rather than in paying for many analyses of different soils of which he may be the owner. If he can do the last, in addition to the former ones, so much the better. Much good may come of it, but let him be cautious whom he employs.

For our Eastern friends we are unable to point out any chemist nearer to them than New-York, who holds himself up to the public as always prepared for such service, at a very low rate; though we do know that an analysis by Dr. C. T. Jackson, or by Mr. Teschmacher, of Boston, with which they would themselves be satisfied, would be entirely reliable. In New-York there are several who devote themselves to such business, and who, for "five dollars," give the analysis. In Albany we have Prof. Salsbury. Farther South, we know of only Dr. R. Stewart, of Baltimore. Others, no doubt, are equally competent with these, though unknown to us. Select a fair specimen from the surface, another six or eight inches below the surface, and also a specimen of the subsoil;—a quart or two of each, and forward as you please.

We shall be happy to act as agents for any of our subscribers, in obtaining such analyses, and will select the most reliable chemist in our power. The cost of freight, and of the work performed, &c., should be sent with the soil.

KENTUCKY FARMS AND FARMING.

The following extracts are from a letter by M. Bateman, editor of the *Ohio Cultivator:*

From Louisville we made an excursion to Lexington, which is about the centre of the best farming district in Kentucky, and we might almost say in the Union; for it is difficult to find a more beautiful and fertile region than is included in Fayette, Bourbon, and one or two other adjoining counties in this State; and as a large portion of the lands in other parts of the State are not of very good quality, the owners of farms in this favored district are sensible of their advantages, and are regarded by all as the aristocracy of the State. The farms are generally large, consisting of several hundred acres each, and are worth from $70 to $100 per acre; then, if we include the value of the stock usually kept, it is obvious that to be a farmer here requires no small amount of capital. Whether or not the business affords as much profit for the capital invested as is usual in Ohio and other Western States, we have some doubts; and we found on conversation with several of these Kentucky farmers, that they were by no means satisfied on this point.

The scenery of this part of Kentucky is quite different from and more beautiful than the most fertile portions of Ohio. The lands are more undulating, with broad and gentle slopes, interspersed with groves of majestic trees, beneath which the blue grass forms a rich turf, and the herds of stately short-horns luxuriate with even more than Durham thrift and fatness. The soil is a limestone clayey loam, of a dark brown color, nearly resembling in quality what is called *second bottom* in Ohio. The greater portion is devoted to grazing, as stock raising is the favorite pursuit; and here we find in perfection the *blue grass pastures*, of which so much is said, and which are no where equalled for productiveness and beauty. So remarkably fine and large is the growth of this grass here, that many persons have been led to suppose it is a different variety from that which abounds in Ohio and other States, (sometimes called *June grass*,) but the wisest botanists have pronounced it the same, (*Poa pratensis;*) and we have known several Ohio farmers who have procured seed from Kentucky for sowing their pasture lands, and the product was not different from the native growth. It is evident, therefore, that it is the superior adaptedness of the Kentucky soil for this grass which makes the difference; and it is only where similar soil can be found in Ohio that we can expect to make blue grass pastures like those of Kentucky. To sow Kentucky blue grass seed on flat, cold, clay soils, as we have seen done, almost without any preparation, with the expectation of forming blue grass pastures like those of Kentucky, is about as reasonable as to expect to raise a herd of Kentucky Durhams from a lot of native scrub calves.

Fine cattle, as well as fine lands, our readers are aware, have been the boast of this portion of Kentucky; and we noticed, in passing, that even the common race of cattle in these parts partake so largely of Durham blood as to give them more the appearance of English stock than we have any where else seen in this country, and quite a number of the herds bore evidence of having been bred with much care and skill. On the farm of Mr. Istelle (one of our subscribers,) we found half a dozen fat Durham steers, that for symmetry, size, and fatness, were almost equal to any that we saw at the Royal Show in England. He had just refused $700 for the lot, and said he would not sell them till after the fall exhibition, when they would probably be sent to New-York for Christmas beef.

On the farm of Mr. Kinnaird, about eight miles from Lexington, we saw a number of cows and heifers, which have never been excelled at the shows of that region, and we think would be hard to beat at any others in this country. If the new importations from England are shown to excel these, it will be worth a trip from Ohio to see them. Mr. Kinnaird is a young farmer of much intelligence and enterprise, and has one of the most beautiful farms in that very beautiful region. Besides fine cattle, he has a lot of South Down sheep, some of them immediate descendants from the noted Webb flock of England; also, some good Berkshire and other hogs. In one of his pastures we noticed an acre or more of the *meadow fescue*, or, as it has been called, "English blue grass." It was grown the past year from seed sent to him by a friend in Virginia, who did not know its true name. This grass has never before been tried in that region, and we think it may prove highly valuable there, especially for winter pasture. We shall be pleased if Mr. Kinnaird will inform us next winter how this variety compares in color and hardiness with the common blue grass.

Mules are a very popular kind of farm stock at the present time in Kentucky, and large prices are obtained for them in the Southern markets. Some of these animals that we saw—as on the farm of Mr. Childs—were very large and sleek, but we confess to no great admiration of them.

Fast horses have in former years received much attention in this region, but of late only a few gentlemen of the sporting profession are particularly interested in blooded stock of this class. J. B. Clay, Esq., son of the late honored Senator of Ashland, has several very celebrated horses among his stock, and is well known for his devotion to the sports of the turf. Much good blood has been infused into the horse stock generally throughout Kentucky by means of the numerous fine horses introduced there years ago.

A new *Cattle Importation Company* was formed in the vicinity of Lexington the past winter, the agents of which, after spending much time in making selections in England, have just returned, and report that they have on the way about forty head of the very finest short-horns, some Cotswold sheep, and a Cleveland bay stallion. These are to be disposed of by auction the coming fall, and will no doubt prove highly valuable in sustaining the high reputation of this region for fine stock. We learn, also, that a Mr. Alexander, of Woodford county, Ky., has been spending some months in England, purchasing on his own account some of the finest cattle to be found there without regard to cost. It is the avowed determination of the wealthy and enterprising stock farmers to make this portion of Kentucky the greatest centre of really fine stock in the Union; our Scioto friends will therefore have to look sharp to their laurels.

There are two active and spirited Agricultural Societies in this region: the Bourbon Society having its exhibitions at Paris, and the Kentucky Society at Lexington. Both, we believe, embrace several counties in their membership, and allow competition from all parts of the State. The annual fairs of these Societies are designed for the *sale* and *exchange*, as well as the exhibition of stock; and when the numerous railroads now in progress at the South and West are completed, it is anticipated that many persons from other States will be present at these fairs. There is also a good Society in operation in Shelby county; and on the day that we were in Louisville, we attended a meeting of the friends of agriculture, at the court house, for the purpose of organizing a Society for that region. A constitution was adopted, and from the degree of interest manifested, there is no doubt but that the Society will be successful. It is called the Western Kentucky Agricultural Society; and it is the design to hold a grand fair at Louisville the coming fall.

ARTIFICIAL GUANO.

The following has proved itself a good substitute for guano:

	lbs.
Bones, dissolved in spirits of salt,	$18\frac{3}{4}$
Charcoal powder,	$18\frac{3}{4}$
Sulphate of ammonia,	$9\frac{1}{2}$
Common salt,	$9\frac{1}{2}$
Gypsum,	$9\frac{1}{2}$
Wood ashes,	46
Nitrate of soda,	28
Sulphate of soda, (Glauber's salts,)	10
Sulphate of magnesia, (Epsom salts,)	10
	108

Five hundred pounds to the acre is a proper allowance. The constituents should be well mixed together, and used as guano is used.

HOW TO SUBDUE A VICIOUS HORSE.

On looking over some old papers the other day, we came across the following, which, if true, is worth knowing. It seems that a fruitless effort was being made in a blacksmith shop to shoe a vicious horse, which resisted all efforts, kicked aside every thing but an anvil, and came near killing himself against that, when, by mere accident, an officer returned from Mexico was passing, and being made acquainted with the difficulty, applied a complete remedy by the following simple process:

He took a cord about the size of a common bed-cord, put it in the mouth of the horse like a bit, and tied it tightly on the top of the animal's head, passing his left ear under the string, not painfully tight, but tight enough to keep the ear down and the cord in its place. This done, he patted the horse gently on the side of the head, and commanded him to follow, and instantly the horse obeyed, perfectly subdued, and as gentle and obedient as a well-trained dog; suffering his feet to be lifted with entire impunity, and acting in all respects like an old stager. The simple string, thus tied, had made him at once as docile and obedient as any one could desire. The gentleman who thus furnished this exceedingly simple means of subduing a very dangerous propensity, intimated that it is practised in Mexico and South America in the management of wild horses. Be this as it may, he deserves the thanks of all owners of such horses, and especially the thanks of those whose business it may be to shoe or groom the animals.

CHEESE MAKING.

This is a subject on which we need the practical experience of all who are successful in the business. A really good cheese is only obtained by a due regard to a great variety of details. How many of these there are, and what they are, are the great points on which we need light; and by a knowledge of these, to the exclusion of other immaterial matters, we may, by and by, supply our markets more abundantly with what is really worthy the name of cheese. We have given the "Swiss mode of making Cheese," on page 142; we here add, for the purpose of giving a fuller view of the subject, an article from an Ohio farmer, who seems to have had great experience, skill, and success in this important branch of operations on the farm:

"A *system* is essential, and every successful dairyman must have his own, though never to deviate from certain fixed principles. Although the quality of cheese in our section is yearly improving, yet very many of our dairymen are sadly deficient. The most essential requisite, that pertains to a dairy, is extreme cleanliness; and only such vessels should be used as will readily admit of being thoroughly washed and scalded every time they are used. A very small quantity of putrescent milk will cause any fresh milk rapidly to sour when exposed to its influence.

The dairy-room should be dry, cool, and airy, easily ventilated, wholly above ground, shaded by trees, windows protected by shutters, opened nights and closed during the day, to prevent dry currents of air, that will cause the rind of cheese to crack, also to keep the temperature of the room below 80 deg. Sweet milk holds sugar and casein or cheese in solution with water, and the butter of the milk floats in it. One great point is to separate the cheese from the water or whey, and with it as much butter as possible. The milk, at a high temperature, will soon change its sugar into lactic acid, and a low one will retard it, though not prevent it. The evening's milk intended to stand till morning, should therefore be cooled to near 60 deg. to prevent souring; also to free it of the animal odor, or pasture flavor, so offensive to many persons. The cream should be taken off in the morning and made into butter; as it occasions a waste of nearly thirty-three per cent. of the butter in manufacturing, if left with the milk. The vat should be large enough to hold the milking of one day, and made of tin, inserted in a wooden one, leaving a space all around, at top and bottom, for hot or cold water. After straining the morning's milk, the temperature should be raised to about 80 deg. in common summer weather, and to 86 or 90 deg. in cold weather, in May, October, and November. If raised above this, more butter is likely to be separated from the curd, and if below, a perfect coagulation of the milk is not as sure; at least, this seems to be a point requisite for perfect coagulation. The practice of heating a part of the milk in a kettle over a fire, in order to bring about the right temperature for setting, should be avoided. Besides the danger of scorching a part of the butter, the richness and value of the milk is sure to be lost in the whey, as will be seen by the quantity of cream afterwards rising. Sufficient rennet should now be added to produce perfect coagulation in thirty minutes; taking care that the rennet be concentrated and active, or the curd will be soft and pulpy, causing much waste. After adding the rennet and thoroughly mixing it, the milk should be tightly covered, to prevent the temperature from varying, and be left perfectly quiet, free from sudden jarring. When the milk is perfectly coagulated, it is known by its parting smooth and clean by passing the finger through it. Cut in in inch squares with a long knife, that will reach to the bottom of the vat. Let it stand fifteen minutes, or more, then pass the hands several times through the curd to the bottom, gently moving it, after which, the whey will rise more rapidly.

During the warm months, the curd should be rid of whey at the earliest possible moment, taking exceeding care not to cause any white whey to run. So long as whey remains in the curd it is sure to impart an acidity, which tends to a greater waste in manufacturing; though the best quality of cheese is often made from sour curd. At this stage, let the whey pass off through a cullender, at the end of the vat, and commence dipping the curd back with a sharp tin scoop, that will cut its way free and smooth. It would prove a saving to press the whey through a fine linen strainer. Avoid breaking or mashing the curd, and the whey will pass off green and pure.

The western practice of driving the heat, and whirling up the whey and curd, or what is familiarly known as the "quick way," will make a softer cheese while green, and will cure earlier, but less firm, more porous, will shrink more in weight, consequently a lighter yield and not as rich. A cheese rightly made of eighty or one hundred pounds should shrink, in curing five months, about seven per cent.; but made the "quick way," will commonly shrink from fifteen to twenty per cent. This may be known as true—the greater the shrinkage, the greater the mould, and the more likely to adhere to the shelves.

The manner of separating the whey is the most important point, involving the richness, which in market is every thing, of the cheese. Richness requires that as much as possible of the butter be chemically incorporated with it. If it merely adheres to the curd mechanically, it is easily washed off with the whey, and here you have it in the form of whey butter, which should be scarce where good cheese is made. When thoroughly drained, cut it in about half-inch squares, taking care that the pieces are uniform in size; add warm whey, if sweet, at about 116 deg., otherwise use soft water, taking care that it does not come in contact with much curd while too hot, till the whole mass be raised to 100 deg. At this point check the scalding process by adding cold water, taking care not to reduce it below this point. Then cover and let it remain till every piece be warmed through; known by touching the end of the tongue to a broken piece. Draw off the whey as dry as possible; and, while warm, add one common sized tea-cup full of finely pulverized salt to sixteen pounds of cheese, green from the press. Great care should be taken that the salt be thoroughly incorporated. This will cause more brine to run off, and should be collected to replenish the rennet-crock daily. The above process cannot be completed successfully very early in the day. Hurrying cheese into the press will cause it to be dry and crumbly, or having a pungent smell, giving it a sharp biting acid flavor, injurious to its sale; or, which is worse, leaky and huffy. Rich cheese requires time and care in the operation. One writer says, that out of every 100 parts of new milk $3\frac{1}{8}$ are butter, and $4\frac{1}{2}$ are cheese. This I think to be a light yield. Ten pounds of milk should produce one of cheese, firmly made, and some parts of the year a greater yield should be realized. After moderately pressing from six to ten hours, fit a bandage on tightly, which will extend over the edges about one inch. The edges should be compressed by gathering the bandage, and tying firmly with strong twine, to give them a rounding appearance on the shelf. Pressing on the bandage will prevent it from ruchling up as one cheese cures, leaving a harbor for flies or black mould. In twenty-four hours remove to the shelves, leaving a heading of cloth pressed on at top and bottom till quite dry, to prevent cracking.

Apply evenly and thoroughly, hot whey butter, and rub it in. The grease should be colored, giving the exterior a bright orange color, and may be prepared by dissolving annetto in weak soap-suds, hot, and simmered over a slow fire. The color will be transmitted to the butter as the water evaporates. Then, in order that every good dairyman may have his due credit, he should have some mark imprinted on the bandage before greasing; for it should be borne in mind, that in a perishable article like cheese, a preference in sales at market is of itself a profit, and well worth an effort to command by superior quality, even though no extra price be obtained.

A thin flat cheese is not commonly fancied; 6 inches deep, 16 in diameter, weighing about 42 pounds; 7 inches deep, 18 in diameter, weighing 63 pounds; 8 inches deep, 20 in diameter, weighing 85 to 100 pounds, are the most fancied styles for cutting cheese.

CURE FOR GARGET.

The following case is reported in the *Boston Cultivator*. It is from the pen of Dr. Eben Wight, of Dedham; and as we have the pleasure of his personal acquaintance, we assure our readers that he is as reliable a witness as any man living; and his opinion—of great value on any subject on which he will make that opinion known—is worthy of entire respect. Dr. Wight says:

At the solicitation of a friend, who has saved a valuable cow from the hands of a butcher, I am induced to make known through your columns a remedy for the garget. Some years since I met with a fine imported Durham cow on the way to the butcher, the owner parting with her in consequence of her being afflicted with the garget. The owner had tried all the usual modes of eradicating the disease, after which he put her under the charge of a distinguished veterinarian, who, after a six-months' attendance, discharged her as incurable.

Deeming her a good subject for a treatment with iodine, and not knowing whether it had been used in the case, I purchased her at what she was worth for beef. At that time she gave but a few drops of milk at a time from one teat; the other had ceased to yield any: the udder and teats were swollen and hard. I determined to make use of iodine in the form of hydriodate of potash, being solvent in water, and if it failed to exhibit its effects on the system, I would resort to an ointment, (20 grs. iodine to 1 oz. hog's lard,) applied externally to the udder and teats. I commenced by giving 10 grs. of hyd. potash in a tablespoonful of water, three times a day, mixed in a mash of shorts and meal; and though the dose was unusually small for a cow, still, as it was giving unmistakable signs of effect,* I did not increase the dose. In seven days she gave milk freely from each teat, and in three weeks she was discharged as cured. The result in the foregoing case was so favorable, that I advised my neighbors who had cows afflicted with the garget to make a trial of the same remedy. I have known of its trial in at least forty cases, and in every one the cure has been effected with even the above-named small dose. A larger quantity could be used with safety.

Any one acquainted with the effect of iodine on the human system, knows its tendency to produce an absorption of the mammæ. Dr. R. Coates, of Philadelphia, reports a case in the *Medical Examiner*, of the complete absorption of the female breast from iodine; but the mammæ recovered their original development after the lapse of a year. Iodine is principally employed in diseases of the absorbents and glandular systems. (See *U. S. Dispensatory.*)

Hydriodate of potash can be procured of any apothecary, and dissolved so as to allow 10 grs. to each spoonful of water, increasing the doses till it gives effect on testing the urine.

EBEN WIGHT.

Dedham, June 25, 1853.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

ON MANURES.—WILLARD'S BROMUS.

To Mr. Alanson Chase and his Son, (Business Partner,) Clinton, Mass.:

MY long-cherished friendship, and interest for the improvement of your noble homestead, induces me to give you this letter of suggestions, through *the Plough, the Loom, and the Anvil*, and the number containing it, which I shall order sent to you, hoping you will subscribe for it, show it to your neighbors, and, as I have done, find unmingled pleasure and profit from its rich and varied contents, as a monthly visitor.

In my last call at your place, among other things, your spacious new barn and cellar pleased me much. Besides all the *solid* manure of cattle and horses, litter, muck, and other carbonaceous matter, composted under it, with frequent sprinkling of salt and plaster, preventing the escape of gases, you may save an equally valuable amount of fertilizing *liquid* by the plan and process I would recommend. (I know a little outlay would be nothing with you, by which the health of the family and of all the animals may be promoted; and besides cleanliness and neatness in the yard, you would obtain such an amount of fertilizing material as to give waving luxuriance and beauty to surrounding fields.) It is to build a *cistern* some distance from the barn, low enough and large enough to receive drainings from the lowest part

* Hydriodate of potash passes quickly into the secretions, especially the urine. It may be detected in the latter by first adding to the cold secretion a portion of starch, and then a few drops of nitric acid, when a blue color will be produced.

of the yard, all the wash from summer showers, and melting snow in spring; covered with a roof, and furnished with a pump high enough to admit a cask on wheels under its spout, after the manner of a city road-sprinkler. To this cistern, which may be of plank, or of hard brick, laid in hydraulic lime, carry all the wash from the house, not excepting the privy; which, if its contents are in a tight box, often supplied with water, into which disinfecting materials are stirred, will go off with the rest without offense or difficulty, in suitable pipes or troughs. I reckon cast iron troughs the best, made like two strips of board nailed together, each three inches wide, or more, according to circumstances, being simple, roomy, and durable. They may be covered with a board, and cleaned easily. Let such be placed back of all the stables, and the urine thereby be carried to the cistern. You may ask if the amount gained by *irrigation* would equal the extra cost of application, as most of the urine *might be* conveyed to the compost.

By the *best* management in compost, considerable is lost by running away—by evaporation—by being too strong—by the drying and hardening of lumps saturated with urine—by the difficulty of *complete pulverization* when once dried—by the want of equal distribution—by not bringing it in contact with all the roots, it being sometimes too deep and sometimes too near the surface; and again by drought.

As all plants take their food only when it is in a soluble state, IRRIGATION, at proper times, and in a proper manner, is highly advantageous. Its action upon the foliage enables it to take advantage of atmospheric influences, while it also secures the whole plant from the effects of general drought. But what is applied in this manner should be applied equally over the surface, and at the most favorable times. It can be repeated without disturbing the soil, and a given amount of nutritive matter can be applied in this superior manner, and timely, with less labor. The pipes, cistern, and machinery, once prepared, are durable.

Such being their advantages, I think those who procure and use them soonest are the wisest. They *get good*, and by their example and extended influence *do good*.

Permit me to add some information and sentiments obtained from gentlemen visiting England, and from my own correspondence. Mr. Dickinson keeps a few cows and many job-horses in London. His stable is a pattern of neatness, and his farm, five miles out of the city, a sample of beauty and productiveness. He sells all his solid manure to farmers, but conveys all the urine to a *tank* some distance from the stable, by underground troughs, for his own use. He dilutes the urine in the tank variously; sometimes by mixing twice the quantity of water, and even more; and says, if it were not so far to cart, it were better for dry land, or dry seasons, to add eighty per cent. of water, provided the same amount of urine were applied. He keeps all his stock on the "improved Italian rye grass," raised on this farm, of which there are hybrids, at least one hundred varieties. He thinks himself quite favored in the kind he has obtained. I am quite satisfied that it nearly resembles my Bromus, which I think unsurpassed, if not *unequalled, by his, or any other.* He begins early to irrigate his lands, and mows three times, and part four times, applying his liquid after each mowing. *No other fertilizer!* The growth is very uniform, and about three feet each time. He uses what he wants *green*, and dries the rest; speaks of it as the best feed for horses, and thinks nothing so good for milch cows, or sheep and lambs, green or dry. Coleman, in his "Reports on European Agriculture," who visited Mr. Dickinson's farm and stables, fully endorses these views, and highly recommends his course to American farmers.

I think, Mr. Chase, as you have so much land in proximity to your barn and the sink is so well adapted to irrigation, and summer soiling, you may commence with fair prospects at once. Call on me, and I will show you the *Willard Bromus* growing, covering the ground like a fleece, and hay of large size, first and second crop. I have had three tons per acre at one cut. It is often six feet high at maturity. The sooner you turn over one or two acres of your lightest grass land, and take this seed and sow, the better. Autumn is Nature's time for seeding. It will do well after corn and potato harvest. Should you wish any of my views as to fixtures or field-culture, when able, they are available. This is my first writing since my long and painful confinement with bilious colic. I was anxious to prepare it in season for the September number, for your sake and others, and have laid down many times while doing it. May it be seasonable, acceptable, and useful.

Yours truly, BENJAMIN WILLARD.

Lancaster, Sept. 1, 1853.

[The above was not received till our September issue was through the press.—ED.]

LAYING DOWN TO GRASS.

BELOW we give an extract from "The Elements of Agricultural Chemistry," by Professor Johnston, soon to be published by Mr. Saxton, of this city.

IMPROVEMENT OF THE SOIL BY LAYING DOWN TO GRASS.—FACTS WHICH HAVE BEEN ASCERTAINED.

On this subject two facts seem to be pretty generally acknowledged:

First, That land laid down to artificial grasses for one, two, three, or more years, is in some degree rested or recruited, and is fitted for the better production of crops of corn. Letting it lie a year or two longer in grass, therefore, is one of the received modes of bringing back to a sound condition a soi that has been exhausted by injudicious cropping.

Second, That land thus laid down with artificial grasses diminishes in value again after two, three, or five years—more or less—and only by slow degrees acquires a thick sward of rich, nourishing, natural herbage. Hence the opinion that grass land improves in quality the longer it is permitted to lie, the unwillingness to plough up old pasture, and the comparatively high rents which, in some parts of the country, old grass land is known to yield.

Granting that grass land does thus *generally* increase in value, three important facts must be borne in mind before we attempt to assign the cause of this improvement, or the circumstances under which it is likely to take place, for the longest time and to the greatest extent.

1. The value of the grass in any given spot may increase for an indefinite period, but it will never improve beyond a certain extent; it will necessarily be limited, as all other crops are, by the quality of the land. Hence the mere laying down to grass will not make *all* land *good*, however long it may lie. The extensive commons, heaths, and wastes, which have been in grass from the most remote times, are evidence of this. They have, in most cases, yielded so poor a natural herbage as to have been considered unworthy of being enclosed as permanent pasture.

2. Some grass lands will retain the good condition they thus slowly acquire for a very long period, and *without manuring*, in the same way, and upon nearly the same principle, that some rich corn lands have yielded successive crops for one hundred years without manure. The rich grass lands of England, and especially of Ireland, many of which have been in pasture from time immemorial, without receiving any known return for all they have yielded, are illustrations of this fact.

3. But others, if grazed, cropped with sheep, or cut for hay, will gradually deteriorate, unless some proper supply of manure be given to them, which required supply must vary with the nature of the soil, with the kind of stock fed upon it, and with the kind of treatment to which it has been subjected.

FORM WHICH THE IMPROVEMENT ASSUMES, AND HOW IT IS BROUGHT ABOUT.

In regard to the acknowledged benefit of laying down to grass, then, two points require consideration:

1. What form does it assume, and how is it effected?

The improvement takes place by the gradual accumulation of a dark-brown soil, rich in vegetable matter, which soil thickens or deepens in proportion to the time during which it is allowed to lie in grass. It is a law of nature, that this accumulation takes place more rapidly in the temperate than in tropical climates; and it would appear as if the consequent darkening of the soil were intended, among other purposes, to enable it to absorb more of the sun's warmth, and thus more speedily to bring forward vegetation where the average temperature is low and the summers comparatively short.

If the soil be very light and sandy, the thickening of the vegetable matter is sooner arrested; if it be moderately heavy land, the improvement continues for a longer period; and some of the heaviest clays in England are known to bear the richest permanent pastures.

The soils formed on the surface of all our rich old pasture lands thus come to possess a remarkable degree of uniformity, both in physical character and in chemical composition. This uniformity they gradually *acquire*, even upon the stiff clays of the lias and Oxford clay, which originally, no doubt, have been left to natural pasture, as many clay lands still are, from the difficulty and expense of submitting them to arable culture.

2. How do they acquire this new character, and why is it the work of so much time?

When the young grass throws up its leaves into the air, from which it derives so much of its nourishment, it throws down its roots into the soil in quest of food of another kind. The leaves may be mown or cropped by animals, and carried off the field; but the roots remain in the soil, and as they die, gradually fill its upper part with vegetable matter. On an average, the *annual* production of roots on old grass land is equal to one third or one fourth of the weight of hay carried off,* though no doubt it varies much, both with the kind of grass and with the kind of soil. When wheat is cut down, the quantity of straw left in the field, in the form of stubble and roots, is sometimes greater than the quantity carried off in the sheaf. Upon a grass field two or three tons of hay may be reaped from an acre, and, therefore, from half a ton to a ton of dry roots is annually produced and left in the soil. If any thing like this weight of roots die every year, in land kept

* See the author's Lectures on Agricultural Chemistry and Geology, Second Edition.

in pasture, we can readily understand how the vegetable matter in the soil should gradually accumulate. In arable land this accumulation is prevented by the constant turning up of the soil, by which the fibrous roots, being exposed to the free access of air and moisture, are made to undergo a more rapid decomposition.

But the roots and leaves of the grasses contain earthy and saline matters also. Dry hay leaves from an eighth to a tenth part of its weight of ash when burned. Along with the dead vegetable matter of the soil, this inorganic matter also accumulates in the form of an exceedingly fine earthy powder; hence one cause of the universal fineness of the surface-mould of old grass fields. The earthy portion of this inorganic matter consists chiefly of silica, lime, and magnesia, with scarcely a trace of alumina; so that, even on the stiffest clays, a surface soil may be ultimately formed, in which the quantity of alumina—the substance of clay—is comparatively small.

There are still other agencies at work by which the surface of stiff soils is made to undergo a change. As the roots of the grasses penetrate into the clay, they more or less open up a way into it for the rains. Now, the rains in nearly all lands, when they have a passage downwards, have a tendency to carry down the clay with them. They do so, it has been observed, on sandy and peaty soils, and more quickly when these soils are laid down to grass. Hence the mechanical action of the rains—slowly in many localities, yet surely—has a tendency to lighten the surface soil, by removing a portion of its clay. They constitute one of those natural agencies by which, as elsewhere explained, important differences are ultimately established, almost every where, between the surface crop-bearing soil and the subsoil on which it rests.

But, further, the heats of summer and the frosts of winter aid this slow alteration. In the extremes of heat and of cold, the soil contracts more than the roots of the grasses do; and similar though less visible differences take place during the striking changes of temperature which are experienced in our climate in the different parts of almost every day. When the rain falls also on the parched field, or when a thaw comes on in winter, the earth expands, while the roots of the grasses remain nearly fixed; hence the soil rises up among the leaves, mixes with the vegetable matter, and thus assists in the slow accumulation of a rich vegetable mould.

The reader may have witnessed in winter how, on a field or by a way-side, the earth rises above the stones, and appears inclined to cover them; he may even have seen, in a deserted and undisturbed highway, the stones gradually sinking and disappearing altogether, when the repetition of this alternate contraction and expansion of the soil for a succession of winters has increased, in a great degree, the effects which follow from a single accession of frosty weather.

So it is in the fields. And if a person skilled in the soils of a given district can make a guess at the time when a given field was laid down to grass, by the depth at which the stones are found beneath the surface, it is partly because this loosening and expansion of the soil, while the stones remain fixed, tends to throw the latter down by an almost imperceptible quantity every year that passes.

Such movements as these act in opening up the surface soil, in mixing it with the decaying vegetable matter, and in allowing the slow action of the rains gradually to give its earthy portion a lighter character. But with these, among other causes, conspires also the action of living animals. Few persons have followed the plough without occasionally observing the vast quantities of earth-worms with which some fields seem to be filled. On a close-shaven lawn many have noticed the frequent little heaps of earth which these worms during the night have thrown out upon the grass. These and other minute animals are continually at work, especially beneath an undisturbed and grassy sward; and they nightly bring up from a considerable depth, and discharge on the surface, their burden of fine fertilizing loamy earth. Each of these burdens is an actual gain to the rich surface soil; and who can doubt that, in the lapse of years, the unseen and unappreciated labors of these insect tribes must both materially improve its quality and increase its depth?*

HINTS AS TO MANURES.

It is a well known fact that hoofs, hairs, feathers, skins, wool, contain more than 50 per cent. of carbon, and from 13 to 18 per cent. of nitrogen, besides sulphur, salts of lime, of soda, and of magnesia. These substances hold, therefore, the first rank, as it were, amongst manures; and, as a long time is required for their decomposition, their action may often last for seven or eight years. They yield excellent results, especially when made into a compost for potatoes, turnips, hops, hay, and, generally, on meadow-land. Hairs spread upon meadows are said to augment the crop three-fold; and the Chinese, we are told, are so well aware of the very great value of that manure, that they carefully collect the hair every time they have their heads shaved—and the operation is performed every fortnight—and sell it to their farmers. Now, the crop of hair that every individual leaves at the haircutter's yearly, amounts to about half a pound; reckoning, therefore, at 13,000,000, the number of individuals who, in Great Britain and Ireland, are undergoing the process of shaving and haircutting, we have a production of about 3,000 tons of hair—that is, of manure of the most valuable kind, since it represents at least 150,000 tons of ordinary farm-yard manure—which might be collected almost without trouble, but which, on the contrary, such is our carelessness or indolence in these matters, is, I believe, invariably swept away in our streets or sewers, and utterly wasted.—*Farmer's Manual of Agricultural Chemistry.*

ACTION OF DROUGHT ON PLANTS.

The article below, from the *Mark Lane Express*, London, could scarcely be more applicable to this meridian, if written expressly for it. We commend it to each of our readers as affording a plausible theory *why plants require so much water.* It also affords strong arguments in favor of irrigation, especially in a climate like ours, where the three summer months are usually very dry and hot.

"The specific action of drought on plants is one of the problems not yet entirely solved. Whether it is the indirect waste of moisture on the plants by evaporation, or the want of the due proportion of water necessary to build up the structure of plants, or whether it is some indirect action on the constituents of the soil, is by no means a settled question.

* In the Prize Essays of the Highland Society, (vol. 1, p. 191,) the reader will find the testimony of a practical man that such was in reality the case, as observed by himself on part of his own farm in Roxburgshire.

The present season has afforded abundant illustration of the effect of want of moisture on the several plants the farmer has to cultivate; and what is more remarkable, the drought, though absolutely less than it was last year, seems to have had a far greater effect on the plants. The meadows especially appear to have suffered. In all the northern counties particularly, the grass crop is peculiarly affected. The finer and shorter grasses are absolutely either wanting, or so thin that they show the meadows to be without bottom grass. The coarser grasses are tall, but thin, and running to seed, forming no tillering stalks, and few blades in comparison to those of former years. The corn is the same—thin, stunted, and spiry in its character. There has been no tillering, no thick, matted surface. The drills have been visible up to the present period, and the stems are fast running to ear before half the usual height is attained, being also hard and yellow in color, and as different as possible from the graceful flopping blade the wheat plant usually exhibits at this period.

Now, in what specific way has this drought so acted on the plants? In ordinary vegetables, 90 per cent. of their whole structure is simply water. Hence it is easy to conceive how large a quantity of that material is necessary during their growth and development. But there was no such absolute deficiency this season. The soil always contained a comparatively large amount of moisture; the dews were often plentiful, amounting to fully as much more as any diurnal development of the plant could require; and all the tables of rain fallen in the spring of this year, we have seen, showed a larger quantity than in the corresponding months of last year. Hence it seems we must look to the abstract cause of the injury—to something beyond the mere denuding of the plant of water, as such.

We think the theory of Liebig far better established this season. The plant, to take up its elements, must have them presented to it in a state of solution. The action of rain operates to dissolve regularly and gradually the material required by the plant, both in the soil and in the rocks from which the soil is continually forming, by disintegrating the small particles existing in the land. These are being supplied to the plant by the rains as it requires them, but this year they have not been so washed out and made ready for its use. But why did not the same cause operate equally in the spring of 1852? Simply because the incessant rains of the autumn and early winter had washed out the soluble constituents of the soil, so as to leave less free material in the land by far than in the previous spring, and hence the ordinary drought had much greater effect on the plants this year than it had last.

The effect of water on plants, regularly supplied, is most wonderful. Those who have seen the Clipston water meadows, and the small and clear stream, which produce from three to five crops of grass per annum, either depastured or mown, or partly the one and partly the other, must be convinced that it is almost as much owing to the plentiful supply of water in a dry season, as to any great amount of manure held by that small river in solution, that the vast increase of grass is produced. By watering, Mr. Kennedy, of Myremill, keeps close upon a thousand head of stock on ninety acres of Italian rye-grass. In ordinary seasons, from five to nine sheep can be kept on one acre of land: the latter may be done in a dropping season, on clover lays, on well-cultivated land; but with the aid of a little artificial food, and by the application of *liquid* manure, in the shower form, by steam, Mr. Kennedy can keep fifty-six sheep per acre! Nor can we believe that this is altogether due to the manure. To that it is partly owing, doubtless; but it is by far more owing to its being watered with that manure in a soluble state, and so fit for the immediate use of the plants. Hence he is independent of season. The water drill, to which we before alluded, is an application of the same principle; and the wonderful results of the dressing of dissolved bone liquid, in a dry season, by the Duke of Richmond, is a powerful fact in the same direction.

That it is the want of soluble manure, or, in other words, elements of plants, which is mainly the cause of the injury, is manifest from the fact that all the poorest land has suffered by far the most from the drought. The very highly manured land has sustained the least damage; while on land to which very highly soluble manures—Peruvian guano, for instance—and similar materials, have been applied, the crops are growing vigorously.

Nor let it be forgotten that the rain brings down the ammonia, which, in dry states of the atmosphere, will float undisturbed; and this failing, as well as the soluble supply below, would of course aggravate the cause of injury.

But what can now be done, with the meadows ripe, and not one half or one third of a crop? We say, free your pastures at once, and put in the whole of the stock, if rain has come, and eat up the meadows thoroughly bare. This will amply relieve the pastures, and afford them the chance of an entire new growth. The meadows, with their small produce, will soon be eaten up; and let a dressing of two or three cwt. of the best guano be then applied to them, and a beautiful new crop, and not very late, will yet be secured; the mowing machine and haymaker will soon get it, even if it should clash with the harvest: but we are clear that on all kinds of land more produce, with the present crop given in, will be obtained by such a course, and the present crop will be very acceptable of itself. The fog, or aftermath, has also every prospect of being better after thus supplying the deficiency of the year."

LIQUID MANURING.

We follow up what we have written on this subject, by the following judicious remarks of the editor of the *Albany Cultivator*, in his September number:

"*Liquid manuring* appears to be more particularly applicable to the neighborhood of towns and cities. Millions of dollars are annually wasted by the large quantities of enriching substances which are annually carried off and wasted in sewers. It has been computed that the city of London affords enough in this way to impart the highest degree of fertility to three hundred thousand acres of land; and at the same rate of calculation, New-York would fertilize nearly a hundred thousand acres. The most surprising effects have lately been obtained from liquid manure in England, far exceeding those from any other enriching application. The reason is obvious: the manure is not only reduced to the *finest degree of division*, but the water which holds it carries it through all parts of a porous soil, and forms a more perfect intermixture than could be effected by any other means; at the same time that the water performs another most important office, namely, supplying the growing plant with the amount of moisture which it so largely needs.

There is no question that a highly diluted mixture of water and manure is the most perfect state in which to apply it; and in the case of sewage-water, this mixture being already made, it can be applied in no other way. The question immediately arises, How is it to be conveyed to the land in the most economical manner? This is the most difficult part of the process, for it is far cheaper to cart a ton of solid manure than the same amount of fertilizing materials with ten times their weight of water. A very important discussion lately took place on this subject in a meeting of the Agricultural Society of England, in which it was declared by those versed in hydraulics, and who had experience in the conveyance of water in pipes, that so great was the facility with which it might be conveyed in pipes by the agency of steam power, when compared with carting by horse labor, that the former could be effected at less than one tenth the cost of the latter. One great difficulty, however, occurred, from the fact that the liquid manure was most wanted on the dryer hills, which are least accessible, the towns being usually lower than the surrounding country; but this difficulty had been obviated by pumping up with a steam engine. Several distinguished and successful farmers had procured hydraulic apparatus for this purpose; one had placed a hydrant for every 40 acres of his land, another for every 11 acres, and another for every 3½ acres; from these hydrants a hose pipe issued, and was carried round in a circle, watering the whole surface regularly. Among these farmers was J. J. Mechi, well known by reputation to the farmers in this country, who, from a large tank, drove the liquid manure through pipes over his whole farm, employing for this purpose the farm engine erected for his mill and threshing machine.

The *London Times* furnishes the following account of the extraordinary success which has attended an experiment of this kind, and which must undoubtedly be attributed largely to this simple supply of *water*, as well as to the fertilizing influence of the manure. The statement of keeping *fifty sheep* per acre—almost ten times as many as our farmers think of pasturing—would draw rather hard on our credulity, were it not otherwise corroborated, and had we not already some extraordinary facts at hand of the enormous growth resulting from similar treatment:—

'At Myremill, in Ayrshire, Mr. Kennedy feeds under cover in the summer months, 220 large oxen, 460 sheep, 20 horses, and 150 store pigs, on 90 acres of Italian rye grass. Last summer, his house-fed sheep fattened better than in the field, and were kept on Italian rye grass for four months, at the rate of 56 head per acre! They likewise received a daily supply of steamed food. But allowing for this, we find that on this farm each acre of grass keeps about four times as much live stock as the average of the cultivated land of similar quality in England. Mr. Kennedy has attained his high state of fertility by the use of liquid manure, distributed over the farm in pipes, and applied to the surface by the force of steam, in a jet-like shower of rain. To use Mr. Mechi's graphic words, he can "increase his wet days" as he finds it necessary, and when other people's fields are parched with drought, his are glistening with perennial verdure. Having an unfailing supply of water, he can either mix it in his manure-tank with a more enriching substance, and so shower it over the land, or he can sow guano broadcast over the grass, and then wash it in dissolved; or if nothing but moisture is needed, he applies that only. No doubt such an apparatus requires a large stock both of capital and skill—the one to start it, and the other to conduct it. A most important experiment it is, however, and likely to lead to great results ere long.'

This subject is yet in the infancy of its successful application,—a stage which every useful operation must first pass through, before it can reach maturity. To what extent in practice it may yet reach, is hard to predict; but it would certainly be well worthy the efforts of enterprising men in and near cities, to provide tanks for the reception of the immense amount of wasted wealth in the form of sewage-water, and pipes for its conveyance to the large plantations occupied as market-gardens, where it is believed all judicious outlays would soon repay large dividends in the fine and luxuriant growth they would soon occasion."

The same writer, in reply to a question proposed by one of his correspondents, says:

"The liquid portions of the manure from cattle are greater in bulk, and richer in quality, than the same from horses. The real money value of such manure must of course vary greatly with circumstances, such as the price of the crop raised, and the manner of applying the manure. For example, a ton of manure converted into strawberries, selling at four dollars per bushel, would return more money than a ton converted into corn at fifty cents, or ruta bagas at ten cents per bushel. Again: manure carelessly applied and badly mixed with the soil, will not yield one third the return afforded from finely pulverized and thoroughly intermixed materials. Still further: the quantity and richness of manure is much controlled by the age, nature, size, condition, treatment and food of the animal which yields it.

In Flanders, where manures are well applied, and animals well fed, the urine of a single cow is reckoned at an average of $10 per annum—the solid parts are estimated at one half to three fourths of this sum. Taking the usual price of guano, $50 per ton, as the standard, the manure from a single cow, saved in the best manner, would be worth about $20. This is, however, higher than manure is usually sold, and by the common management more than half is lost.

No accurate estimate can, however, be made of the loss, when it is thrown into the barn-yard, and exposed to the weather, without knowing other particulars. As most farmers manage, by providing straw enough to absorb about one fourth of the urine, from one half to two thirds are lost; a larger quantity of straw, in connection with leaves, peat, and an occasional layer of turf, the latter being the most valuable of all as an absorbent, would save nearly the whole, even if exposed to the weather."

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

MR. CHAPMAN'S LAST IMPORTATION OF HEIFERS.

Messrs. Editors:—By the arrival of the "Mary Carson" at Philadelphia, on the 25th of August, I received from Robert Bell, Esq., of Mosbro' Hall, Rainsford, near Liverpool, Eng., four short-horn heifers. These heifers were imported for me, by Geo. Vail, Esq., of Troy, N. Y., who, until his great sale in October last, ranked as one of our best and most enterprising importers and breeders of short-horn cattle. His importations were always from Mr. Bates' herd, or from that of Mr. Bates' tenant, Mr. Bell; and as these gentlemen always used the same bulls, their herds were nearly identical. Mr. Vail always considered the *Bates* blood *the* best in his herd; and to its introduction and continued use, in a great measure, is to be attributed his success as a breeder of short-horns. These heifers, above alluded to, were selected by Mr. Bell from his own herd, and with particular reference, with one exception, to their possessing much of the celebrated *Duchess* blood of Mr. Bates' herd. This (Duchess) family Mr. Bates considered preferable to any other family of short-horns; and the high prices which they now command seem to prove conclusively that Mr. Bates was correct in his opinion. Below I send you the pedigrees of the four heifers.

Agate—Roan; calved Dec. 6, 1850: got by Mr. Bates' Duchess bull, 3d Duke of York (10,166); dam [Annie] by Mr. Bates' Duchess bull, 2d Cleveland Lad (3,408); g. d. [Annabella] by Mr. Bates' Duchess bull, Duke of Cleveland (1,937); gr. g. d. [Acomb] by Mr. Bates' Belvidere (1,706).

Frantic—Roan; calved Sept. 3, 1850: got by Mr. Bates' Duchess bull, 4th Duke of York (10,167)—purchased by Earl Ducie, at the sale of Mr. Bates' herd in 1850, for £210; dam [Faith] by Mr. Bates' Duchess bull, 4th Duke of Northumberland (3,649); g. d. [Fidget] by Mr. Bates' 2d Earl of Darlington (1,945); gr. g. d. [Fletcher] by a son of Young Wynyard (2,859).

Boukie—Roan; calved April 25, 1849: got by 4th Duke of York (10,-167)—as above; dam [Cicely] by Mr. Bates' Duchess bull, Duke of Northumberland (1,940); g. d. [Craggs] by a son of 2d Hubback (2,682); gr. g. d. [Craggs] bought of Mr. Bates, and descended from the stock of the late Mr. Maynard.

Bright Eyes 3d—Red; calved June 23, 1850: got by Earl Derby (10,-177); dam [Bright Eyes 2d] by Lord George Bentinck (9,317); g. d. [Bright Eyes] by Conqueror (6,885); gr. g. d. by a son of Bearl (65); gr. g. g. d. by Mason's Son of Comet (155); gr. g. g. g. d. by Wellington (683).

These heifers were all bred to *Bates'* bulls before being sent out from England. Respectfully yours, S. P. Chapman.

Mt. Pleasant Farm, Clockville, Madison Co., N. Y., Sept. 5, 1853.

AGRICULTURAL EDUCATION.

It is one of the self-denying duties which one owes to the public, to contend against that which is good in itself, and which, under certain circumstances, would be of very great value, while existing conditions are absolutely fatal to its present success, and render it absolutely sure that money invested with the most honest and the most patriotic intentions will be essentially thrown away.

Such, in our view, are the beautiful designs laid out, as on a map, with great skill, by some of our contemporaries, in relation to agricultural education.

If designed for the Duke of Sutherland, or him of Orleans, they could not, perhaps, be improved; or if reference is had to a community of rich planters, who enjoy, *otium cum dignitate*, as the Latins say, a life of quiet and honorable leisure, while overseers or superintendents are employed to direct every hour's labor done through the year—if they at the same time wish to oversee and direct the superintendent, and actually be, what they often nominally are, *super*-superintendents, these plans are admirably designed. But such, we apprehend, is not the condition of any of the farming communities throughout this country. Our Southern planters' sons have no taste, generally, for those duties, and, therefore, no desire to qualify themselves for a more judicious and successful management of their affairs; and comparatively few planters, perhaps, have the funds wherewith to found such institutions, and also support their sons for several years in acquiring the knowledge of which they are conscious they actually have need. Most farmers are in the same category in this business of education, in which so many of them are in reference to the cultivation of their farms. They know their deficiencies, but are too poor to begin with buying manures. Could the improved crops be made available in advance, they would go into the work of reform with zeal. But Professor

Mapes holds his 'improved superphosphates' under a lock which nothing but eagles and guineas can unfasten; and the poor farmer must remain, for the present, essentially where he is.

We are far from advocating indolence or indifference in these matters. Something must be done, and that too without much delay, or many of our farmers who are now only poor will be actual bankrupts; and many a farm, now under mortgage for half its value, will be sold under the hammer, or the mortgage will be foreclosed, and the occupant be not only stripped of his farm, but of his house also.

We look, however, for something more practicable, and requiring less outlay, than is contemplated by any of these thorough systems. We are anxious for something to relieve the classes we have just described. Access may now be had by the sons of the wealthy to the best schools of this country, or of Europe. They annually expend far more than would be required for this purpose in mere pleasure, and, therefore, the public are not very urgently called upon to provide for them.

One of the best discussions of this subject we have seen, and one of the most thorough systems proposed, is by our learned and accomplished friends of the *Polytechnic Journal*, in their September issue. But, ifwe do not read them incorrectly, they also furnish evidence that, for the masses, their splendid system would be of little practical utility. We refer to what they say of the honest, but essentially unschooled "Dutchmen" of Pennsylvania. Could our farming communities throughout the States present the same evidence of thrift which do these "stereotyped" farmers of the Quaker State, we should be more prosperous and successful than we shall ever be under all the schools and colleges which the most ambitious and most hopeful anticipate. Let us notice what our friends say:—

"How comes it that the 'Dutchmen' of Pennsylvania, as they are generally termed, are invariably acknowledged to be good farmers? Because they have brought with them from their fatherland a system of farming requiring them to manure one third or one fourth of the lands under tillage regularly every year. These men have adhered to the mode of farming practised by their fathers and ancestors; they transplanted that stereotyped system upon the fertile region of Pennsylvania—the same system which has kept the lands of their fathers thousands of years in a perfectly productive state, and on the same soil which was ploughed by the Romans in the time of the Emperor Augustus.* We do not mean to say that the Germans of Pennsylvania farm their lands according to proper rules and the principles of agricultural science, or that their system of farming is to be imitated; or that they could not do better—far from it; they have yet much to learn; but they were wise enough to adhere to an old, well-tried system, and their fields show the result of it. Every one who visits that portion of Pennsylvania where the Germans reside will be agreeably surprised with the appearance of the fields, meadows, and those large barns and manure-heaps, the secret of their success. Every strip of land is well cultivated and tended with care; every meadow drained or irrigated. The whole aspect of their estates shows that they love and cherish the soil. They work themselves; their daughters and wives work; all work. They have little hired labor, and yet, with that small amount of labor, they produce large crops, and are very prosperous. To these 'Dutchmen' Pennsylvania owes much of her wealth, her prosperity, the high rank which she holds among her sister States, and the fortitude with which she endured the

* See Fleischmann's Report on Agriculture, in the Report of the U.S. Patent Office, 1847.

memorable financial crisis. The Germans of Pennsylvania seldom emigrate to the West, to exhaust or ruin another tract of land; and when they are *obliged* to move, in order to make their children also independent tillers of the soil, they always carry with them their industry; and their good farming has become proverbial throughout the Union.

Had the Southern planter gone to work in a similar manner; had he only now and then endeavored to remunerate his lands for the excessive cropping, with a few loads of manure; had he followed a regular rotation of crops; had he kept up a system of farming and not of exhausting, the aspect of things of our neighbors would be a different one. That ruinous system was begun by the first settlers: all wanted to get rich too fast, without reference to their successors, and the future prosperity of their adopted country. The deed is done; but it is not too late to remedy the evil. The remedy consists not in the analysis of the soil, not in the study of chemistry, not in a patent manure; neither is it in the knowledge of the fine points of a horse, cow, or bull, the production of the tallest corn, largest tobacco leaf, or a great crop of wheat, cotton, or sugar. All such knowledge and all such speculations do not strike the evil at the root."

This page of quotation contains or implies a vast deal, and, if it shows us any thing, it shows us that the "land well cultivated and tended with care," "every meadow drained," and the "little hired labor," while they adhere to the systems of their fathers beyond the sea, "requiring them to manure one third or one fourth of the lands under tillage regularly every year,"—"the same system which has kept the lands of their fathers thousands of years in a perfectly productive state,"—contain the entire solution of the problem which is set before the agriculturists of this country.

Neither these learned editors nor ourselves have less regard for education in general, nor for agricultural education, than others have, nor will we consent to be placed on a lower *platform* on this subject than the writer of the article from which this extract is taken; but the difference is this: while he proposes a thoroughly furnished college, or university even, at once, we think we must go step by step, and raise the mass of our farmers into an atmosphere where they can see more clearly what they now refuse even to examine, and furnish them also with the means for still greater advance, by their own acquired resources. In this way, ultimate success is certain. In every other, as we view the subject, nothing is certain but defeat.

WHERE THE CORN COMES FROM.

An English paper says:—It is proved by the return of the foreign corn trade in the last few years, that a change is taking place in the principal sources of the supply of food. The United States and the Baltic are no longer, by any means, our largest producers. Their yearly surplus falls short of our yearly wants, and it is from the fertile districts and fine rivers of Eastern Europe that we now draw our greatest and most inexhaustible supply. In 1841, when the total imports of wheat into this kingdom were 2,400,000 quarters, only 230,000 quarters, or about one tenth, came from Russia, Turkey, or the Mediterranean. In 1852, the total import of wheat (exclusive of flour) was about 3,200,000 quarters, of which 1,700,000 quarters came from the ports of those countries; and taking the whole import of corn at 6,750,000 quarters, that of the East was 3,500,000 quarters.

Of this quantity a large proportion is shipped at Galatz and Ibraila, and other Turkish ports, which are the natural channels for the abundant produce of Hungary, and the fertile provinces south of the Danube. Egypt also sent us in 1852 no less than 279,000 quarters in 143 vessels. M. Mongrédien points out that this large and increasing trade is almost exclusively in the hands of Greek merchants established in England, with branch houses in the Levant, and that the ingenuity and perseverance of the Greeks are displayed to an extraordinary degree by the manner in which they have contrived, in about thirty years, to found and retain this extensive commerce. The Greek firms in England amount to about 200, and the yearly amount of their transactions in the grain trade alone is computed at no less than four millions. Their business is conducted with the utmost diligence and exactness, and even in this country the Greeks successfully compete with the traders in corn from all parts of the world.

TUNNELS OF THE WORLD.

The below article on the tunnels of world was prepared by General Dearborn for the use of the Maine Legislature. It will be found to contain much useful and interesting information:

"Although scarcely any two tunnels are exactly alike, as to the strata through which they pass, the size, length, number, and depth of shafts, the quantity of water to be extracted, the climate of locality, and the lining—all of which affect the cost—and time required for the work, still a near and approximate decision can be arrived at by examining the details of those already finished, and comparing them with a proposed tunnel, if the same tools and appliances are to be used for working in both cases. If improvements are introduced, such as steam drills, cutting and boring apparatus, &c., then the cost and time will be modified in proportion to the rapidity and expense with which these machines can be made to do their work.

The machines invented for boring Hoosac Mountain, and excavating the Mount Cenis tunnel, exhibit great ingenuity; the former has been tried, and gives good results, bidding fair to answer the ends proposed; but a longer trial is required to determine its merits. The latter, it is said, will cut 22 feet in solid rock in twenty-four hours; but it has not, to my knowledge, been tested to any great extent as yet, so that we must wait further experiments before a correct opinion can be formed of its ultimate aid in tunnelling.

The tunnels enumerated have been constructed on the usual method of carrying on such works.

The constructing of tunnels for aqueducts, mining, &c., dates back to the earliest period of history. Those mentioned by Strabo, through Mount Patus, for regulating the height of the water in Copais, in Bœotia, are some of thirty stadia, equal to 3.447 miles in length, and were works of great labor. The tunnels of Egypt, and those of the celebrated Roman aqueducts, and the tunnel at Lake Albano, 6,000 feet long, cut through lava, in 398 B. C., are monuments worthy of their age.

There is a tunnel reported to have been found under an arm of the sea, near Marseilles, from Abbey St. Victoria to Fort St. Nicholas, having an arch of 60 feet span, and being 1,625 feet long, supposed to be of Roman origin. The first tunnel constructed for canal navigation was on the Languedoc canal, in 1666, planned by F. Andreossy.

France has fifty-six tunnels on her canals and railroads, thirty-six of which have an aggregate length of 45.44 miles. The longest of small size is 7.45 miles, and that of large dimensions is 3.52 miles long. The Rouen and Havre Railroad has eight tunnels; Paris and Lyons eight also.

That truly grand work, the aqueduct from the Durance to Marseilles, has three tunnels, whose total length is 10.56 miles. That through the Taillades had 7,320 gallons of water pumped out of it each minute, during a part of the time it was in progress, to carry it on to completion. There was a tunnel projected for the Picardy Canal of 8.51 miles in length, but two short ones were substituted for it.

On the German railroads there are ten tunnels. The George Stalton tunnel in the Harz Mountains is 6.48 miles long. It was begun in 1777, and finished in 1800, and cost £71,172.

Spain has some railroad tunnels. Sardinia States have a number: one at Mount Giovi, nearly two miles long, on the Genoa and Turin Railroad. There are on this railroad, in twenty-five miles through the Apennines, nine tunnels; and the road is considered one of the most difficult pieces of railroad engineering ever undertaken.

The Mont Cenis tunnel, projected for the Lyons and Turin Railroad, is one of the grandest works of this nature ever contemplated. It is to be 7.63 miles long, and 19 × 25 feet in size. The plans for it, and the machinery to work it, were designed by the Chevalier Mause, the distinguished engineer of this railroad. A board of scientific gentlemen, engineers, and geologists, were appointed to examine those plans, &c., and they decided unanimously in favor of the project. The estimated cost is $2,615,000, and the time fixed for its completion is five years. The summit of the post-road over this mountain is 2,400 feet above the tunnel; the mountain is 2,450 feet above this. No shafts are to be sunk.

In Switzerland, in Val Cristallena, the Alps are to be pierced by a tunnel for the Italian and German Junction Railroad, 3.5 miles long.

The Sömmering tunnel, through a mountain of that name in Austria, is one mile long.

Hungary has a mineral railroad tunnel, ten miles long, just completed.

England has forty-eight canal tunnels, of an aggregate length of forty miles, the longest of which is over three miles, on the Huddersfield Canal, if we except one reported eighteen miles long on the Bridgewater Canal. She has also seventy-nine railroad tunnels, forty-nine of which amount to 32.53 miles: the longest is 361 miles.

The London and Birmingham Railroad has eight tunnels; London and Dover, five; Newcastle and Carlisle, five.

A canal tunnel of five miles in length was projected for the Manchester and Bolton Canal, and one 4.5 miles long for the Portsmouth and Corydon Canal, but were not constructed.

The United States have sixty-seven tunnels on canals and railroads, the largest of which is about one mile. The details of these are now difficult to obtain. Many of them are short, however.

Baltimore and Ohio Railroad has sixteen tunnels; Parkersburg Railroad, seventeen; Hempfield Railroad, seven.

A tunnel of 4.04 miles was projected by the celebrated engineer, General Bernard, in 1825, for the passage of the Alleghany Mountains, by the Chesapeake and Ohio Canal.

In the foregoing statement there are no doubt many tunnels omitted, as I have mentioned those only that are contained in works in my own library, with three or four exceptions.

The art of tunnelling has been so extensively practised, that they are not now looked upon by engineers and others as such formidable obstacles as they formerly were."

THE AMERICAN INSTITUTE, NEW-YORK, 1853.

This popular Institution has issued the following Programme of their twenty-sixth Annual Fair:

"October 1st, 3d, 4th, 5th, Castle Garden will be open for the reception of goods and specimens.

Oct. 6th, Castle Garden will be open for the admission of visitors, from 9 A.M. until 10 P.M., and continue the same each day (Sundays excepted) until the close.

Oct. 10th, Testing of ploughs, near Frye's Hotel, Flatbush, on the plank-road to Coney Island, at 11 o'clock A.M.

Oct. 11, Ploughing and Spading Matches, same place, 11 o'clock A.M.

Oct. 17, Special exhibition of roses and cut flowers, at 12 o'clock M.

Oct. 19th, 20th, and 21st, Cattle show at Hamilton Square.

Oct. 20th, Anniversary Address, at Metropolitan Hall, at 7 P.M. Tickets may be had at Castle Garden, or of any of the Managers.

At their Fair last year, the Managers awarded 90 gold medals; 304 silver medals; silver cups and plate to the value of $1167 25; cash premiums, in place of cups, medals, &c., $677 25; 174 volumes of books to apprentices, minors, and others; $20, and three bronze medals, the Van Schaick premium; and 175 premiums on fire-works.

The list of premiums offered for this year has been materially increased, particularly those in the Agricultural and Horticultural departments.

The annual exhibition of cattle of all breeds, and all useful farm stock, will be held at Hamilton Square, on the 19th, 20th, and 21st days of October. Hamilton Square is situated between the Third and Fourth Avenues, and Sixty-sixth and Sixty-ninth streets, four miles from the City Hall. The railroad cars and several lines of omnibuses pass it every hour in the day. Every arrangement will be made for the accommodation of exhibitors.

The Clerk will be in attendance on the ground, on the 17th and 18th days of October, for the purpose of receiving entries. Feed of all kinds will be provided on the ground, at the cheapest rates.

Competition is open for stock from any part of the United States. No entrance-money will be required.

It is very desirable that a catalogue, for the use of the judges and visitors, should be ready for delivery at an early period. It will greatly facilitate this object, if the exhibitors will send their entries, with pedigrees, &c., to A. Chandler, Corresponding Secretary, No. 351 Broadway, as early as possible.

Copies of the Premium List for the Agricultural Department may be obtained at any time, by applying at the rooms of the Institute, No. 351 Broadway, where all inquiries will be promptly answered."

Let all with one accord lend their aid to the advancement of this useful institution.

THE GREAT EXHIBITION.

The more we examine this immense collection, the more we are gratified and astonished at its extent and its excellent display. Several times we have passed through it with friends from abroad, who could devote but a short time to its examination, and we find that a rapid survey, which allows no careful observation of any one thing, consumes quite three hours, while, notwithstanding the numerous visits we have paid to the Crystal Palace, each consuming from four to seven hours, so far are we from being familiar with all its beauties, that we make new discoveries every hour we spend there. But some kind of directory is necessary for a satisfactory examination. We have also met friends there who had been over the building two or three hours alone, and with nothing to guide them in the selection of objects for examination, who were about to give up in despair, like a stranger set down in a large city, without a map to guide his movements, really seeing nothing in a satisfactory manner, while they were delighted with the few we have pointed out to them, and considered themselves well paid for the cost and trouble of the visit; and they left with a resolve to make another journey to the city whenever practicable, to complete what was so delightful in its commencement. You are often within arm's length of an object of great interest, which something less attractive prevents you from examining, and when you afterwards read the description of it, you are sorely grieved that it escaped your notice. A good descriptive catalogue, arranged in the order they occur, would be of immense advantage. The printed catalogue is systematic, but it does not answer this design.

We purpose, in a humble measure, to supply this deficiency by an enumeration and short description of many of the more interesting articles there to be seen, and *in the order in which they occur* in passing through the building. We made a very short list of this kind in our last number; but so many objects of interest have since been added, that we now go over the same ground again, naming only without describing what were then referred to.

We start from beneath the dome, and, omitting all the statuary for a separate chapter, begin with the French department, and in the first section of it from the dome on the western nave, or that leading to the Sixth Avenue entrance.

Here is the very splendid show belonging to the Government of France, the Gobelin Tapestry and ancient Sevres Ware. This kind of ware we described in our last number, when referring to the collection of M. Lahoche. The articles we are now going to describe were not then opened:

The first piece of embroidery on your right as you enter the section is Le Loup et l'Agneau, or the Wolf and the Lamb, after Desportes; a most elegant piece of art, which multitudes would mistake for an ancient painting. Then an Autumn Scene, after Leasoret, the lower portion of which we think is finer than the upper, though all parts are superb. La Lice et sa Compagnon is a most perfect representation of three or four dogs. Next, Sujet de Chasse, or the representation of the chase, with a combination of moving and of still life. Over the door-way, opposite the entrance, is a splendid picture of Mountain Scenery, representing two goats contending for a passage across a narrow bridge, on which they have met, with the wild scenery of a mountain torrent. Near the top of the heights is a tower. We can conceive of nothing finer than this piece of embroidery. A WINTER SCENE and fine landscapes complete this series. Some of the latter are of less pretensions than those on the opposite side, and will not detain you so long. These on the left are the BEAUVAIS tapestry.

On a stand, in the centre of the court, is a most imposing vase of the ancient Sèvres ware, which will be more admired the more it is examined. The tables are covered with similar ware, plates, tea-sets, bottles, pitchers, &c. On the left, as you enter, is an elegant tea-set, having the appearance of open-work; and on the right is another which is actually thus ornamented, the ware being double. These are both very superb. Other vases in and near the corners of the court are worthy of especial notice.

Upon the tables lining the nave is an admirable collection of groups in terra cotta. Old men and children, mothers and grandmothers, beggars and the more prosperous, all are represented by the most perfect statuettes. The expression of the countenances of each is a pleasing study for a long time. Still, multitudes pass by them with scarcely a glance.

Entering the next court, as numbered in the printed catalogue, or towards Fortieth street, are specimens of

BELGIAN SUGAR AND CANDY, very fine. Here is also a VEILED HEAD, unlike others found on the Italian side, and not so beautiful; also a collection of GLASS AND CHINA, CLOTHS AND OIL CLOTHS, CHEMICALS, &c.

Still farther on we find various manufactures, including snuff, flax, cloths, &c., and cotton, woollen and silk goods, some very elegant, with shawls, gloves, hose, &c. All these are from Belgium.

In the next court we find goods from Saxony, consisting of MUSICAL INSTRUMENTS, TOILET ARTICLES, &c. Next, a handsome case of VARIETIES, from Nuremburg; a MACHINE FOR DRILLING THE EYES OF NEEDLES, very ingenious, which drew the prize at the London Exhibition; elegant scissors, shears, knives, locks, balances, &c., from the German States.

Turning to the right, we notice a bas-relief, representing ARMIN AND THUSNELDA, marble, very fine; curtains, furniture, pianos, &c. One of these is the

MECHANICAL PIANO of Mons. Debain. It is played by machinery, without the use of the keys, and renders the highest styles of opera music with admirable effect. It is a very ingenious instrument. A gentleman is in attendance to play and to exhibit its structure.

The next court, which borders on the west nave, contains the elegant wares of M. Lahoche, described in our last number. The very courteous exhibitor and his equally courteous friend who assists him, have spared us and others the trouble of many inquiries as to the portraits on their wares, by affixing names to the likenesses on the ancient Sèvres ware, of which we gave the list in our September number. Some very beautiful Cologne bottles, and bottles for various cosmetics, &c., were not specially referred to in our former description, but are worthy of being found and carefully examined. Another article, not before mentioned, is a very curious MECHANICAL TURNING CLOCK, which is worthy of especial notice.

RAPHAEL'S HOLY FAMILY, in porcelain, is also exhibited by M. Lahoche, and is most superb. So also are the small bronzes at the end of his tables.

Opposite this ware are some chandeliers, of beautifully chaste design, by Lerolle Brothers, from Paris. In one, each pendant bears a lily of pure white, contrasting with good effect the bronze or gilt of the branches. Another is ornamented with beautifully-arranged pink-colored flowers.

Near these, in the centre of the court, stands a fine bust of Louis Napoleon, and another, on the table, of Cerito, a famous dancing-girl of Paris.

The bronzes of Messrs. Lerolle are exquisitely done, and in exceedingly good taste, single or in groups.

At the entrance of the next row of courts stands a case of exquisite silk goods—French, of course—exhibited by A. T. Stewart & Co. Beyond this, which is surrounded also by silks, velvets, &c., exceedingly rich, are beautiful articles for the toilet, cushions, &c. Preserves, chemicals and pharmaceuticals, are also in this vicinity. One table, as you enter the next row of courts, is covered with specimens of bronzes, of zinc, statuettes, &c., of most excellent style and finish. Here also is a group in bronzed plaster, the AMAZON AND TIGER, much reduced in size; mechanical churns, glass filters, &c.

In the next court is a case of exquisitely fine muslin; a duplicate dress of the French Empress, containing seventeen yards, and two yards in width, is so fine that the whole can be crowded into a common-sized tumbler. Its price is 1,000 francs. It is exhibited by Gindre & Cie., Lyons. Many other elegant goods are in the same case, or are arranged near by. Bertrand's case of plaster casts is a very curious and pleasing collection.

If we now pass round to the south nave, and go through the row of courts in this same French and German department, but lining the westerly side of the south nave, we find splendid goods of very various character, including guns, pistols, swords, &c.; woollen and silk goods, of various kinds, excellent and sometimes superb in quality. Among other matters of interest is a MUSICAL TABLE. It is of mahogany, covered by a marble slab, beneath which is arranged a musical box, playing twelve pieces. It is valued at $250 or $300.

Artists of various kinds would be much interested in hundreds of entries we have not referred to. But this is all our plan will permit us to describe in this, one quarter of the lower floor of the main building.

We next purpose to visit the gallery over the ground already examined.

[*To be Continued.*]

UNITED STATES AGRICULTURAL DEPARTMENT.

We commence, in this number, a report of the Agricultural Department, of which we intend to publish full descriptions, illustrating those of especial interest, so far as we can, by engravings, until the readers of our journal shall be well posted up in every thing relating to this branch of the subject. We shall endeavor to do the same with the machinery.

That we may know what progress we make, we shall follow the order in which the several implements are located, beginning in the gallery at the Washington Monument. This does not belong to us, especially, and we are glad that it does not. It is very analogous to a new variety of fruit which some farmer might *try* to produce, by mixing up potatoes, apples, melons, peppers, mustard, and pumpkins. Were all these duly mingled in one growth, perhaps the architects of this monument might insert a block in the walls which should represent the new monster.

The first implement that presents itself to our notice is a new

IRON SIDE-HILL PLOUGH. The beam turns on a pivot, through an entire semicircle, so that the driver and the team change positions, while the plough-share retains the same position. The share, cutter, &c., are double; that is, it consists of two shares and cutters, placed back to back. The mould-board is also double, but both parts are on one side of the plough. A few inches behind the cutter, it is divided into three pieces, two of which may be called wings, each turning on a hinge. These wings are attached one behind the other. The hinder one is covered partially by the foremost; but when the beam is swung half round, this hinder wing becomes the foremost; and each is so shaped, that when its position is reversed, it is in the proper shape and position to turn the furrow in a proper manner. It is not necessary to unhitch the team, but the holder of the plough sets the beam free of its fastening, and suffers the team to draw it round, as they resume their places in or by the last furrow. It was patented by Hall & Speir, Pittsburgh, Pa., in January, 1853.

Two Iron Ploughs, from the same establishment, are also exhibited, less remarkable than the preceding for any new feature they present, except that there is no wood-work about them, and that they are very light and manageable. The use of iron in place of wood, in very many cases in which the softer and more perishable material has been employed, seems very much on the increase.

A small Maize Harvester, or Corn Cutter, exhibited by Jacob H. Young, Mount Pulaski, Ill. It is claimed for this machine that it will harvest sixteen or twenty acres a day, with a man and a boy. It drops the bundle at the pleasure of the laborers. Its cost is from fifteen to twenty dollars.

From this small model no very good idea can be formed of its actual capacities, but to us it appears too complicated to work easily and successfully.

Hay Press, without name or description, a small model.

Golden Harvester, a reaping, raking, and bundling machine combined. A. Elliott. There are some very good points about this machine. The horse travels behind his work rather than by the side of it; and this is a great gain of power. We regard this a very important consideration. The machine is simple: a single shaft running in the line of the motion of the machine produces all its action. It is guided by a lever attached to two hind wheels, after the fashion of a rudder. Upon the shaft are cranks to which the knives are attached, and also the drums upon which the bands revolve.

Model of Trough, &c., for Feeding Pigs. This is a simple but very good invention, exhibited by R. M. Abbies, Thompsonville, Ct. In front of the pen is a swinging partition, suspended from the top by a hinge, the natural position of which is in front of the feeding-bowl. By pressure, this is swung over the feeding-bowls, and the swine are kept away from them while they are cleaned or filled. When the pressure is removed, they return to their place. Over each bowl is a sort of concave iron frame which admits the head of the swine, but not the body. Hence they must stand outside, and eat like more civilized animals.

A Reaping Machine, model; nameless; not in working order.

Forks, Hay-Cutters, and Scythes, by David J. Millard, Clayville, from Paris Furnace Company, Oneida co., N. Y. These are excellent tools.

Forks, Rakes, and Hoes, by Tuttle Manufacturing Company, Naugatuck, Ct. These are very handsomely wrought. Agency, 14 Dey street.

Horse Rake, a small model, nameless, but seems well contrived.

Tools, from Old Colony Iron Company, Taunton, Mass.

Shovels and Spades, from E. & J. Bussing & Co., very handsome.

Mop Handle, H. & J. Marsh & Co. This is a capital contrivance, but not new.

Brooms, Moore's Patent. This is designed for keeping the material of the broom tight and strong, even though some portion of it may have been *used up*. It is worthy of attention.

HORSE RAKE. This handsome model of a rake has spring teeth, and frees itself from stones, &c.

HOES, by the American Hoe Company, Ct. Agents, Boyd & Keen, 11 Gold street. Some of these hoes are very massive, suited for the most unyielding soils, and are finished in the most excellent manner.

SCYTHES, by Mansfield & Lamb, Smithfield, R. I.

SCYTHE SNATHS, by A. Kimball & Sons, Fitchburg, Mass.

HAND CULTIVATORS, HAND HARROWS, HORSE RAKES, CRADLES, HOES, FORKS, &c., by Longett & Griffin, N. Y., Agents for Oxford Hoe and Edge-tool Company.

LAVERNE'S MACHINES FOR RAISING PACKAGES, a very good contrivance, which can be made portable or stationary. A modification of this might be applied to unloading hay. Office, 678 Sixth Avenue.

TOOLS, in variety, by Ralph & Co.

CURIOSITY. We notice on this table a BALL OF HAIR, four inches in diameter, one of eleven of equal size, taken from the stomach of a cow. Nothing is stated of their effects on the animal.

HORSE-SHOE TILES FOR DRAINING LANDS AND FOR CELLARS, an excellent article, by A. S. Babcock, Albany. Price, $12 to $18 per thousand.

RIFLES FOR SCYTHES, by Edward Crossman, Canaan Four Corners.

DOUBLE LEVER CHURN, John O'Neill, Xenia, O.

CORN AND GRAIN DRILL. Deering & Dederick, Albany, N. Y. This drill took the prize at Utica in 1852.

SHOVELS, FORKS, &c., by G. Gay, Pierce & Wood, and by Henry Partridge & Son, Medfield, Mass.

KIMBALL'S PATENT SHOVEL, with malleable iron socket, from Worcester, Mass.

FIRE-ESCAPE LADDER, by Mr. Dederick. This is a very good arrangement for escaping from a house when the lower stories are on fire.

A TWO-WHEELED PLOUGH. A very heavy implement, but possibly useful for certain purposes. The wheels are some 12 or 15 inches in diameter, fixed near the point of draught.

PLOUGHS, by Minor Horton & Co.

STEEL MOULD-BOARD PLOUGHS. Garrett & Cottman, Cincinnati, O. It is claimed for these ploughs that they are susceptible of a much finer polish than the cast-iron ploughs; that they will scour in the most adhesive soil, and will not rust as soon as the cast iron ploughs; that they run much lighter to the team. The edges of the shares are laid with steel, and can be kept sharp. Price, from $8.50 to $15.

MUMMA'S PATENT CORN SHELLER AND APPLE-ROOT GRINDER.

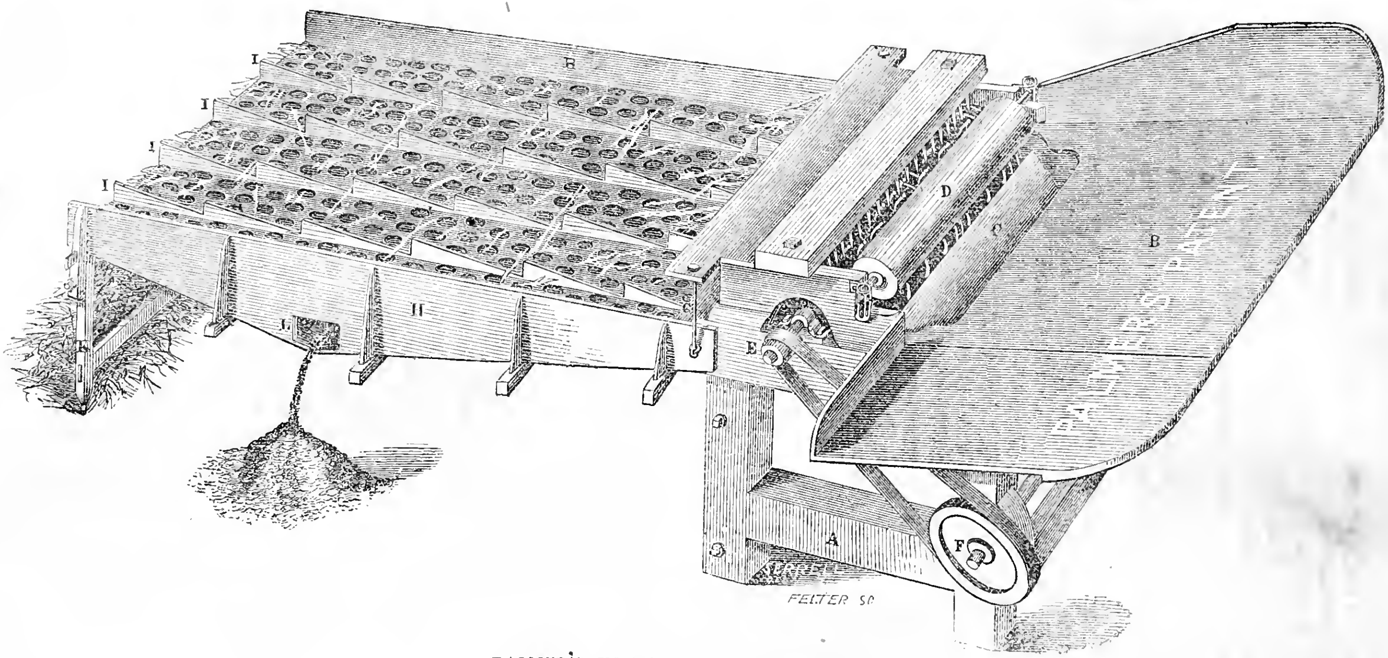
INDIA-RUBBER WASHING MACHINE. This machine combines both the pressing and the rubbing process in as simple a form as possible, and appears to do the work as well as any machine can do it. It is adapted to delicate goods as well as to coarser fabrics. E. L. Evans is patentee, 341 Broad street.

TILLINGHAM'S PREMIUM CHURN.

IMPROVED BRAN DUSTER, by Carr & Hughes, Cincinnati, O., and Cambridge City, Ia. It is claimed that this is an improvement on former patents. We have not the means of testing the justice of the claim.

RAKES, by A. E. Lyman, Williamsburgh, N. Y.

READING'S CORN SHELLER AND GRAIN DRYER. These two machines were described in our number for June last, p. 374. They both are excellent for the uses for which they are designed, and are of moderate cost. The ormer will shell corn as fast as a man can shovel it into the hoppers.



PALMER'S IMPROVED SPIKE THRESHER.

PALMER'S IMPROVED SPIKE THRESHER.

THE foregoing is a perspective view of a spike machine, with improvements to guard against the accidents which often have happened, from the bursting of the cylinder, or from spikes being thrown out by the centrifugal force of the machine.

These improvements are simple and effective, and consist in a change in the construction of the feed-board and cylinder, and in the addition of a protective roller, placed between the operator and the cylinder.

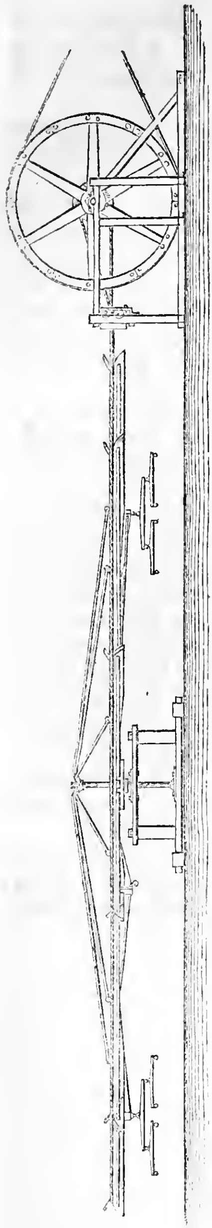
In the lower part of the feed-board an aperture or opening (C) is left, through which stones or any similar foreign substances which may chance to be held in the straw are discharged from, and are prevented from being carried into the machine; and from which result, in the ordinary spike threshers, not only injury to the machine, but oftentimes accident to the operator. This aperture is so contrived that while it allows all such substances freely to pass *out* of the machine, the easy and rapid entrance of the grain *into* the thresher is not hindered or interfered with.

The cylinder is secured against bursting by means of three strong iron bands encircling it at either end and in the middle, while the spikes are prevented from being thrown out by the centrifugal force, by being deeply inserted in the staves of the cylinder, and with a heavy, deep-cut screw.

Directly in front of the cylinder, and just above the aperture left in the feed-board, is placed a protective roller, (D,) its gudgeons moving on helical springs, which allow the roller to be elevated so as to accommodate itself to the quantity of feed given, but not sufficiently stiff and rigid to counterbalance the natural weight of the roller. This roller, however, is so contrived that it can be elevated only to a certain distance, sufficiently to *permit* the free entrance of the grain, but not so far as to allow the hand or limbs of the operator to be drawn into the machine. This roller is also of the further use to intercept any spikes or teeth which may, by any possible accident, become broken or thrown out, and prevent any accident resulting therefrom.

These improvements may also, at a small expense, be added to the ordinary spike threshers, and they will be furnished to all those who, holding such threshers, desire to retain them, and wish to have their use made safe.

By means of these improvements all liability to accident is removed, while at the same time the machine, from having an increased number of teeth in the cylinder, will accomplish more work in a given time, and with greater perfection.



PALMER'S IMPROVED HORSE-POWER.

PALMER'S IMPROVED HORSE-POWER.

THE annexed illustration gives a perspective view of Palmer's New and Improved Horse-Power, which, though originally designed by the inventor to accompany his threshing machines, (before described,) is well adapted and fitted to be used whenever power is needed, and in combination with any kind of machinery.

It is distinguished from horse-powers ordinarily in use, by being so constructed that any required length of leverage—from *twelve* to *twenty-five* feet —may be obtained and rendered available, and that two, three, or even a greater number of bands, may be worked at the same time, and thus motion be applied, at one and the same time, to various kinds of machinery. From the increased length of leverage obtained in this machine over ordinary horse-powers, the power applied is rendered much more effective; while at the same time all liability of accident to the user is removed by the peculiar manner in which the power is transferred, and which is done without the necessity or use of cogs, cog-wheels, and shafts.

Power or motion is transferred from the horse-power, by means of bands, or chains, playing in points of support attached to the *ends* of the arms or levers, by which arrangement the power is not only used at the best advantage—length of leverage being considered—but it is also made available without a necessity for cog-wheels or shafts, and, therefore, with much less loss from friction.

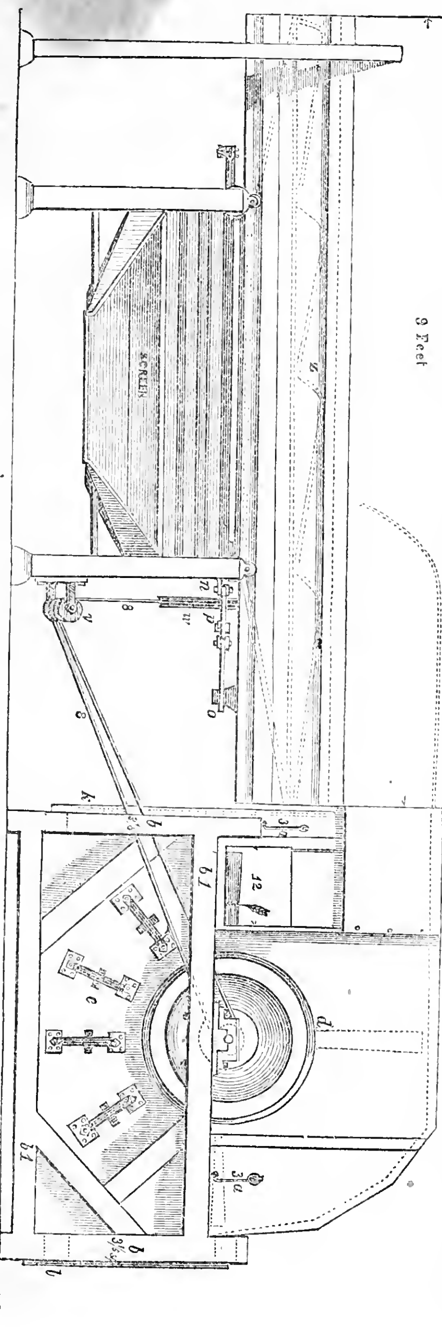
By means of a series of conical pulleys on the large wheel attached to the horse-power, and from which motion is imparted to any required machinery, different velocities may be given, so that the horse-power may be adapted to different uses, where different resistances are to be overcome.

This improved horse-power is peculiarly well adapted to drive an upright or other saw, wherever their use is desired, as the velocity of the saw may be readily varied according to the character of the wood or material to be acted on; and such saws will be furnished in connection with the horse-powers, whenever they may be desired.

These powers are also simple in their construction, not liable to get out of order, and may be made (excepting the few castings, and the other iron work) by any intelligent farmer or mechanic; and they are also so framed and put together that they can easily be separated into their several parts, and be rendered compact and convenient for transportation or storage.

PALMER'S AMERICAN ROTARY SEED AND GRAIN THRESHER.

AMID the crowd of agricultural implements on exhibition at the Crystal Palace, we find Palmer's American Rotary Seed and Grain Thresher, a representation of which we have annexed, with its straw separator and winnower attached. This machine has all the advantages of the common flail in threshing, and not as liable to injure the grain or seed as the common spike thresher. It is a labor-saving machine, simple in its construction, not liable to get out of repair, and is so made that none of its parts can be dislodged by the great speed given to the rotaries; and thus the liability to accident, which in other threshers so often results in loss of limb, if not of life, is avoided and prevented.



PALMER'S AMERICAN ROTARY SEED AND GRAIN THRESHER.

DESCRIPTION.—*b, b, b*, are the frame of machine; *d*, one of the rotating flails; 12, place where the grain is fed; *e*, contrivance for regulating the adjustments of the rubbers on the inside of the flail case; *k* is the slide to change the delivery of the straw or grain; *o, p*, shaking lever, to move the screen; *w*, the wheel of the winnower, a vertical view; 8, 8, bands, transferring motion to the winnower from the thresher; *Z*, wire screen, to carry off the straw. The grain and straw are discharged directly over the place where they are fed into the machine. The rotaries revolve in the direction indicated by the arrows. The figures indicate the dimensions of the timbers.

The great and distinguishing feature of this thresher, however, is, that it can be so fixed or adjusted that it will thresh, with equal perfection, all the different kinds of seed and grain, as grass, flax, and clover seed, oats, barley, wheat, rye, peas, and rice—Indian corn alone excepted—and thus enable the farmer to thresh *all* his crop of *every character*, and with the same machine. This end is attained by means of the castings on the inner side of the trough or flail-case, called rubbers, which have mill-like furrowed surfaces, and which are capable of being placed nearer to or farther from the track of the rotaries. The machines are manufactured by Messrs. Coggeshall & Co., 643 Water street, of this city, to whom we refer for further particulars.

(To be continued.)

STATUARY.

We purpose now to present a list of all the statuary contained in the Palace, with an occasional descriptive illustration. We do not, of course, include all the statuettes, of which there are many hundreds, but insert a few of even these, where they are in connection with the larger forms of art, so as to give the series unbroken. We name and describe them in the order in which they stand at the sides or in the centres of the naves, forming continuous rows all around the several departments.

We commence near the dome, going down the nave leading to the Fifth Avenue, and on the right hand, as you advance. The first of the series is

Eve after the Fall, by Pietro Pagani, Milan. This is admirable, both in posture, form, and expression.

Nymph crowning Herself with Flowers, by F. Pelliccia, Carrara.

Ganymede and the Eagle, by Thorwaldsen, Denmark. Ganymede was attending his father's flocks on Mount Ida, when he was seized by command of Jupiter, who was enamored with his beautiful form, and he was carried to heaven on an eagle. He was there made cup-bearer to the gods, in place of Hebe.

Shakespere, a bust, by Marchetti, of Carrara.

Iris, a bust, by L. Cartei, Florence.

Cupid and Psyche, by Fabbricotti, Carrara, copy from antique in the Capitol at Rome. Psyche was a nymph, whom Cupid married. Venus put her to death for depriving the world of her son, whom she had carried to a place of bliss, away from the interruptions of others; but, at the request of Cupid, Jupiter made her immortal.

V. Monti, a bust, by Abbondio Sangiorgio, Milan.

Atala and Chactas, by J. Fraccaroli, Milan.

Shepherdess with Bird, by Angelo Bienaimé, of Rome, resident at London.

Drunken Bacchus, by Ulysse Cambi, Florence.

Returning, on the opposite side of the nave, we have

Damalis, by Etex, of Paris.

Racine, by P. J. David d'Angers, Paris.

The Wounded Heron, bronze, by Amant Duplan, Paris. A real gem.

A Hunting Group, beneath a vase, bronze, by Lerolle Brothers, Paris.

Agar and Ishmael, by L. Caselli, Florence.

Ericsson, a bust, by H. Kneeland, Yorkville.

In the centre of this nave are

Bronze Dog.

A Bronze Stag, reposing.

Dead Mother, Child, and Eagle, by Auguste Lechesne, Paris. The eagle is seizing the child for its prey. A painfully expressive group.

Adam and Eve after the Fall, by Professor Jerichau, Denmark, resident at Rome. An excellent group.

Eagles over a Dead Chamois. An excellent piece of art, exhibited by Aubanel, of Paris.

The Amazon and Tiger, in bronzed zinc, reduced, from Kiss.

Two Lovers going to the Fountain, executed by Tommaso Lazzerini, of Carrara, after the model of Professor Henschel.

Ganymede and the Eagle, a copy from Thorwaldsen, by Pietro Biènaimé, of Carrara.

A Fisher Boy, by Luigi Cocchi, Milan.

Herminia writing the Name of her Lover, Tancredi, by F. Pelliccia, Carrara.

Rebecca, by E. Vasse, Florence.

Guardian Angel and Child, by Luigi Bienaimé, Rome. She is defending him from a serpent which lies in his path. A very beautiful group.

Mendicant Girl, by G. Strazza, Rome. A perfect gem.

Commencing the series on the margin of the nave, where we just left it by the stairway, we find first

The Industrious Girl, by Pietro Magni, Milan. This is a gem, and absolutely perfect.

Flora del Campidoglio, a copy, by Eugenio Baratta, Carrara.

Soldier's Son, by Jorini, Milan. A capital match for the industrious girl. The little fellow has his father's hat on, which pleases him very much.

A Boy Sleeping, by Fraiken.

Recumbent Female, by same.

Children in the Woods, by Geefs. Very beautiful.

Victory, a bust.

Venus and Cupid, in plaster, by C. A. Fraiken.

Hebe of Canova, a copy, by Tommaso Lazzerini. Hebe was daughter of Jupiter and Juno, always in the bloom of youth, and called the goddess of youth. She was made cup-bearer to the gods, but was dismissed from this service to make place for Ganymede. She was employed by Juno to prepare her chariot and harness her peacocks.

Girl and Parrot, (in rear,) a bronze statuette, but very good.

Child with Shells, by C. Steinhäuser, Rome.

Amazon, a bust.

A Group, in iron, from the Royal Foundry, Berlin.

Ancient Contests, in iron, from the same.

A Danaid, by Carlo Baratta.

Hope, by Thorwaldsen, copy, in bronze, by G. Giess, Berlin.

Eve, by Bailey, copy, in bronze, by G. Giess, Berlin.

Niobide, antique, copy, in bronze, by G. Giess, Berlin.

On the opposite side of the nave are

Three Graces, in plaster, by T. R. Farrell, Ireland.

The Hunter Reposing, by T. R. Farrell, Dublin.

Flora del Campidoglio, copy, by Marchetti, Carrara.

Venus of Coss, by Nannetti.

Dancing Girl in Repose: very good.

The Emigrant, by John Lawler, London.

The Virgin and Child, by G. Nannetti, Ireland.

Mother and Child.

Monumental Statue, in plaster.

Sabrina, by William Calder Marshall, London. The readers of Milton's Comus are familiar with the character here represented. This statue is a gem.

Diana Roving, in plaster, by Nannetti, Dublin.

Silent Cupid, a beautiful statuette.

The Sleep of Innocence, by G. Dupré, Florence.

Cupid with the Arms of Mars, by A. Jerichau, Copenhagen, resident at Rome.

Bronze Dog, Sentinel, by T. F. Hoppin. He has just acquired his liberty by breaking his chain, but as he hears his master's voice, stops and listens. It is a fine figure.

Amazon and Tiger, by Kiss; a statue of full size, in bronze, admirable in its effect and admirable in its details. A good emblem of liberty and tyranny.

Under the base of this large group are two plaster casts, small in size, but of very great merit. One is the Antediluvian, the other is John the Baptist beheaded. A sentimental young lady could not bear either of them; an artist would make either a study of great interest.

The centre of this nave is occupied by a

Grieving Psyche, by Luigi Bienaimé, of Rome.

Harpocrates, by Santarelli, Florence. Harpocrates was one of the gods: he is represented as holding one of his fingers to his mouth, and hence is called the god of silence, and is supposed to intimate that the mysteries of religion are not to be revealed to the people.

Bacchante, by Pelliccia, of Carrara.

The Warwick Vase, copy, by Marchetti, Carrara. This vase, so celebrated, is a magnificent piece of art.

The Minstrel's Curse, by Carl Muller, illustrating a German ballad.

This brings us to the east nave. The series is as follows:

Cupid in a Malicious Mood, by Professor E. Santarelli, Florence.

Human Love, (maternal,) by John Ernstson Bandal.

St. John, by E. Baratta, Carrara.

Daniel O'Connell, (within the court,) a bust, by C. Moore, London.

First Whisper of Love, in plaster, by Marshall, of London. Very pretty.

Truth, by Ulysse Cambi, Florence. This is a beautiful statue.

Ptolemy Lagus, Fed and Sheltered by an Eagle. Irish.

Two Lovers, by Alexander Munro.

On the opposite side of the nave, returning, are

Professor Mutter, a bust, by Peter Reniers.

B. Frank Palmer, a bust, by same.

Wilson McCandless, a bust, by the same.

Love of a Small Bird, by Nicola Marchetti, Carrara.

Mercury of Thorwaldsen, a copy, by Tommaso Lazzerini, Carrara.

Virgin and Dead Christ, (Pietà,) by Amadeo Aunger, Turin.

Esculapius, copy from antique, by Greek sculptor.

Ceres, same.

The centre of this nave is occupied by the horrible statue of Daniel Webster, which is utterly unworthy a place in the exhibition, and the group of statues by Powers—

PROSERPINE—THE GREEK SLAVE—EVE—THE FISHER BOY. Proserpine was the daughter of Jupiter and Ceres. Pluto seized her as she was wandering about near her residence in Sicily, and carried her to the infernal regions, where she became his wife and queen:

> "Gathering flowers,
> Herself a fairer flower, by gloomy Dis
> Was gathered."

She is also supposed to represent the seed corn, which lies buried in the earth, and then rises to bless mankind.

North nave:

INDIAN HUNTER, a splendid group, in bronze, by A. Ottin, Paris.
VENUS DE MEDICI, copy, by a Greek artist.
APOLLO, commonly called THE APOLLINO, same.
DANIEL WEBSTER, bust in bronze.
DIANA OF THE LOUVRE, copy, by Marchetti, Carrara.
MRS. CRAWFORD, a bust, by Thomas Crawford, Rome.
APOLLO OF THE BELVIDERE, a bust, by Marchetti, Carrara.
GENERAL SCOTT, a bust, in plaster, S. D. Jones.
POETRY, by F. Pelliccia, Carrara.
VENUS OF THE LOUVRE, copy, by G. A. Fabbricotti, Carrara. This statue is very celebrated for its beauty.

On the opposite side, returning:

CICERO, by P. Fontana, Carrara.
DANTE, a bust, by Nicola Marchetti, Carrara.
FAITH, copy of Bartolini, by E. Baratta, Carrara.
THE CHILD'S FIRST GRIEF. A beautiful work, representing a child holding in her hand a dead bird, killed by a serpent which is escaping. The nest is visible at the root of a tree, with eggs. The child is grieved almost to tears. The workmanship and design are admirable. By E. Vasse, Florence.
BRONZE FEMALE, by H. K. Browne, New-York.
DANIEL WEBSTER, a bust, by Anthony Piatti.
HUSBANDMAN'S ORPHAN, by Anthony Piatti.
SLEEPING INFANT, by Piatti.
JUPITER, a bust, copy of antique, by Marchetti, Carrara.
DANIEL WEBSTER, a statuette, by Thomas Ball, of Boston. Decidedly the best representation of this great man that we have ever seen.
THE GENII OF SPRING AND SUMMER, by F. Pelliccia. Beautiful statues. These two small statues are on the right and left of a figure representing
COLUMBUS EXPLAINING THE LOCALITY OF THE NEW WORLD, copied by Delmedico Staffetti, of Carrara, from an original executed by Costa, of Florence. The original was ordered by Abbas Pacha.

In the centre of the nave are

HON. CHARLES ALLEN, of Worcester, Mass., a bust.
LESBIA, by L'Evêque, Paris.
DR. JOHN GREEN, a bust.
THE EMIGRANT.
A BACCHANTE, A. Galt, Norfolk, Va.
SHEPHERD, a group in bronze, by Giess.

In the Italian and Austrian departments are the following:

[The reader will observe only four statues, that are by artists from Austria in the Austrian department. The propriety of this arrangement we do not understand.]

Court 6:

Four Bas-reliefs, by Jerichau, Copenhagen, resident at Rome, very superb pieces.

Sappho, a bust.

The Saviour, a bust, by C. Baratta, Carrara.

Laura, a bust, by E. Vasse, Florence.

Son of William Tell, a statue, excellent, by Pasquale Romanelli, Florence.

Heloise, a bust, very fine, by Enrico Vasse, Florence.

Cleopatra, a bust, very fine, by same.

Shepherdess, by Orlandi, Carrara, a gem.

Angel of Sacred Music, by V. Consani, Florence.

Young Augustus, a bust.

Death of Francesco Ferruccio, by Giampaoli, of Lucca, very fine.

A Vestal, a bust.

Rousseau, a bust, by E. Barratta.

Gioberti, a bust, by A. Bruneri, of Turin.

Dying Gladiator, by E. Baratta, Carrara.

Bacchante, copy of an antique, by Pietro Bienaimé, of Carrara.

Virgin and Child, bas-relief, by U. Cambi, Florence.

Court 12:

Virgin and Child, bas-relief, by Imhof, Rome.

Paris, a bust, by P. Fontana, Carrara.

Copernicus, a bust, by Marchetti, Carrara.

Gavazzi, a bust, by Guido Butti, Milan, resident in New-York.

Prayer, Antonio Galli, Milan.

Cupid leaning on a Wine Skin, by Achille Stocchi, Rome.

Hen and Chickens, excellent, by C. Buzzi, Milan.

Venus and Cupid, in bronze, (a fountain,) by C. Papi, Florence.

St. John sleeping, by Luigi Magi, Florence.

Faithful Love, (Cupid cutting his Wing,) a statuette, a gem, by E. Vasse, Florence.

Boar's Head, in bronze, very fine, a specimen of casting, by C. Papi, Florence.

The Betrothed, by P. Romanelli, Florence; a superb work.

Pius IX., a bust, copy, by Francesco Tenerani, of Carrara, from original, by his brother, Pietro Tenerani, of Rome.

Veiled Head, by G. Croff, Milan.

In the interior court:

The Redeemer, a bust, by Abbondio Sangiorgio, Milan.

Veiled Head, by Gaetano Motelli, Milan.

Religious Meditation, a bust, by Alessandro Rossi, Milan.

The Fishing Boys, Gaetano Motelli, Milan.

Flower-Girl finding Cupid among the Roses, Gaetano Motelli, Milan, a perfect gem.

The First Steps, by Pietro Magni, Milan. A mother is guiding the first efforts of her child in learning to walk. A very beautiful piece of art.

Basket of Flowers, Attilio Galli, of Viggiù.

A Woman of Chiozza, Ignazio Micotti, Milan.

HEBE AND THE EAGLE, by Kähszmann, of VIENNA. This is one of the few pieces of Austrian art among the many sculptures found in the Austrian department.

SHEPHERD, by the same.

FLOWERS, bas-relief, by Attilio Galli, Viggiù.

CAGE OF CUPIDS, Gaetano Motelli, Milan. This is one of the most beautiful and the most curious works of art in the Palace. It is cut from a single block of marble, while every part of the cage is filled with the most finished representations of little Cupids. Every face is full of expression, and the expression of each differs, in some respect, from that of others. One of them peeps out from beneath a curtain on the back side, while another has climbed upon the top.

THE REDEEMER, a bust, by Innocenzo Fraccaroli, Milan.

BASKET OF CUPIDS, by Gaetano Motelli, Milan.

VENUS STEPPING INTO THE BATH, by Hans Gasser, VIENNA.

VEILED HEAD, by Giuseppe Rados, Milan.

GIRL WREATHING HERSELF WITH FLOWERS, by Kähszmann, VIENNA.

INDOLENCE, a bust, by Antonio Tantardini, Milan. This is labelled "Resignation" by mistake.

SLEEPING VENUS, statuette, by Giuseppe Rados, Milan.

BOY RIDING ON A TORTOISE, and

BOY RIDING ON A CRAWFISH. Both of these are by Giuseppe Croff, Milan.

LEDA AND THE SWAN, by same. Leda was daughter of King Thespius and Eurithemis. Jupiter became enamored of her, and changed himself into a swan.

CHILD THROWN ASHORE BY A WAVE, by Antonio Galli, Milan.

In the French department are

EMPEROR NAPOLEON III., a bust, by Madame Lefèvre Deumier, said to be a most excellent likeness.

FANNY CERITO, bust, a dancing-girl, by P. Gayrard, of Paris.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

MANAGEMENT OF MANURES.

MESSRS. EDITORS:—In the September number of your valuable publication you have an editorial on the "Waste of Manures," which, if it were generally read and its precepts followed, would be worth more to every family, in the year, than twice the subscription price of your paper. In the country, even among prudent and calculating farmers, vast quantities of the richest fertilizers are not only lost, so far as those who have the first and lawful right to them are concerned, but they are lost in a way that makes them actual nuisances—disturbing the flow of the greatest of all blessings, individual and public health.

In our villages this waste becomes still more apparent, arising, perhaps, partly from the fact that a portion of the inhabitants have not lands to be benefited by it if saved—and it may be in part from the small quantities of land usually in occupancy by the greater number of inhabitants. So we see that, in a majority of cases, the wash of the kitchen and the accumulations of the privy are disposed of in the easiest way possible, to get their contributions out of the way—not always out of smell or beyond the power of giving out miasmatic influence, however; and how often, in our small villages, and proportionably oftener as the size and population of the place increases, are our olfactory nerves sadly disturbed in passing the sheds of public houses or by-places, from the effluvia that arise from the deposit and waste of urine in these places—necessary, to be sure; for all populous towns must have their retired places for the benefit of strangers and passers-by. If these were more frequent, it would be a matter of great accommodation; and we have no doubt that, under a proper arrangement, they might be got up in far more decent style, and with a much better effect on public taste and morals, by the authorities of our large towns and cities, or even by individual enterprise, much to public benefit, and as a source of pecuniary profit.

As you propose, large tanks may be sunk in our villages and cities for depositing urine, and it may be incorporated with other material, so that it may be removed in carts as convenience requires; or, with a sufficiency of gypsum thrown in to retain the ammonia, it might undoubtedly be taken off in water-carts at a cheaper rate, and applied with equal benefit to the land.

In its liquid state, urine is one of the most valuable fertilizers. Chemistry says so, and, what is far better, experience tests the fact. Applied to fruit trees when they are in a dormant state, the effects which follow are of a surprising character. For the peach or plum there can be nothing better,—we know of nothing half so good. Insects seldom disturb the roots of trees over which it is applied, and the foliage of such trees presents a deepness and richness of verdure which other trees cannot exhibit. Of its effect upon the apple, pear and quince, we cannot speak with so much certainty; but from the evidence before us, and the nature of things, we cannot doubt but a good effect would be produced by its application to them. From the fall of the leaf in autumn to the bursting of the bud in spring, it may safely be applied in a crude state. The ground should be well forked in spring, that none of the choice salts deposited upon it may pass into the atmosphere.

If placed in considerable quantities around trees in late spring, or in any part of the growing season, when the spongioles are in full action, drawing in supplies for the growth and nourishment of the tree, and, like dainty children, seeking for the richest food, supposing it to be the best, its effects may be injurious, unless it is diluted by a mixture with other substances. Indeed, we have heard of gluttony and death resulting when the tree was fed with immoderate quantities of it in midsummer.

Such being its effect, let us for a moment contemplate the results which may arise if a proper and careful appropriation be made of it. In the country, almost every body owns the house they occupy, and a piece of land attached to it. In our villages there is scarcely a house but has its little ground-plot. As yet, the majority of these houses are unadorned by a single plum or peach tree, especially the latter—for, north of the Highlands on the Hudson, the idea is too prevalent that they "will not pay," while south they are raised in great quantities, but not by all who have a little land. Still, around all domicils there is a niche where the trunk of a peach tree can stand. The top, of course, will grow in the air, and require no land, and the roots will run some where. All the occupants of these houses like fruit; and well they may, for fresh ripe fruit is very palatable and very healthy.

Now we have no doubt but such people may have a plenty of fruit of their own raising, and fertilize the trees with substances which are now thrown away and lost, to them at least. We believe, further, that the urine of one individual, carefully saved and applied to a single peach tree, for one half the time from November to April, will furnish it with all the nutriment it needs beyond that which it derives from the soil, and keep it in good health and high productiveness to a good old age.

If this be so, a family of six can easily raise six good peach or plum trees, and what an enormous supply these would yield in comparison with that which most families can now boast of! Let every family try, and see if it is not so.

We are aware we have digressed from our text—saving manures—and run into raising fruit; we have done so in application of our subject. In due time we may give another head, and further application. W. B.

Elmwood, Sept. 7, 1853.

COMMERCE AND COMMERCIAL CITIES.

The growth of commercial cities has almost always been rapid, and while increasing in size and importance, there has usually been a corresponding increase of splendor and luxury. The maritime cities of old Phenicia, their extended commerce, and their adventurous fleets, are stories of history. Alexandria and Carthage are other and not less noticeable examples. Calcutta, London, and New-York, of to-day, and San Francisco of the hour, are the modern instances of the growth of commercial emporiums. One hundred years ago, Calcutta was almost unthought of. The waste where it now stands was broken by a single trading-station of the East India Company, known as Fort William. To-day a splendid and opulent city of tens of thousands of inhabitants invites the trader and the traveller to its crowded and busy streets. London, of ancient foundation, for half a century has been growing with an accelerating rapidity, until now a fair-sized city is annually added to its borders. New-York, half a century ago, was a small town, confined to the lower part of the island. Now it stretches miles, while the railroad lines are converting the villages and counties of the surrounding States into suburbs. New-Brunswick, Paterson, and other places in New-Jersey; Morrisania, Yonkers, Tarrytown, Sing Sing, Peekskill, and other places in New-York; Norwalk, &c., in Connecticut; Hempstead, &c., on Long-Island, with all the country comprehended in the circle we have described, are rapidly filling up with tens of thousands who have their business in the great commercial emporium of the New World. San Francisco has sprung like the creation of a wand out of barren sand and bleak hill-sides, into a city of many thousands, and is doubtless to be the first or certainly the second commercial city of the American coast on the Pacific.

The growth of these commercial cities is no small item of interest to the political economist. Tyre, and her sister cities of the Mediterranean, have all passed away. Excepting Alexandria, scarce a stone remains to tell where they stood. Is there not something to be learned from their history? Is there not something taught by the rapid rise and splendid but short career of these powerful communities?

Commerce is a valuable *agent* in exchanging the industry of nations. But Commerce is not Production. All commerce, with those who carry it on, the transporter, the shippers, the horses, the railroads, the locomotives, and the ships, is a *direct tax* on the industry of those who actually labor. The first payments made from the sales of produce, no matter in what form it is sent to market, are those of the agents, consignees, and transporting carriers. After these are paid, the account of sales is returned to the producer, minus "charges." The balance thus left is often small, and we have known that the producer has actually been brought in debt to his factor on "charges account." The more rapid and splendid the growth of commercial cities, the greater is the tax levied on the producers to pay for this splendor; and while a million of laborers live in comparative poverty, barely supporting themselves, the factors live in magnificence and luxury.

There is a commerce which is legitimate. By this we mean that traffic which exchanges our own products for that which we cannot produce. Drugs, dye-stuffs, spices, coffee, tea, ivory, and things which belong to other climates, are necessary to our refinement, comfort, and economies. But iron, wool, cloth, calico, linen, sugar, hardware, and thousands of other articles and products, we can produce or fabricate in our own country, to greater advantage than to purchase of those laborers who produce or make them abroad. For several reasons:

1st. The vast resources of national and individual wealth which are possessed by our people in their industrial power should be developed in the most diversified forms—thus to promote domestic exchanges, reciprocal intercourse, the cultivation of the arts, and the elevation of labor in our midst.

2d. The vast stores of wealth in the metals, ores, natural mechanical power, soils, and fuel, are so many elements of riches and prosperity given to us for our improvement. It is folly for us to buy copper, while we can almost supply the world. It is no wiser to purchase zinc, while we have the best deposit now known. It is waste and extravagance to buy iron, while we possess the best ores and the most magnificent deposits on the globe. So of all other things which lie at our feet, while we have the labor to produce all we want, and suffer when that labor is unemployed.

3. It is waste and extravagance to purchase foreign fabrics, on which charges, profits, and taxes are paid to foreign governments and capitalists, *paying the rents on foreign lands, and increasing the value of foreign mill-power and steam engines*, while we have better facilities and more splendid water-power at home, which are *valueless*, because we give a profitable employment to capital *four thousand miles distant*, which capital would otherwise seek investment here, and thus create wealth by imparting market values to waste lands, unoccupied mill-sites and idle laborers.

4. It is wasteful, extravagant, and pernicious to seek a market four thousand miles distant, and pay the transportation on bulky products, of small value, with all the charges, taxes, and duties thereon, and then pay the charges and duties on fabrics whose high values are comprised in small bulks—thereby paying a large tax on small outgoing, and a large tax on large incoming values.

5. It is wasteful and impoverishing to the producer to foster large commercial cities, which export and import, at heavy charges, while the building of inland and neighboring towns and cities will reduce the distance of transportation to market, diminish charges, shorten the time, multiply the varieties of products to be demanded by a neighboring population, increase the value of land by the value of a near market, and employ labor not otherwise marketable.

6th. It is wasteful and impoverishing to the country at large to centralize wealth, capital, and population in a few large cities, while, by a true system of industrial economy, that wealth and capital could find better and more active employment in a hundred or a thousand different localities—thus equalizing wealth, distributing blessings, and conferring prosperity and happiness on hundreds of thousands who would otherwise be dependent on the caprices, the avarice, and the hazardous fortunes of vast commercial adventurers, who may at almost any moment be swallowed up in ruin.

Hence, while we have a sort of national pride at witnessing the growth of New-York and several of our large commercial cities, we deplore the fact, as it affords evidence of the luxury, the dissipation, the laxity of morals, and the uncertainty of so much splendor and show. The wisdom of to-day should lead men to look at facts as they are.

The tendency of the present policy of "free trade" is to build up commercial cities, throw capital into trade, withdraw it from manufactures, production, and the legitimate development of our stores of wealth, and, as in times long past, foster a spirit of restlessness, ambition, and iniquitous conquests. It tends to build up communities of "merchant princes," centralize wealth and capital in the hands of a few, "make the rich richer, and the poor poorer," by affording credit to the rich, and making "a nation of agriculturists," as the free traders pretend we ought to be, depend on foreign markets to sell our bread to the unpaid laborers of Europe, ground down to the earth by the commercial system of England. The free-trade policy is the deadly enemy of true democracy, and we hope the farmer and the working-man will not be long in finding it out.

OTIS'S MORTISING, BORING, AND HUB-MORTISING MACHINE.

This seems to be a great improvement upon the mortising machines with which we are acquainted. It will make 300 graduated strokes per minute, and will mortise a 4-panel door in four minutes, or two sets of buggy-hubs per hour.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

WASH TO PRESERVE APPLE TREES: CASTOR-OIL PLANTS: CHESS IN WHEAT.

Messrs. Editors:—Will some of your readers give a recipe of a wash to preserve young apple trees from being destroyed in winter by rabbits eating off the bark? We are greatly subject to this evil in this location, and are greatly in want of a remedy.

Also the best method to extract the oil from the castor-oil bean; its qualities, and the best uses for which it is adapted.

Again, can any of your agricultural patrons give us some light upon the nature and cause of chess among wheat? Most writers upon vegetable productions say nothing about it, and Webster's Dictionary is the only work in which as yet I can find any mention of it. The question is, is it wheat degenerated, or altogether a new production; or may it be said to be a *lusus naturæ*. The above-mentioned lexicographer says, the word, in the Persian language, means evil, depraved, and a useless weed. The botanical name is *Bromus secalinus*, and it abounds most in fields where the wheat has been winter-killed. It bears some resemblance to oats.

This fact is mentioned by Pliny. His words are, "Primum omnium frumenti vitium avena est, et hordeum, in eam degenerat." This change of wheat and barley into oats, he ascribes to a moist soil, wet weather, bad seed, &c. This opinion coincides with observations made in this country, as wheat is most likely to perish in moist lands, and instead of it, chess often appears. But this change of wheat into chess is now generally denied, and this opinion is affirmed by the ablest of botanists to be erroneous.

Still there is a mystery about this production of nature. Old practical farmers assert that it is wheat degenerated. Will any of your readers who have paid attention to it give the result of their experience? The questions to be answered are: 1st. Is this plant ever found growing naturally where no wheat has been sown? 2d. Does it ever appear among wheat where the sower can warrant it was not in the seed? 3d. If chess is sown, will it produce chess again, and not alter, and become, if possible, still further adulterated? A solution of these queries, with any other information from experience and observation, would be an accession of light upon the subject.

Wisconsin, September 12, 1853. R. S.

HORTICULTURAL.

Cultivation of the Calceolaria.—It has often been to me a matter of great surprise that the large flowering, or, as they are generally called, *herbaceous* calceolarias, are not more cultivated. You may visit, in this neighborhood, a dozen gentlemen's gardens, and not see more than a dozen plants of this beautiful section of calceolarias, and those few but miserable, half-starved, half-choked specimens, which, for the credit of both the gardener and calceolaria, would be better on the rubbish-heap.

If you inquire the cause why they are not grown, ten out of twelve persons will confess "that they are beautiful things;" but, says one, they are so subject to the green fly; another says, they are so bad to winter—I invariably lose them at that season; a third says, that they die as soon as they have done blooming; and one good gardener told me the other day, "If a person gets them to do well once in his lifetime, he has had his share of good luck." Now, in answer to the first, are not geraniums, cinerarias, and a host of other plants, which these men "grow respectably," subject to the green fly? And will not the smoke of tobacco, with which he kills the fly attacking his geraniums, kill the fly which is on calceolarias? As to their being hard to winter, it is more fanciful than real. If a person attempt to keep the "old plants," it may be true; but if cuttings are stuck in in August or September, and be potted in four-inch pots in October, and kept in a cold frame until Christmas, then placed on a shelf in the green-house "near the source of ventilation," and not kept *too wet*, not more than one in a hundred, if even that, will go off in winter.

Propagation.—Select a place shaded from the midday sun, say under a north wall or hedge, (not under the drip of trees;) spread six inches of rough cinders or coal-ashes over the space requisite to hold the number you want, then put on six inches of the following compost: leaf-mould, loam, and silver sand, in equal quantities; the whole passed through a fine sieve. Let the *rough* be place next to the ashes, and over all this put half an inch of silver sand; water the whole; place on the land lights to mark the places. Take young shoots, as above mentioned, in the beginning of September, prick them in the prepared bed, and place over them the glasses; keep them close, syringe them frequently, and not many will fail to grow.

Time for Potting.—Pot the cuttings, when rooted, in 4 or 5-inch pots to winter in. In February give them a shift into 6 or 7-inch pots, and when the roots reach the outside of this soil, put them into their blooming-pots, say from 8 to 12-inch pots, according to the probabilities of the plant.

Soil.—For wintering, loam and leaf-mould, one part each, and half a part of sand; for February potting, loam and leaf-mould, one part each, sand and rotten dung, half a part each, and for final potting add more dung.—*Floricultural Cabinet.*

Covent-Garden Bouquets. — All who have visited or are acquainted with London, must have observed the exceeding beauty and taste with which the bouquets of Covent Garden are arranged, and the art which must be employed in forming them; and it has been an object of curiosity to many how such an arrangement is obtained. Until we set all our faculties of observation to work, we were equally as ignorant of the subject as any of our readers at the Land's End could be, but, after a little perseverance, we at last arrived at it. The process is as follows:

Procure a quantity of the finest copper wire, such wire as is used in the artificial flowers which decorate the interior of ladies' bonnets. It is with this that all the bouquets are tied; there is no string or matting made use of. Let a portion of this wire be kept in a coil for tying, but let a portion of it also be cut into lengths of about six inches. Having decided what the device of the bouquet is to be, and the flowers of which it is to be composed, let one of these flowers form a centre-piece, or "foundation," as the ladies say when they begin knitting a purse. This centre-piece forms, as it were, the centre of the circle, and all the other flowers are to be arranged in concentric circles round it. One end of the coil of wire is fixed to the stalk of the centre flower, and every single flower which is added is secured by a twist of the wire, much in the way we have seen boys tying a whip on the end of a stick. These bouquets are not formed of large branches of flowers, such as a great truss of a scarlet geranium, or a spike of a hyacinth, but single flowers, or florets, or bells, only are used. To supply the want of a long stalk in such cases, to bind them by, the six-inch lengths of wire are twisted round the short stalks of the florets or bells, and these serve in place of stalks. Camellias, also, are furnished with these artificial stalks, when the natural one is too short; and when the bouquet is completed, the stalks of the flowers are in fact a bundle of wires. It is thus that so much device is obtained, which could not be had by using large bunches or trusses of any particular flowers.

Sowing Seeds.—Fill the seed-pots half way up, at least, with drainage; then with soil, within half an inch of the rim—the finest next the surface; press it down firmish, not too much; then thoroughly water them, or soak them by se ting them in a tub of water. Let them drain thoroughly in an open place, until the surface begins to get a little dry; then press it level, gently, with the bottom of a flower-pot, or, better still, with a round piece of wood, say three to five inches in diameter, with a large nail or pin fixed to its centre to hold by. Spread the seeds evenly on this surface, and then cover with fine light sandy soil, no deeper than the thickness of the seed; so that for small dusty seed the slightest dusting of sand will be necessary, or nothing but another gentle pressing.

The young plants will not want light until they are up; and the moisture already in the soil will be sufficient to vegetate all quick-growing ones, if prevented evaporating. To effect this object there is no simpler or better plan than covering the mouth of the pot with inverted saucers or flats of a similar or larger size. Enough of air will thus penetrate to insure germination, but not enough to dry up the moisture. When, however, the soil does get too dry, it must be watered or soaked again afresh; and in delicate cases, it will be safest to set the pots in water, as high as within an inch of the seeds, and allow it to remain until all below is thoroughly soaked. In common cases, a sprinkling on the surface will be sufficient.

Remove the saucer whenever the seeds appear; but, in small delicate varieties, it will be advisable to place a square of glass over the mouth of the pot, and then, by degrees, elevating the glass on one side, before exposing the tender things to the full draught of air in the green-house. Rest assured that an ounce of attention to these trifles will be more satisfactory than some bushels of unavailing regrets.—*Cottage Garden.*

PEDIGREE OF ARABIAN HORSES.

In our article on the Arabian Horse, given a few weeks since, we omitted the manner in which their pedigrees are made out; and as it is a matter in which our readers may feel some curiosity, we take from Mr. Layard's late work the following:

"Amongst men who attach the highest value to the pure blood of their horses, and who have no written pedigree—for among the Bedouins documents of this kind do not exist—such customs are necessary. The descent of a horse is preserved by tradition, and the birth of a foal is an event known to the whole tribe. If a townsman or stranger buy a horse, and is desirous of having written evidences of its race, the seller with his friends will come to the nearest town and testify before a person specially qualified to take evidence, called 'the cadi of the horses,' who makes out a written pedigree, accompanied by various prayers and formularies from the Koran, used on such occasions, and then affixes to it his seal. It would be considered disgraceful to the character of the true Bedouin to give false testimony on such an occasion, and his word is usually received with implicit confidence."

THE NATIONAL HORSE-SHOW

Will come off at Springfield, Mass., beginning on Wednesday, October 19, and continuing four days.

The Committee state that it is designed to be a National Exhibition, and inducements will be offered which, it is hoped and expected, will bring out horses from all sections of the Union, and from our Canadian neighbors on the north. The Committee have assurances already, from various quarters, that this will be the case.

The Committee have made arrangements with several of the railroads centring there to bring all horses designed for exhibition *free of charge;* and it is hoped that a similar arrangement may be made with railroads at a distance.

The exhibition is designed for purposes both of show and sale—considerations which combined must prove immensely attractive.

Premiums are offered for the best horses, ranging from $200 down to $25, to be awarded to the best stallions, geldings, breeding-mares, matched horses, fancy horses, colts, farm or draught-horses, ponies, &c. The largest premium ($200) is offered for the best stallion of seven years old and over.

George Dwight is President of the Society. The ground selected for the exhibition is Armory Square, on the hill; a place, says the *Springfield Farmer*, very well adapted to the purpose.

THE PRODUCT OF TOBACCO.

In a late number of *Blackwood* appeared an interesting and instructive essay upon "Narcotics," from which we extract the following account of the tobacco plant, and estimate of the usual product throughout the world:

"The tobacco plant is indigenous to tropical America, whence it was introduced into Spain and France in the beginning of the sixteenth century, by the Spaniards, and into England half a century later, (1586,) by Sir Francis Drake. Since that time, both the use and the cultivation of the plant have spread over a large portion of the globe. Besides the different parts of America, including Canada, New-Brunswick, the United States, Mexico, the Western Coast, the Spanish Main, Brazil, Cuba, St. Domingo, Trinidad, &c., it has spread into the East, into Turkey, Persia, India, China, Australia, the Philippine Islands, and Japan. It has been raised with success also in nearly every country in Europe; while in Africa it is cultivated in Egypt, Algeria, in the Canaries, on the Western Coast, and at the Cape of Good Hope. It is, indeed, among narcotics what the potato is among food plants—the most extensively cultivated, the most hardy, and the most tolerant of changes in temperature, altitude, and general climate.

We need scarcely remark, that the use of the plant has become not less universal than its cultivation. In America, it is met with every where, and its consumption is enormous. In Europe, from the plains of sunny Castile to the frozen Archangel, the pipe and cigar are the common solace among all ranks and conditions. In vain Pope Urban VIII. thundered out his bull against it; in vain our own James I. wrote his "Counterblaste to Tobacco." Opposition only excited more general attention to the plant, awakened curiosity regarding it, and promoted its consumption.

So in the East—the priests and Sultans of Turkey and Persia declared smoking a sin against their holy religion, yet nevertheless the Turks and Persians became the greatest smokers in the world. In Turkey the pipe is perpetually in the mouth. In India, all classes and both sexes smoke. In China the practice is so universal, that 'every female, from the age of eight or nine years, wears as an appendage to her dress a small silken pocket, to hold tobacco and a pipe.' It is even argued by Pallas, that the extensive prevalence of the practice in Asia, and especially in China, proves the use of tobacco for smoking to be more ancient than the discovery of the New World. 'Amongst the Chinese,' he says, 'and among the Mongol tribes, who had the most intercourse with them, the custom of smoking is so general, so frequent, and has become so indispensable a luxury; the tobacco purse affixed to their belts so necessary an article of dress; the form of their pipes, from which the Dutch seem to have taken the model of theirs, so original; and lastly, the preparation of the yellow leaves, which are merely rubbed to pieces, and then put into the pipe, so peculiar, that they could not derive all this from America by way of Europe.'

Leaving the question of its origin, the reader will not be surprised, when he considers how widely the practice of smoking prevails, that the total produce of the tobacco grown on the face of the globe has been calculated by Mr. Crawford to amount to the enormous quantity of two millions of tons. The comparative magnitude of this quantity will strike the reader more forcibly when we state that the whole of the wheat consumed by the inhabitants of Great Britain—estimating it at a quarter a head, or in round numbers at twenty millions of quarters—weighs only four and one third millions of tons; so that the tobacco raised for the gratification of this one form of the narcotic appetite, weighs as much as the wheat consumed by ten millions of Englishmen. And reckoning it at only double the market value of wheat, or twopence and a fraction per pound, it is worth in money as much as all the wheat eaten in Great Britain.

The largest producers, and probably the largest consumers of tobacco, are the United States of America. The annual production, at the last two decennial periods of their census returns, was estimated at—

1840, - - - - - - -	219,163,319 lbs.
1850, - - - - - - -	199,752,646 "

being about one twentieth part of the whole supposed produce of the globe.

One of the remarkable circumstances connected with the history of tobacco, is the rapidity with which its growth and consumption have increased in almost every country, since the discovery of America. In 1662, the quantity raised in Virginia—the chief producer of tobacco on the American shores of the Atlantic—was only 60,000 lbs.; and the quantity exported from that colony in 1689, only 120,000 lbs. In two hundred and thirty years, the produce has risen to nearly twice as many millions. And the extension of its use in our own country may be inferred from the facts that, in the above year of 1689, the total importation was 120,000 lbs. of Virginian tobacco, part of which was probably reëxported; while, in 1852, the quantity entered for home consumption amounted to 28,558,753 lbs., being something over a pound per head of the whole population, and to this must be added the large quantity of contraband tobacco, which the heavy duty of 3*s.* per lb. tempts the smuggler to introduce. The whole duty levied on the above quantity, in 1852, was £4,560,741, which is equal to a poll-tax of 3*s.* a head."

RAILROAD OPERATIONS.

The Great Western Railway in Canada, leading from Windsor (opposite Detroit) to Niagara, is now complete about eighteen miles from Windsor, and it is intended to finish the whole by the 1st of January next. The whole distance, 280 miles, (nearly a straight line throughout,) is to be laid with compound rail, and, it is predicted, will be one of the best railways on the American continent. The wire bridge over the Niagara is in a good state of progress, and when the whole is completed, the time from Detroit to New-York city will be made in twenty hours.

There are now in course of erection at the dépôt some very large buildings: one, intended as a machine-shop and engine-house, is 145 feet by 164, and will hold twelve locomotives, besides all the machinery necessary for repairing. Another building will be commenced immediately, which will be 84 by 150 feet, will contain three divisions, so as to guard against fire, and is intended as a freight-house. These, with what are already erected, will be all actually required to open the road, but a number of others will also be erected as soon as mechanics can be got to undertake the work.

Milwaukie and Mississippi Railroad.—The *Argus and Democrat*, of Madison, Wisconsin, says: "Mr. A. L. Cantlin, a man of great wealth and still greater credit, has entered into satisfactory bonds to complete the road to Madison by the first of January next, and to Prairie du Chien by the first of January following thereafter."

This looks like earnest; and if Galena does not look out, she will not have the first car from the lakes.

Buffalo and Alleghany Valley Railroad.—The interesting ceremony of breaking ground on the Aurora route took place yesterday afternoon at the village of Aurora. Several hundred of the citizens of that place, a number of our citizens, and several railroad men from other places were present.

Alexandria, Loudoun and Hampshire Railway.—The surveys of this important work are being pushed forward with commendable energy, and thus far with highly satisfactory results. The Alexandria *Gazette* states that Mr. Bowie, the engineer in charge of the second surveying-party, has ascertained that the Blue Ridge can be easily passed at Key's Gap, at a grade of fifty-two feet to the mile. Having completed his surveys to the Shenandoah river, he is now running his line eastwardly through Hillsborough. The party hitherto operating in Fairfax county, having about closed their route as far as Goose Creek, will shortly be transferred to the Blue Ridge at Snicker's Gap. The route to Goose Creek will be almost a perfect air-line, with exceedingly favorable grades. There are five surveying-parties in the field; two east and three west of the Blue Ridge.

The Oakland and Ottawa Railroad.—The iron for this road is bought, the right of way for most of it is secured, and the contract for its construction entered into. These things make the completion of the road certain. The necessary stock has been taken, and we are informed that the laborers to build the road will in a few days be at work at different parts along the line.

Indiana and Illinois Central Railway.—The Board of Directors of this Company met at Decatur, Ill., on the 10th of August, and confirmed a contract for the construction and equipage of the entire line from Indianapolis to Decatur, with Messrs. M. C. Story & Co., of New-York. The contractors furnish 70 per cent. of the entire amount necessary to construct and equip the road, only requiring the company to raise 30 per cent. Twenty-two thousand dollars per mile includes every thing, except ballasting, and the work is to be completed by the first of December, 1855. Before the work can be commenced, however, about $300,000 of additional stock must be raised at home.

Covington and Lexington Railroad.—This work is making very rapid and satisfactory progress. The road is now opened about twenty-eight miles from Covington, and regular freight and passenger trains have been put on for this distance. By the first of September the road will be completed some twenty miles farther, to Falmouth, the shire town of Pendleton county. At this point, the centre of a large trade will be reached. The grading of the road to this point is completed, and is nearly so to Cynthiana, sixty-four miles from Covington. The entire work of grading is so far completed that the whole line will be in readiness for the rails as fast as they can be laid. This is being done at the rate of one half mile per day, and which will be continued, with good weather, till the road is completed. The cost of the work thus far is within the least estimates of the company.

Mississippi and Missouri Railroad.—This great work is fairly under way. Every thing is now in such shape, that the parties, who have built more railroads within the last two years than any other company of men, can say that it shall go through immediately. In one year, the iron horse will run to Iowa City.

MECHANICAL RECORD, ETC.

The Metropolitan Hotel, New-York, was opened to the travelling public on the 1st day of September, 1852. It was finished and furnished throughout with a degree of magnificence which, up to that time, had never been attempted in any city in the world, and has not been surpassed since. The arrivals and departures have averaged more than one thousand per week, and such has been the desire to secure even a temporary habitation at the Metropolitan, that frequently more than one hundred cots have been spread for weeks in succession. The wages of employees range from two shillings to five dollars per day. This will give a pretty good idea of the expenditures under this head alone. The laundry of the house is, probably, the most extensive of any in the world; four thousand pieces are washed daily, and in an emergency, fifteen minutes suffice to wash, dry, iron, and deliver linen for occupants of the house.

The commissary department of the Metropolitan is a very important one. Among the leading articles of consumption we notice:

Beef, 418,000 lbs.; lamb and mutton, 3,500 head; veal, 150 head; fish and lobster, 110,000 lbs.; oysters and clams, 626,000.; poultry and game, 171,000 head; ham and pork, 91,000 lbs.; butter and cheese, 65,000 lbs.; eggs, 780,000; milk and cream, 204,000 quarts; flour and corn meal, 2,800 bbls.; fruits and vegetables, value, $20,000; brandy and other liquors, 6,322 gallons; champagne, 21,160 bottles; sherry, Madeira, &c., 22,912 bottles; claret and white wines, 18,942 bottles. This is independent of malt liquors, cordials, cooking wines, &c. The beef consumed last year in this house required a drove of one thousand head to supply. When we consider that this number was required for one hotel in this city, we can form a pretty good idea of the immense herds it must require to supply such a population as New-York contains.

The gross cash receipts of the Metropolitan Hotel, for the year ending September 1, 1853, were $500,000. This is independent of wear and tear, which is by no means a small item, particularly with such splendid and expensive furniture and appointments. The cost of heating the house and the gas consumed, during the year, was $14,600. Croton water rent, $1,000. Six stages and twenty carriages are constantly employed in transporting passengers to and from the hotel.

Relative Purity of Different Descriptions of Artificial Light.—Professor Frankland, of Manchester, has given the following as the comparative purity of different descriptions of artificial light.

Quantity of carbonic acid and heat generated per hour, by various sources of light equal to twenty sperm candles:—

	Carbonic acid.	Heat.
Tallow,	Cubic feet 10.1	100
Wax,	8.3	82
Spermaceti,	8.3	82
Sperm oil, (Carcel's lamp,)	6.4	63
London gases, (coal,)	5.0	47
Manchester gas,	4.0	33
London gas, (Cannel,)	3.0	33
Boghead hydro-carbon gas,	2.5	19
Lesmahago hydro-carbon gas,	2.5	19

Professor Frankland adds:—"The two objections most frequently advanced against the use of gas in dwelling-houses are the deterioration of the air by the production of carbonic acid, and the evolution of so much heat as to render the atmosphere oppressively hot. It will be seen from the comparison exhibited that in these respects even the worst descriptions of coal gas are, for an equal amount of light, superior to all other illuminating materials; whilst, with the better descriptions of gas, three or four times the amount of light may be employed with no greater atmospheric deterioration."

INVENTIONS.—The dates of the following inventions may be of some convenience to our readers for reference. They have been taken from *The Louiston Farmer and Mechanic:*

Glass windows were first used in	1180
Chimneys in houses,	1236
Lead pipes for conveying water,	1252
Tallow candles for lights,	1290
Spectacles invented by an Italian,	1299
Paper first made from linen,	1302
Woollen cloth first made in England,	1331
Art of painting in oil colors,	1410
Printing invented,	1440
Watches made in Germany,	1477
Variation of compass first noticed,	1540
Pins first used in England,	1543
Circulation of human blood first discovered by Harvey,	1619
First newspaper published,	1630
First steam engine invented,	1649
First fire engine invented,	1663
First cotton planted in the United States,	1759
Steam engine improved by Watt,	1766
Steam cotton mill erected,	1782
Stereotyping invented in Scotland,	1785
Animal magnetism discovered by Mesmer,	1788
Sabbath-school established in Yorkshire, England,	1789
Electro-magnetic telegraph invented by Morse in	1832
Daguerreotype process invented,	1839

NEW MANUFACTURING TOWN.—A letter from Moultonborough to a Boston paper says:

"There is a fine water-power in this town, which has been recently purchased by a company from Boston, and a machine-shop and foundry are soon to be built, under the direction of an agent of Seth Ames & Co., the present proprietors of the location. The company was incorporated by the last Legislature as the Red Hill Manufacturing Company; and if all the reports are true, the little village known in this vicinity as 'Moultonborough Falls' is soon destined to become a second Lawrence. So may it be."

IMPROVEMENT IN GRIST MILLS.—The *Worcester Spy* speaks of improvements in the manner of pecking mill-stones by which their capacity for grinding corn can be doubled. The editor of the *Spy* saw it applied to a mill in Worcester, and the result of its application was, that a bushel of Northern corn was ground in a minute and a half, and that an old-fashioned mill, with a single run of stones, with the improvement, will grind *forty-six bushels an hour.*

PERCUSSION-CAPS SUPERSEDED.—A new composition has lately been invented by Messrs. Winiwartier & Gersheim, of Vienna, for the purpose of superseding the ordinary percussion-caps, and, in many instances, the gunpowder charge also. The most prominent features of these gun-primers, as the composition is called, are the absence of a metallic coat or cover, and their uniform explosive power, the materials being of such a nature that, after a detonation, no residue whatever is left behind. The materials which form the new composition are fulminating mercury, chlorate of potash, and sulphide of antimony, the dangerous properties of which ingredients are diminished by the application of collodion, which is used as a cement; and it is the ingenious employment of this substance which constitutes the chief peculiarity of the invention.

MENDING GLASS.—Melt a little isinglass in spirits of wine, and add a small quantity of water. Warm the mixture gently over a fire. When mixed by thoroughly melting, it will form glue perfectly transparent, and which will reünite broken glass firmly, neatly and invisibly. Lime, mixed with the white of egg, forms a very strong cement for glass, porcelain, &c., but it must be done neatly.—*Scientific American.*

Ether as a Motive-power.—The results of the experiments with ether as a motive-power are attracting much attention in France; and if the published accounts are correct, the application of etherized vapor as a motive-power is a most important movement. A late number of *Galignani's Messenger* gives the following account of a report of experiments on board the steamer Du Trembley:

"This report, which is from a commission appointed by the authorities, states that an enormous economy of fuel is obtained by the new system and the apparatus of which M. Du Trembley is the inventor. The consumption of coal on board the Du Trembley is declared to have been only 1 kilogramme 11 dec. to 1 kilogramme 16 dec. per horse-power and per hour, whereas the consumption by the best steam engines on the usual principle is 4 kilogrammes. This great economy is, adds the report, very little affected by the outlay for ether. The great danger which previously existed in the use of ether by escapes from the joints, has, it is asserted, been entirely removed. This discovery, which has now stood the test of several long voyages, will cause a total revolution in steam navigation, for it will enable vessels to have a very large additional space for cargo, which is one of the great advantages promised by Capt. Ericsson's hot air engines, and the etherized vapor has a great superiority over the latter, as the rate of speed is the same as with the ordinary mode of steam navigation, with a much larger consumption of fuel, whereas, as yet, the speed obtained by the Ericsson engine is very much below that obtained by steam; consequently, whatever is gained by economy of fuel as regards hour for hour, is lost by the additional time required for a voyage, thus increasing at the same time the additional expense of the wages of the crew, the increased consumption of provisions, and the increase of wear and tear."

The American Alarm Lock is the latest novelty in the way of invention we have noticed. It is in the main a combination lock, enclosing a bell, so that any fingering or picking at the key-hole, even with the proper key, causes the ringing of a sharp, shrill alarm. This bell, if preferred, may be located away from the lock—in the bed-room of a watchman, cashier or sub-treasurer, if you please, so as to give him instant notice when any one meddles with the lock.

The Worth of Trees and Railroads.—We learn from the *Caledonian* that six pine trees standing on a lot near Island Pond, some hundred and fifty or more miles from the seaboard, were recently sold for the handsome little sum of five hundred dollars. Verily the railroads do increase the value of lumber. Ten years ago, these majestic pines, for masts, would not have sold for ten dollars.

High Price for Stock.—We have noticed recently the arrival at New-York of several herds of pure-blood stock, imported by different Societies in the Southern and Western States, for the purpose of improving the breeds of stock among the farmers in those States. One lot was said to have cost in England over $50,000. A sale of some of this stock, imported by the Northern Kentucky Importing Association, was had in Bourbon county, Ky., on the 18th inst. The prices paid were high. The purchasers were put under obligations not to remove the stock from the State for one year. The following are some of the prices paid:

A white bull, calved in May, 1850, cost in England $660, sold for $3,005. Diamond, roan—calved in June, 1850; cost $630, sold for $6,001. The Count, roan—cost $525, sold for $2515. Orontos, red and white—calved September, 1851; cost $630, sold for $4,525. Fusileer, roan—cost $375, sold for $4,475. Challenger, roan—calved January, 1852; cost $450, sold for $4528. Cows and heifers went in the same proportion. Mazurka, dark roan, calved August, 1851, cost $600, sold for $3,050. Three South Down bucks sold for $755, $480, $340, and three ewes for $350, $180, $230, and a Cleveland bay stallion—the only horse imported—$2,800! The profits of the company from the sales amounted to $32,976.

The Biggest Train.—The locomotive Salamander brought in the largest train of loaded freight cars yesterday that was ever drawn over the Central Road. The train numbered over one hundred loaded cars, and was over one third of a mile in length. It was mostly loaded with wheat, its capacity being 20,000 bushels—and was all picked up at Marshall, and this side of there. Within the last forty-eight hours the receipts of wheat at the Central dépôt have been nearly 40,000 bushels.—*Detroit Advertiser*, *Aug. 11th.*

A Ceylon Ox-Cart.—A correspondent of the *Boston Journal*, writing from Ceylon, thus describes a vehicle which he found on an island whose sixteen-lettered name we will not stop to write:

"On reaching the shore of Poongkoordetovoo—which jaw-breaking name, by the way, with its *sixteen* letters, is spelt in the Tamil language by the use of *six* characters only—we found an ox-cart waiting to help us on to the house of the catechist, a distance of about four miles. The ox-cart is the only one in the island, and this too, where the population in 1840, the census says, was 3700! It would be thought by an American farmer a great curiosity, as well as the exceedingly diminutive oxen which drew it, whose bodies were almost literally covered with the marks of the branding-iron. These marks are thought by the people to be very beautiful, and they regard them also as tending much to the health of the ox. The wheels of the cart are not much more than half as far apart as is usual with American carts, and the length of it was so contracted that it was not without inconvenience that even two of us could ride. It was covered over with an *ola* mat, and that protected us from the rays of a vertical sun. This was much better than to be walking with the king of day, in his own region, pouring down his rays directly above our heads."

Patent Timothy and Clover Sower.—This is a very desirable and ingenious hand implement for sowing clover and timothy seed. It is a simple hopper, or a long, trough-like-box, of any convenient length, with a zinc bottom perforated with holes at equal distances. The seed is distributed by a notched rod, which is vibrated by means of a lever attached to the top of the hopper. It sows the seed accurately, and is so arranged as to sow any desired quantity from two to sixteen quarts per acre. It is a very neat and valuable contrivance for the easy, rapid, and perfect performance of a labor which is otherwise very difficult.

Curious Calculations.—The ocean, accepting the supposed average depth of it as one thousand feet, contains 29,000,000 of cubic miles of water; and to fill its basin would require all the rivers of the earth pouring their waters into it for forty thousand years. The amount of heat received from the sun every year, would suffice to melt a crust of ice thirty-two feet thick, enveloping the whole earth. According to the technical reckoning, the solar heat which annually raises the sea-water in the form of vapor, corresponds to the enormous sum of sixteen billions of horse-power.

NEW-YORK AS IT IS—FOR STRANGERS.

Jullien is about closing a most triumphant series of concerts. New-York has never before witnessed such perfection of orchestral music.

Max Maretzek is just commencing a series of operas at Niblo's, with the best promise of success, with Steffanone, Salvi, Marini, Beneventano, &c., and a powerful chorus.

The Ravels are still at Niblo's, as funny as ever.

Two Giraffes are to be seen at Barnum's Museum. These animals are very great curiosities, elegant in form, graceful in many of their movements, and unlike every other animal we have ever seen. Go and see them by all means. They are very seldom to be seen in this country.

Niagara Falls.—Numerors views of this wonder of the world are to be seen at Hope Chapel, and will repay the visitor.

The Baroness De Berg gave her second grand concert a few evenings since, assisted by the ablest talent in the country, Salvi, Marini and Paul Julien. She is a very accomplished pianist. She cannot thunder on the wires like one of our sex, but is smooth and finished in every respect, and has entire command of the keys. She abundantly deserves success.

Signor Blitz is here also, with his five hundred learned canaries, doing most wonderful things.

Perham's Seven Mile Mirror.—This famous panorama is now in New-York. It gives a better view of the country through which it passes, than any other extended panorama we have ever seen. Gentlemen well-known through the country give their public commendation of it. The offer of nearly $90,000 in "gifts" may look like what is called *humbug*, but we know Mr. Perham so well that we are confident he will carry out his part of the business precisely as he promises. See his advertisement.

Other exhibitions before mentioned are still open.

NEW BOOKS.

Manual of Elementary Geology; or, The Ancient Changes of the Earth and its Inhabitants, as illustrated by Geological Monuments. By Sir Charles Lyell, M.A., F.R.S. Reprinted from the fourth and entirely revised edition. Illustrated with 500 woodcuts. New-York: D. Appleton & Co., 202 Broadway. 1853. pp. 512. $1.75.

An edition of 2000 copies, printed in January last, having been disposed of, and a call made for a still further supply of this standard work, the Messrs. Appletons have here given us a volume as finished in execution as it is authoritative in matters of science. It is furnished with a copious index. No work now published on this subject can claim precedence of this.

Philosophy of Sir William Hamilton, Bart., Professor of Logic and Metaphysics in Edinburgh University. Arranged and edited by D. W. Wright, Translator of Cousin's History of Modern Philosophy. For the use of Schools and Colleges. New-York: D. Appleton & Co. 1853.

This handsomely-executed volume contains all that Mr. Hamilton has published on the subject of Metaphysics, except part of an unfinished dissertation. His notes in his edition of Dr. Reid have been used in making up this work. The notes of the editor are chiefly confined to pointing out references to other parts of the work, though some of them are of great value. It is by no means of the less value, that our able and judicious editor allows his author to explain himself.

Elements of Agricultural Chemistry and Geology. By James F. W. Johnston, M.A., F.R.S. S.L. and E., &c., &c. With a complete Index and American Preface, by Simon Brown, Editor of the New-England Farmer. New-York: C. M. Saxton. 1853. Sent by mail to any part of the United States for $1.

This book is exactly what it professes to be. It is the work of a thorough scholar, and this edition is by an able editor, while the publisher has also done his work well, (though it would have been improved in appearance, had the paper-maker used a little more chlorine.) We know of nothing superior to this, if it has its equal, in the same compass. It is perfectly reliable in every department.

The Progressive Farmer: a Scientific Treatise on Agricultural Chemistry, the Geology of Agriculture; on Plants, Animals, Manures, and Soils, applied to Practical Agriculture. By J. A. Nash, Principal of Mount Pleasant Institute, Instructor of Agriculture in Amherst College, and Member of the Massachusetts Board of Agriculture. New-York: C. M. Saxton. 1853. pp. 254. Sent by mail at 50 cents.

This small manual contains a chapter of 45 pages on Descriptive Chemistry; 30 pages on the Geology of Agriculture; 20 pages Vegetable Physiology; 45 pages on Animals and their Products, Milk, Butter, and Cheese, with Modes of Feeding; the

Manures occupy 40 pages, and the closing chapter is on Practical Agriculture. Mr. Nash thoroughly understands himself, and has made an excellent book, which would prove itself of great value in the hands of any farmer who would be governed by its directions.

The Humorous Speaker; being a choice selection of amusing pieces, both in prose and verse, original and selected; consisting of Dialogues, Soliloquies, Parodies, &c. Designed for the use of schools, families, &c., &c. By Oliver Oldham. New-York: Newman & Ivison, 178 Fulton street. 1853. pp. 408.

This selection contains the compositions of J. G. Saxe, Stevens, Dickens, Hawthorne, Colman, Pierpont, Bulwer, Moore, Garrick, Hood, Haliburton, Holmes, and a long list of other writers, of more or less note. Persons of every taste can find something here to please them.

The Claremont Tales; or, Illustrations of the Beatitudes. New-York; Robert Carter & Brothers. 1853. pp. 363.

This handsome little volume contains eight Stories or Tales, "A humble mite dropped by a mourner's hand," designed especially to interest the young. It is eminently worthy the attention of religious parents.

The A B C Primer and the A B C Song Book. These are two little unpretending volumes, well designed for the instruction of children in the rudiments of music. The style is perfectly appropriate, the system is good, and in all respects it is just suited to the wants of teachers of schools and of private classes. It is executed in capital style and convenient form, (as usual,) by Messrs. Hall & Son, Broadway.

The Illustrated Magazine of Art is also on our table. We read it with great interest. It fills, and with ability, a place in our periodical literature which would otherwise be entirely blank.

The Educator is also a very useful magazine, by the same publisher, 17 Spruce street.

Harper's Magazine continues to maintain its high reputation. It is worthy of all commendation.

Putnam's Magazine makes its issues as regularly as the month comes round. It has an able corps of writers. The author of the "Letters from Newport," &c., must be careful, or he will be in danger of large draughts on his strong-box for broken buttons and torn button-holes. He is very 'cute as a comic writer.

Illustrated Record of the Crystal Palace, Nos. 3 and 4, is equal to its predecessors.

The Horticulturist for September was received from the agents, Messrs. Newman & Ivison.

List of Patents Recently Issued.

FROM AUG. 9 TO SEPT. 7.

G. W. Baynes, Thomas Hinty and Minter Jackson, of Glenville, Va., for Improvement in Bedstead Fastenings.

William Beach, of Philadelphia, Pa., for Improvement in Meat Tenderers.

John Binder, of Chelsea, Mass., for Improvement in Hinges for Folding Bedsteads.

P. F. Charpie, of Mount Vernon, O., for Improvement in Gun Locks.

Thomas Grossley, of Roxbury, Mass., for Improvement in Printed Carpets.

B. F. Delano, of Chelsea, Mass., for Improvement in Rubber Brace.

M. B. Dyott, of Philadelphia, Pa., for Improvement in Facing Buildings.

A. W. Graheart, of Beallsville, Ohio, for Improvement in Machines for Preparing Spoke Timber.

A. H. McKinley, of Higginsport, Ohio, for Improvement in Socket for Auger Handles and Braces.

Jacob Mumma, of Mount Joy, Pa., for Improvement in Draught Apparatus of Seed Planters.

E. K. Root, of Hartford, Ct., for Improvement in Drop Hammers.

Wm. Van Anden, of Poughkeepsie, New-York, for Improvement in Trip Hammer.

By J. P. Schenkl (assignor to J. P. Schenkl & A. S. Saroni,) of Boston, Mass., for Improvement in Breech-Loading Fire-Arms.

W. H. Babbitt, of Waynesburgh, Pa., for Improvement in Hill Side Ploughs.

A. G. Coes, of Worcester, Mass., for Improvement in Screw-Wrench.

W. & S. G. Coleman, of Providence, R. I., for Improvement in Ship Block.

A. C. Gallahue, of Alleghany City, Pa. Ante-dated Feb. 18, 1853, for Improvement in Machinery for Pegging Boots and Shoes.

Gibson North, of Philadelphia, Pa., for Improvement in Oven Doors of Cooking Stoves and Ranges.

A. R. Tewksbury, of Boston, Mass., for Improvement in Boat or Scow.

Henry Stanton, U. S. A., for Improvement in Discharging Breech-Loading Fire-Arms.

Luther Atwood, of Boston, Mass., for Improvement in Processes for Purifying Alcohol.

J. P. Moinier and P. H. Boutigny, of Paris, France, for Improvement in Generating Steam; patented in France, January 18, 1853.

J. B. Duff, of New-York, N. Y., for Improvement in Soap-Cutting Machines.

M. J. Gardner, of York, Pa., for Improvement in Oscillating Steam Engines.

Peter Horn, of Hagerstown, Md., for Improvement in Seed Planters.

F. B. Parker, of Queensville, Ind., for Improvement in Hay Rakes.

Milton Roberts, of South Levant, Me., for Improvement in Arrangement of Cutters for Turning.

Samuel Vansyckle, of Little York, N. J., for Improvement in Grate Bars.

Lettie A. Smith, of Pineville, Pa., for Improvement in Butter Workers.

W. M. Warren, of Watertown, Ct., for Improvement in Railroad Car Seats.

L. A. B. Walbach, deceased, late of the U. S. A., for Improvement in Boring Cannon.

Zachariah Allen, of Providence, R. I., for Improvement in Counterpanes.

Henry Ritchie, (assignor to S. C. Thompson, G. W. Westerfield, and Henry Ritchie,) of Newark, N. J., for Improvement in Padlocks.

Snow Magoun, of Newton, Mass., (assignor to E. N. Moore and C. H. Crosby, of Boston, Mass., for Improvement in Cutting and Bevelling Printers' Rules.)

Jonathan Foreman, of Boston, Mass., (administrator to E. W. Foreman, deceased, late of New-Rochelle, N. Y., and assignor to Henry W. Sears, of New-York, N. Y., for Improvement in Diving Bells.

E. S. Snyder, of Charlestown, Va., for additional Improvement in Machines for separating straw from grain. Original patent dated June 13, 1848.

R. R. Finch, Jr., of New-York, N. Y., for Improvement in Stove Pipe Collar.

Thomas S. Gore, of Jersey City, N. J., for Improvement in Stoves.

Benjamin Irving, of Green Point, N. Y., for Improvement in Steam Boilers. Patented in France, May 12, 1853.

John Krauser, of Reading, Pa., for Improvement in Cider Mills.

O. S. Leavitt, of Maysville, Ky., for Improvement in Hemp and Flax-Breaking Machines.

William H. Mitchel, of Brooklyn, N. Y., for Improvement in Machines for Distributing and Composing Type.

Frederick Nishwitz, of Williamsburgh, N. Y., for Improvement in Grain Harvesters.

Samuel Darling, of Bangor, Me., for Improvement in Grinding and Shaping Metals.

Andrew Ralston, of West Middletown, Pa., for Improvement in Saw Mills.

Stephen B. Ruggles, of Boston, Mass., for Improvement in Machines for cutting Sheet Metal.

Daniel Winslow, of Westbrook, and Perley D. Cummings, of Portland, Me., for Improvement in Paper Files.

Charles Weston, of Salem, Mass., for Improvement in Machines for Splitting Leather.

William Wigston, of New-York, N. Y., for Improvement in Apparatus for Purifying Gas.

Elliot Savage, (assignor to Franklin Roys and Edward Wilcox,) of Berlin, Conn., for Improvement in Machinery for Cutting and Bending Metallic Discs.

Elijah Valentine, of Palmer, (assignor to Abel Bradway, of Monson, Mass.,) for Improvement in Shingle Machines.

James T. Asbury, of Taylorsville, N. C., for Improvement in Straw Cutters.

Philos Blake, Eli W. Blake, and John A. Blake, of New-Haven, Conn., for Improvement in Nut Crackers. Ante-dated March 6, 1853.

James Barnes, of Franklin, N. Y., for Machine for Edging Leather Straps.

Victor Beaumont, of New-York, N. Y., for Improvement in Printing Presses.

Wm. Compton, of New-York, N. Y., for Improvement in Piano-Fortes.

Henry Hunt, of Brooklyn, N. Y., for Improvement in Sealing Preserve Canisters.

Jos. Linder, of New-York, N. Y., for Improvement in Horse Collars.

John Moyle, of Martinsburg, Va., for Improvement in Saw Cutters.

Charles Montague, of Pittsfield, Mass., for Improvement in Printing Presses.

Stephen Meredith, of Erie, Pa., for Improvement in Feed Apparatus to Gas Generators.

James Spratt, of Cincinnati, Ohio, for Improvement in Bottle Fastenings.

W. W. Spafford, of Boston, Mass., for Improvement in Machinery for Planing Metals.

Gideon B. Smith, of Baltimore, Md., for Improvement in Counterfeit Coin Detector.

Henry L. Weeds, of Hannahatchie, Geo., for Improvement in Cotton Gins.

Thomas Warner, of Chicopee, Mass., for Improvement in making Twisted Gun Barrels.

Benjamin Irving, of Green Point, N. Y., for Improvement in Paddle Wheel.

Thomas Allison, of Milton, N. Y., for Improvement in Straw Cutters.

L. H. Davis, of Kennet-Square, Pa., for Improvement in Corn Shellers.

Porter Dickinson, of Amherst, Mass., for Improvement in Corn Shellers.

Stephen Morse, of Springfield, Mass., for Improvement in Iron Car Brakes.

Hiram Sands, of Cambridge, Mass., and Gary Cummings, of West Derby, Vt., for Improvement in Brick Machines.

Samuel H. Turner, of Brooklyn, N. Y., for Improvement in Printers' Ink.

The Plough, the Loom, and the Anvil.

PART I.—VOL. VI. NOVEMBER, 1853. No. 5.

RUSSIAN INDUSTRY.

RUSSIA at the present day is "the observed of all observers." Her position among the monarchies of the old world gives to her an importance which attaches to no other sovereignty on that continent. *What she is to be and to do*, is quite as important an inquiry, to say the least, as *what may be the condition and policy of England*. At the same time, we know less of Russia than of almost any other country. Few travellers, comparatively, have qualified themselves for extensive details, and in several departments of interesting inquiry, our information is very limited. Still, we have in late years quite important and reliable statements of the manners, customs, and institutions of that people, and we may serve a double purpose by presenting some of these to our readers. We may show the connection between variety of pursuit and general progress, as we have so often done with the statistics of other countries, while we also furnish a sketch of no little interest, which shall familiarize our readers with that to which they have not, in general, convenient access. We rely, to a great extent, upon extracts from authors cited by Mr. Carey, in his new work on the Slave Trade, and his remarks in the same connection, while we add information from other sources as we may be able.

"'The industry of Russia,' says a recent American journal, 'has been built up, as alone the industry of a nation can be, under a system of protection, from time to time modified as experience has dictated; but never destroyed by specious abstractions or the dogmas of mere doctrinaires. Fifty years ago, manufactures were unknown there, and the caravans trading to the interior, and supplying the wants of distant tribes in Asia, went laden with the products of British and other foreign workshops. When the present Emperor mounted the throne, in 1825, the country could not produce the cloth required to uniform its own soldiers; farther back, in 1800, the exportation of colored cloth was prohibited under severe penalties; but through the influence of adequate protection, as early as 1834, Russian cloth was taken by the caravans to Kiachta; and at this day the markets of all Central Asia are supplied by the fabrics of Russian looms, which in Affghanistan and China are crowding British cloths entirely out of sale—notwithstanding the latter have the advantage in transportation—while in Tartary and Russia itself British woollens are now scarcely heard of. In 1812 there were in Russia, 136 cloth factories; in 1824, 324; in 1812 there were 129 cotton factories; in 1824, 484. From 1812 to 1839 the whole number of manufacturing establishments in the empire more than trebled, and since then they have increased in a much greater ratio, though from the absence of official statistics we are not able to give the figures. Of the total amount of manufactured articles consumed in 1843, but one sixth were imported. And along with this vast aggrandizement of manufacturing industry and commerce, there has been a steady increase in both imports and exports, as well as of revenue from customs. The increase of imports has consisted of articles of luxury and raw materials for manufacture. And, as if to leave nothing wanting in the demonstration, the increase of exports has constantly included more and more of the products of agriculture. Thus in this empire we see what we must always see under an adequate and judicious system of protection, that a proper tariff not only improves, refines, and diversifies the labor of the country, but enlarges its commerce, increases the prosperity of its agricultural population, renders the people better and better able to contribute to the support of the Government, and raises the nation to a position of independence and real equality among the powers of the globe. All this is indubitably proved by the example of Russia, for there protection has been steady and adequate, and the consequences are what we have described.'—*New-York Tribune.*

The reader, says Mr. Carey, may advantageously compare the following sketch, from the same source, of the present position of Russia, so recently a scene of barbarism, with that already laid before him, of her neighbor, Turkey, whose policy commands to so great an extent the admiration of those economists who advocate the system which looks to converting the whole world outside of England into one vast farm, and all its people, men, women, and children, into field laborers, dependent on one great workshop, in which to make all their exchanges:

'Russia, we are told, is triumphant in the Great (London) Exhibition. Her natural products excite interest and admiration for their variety and excellence; her works of art provoke astonishment for their richness and beauty. Her jewellers and gold-workers carry off the palm from even those of Paris. Her satins and brocades compete with the richest contributions of Lyons. She exhibits tables of malachite and caskets of ebony, whose curious richness indicates at once the lavish expenditure of a barbaric court, and the refinement and taste of civilization. Nor do we deem it of much account that her part of the exhibition is not exclusively the work of native artisans. Her satins are none the less genuine product of the country because the loveliest were woven by emigrants from the *Croix Rousse* or the *Guillotière*, seduced by high wages from their sunnier home in order to build up the industry of the Great Empire, and train the grandsons of Mongol savages in the exquisite mysteries of French taste and dexterity. It matters not that the Exhibition offers infinitely more than a fair illustration of the average capacity of Russian labor. It is none the less true that a people who, half a century ago, were without manufactures of any but the rudest kind, are now able by some means to furnish forth an unsurpassed display, though all the world is there to compete with them.

We are no lover of Russian power, and we have no wish to exaggerate the degree of perfection to which Russian industry has attained. We do not doubt that any cotton factory in the environs of Moscow might be found imperfect when contrasted with one of Manchester or Lowell. We are confident that the artisans of a New-England village very far surpass those of a Russian one in most qualities of intelligence and manhood. Indeed, it is absurd to make the comparison; it is absurd to do what travellers insist on doing—that is, to judge every nation by the highest standard, and pronounce each a failure which does not exhibit the intellect of France, the solidity and power of England, or the enterprise, liberty, and order of the United States.

All that should be asked is, whether a people has surpassed its own previou condition, and is in the way of improvement and progress. And that, in respect of industry at least, Russia is in that way, her show at the Exhibition may safely be taken as a brilliant and conclusive proof.

Russia is powerful, and is becoming more so daily. Why is it so? It is because her people are daily more and more learning the advantages of diversification of labor and combination of exertion, and more and more improving in their physical and intellectual condition—the necessary preliminaries to an improvement of their political condition. Turkey is weak; and why is it so? Because among her people the habit of association is daily passing away as the few remaining manufactures disappear, and as the travelling pedler supersedes the resident shopkeeper.

It is said, however, that Russian policy is unfavorable to commerce; but is not its real tendency that of producing a great internal commerce, upon which alone a great foreign one can be built? That it does produce the effect of enabling her people to combine their exertions for their common benefit is most certain; and equally so that it tends to give her that direct intercourse with the world which is essential to the existence of freedom. The slave trades with the world through his master, who fixes the price of the labor he has to sell and the food and clothing he has to buy, and this is exactly the system that Great Britain desires to establish for the farmers of the world—she being the only buyer of raw products, and the only seller of manufactured ones.

So long as Russia exports only food and hemp, she can trade with Brazil for sugar, and with Carolina for cotton, only through the medium of British ships, British ports, British merchants, and British looms, for she can need no raw cotton; but with the extension of manufactures she needs cotton, which she can draw directly from the planter, paying him in iron, by aid of which he may have machinery. In illustration of this, we have the fact that so recently as in 1846, out of a total consumption of cotton amounting to 310,656 cwts., no less than 122,082 cwts. had passed through British spindles; whereas in 1850, out of a total consumption of more than one half greater, amounting to 487,612 cwts., only 64,505 cwts. had passed through the hands of the spinners of Manchester.

The export of raw cotton to Russia has since largely increased, but the precise extent of increase cannot be ascertained, although some estimate may be formed from the growth of the consumption of one of the principal dyeing materials, indigo; the export of which from England to Russia is thus given in the London *Economist:*

	1849.	1850.	1851.	1852.
Chests,	3225......	4105......	4953......	5175

We have here an increase in three years of almost sixty per cent., proving a steady increase in the power to obtain clothing and to maintain commerce internal and external; directly the reverse of what has been observed in Turkey, Ireland, India, and other countries in which the British system prevails; and the reason of this is, that that system looks to destroying the power of association. It would have all the people of India engage themselves in raising cotton, and all those of Brazil and Cuba in raising sugar, while those of Germany and Russia should raise food and wool; and we know well that when all are farmers, or all planters, the power of association scarcely exists; the consequence of which is seen in the exceeding weakness of all the communities of the world in which the plough and the loom, the hammer and the harrow, are prevented from coming together. It is an unnatural one. Men every where seek to combine their exertions with those of their fellow-men; an object sought to be attained by the introduction of that diversification of employment advocated throughout his work by the author of *The Wealth of Nations*. How naturally the habit of association arises, and how beneficial are its effects, may be seen from a few extracts now offered to the reader, from an interesting article in a recent English journal. In Russia, says its author,

'There does not prevail that marked distinction between the modes of life of the dwellers in town and country which is found in other countries; and the general freedom of trade, which in other nations is still an object of exertion, has existed in Russia since a long by-gone period. A strong manufacturing and industrial tendency prevails in a large portion of Russia, which, based upon the communal system, has led to the formation of what we may term "national association factories."'

In corroboration of this view of the general freedom of internal trade, we are told that, widely different from the system of western Europe,

'There exists no such thing as a trade guild, or company, nor any restraint of a similar nature. Any member of a commune can at pleasure abandon the occupation he may be engaged in, and take up another; all that he has to do in effecting the change is to quit the commune in which his old trade is carried on, and repair to another, where his new one is followed.'

The tendency of manufacturing industry is

'For the most part entirely communal; the inhabitants of one village, for example, are all shoemakers, in another smiths, in a third tanners only, and so on. A natural division of labor thus prevails, exactly as in a factory. The members of the commune mutually assist one another with capital or labor; purchases are usually made in common, and sales also invariably, but they always send their manufactures in a general mass to the towns and market-places, where they have a common warehouse for their disposal.'

In common with all countries that are as yet unable fully to carry out the idea of Adam Smith, of compressing a large quantity of food and wool into a piece of cloth, and thus fitting it for cheap transportation to distant markets, and which are, therefore, largely dependent on those distant markets for the sale of raw produce, the cultivation of the soil in Russia is not,

'In general, very remunerative, and also can only be engaged in for a few months in the year, which is, perhaps, the reason why the peasant in Russia evinces so great an inclination for manufactures and other branches of industry, the character of which generally depends on the nature of raw products found in the districts where they are followed.'

Without diversification of employment, much labor would be wasted, and the people would find themselves unable to purchase clothing or machinery of cultivation. Throughout the empire, the laborer appears to follow in the direction indicated by nature, working up the materials on the land on which they are produced, and thus economizing transportation. Thus,

'In the government of Yaroslaf the whole inhabitants of one place are potters. Upwards of two thousand inhabitants of another place are rope-makers and harness-makers. The population of the district of Uglitich, in 1835, sent three millions of yards of linen cloth to the markets of Rybeeck and Moscow. The peasants on one estate are all candle-makers, on a second they are all manufacturers of felt hats, and on a third they are solely occupied in smiths' work, chiefly the making of axes. In the district of Pashectœ there are about seventy tanneries, which give occupation to a large number of families; they have no paid workmen, but perform all the operations among themselves, preparing leather to the value of about twenty-five thousand roubles a year, and which is disposed of on their account in Rybeeck. In the districts where the forest trees mostly consist of lindens, the inhabitants are principally engaged in the manufacture of matting, which, according to its greater or less degree of fineness, is employed either for sacking or sail-cloth, or merely as packing-mats. The linden tree grows only on moist soils, rich in black *humus*, or vegetable mould; but will not grow at all in sandy soils, which renders it comparatively scarce in some parts of Russia, while in others it grows abundantly. The mats are prepared from the inner bark, and as the linden is ready for stripping at only fifteen years of age, and indeed is best at that age, these trees form a rich source of profit for those who dwell in the districts where they grow.'

We have here a system of combined exertion that tends greatly to account for the rapid progress of Russia in population, wealth, and power.

The men who thus associate for local purposes acquire information, and with it the desire for more; and thus we find them passing freely, as interest may direct them, from one part of the empire to another: a state of things very different from that produced in England by the law of settlement, under which men have every where been forbidden to change their locality, and every where been liable to be seized and sent back to their original parishes, lest they might at some time or other become chargeable upon the new one in which they had desired to find employment, for which they had sought in vain at home. "The Russian," says our author,

'Has a great disposition for wandering about beyond his native place, but not for travelling abroad. The love of home seems to be merged, to a great extent, in love of country. A Russian feels himself at home every where within Russia; and, in a political sense, this rambling disposition of the people, and the close intercourse between the inhabitants of the various provinces to which it leads, contributes to knit a closer bond of union between the people, and to arouse and maintain a national policy and a patriotic love of country. Although he may quit his native place, the Russian never wholly severs the connection with it; and, as we have before mentioned, being fitted by natural talent to turn his hand to any species of work, he in general never limits himself in his wanderings to any particular occupation, but tries at several; but chooses whatever may seem to him the most advantageous. When they pursue any definite extensive trade, such as that of a carpenter, mason, or the like, in large towns, they associate together, and form a sort of trades' association, and the cleverest assume the position of a sort of contractor for the labor required. Thus, if a nobleman should want to build a house, or even a palace, in St. Petersburgh, he applies to such a contractor, (*prodratshnik*,) lays before him the elevation and plans, and makes a contract with him to do the work required for a specified sum. The contractor then makes an agreement with his comrades respecting the assistance they are to give, and the share they are to receive of the profit; after which he usually sets off to his native place, either alone or with some of his comrades, to obtain the requisite capital to carry on the work with. The inhabitants, who also have their share of the gains, readily make up the necessary sum, *and every thing is done in trust and confidence;* it is, indeed, very rare to hear of frauds in these matters. The carpenters (*plotniki*) form a peculiar class of the workmen we have described. As most of the houses in Russia, and especially in the country parts, are built of wood, the number and importance of the carpenters, as a class, are very great in comparison with other countries. Almost every peasant, whatever other trade he may follow, is also something of a carpenter, and knows how to shape and put together the timbers for a dwelling. The *plotniki* in the villages are never any thing more than these general carpenters, and never acquire any regular knowledge of their business. The real Russian *plotniki* seldom carries any other tools with him than an axe and a chisel, and with these he wanders through all parts of the empire, seeking, and every where finding, work.'

The picture here presented is certainly widely different from that presented by Great Britain and Ireland. A Russian appears to be at home every where in Russia. He wanders where he will, every where seeking and finding work; whereas an Irishman appears hardly to be at home any where within the limits of the United Kingdom. In England, and still more in Scotland, he is not acknowledged as a fellow-citizen. He is *only an Irishman*—one of those half-savage Celts intended by nature to supply the demand of England for cheap labor; that is, for that labor which is to be rewarded by the scantiest supplies of food and clothing. The difference in the moral effect of the two systems is thus very great. The one tends to bring about that combination of exertion which every where produces a kindly habit of feeling, whereas the other tends every where to the production of dissatisfaction and gloom; and it is so because that under it there is necessarily a constant increase of the feeling that every man is to live by the taxation of his neighbor, buying cheaply what that neighbor has to sell, and selling dearly what that neighbor has to buy. The existence of this state of things is obvious to all familiar with the current literature of England, which abounds in exhibitions of the tendency of the system to render man a tyrant to his wife, his daughter, his horse, and even his dog. A recent English traveller in Russia presents a different state of feeling as there existing. 'The Russian coachman,' he says—

'Seldom uses his whip, and generally only knocks with it upon the footboard of the sledge, by way of a gentle admonition to his steed, with whom, meanwhile, he keeps up a running colloquy, seldom giving him harder words than "*My brother—my friend—my little pigeon—my sweetheart.*" "Come, my pretty pigeon, make use of your legs," he will say. "What, now! art blind? Come, be brisk? Take care of that stone, there. Don't see it?—There, that's right! Bravo! hop, hop, hop! Steady boy, steady! What art turning thy head for? Look out boldly before thee!—Hurra! Yukh! Yukh!"

'I could not,' he continues, 'help contrasting this with the offensive language we constantly hear in England from carters and boys employed in driving horses. You are continually shocked by the oaths used. They seem to think the horses will not go unless they swear at them; and boys consider it manly to imitate this example, and learn to swear too, and break God's commandments by taking his holy name in vain. And this, while making use of a fine, noble animal he has given for our service and not for abuse. There is much unnecessary cruelty in the treatment of these dumb creatures, for they are often beaten when doing their best, or from not understanding what their masters want them to do.'

The manner in which the system of diversified labor is gradually extending personal freedom among the people of Russia, and preparing them eventually for the enjoyment of the highest degree of political freedom, is shown in the following passage. 'The landholders,' says the author before referred to—

'Having serfs, give them permission to engage in manufactures, and to seek for work for themselves where they like, on the mere condition of paying their lord a personal tax, (*obrok.*) Each person is rated, according to his personal capabilities, talents, and capacities, at a certain capital; and according to what he estimates himself capable of gaining, he is taxed at a fixed sum as interest of that capital. Actors and singers are generally serfs, and they are obliged to pay *obrok* for the exercise of their art, as much as the lowest handicraftsman. In recent times the manufacturing system of Western Europe has been introduced into Russia, and the natives have been encouraged to establish all sorts of manufactures on these models; and it remains to be seen whether the new system will have the anticipated effect of contributing to the formation of a middle class, which hitherto has been the chief want in Russia as a political state.'

That such must be the effect cannot be doubted. The middle class has every where grown with the growth of towns and other places of local exchange, and men have become free precisely as they have been able to unite together for the increase of the productiveness of their labor. In every part of the movement which thus tends to the emancipation of the serf, the government is seen to be actively coöperating, and it is scarcely possible to read an account of what is there being done without a feeling of great respect for the Emperor, 'so often,' says a recent writer, 'denounced as a deadly foe to freedom—the true father of his country, earnestly striving to develop and mature the rights of his subjects.' "*

In 1827, an imperial *ukase* put an end to the unlimited sale of the serf as a mere chattel, and declared him an integral and inseparable part of the soil. Another and subsequent *ukase* permitted him to enter into contracts, with power to hold property.

"The free peasants as yet constitute a small class, but they live

'As free and happy men, upon their own land; are active, frugal, and without exception, well off. This they must be, for considerable means are necessary for the purchase of their freedom; and, once free, and in possession of a farm of their own, their energy and industry, manifested even in a state of slavery, are redoubled by the enjoyment of personal liberty, and their earnings naturally increase in a like measure.

'The second class, the crown peasants, are far better off (setting aside, of course, the consciousness of freedom) than the peasants of Germany. They must furnish their quota of recruits, but that is their only material burden. Besides that, they annually pay to the Crown a sum of five roubles (about four shillings) for each male person of the household. Supposing the family to include eight working men, which is no small number for a farm, the yearly tribute paid amounts to thirty-two shillings. And what a farm that must be which employs eight men all the year round! In what country of civilized Europe has the peasant so light a burden to bear? How much heavier those which press upon the English farmer, the French, the German, and above all the Austrian, who often gives up three fourths of his harvest in taxes. If the Crown peasant be so fortunate as to be settled in the neighborhood of a large town, his prosperity soon exceeds that even of the Altenburg husbandmen, said to be the richest in all Germany. On the other hand, he can never purchase his freedom; hitherto, at least, no law of the Crown has granted him this privilege.'—*Jerrmann*, p. 156.

We are told that the policy of Russia is adverse to the progress of civilization, while that of England is favorable to it, and that we should aid the latter in opposing the former. How is this to be proved? Shall we look to

* Pictures from St. Petersburg, by E. Jerrmann, p. 22.

Ireland for the proof? If we do, we shall meet there nothing but famine, pestilence, and depopulation. Or to Scotland, where men, whose ancestors had occupied the same spot for centuries, are being hunted down that they may be transported to the shores of the St. Lawrence, there to perish, as they so recently have done, of cold and of hunger? Or to India, whose whole class of small proprietors and manufacturers has disappeared under the blighting influence of her system, and whose commerce diminishes now from year to year? Or to Portugal, the weakest and most wretched of the communities of Europe? Or to China, poisoned with *smuggled* opium, that costs the nation annually little less than forty millions of dollars, without which the Indian government could not be maintained? Look where we may, we see a growing tendency towards slavery wherever the British system is permitted to obtain; whereas freedom grows in the ratio in which that system is repudiated.

That such must necessarily be the case will be seen by every reader who will for a moment reflect on the difference between the effect of the Russian system on the condition of Russian women, and that of the British system on the condition of those of India. In the former there is every where arising a demand for women to be employed in the lighter labor of conversion, and thus do they tend from day to day to become more self-supporting, and less dependent on the will of husbands, brothers, or sons. In the other the demand for their labor has passed away, and their condition declines; and so it must continue to do while Manchester shall be determined upon closing the domestic demand for cotton, and driving the whole population to the production of sugar, rice, and cotton, for export to England.

The system of Russia is attractive of population, and French, German, and American mechanics of every description find demand for their services. That of England is repulsive, as is seen by the *forced* export of men from England, Scotland, Ireland, and India, now followed by whole cargoes of women* sent out by aid of public contributions, presenting a spectacle almost as humiliating to the pride of the sex as can be found in the slave bazaar of Constantinople."

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

CROPS AT THE SOUTH.

Messrs. Editors:—In compliance with your request, I now seat me, whilst in at noon, to give you an article for your paper, which, as the spirit moves, will be followed by an occasional article. I now give you some data and inferences as to the present year's crops. The data are sure and reliable. The inferences are my own, given for what they are worth. I have made on this place twenty-three crops, settling on this spot in January, 1831. I began the agriculturist's life by keeping notes of my daily business, and do so now. I began to read agricultural works when I settled here, and so continue. My first article for the press was written 8th of November, 1832, my last is now in hand.

Thus much for myself, that your readers may have some sort of hint who

* The cargo of a ship that has recently sailed is stated to have consisted of more than a thousand females.

the writer is. I am indebted for all I know to agricultural works, and close attention in the plantation; and just here, I beg to say I superintend, usually, all the work on the plantation, not giving orders to my foreman, and sitting in the shade whilst those orders are being executed. I am out with my hands, rain or shine, hot or cold.

There is prevalent an opinion that this crop will be full, or perhaps even over that of the last. That persons interested in the purchase of cotton and of cotton goods may have data, I offer the following as facts which cannot be denied:

The season from 1st March to date, has been a succession of droughts and deluges of rain. By the time the plant would fully recover from too much rain, there would be another wet spell.

All persons conversant with a cotton crop know that extremes do more to destroy a planter's hopes than aught else.

I had more cotton planted in 1852 on 1st of April than I had this year on the 10th. The season had been so wet up to the 10th, that I had to plant old ground too early, and then, when I could plant my new ground, it was too late for a fall crop. The rot began rather earlier than usual last year, but to date, not as bad as when at its worst; say ten days later. To date last year, I had gathered and ginned two bales of cotton per hand, whilst now I have not one bale picked, barely three-fourths, per hand, and none ginned. Last year at this date I was picking full weights. For four days past I have been doing so, but this evening I have not done half work, and the prospect is so for many days. Six of my best hands gathered yesterday—a dry day, and the first this week—1982 lbs., which they could have done at least in half the time last year. For a week at least, I have no idea I can average, with same hands, 2000 lbs. each. The crop on good land is at least two weeks later, on upland rather earlier, yet the bolls are exceeding small on all land. I have heard two others remark that the bolls are smaller and more difficult to pick than they ever knew of before.

Again, our season last year was remarkably fine for ripening and for picking. Many of us were disappointed in our crops, owing to cotton maturing later than usual. Our first nipping frost was 8th of November; the first ice, on the 15th. I have known ice here on 5th and 6th October.

We have already had more rain and more rainy days than we had last fall altogether. This season is more like 1843 than any year I remember. We have had very many heavy, washing rains.

These are facts which I think no one will deny. And to close up this statement in regard to this place, I had in cotton last year $9\frac{2}{3}$ acres per hand, and a fraction over; this year, a fraction under 8 acres.

I now give my inferences, and let them go for what they are worth. If this place is a criterion, it would be very difficult, with present prospects and ordinary seasons, to gather the crop made last year. My crop was 9 bales per hand. I would like to know who could gather 8 bales, after this, in ordinary years.

I have not seen much of the growing crop; have heard something; and judging from the light before me, I know of no neighborhood making a crop equal to last year. The rot seems to be more extended, and the boll-worm to be as bad as usual.

My own crop was fine, until the wet weather in July, and yet it was almost as good in August, after the dry weather set in. But the drought, following so much rain, caused a cast of much of the young fruit. The rot, as I said, is not as bad as last year, but we have ten days yet for it to run its course. The boll-worm is not as bad here as usual. Yet, with a good season, and as late as last year, I cannot make the crop of last year, nor can it grade as high. We should now be gathering our fine cotton, whereas it is any thing else. I will readily pay $1 per bale to any insurance office that will insure me 8 bales per hand, and I will double it for 9 bales. I believe now I would make money by paying $2 per bale for 8. Then apply my case to the entire crop, and there will be a decrease of one ninth certain: 9÷3,200,010=355,555 less, and the crop would be 2,850,000 bales. I conclude that the crop will not exceed 2,800,000 bales. If my facts are right, and this place a fair criterion, I think I will be borne out in my inferences. Many think the supposed deficit of 700,000 bales much too large. I would be willing to meet half way.

Yours, with respect, M. W. PHILIPS.

Edwards, Miss., Sept. 16, 1852.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

A FEW DAYS IN CANADA WEST.

THE traveller, on arriving in Hamilton, Canada, will readily notice the great difference between the cities of Canada and of the United States. The buildings in Hamilton are quite scattering, not having the neatness and splendor of those in the cities of the United States, although the city contains a number of large and firm buildings. The city stands one and a half miles from the bay, the ground descending gradually from the city to the lake. The city is built on a diluvial formation, which between the city and the water is of great thickness. The excavation near the city for the Great Western Railroad is one hundred feet deep. The skeleton of a mammoth has been found near Hamilton, seventy feet from the surface.

The price of produce on the 5th of August was, wheat, $1,00; corn, 50c.; oats, 62½c.; butter, 16c.; cheese, 9c.; horses, from $20 to $150.; oxen, from $85 to $100 per yoke; cows, $25. It is singular to notice the great difference in prices in Canada of produce within a few miles, often 15 or 20 cents in a bushel of grain. The price of grain and cattle in Canada for the last year or two is nearly as high as in the State of New-York. Formerly the price of wheat was from five to six shillings, and other produce in proportion. The inhabitants of Wentworth, Halton, and Brant counties make much reckoning on the Northern Railroad, running from Lake Huron and intersecting our road near the Falls, and the Western Railroad, beginning opposite Detroit, in Michigan, and terminating in the same region as the Northern Road does. One of these roads—I am not certain which—crosses the Niagara at the upper suspension bridge. The Canadians are calculating that these roads will transport the larger part of the produce of the West. These it is thought will be finished in the early part of next summer. A large number of droves of cattle from the West are driven through Canada annually, making the route to the East much nearer.

The only hill that I noticed in Canada was back of the city of Hamilton. This hill is noticed from the stage-road from Brantford, five or six miles. The Medina sandstone is seen cropping out of the side of the hill back of the city; and the limestone of the Clinton group is seen cropping out about half way between Hamilton and Brantford. I understand that gypsum, or plaster, is found in two places along the Grand River, between Brantford and Paris, and also a short distance above Paris. Almost the whole country appears one great diluvial formation of vast thickness, with scarcely any stone or gravel, with the exception of a few boulders of granite and some of the northern limestone. These boulders are drilled and blasted for underpinning for buildings. The soil, in the parts I visited, is clayey, very deep, and well adapted to wheat. Often 40 bushels per acre are raised. Although Scobie in his Almanac and Register puts the wheat crop of the Province at only 20 bushels per acre, I was informed by my uncle that he had often raised over 40 bushels per acre. His wheat, and that of his neighbor, Mr. D. Christie, yielded over 30 bushels per acre. Mr. Christie, the present member of Parliament for Wentworth District, took the premium at the World's Fair, in London, on blue-stem wheat, and the year after at the Provincial Fair at Toronto. Mr. Christie had the kindness to show me his medals and certificates for prizes on wheat. The varieties of wheat raised, as far as I could learn, were blue-stem and Soland, and a beautiful variety of spring wheat lately from Scotland. The oat crop, in many parts that I visited, was quite short, in consequence of a drought, the most severe they ever have experienced. The oat crop, notwithstanding the drought, was large with many farmers. The variety raised is the Black Maine. A large amount of barley is raised in Canada, which yields largely, and is generally worth from 45c. to 50c. a bushel. There is not much corn raised in Canada; it is a large farmer that raises 10 acres of corn. The grass crop was very large in Canada, yielding generally two tons per acre. The crops are generally half clover and half timothy. Buckwheat is not much raised, but what I noticed was very fine. In general, the barns in Canada were better filled than any barns that I have seen in a number of years.

ROBERT HOWELL.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

THE FARM-HOUSE.

MUCH has been written, of late, on the style of architecture best adapted to the wants of the farmer and mechanic. A great change has been effected in the aspect of the farming districts. Neatly-painted cottages are taking the place of weather-beaten, barn-like rookeries. Painted paling fences enclose house-plats and gardens where, before, there was no fence, or but a rude one.

Yet what has been done is but a beginning of what might and ought to be done. Why should not every farm-house be characterized by neatness and good taste? It is not for want of means, certainly. The farmers of our country are as well able to occupy, not only good and commodious houses, but expensive houses, as any other class in community. The cottages of the English peasants are remarkable for their neatness and display of correct taste. Cannot the yeomanry of America, tilling their own soil and sleeping beneath their own roofs, do as much and far more?

But I have entered upon a broad field, and shall not attempt to roam over the whole of it. I will take, as a starting-point,

Fruit and ornamental trees and shrubbery for the farm, not pledging myself, however, to be confined to this topic, for I shall be likely to rove wherever fancy leads me.

Where do we more naturally look for fruit and ornamental trees than about the farm-house? Who can better afford them than the tiller of the soil?

Is it not a notorious fact, that professional men and mechanics do far more in this line than farmers? Those whose business it is to cultivate the soil and mature its products, should, of all men, be most practically conversant with its productions, and their grounds should exhibit a liberal display of their own handiworks.

Go into the shop of an artisan, and you will find specimens of his artistic skill. The studio of the artist is lined and decorated with the productions of his genius. Why then should not the tiller of the earth, who possesses advantages greater than they all, having the Great Architect to second his plans and crown his labors—why should not he surround his dwelling with specimens of his taste? Why not environ his home, and the home of his offspring, with that which will ever associate, in their memories, the word *Home* with all that is agreeable to the eye, the ear, and the palate?

Now this is practicable with every man who possesses a freehold even of but one acre.

I will explain, first negatively, then affirmatively.

Home was never made "*sweet home*" by allowing the pigs to be tenants at will on the whole plantation. A more unsightly, unseemly and unsavory, and, withal, thriftless practice, was never indulged in, than that of allowing swine to run lawless over one's premises. It is death to every thing verdant and comely, and life to nothing but cockroaches and fleas, and other tenants of filth.

"A place for every thing, and every thing in its place," should be every body's motto. The place for pigs is in their "quarters," which is, either the pigsty, or, at certain seasons, in a field to which they should be confined.

The pig belongs to the working class; and, if properly cared for, will do enough to pay his way. Let him have earth, peat, or muck, a fresh supply once a week, and he will make manure enough to pay his keep, and, at the same time, *keep* out of harm's way.

Not by making the grounds about the house the repository of wagons, old and new; carts, wheelbarrows, sleds, sleighs, and sledges; ploughs, harrows, and drags; wood, rails, posts and boards, and every conceivable article of husbandry or agricultural mechanism, all pitched and tumbled in every which way, so as to exemplify the idea of "confusion worse confounded."

The human mind naturally loves order. When, in the mind of a child, the idea of home is indissolubly connected with that of disorder, the remembrance is never cherished with fondness.

Not by suffering buildings to go to decay, roofs to remain in a leaky condition, windows to be in such a state as to require drafts upon the wardrobe, or permit the foxes to look out at them; fences reeling and staggering like drunken men; fruit trees dying, and falling without being replaced by young ones, and every thing indicating the sere and fallen leaf of neglect and decay. Such things chill the youthful blood and alienate the affections from home.

But home is rendered dear by making it agreeable to the eye. Let the highway, or the path leading to the house, be lined with shade trees. The cost is but the labor of setting and a little attention afterwards. What farmer could not line the roadside, an eighth of a mile each way from his house, with forest trees, and be not one cent the poorer for it? What an air of comfort it would give to the establishment! How grateful the shade to the weary traveller in a sultry day! How oft will a blessing be invoked upon the head of the proprietor by the passing stranger! Then, viewed in the light of economy, who that might wish to purchase, would not gladly pay ten-fold the cost of such trees?

I have a buttonwood standing a few yards from my house. The body of it measures twenty-five feet in circumference, and it rises full one hundred feet in height, spreading its Briarean arms over an area of as many feet in diameter. Tradition says that it was originally a stake to which horses were tied. Every farmer may have many such on or near his premises, by simply driving the *stakes*.

In no way, perhaps, can this object be attained more directly than by planting fruit trees.

Professional men, retired tradesmen, and gardeners plant fruit trees and raise fruit in variety and abundance. But how is it with the great mass of farmers? To such I would address myself more particularly. Have you an abundance of fruit, and a good variety? One cherry tree, one pear tree, and a few apple trees, don't constitute a variety, nor will they yield an abundance. Yet multitudes of farmers, "well to do in the world," can't boast even that much.

Now, my idea for a proper supply of fruit for an ordinary family, and what I know to be within the compass of every farmer, is something like the following:

1st. A good supply of currant and gooseberry bushes, different varieties, enough to furnish the family both green and ripe, give to the poor of the neighborhood, and let the birds have a plenty, to make sauce for all the worms they have eaten.

These bushes should be kept clean from grass, and be thoroughly pruned every spring. They do best when confined to one stem, tree-like.

2d. A liberal strawberry bed, covering at least from six to ten square rods. If the dwellers in cities and towns can afford to pay the gardener for growing, picking, and marketing his berries, surely the farmer can well afford to pick and eat his own. What family would be rendered less amiable or less happy by having a quart of fine ripe strawberries upon the table every day for six weeks? They are as easily raised as potatoes.

Not less than ten cherry trees, with as many varieties, will suffice. Varieties should be selected which ripen at different times, that there may be a supply during the whole season of cherries. If cherries are palatable and wholesome one week, why not have them eight? What more pitiably ludicrous, than to see a family in possession of two hundred acres of land, struggling to protect their *only* cherry tree from the birds, who innocently claim a moiety of the fruit! To one limb is attached a cow-bell; to another, a wind-mill; to another, a looking-glass; to another, a red flannel skirt; to another, a kettle of burning brimstone; while the whole tree is enveloped in an old fishing-seine, and the family are marshalled around, one with an old fowling-piece, another with a bow and arrow, another with a tin horn, and the mother with a broom, to drive away the "pesky" birds! Better far to raise enough for both men and birds. For "the birds of heaven shall vindicate their grain" and cherries too.

So of plums. Provide liberally. Don't be disheartened at the sight of the blotch, or the curculio, or both. Apply the pruning-knife, and burn the parts diseased. Shake off the *warments*, and labor to exterminate. Apply salt freely, and let the old hen, with her chicks, have free access to the trees.

Of peaches, stop not short of *twenty* or *thirty*, with varieties that will be ripening from the time of the early rareripes to that of the latest fall peach.

I am still more convinced of the correctness of the views I advanced through the *Plough, Loom, and Anvil*, some months since—that, to obtain a hardy and long-lived peach tree, we must raise it from the seed; and that the stone of a peach from a seedling is little, if any, less certain to produce its like, than is Indian corn.

When the yellow leaf appears in midsummer, and the fruit matures prematurely, grub up the tree, and commit it, with its branches and fruit, to the flames. On this subject more anon. R. B. H.

VERMONT AGRICULTURAL FAIR.

The account of this Fair is thus given by the editor of the Boston *Cultivator:*

"The horse department was, of course, the most attractive. This was not equal to that of last year at Rutland, but still comprised many excellent horses. By the regulations of the Society, they were divided into five different classes, each of which had a separate list of premiums, viz.: the descendants of the Sherman, Woodbury, and Bullock Morgans, crosses of these families, and all horses of "other blood." All entered in these different classes were driven around a half mile circle in separate parties, the judges in each class being seated for observation on an elevated stand prepared for the purpose, and the animals were afterwards minutely inspected individually.

Some of the most popular horses in the State were not exhibited, owing to the indisposition of their owners; but there were good ones in each of the classes, and the public were gratified with the sight of some noted patriarchs in the Morgan family, who, according to the nature of horses, must soon pass that bourne from which even the best *travellers* cannot return. Among these was the "Steele Morgan," for many years owned by Solomon Steele, Esq., of Stanstead, Canada East. This animal, as we were informed by Mr. Steele, was thirty years old on the twelfth of May last, and on that day trotted a measured half mile, in the presence of six witnesses, in a fraction less than two minutes. He must have been a horse of uncommon constitution; and I am told that his progeny are held in high estimation along the line in the vicinity of Derby, Stanstead, etc. Another famous old horse was the "Putnam Morgan," got by the "Woodbury Morgan." He is twenty-six years old; is owned by D. W. Cowdery and others, of Tunbridge, Vt. He has been a horse of remarkable compactness and muscular development, and the sire of valuable stock.

In the Sherman class of Morgans were some fine horses of various ages, got by Black Hawk, Comet, and others; but my engagements on a committee prevented me from such particular examinations as would otherwise have been made. My attention was specially called to a horse owned by L. North, of Champlain, N. Y. He is eight years old; was formerly known as the "Myrick Colt;" got by Black Hawk. Another horse in the same class, owned by S. C. Hall & Co., of Manchester, N. H., deserves mention in this connection. He is ten years old; stated to have been by Black Hawk, from a mare partaking of Morgan and Messenger blood. Both these are powerful horses, and drew many encomiums from those who witnessed their action.

Among the "Woodburys," the chestnut horse of J. & R. C. Johnson, Bradford; the bay of E. Pike, of Cornish, N. H., and others whose owners' names I had no means of ascertaining, were deserving of notice.

Of the "Bulrushes," the bay horse, five years old, owned by E. Pike, of Cornish, N. H., was a very good specimen. He inherits the blood on both sides, with many of the points which denote the serviceable qualities for which that family is distinguished.

A bay horse, seven years old, owned by John Chapin, of Greenfield, Mass.—said to have been got by "Green Mountain Morgan," dam of the Sherman branch in the second generation—was a fine figure, and evidently a valuable animal.

I had not the opportunity of ascertaining the names of the owners of several fine mares.

Cattle were not largely exhibited, and of those I saw, the standard of merit could not be said to be very high. The farmers of Vermont do not seem to have studied this class of animals very much. As the rearing of cattle constitutes an important branch of husbandry with them, it is singular that it should not receive more attention. There were several bulls on the field which appeared to belong to the Short-horned breed, but in general they were coarse, hard-fleshed animals. There were a few good Herefords, among which was a bull owned by D. N. Briggs, of Richmond, and the cow "Fanny," and a yearling bull from her, owned by A. L Bingham, of Cornwall. Of Devons, William R. Sanford, of Orwell, exhibited several fine animals, some of which were imported. Several bulls in this class were worthy of notice, but their owners are unknown to me.

In sheep, of the Merino class, the show was very good. Of the Spanish, there was a large delegation from the celebrated flocks of E. Hammond, Middlebury, which did him great credit. Good specimens were also shown by Messrs. Sanford, of Orwell; Campbell, of West Westminster, and others. Mr. Eastman, of Rupert, showed several sheep under the name of "Montarcos," which appeared to possess considerable uniformity of fleece; the staple being tolerably fine, soft, and much crimped. Of the French, the leading exhibitors were Jewett, Morse & Co., of Middlebury, and A. L. Bingham, of Cornwall. Each of these lots comprised one hundred or over. Both were in good condition, and most of them were superior specimens of this popular kind of sheep. Of the Silesian, William R. Sanford, of Orwell, and George Campbell, of West Westminster, showed beautiful specimens. Messrs. S. & C. state that every year's experience with these sheep increases the estimate of their value. A few lots of English sheep were exhibited, but those I saw were not well bred.

The show of swine did not amount to much, either as to numbers or quality, taken as a whole. I noticed a lot of very handsome Suffolks, bred and owned by Mr. Whiting, of Woodstock.

The display of fruits was much smaller than at Rutland last year, but comprised a few good specimens of apples, pears, etc.

The display of implements was smaller than that of last year; and, so far as I noticed, comprised nothing particularly novel.

There was a respectable display of manufactured and fancy articles, and some very nice things were shown in this department."

AGRICULTURE OF MONROE COUNTY, N. Y.

This county is said to produce more wheat than any other county in the United States. The following has been stated to be an accurate account of its production:

In 1845 it was 1,338,585 bushels; in 1850, 1,441,653. To produce the wheat crop of this county in 1845, 68,383 acres were harvested; showing an average yield of a fraction less than twenty bushels per acre. Most farmers believe that this average has been considerably increased since, and the opinion appears to be well founded.

The corn crop of 1845 was 453,463 bushels; that of 1850 was 767,021. Increase in five years, 313,558. The oat crop of 1845 was 538,063; that of 1850, 449,150. Decrease, 88,913 bushels. Potatoes, in 1845, 667,491; in 1850, 561,425. Decrease, 106,066 bushels. Barley, in 1845, 57,102; in 1850, 106,049. Increase, 48,947 bushels. These facts show that the cultivation of barley had advanced nearly 100 per cent.

Rye, in 1845, 3,198; in 1850, 8,148. Increase, 4,950 bushels.

Beans, in 1845, 4,271; in 1850, 8,215. Increase, 3,944 bushels.

Peas, in 1845, 66,341 bushels. [Number not given in the census of 1850.]

Buckwheat, in 1845, 31,149; in 1850, 26,306. Decrease, 4,843 bushels.

Hay, in 1850, 62,602 tons. [Crop of 1845 not given.]

Milch cows, in 1845, 19,590; in 1850, 14,201. Decrease, 5,381. In 1845, the butter returned was 1,504,337 pounds; of cheese, 366,782. In 1850, butter, 1,258,735; cheese, 286,653.

Sheep, in 1845, 173,952; in 1850, 112,297. Decrease, 61,655.

Horses, in 1845, 16,811; in 1850, 13,576. Decrease, 3,235.

Number of swine, in 1845, 48,493; in 1850 it was 31,201. Decrease, 17,292. Taken in connection with the fact that the corn crop had increased more than three hundred thousand bushels, this falling off of over seven thousand hogs in the county is unaccountable.

Number of neat cattle, not cows, in 1845, 19,715; in 1850, the number was 18,168. Decrease, 1,547.

Value of farm implements and agricultural machinery, in 1850, $782,833. This is a larger sum than any other county in the State returned at the last census.

Pounds of wool, in 1845, 402,926; in 1850, 365,084. Decrease, 37,842. It is worthy of notice, that while the number of sheep has decreased 61,655, the decrease in wool bears no comparison to that in sheep.

THE APPLICATION OF PERUVIAN GUANO TO COTTON.

The following article was contributed by Mr. J. M. Dantzler, of St. Matthew's Parish, to the *Southern Agriculturist.* It is upon a subject of great interest to Southern planters, who have generally supposed that guano was not adapted to the condition of their soils. This statement throws light on that point. The experience of others ought also to be published. We invite our numerous Southern readers to give us more information upon it.

Messrs. Editors: For the benefit of my brother planters, you will allow me a short space in your valuable journal, to give the result of my experiment with Peruvian guano as applicable to cotton. I will confine myself simply to a statement of facts.

In the spring of '52, I procured a little over a ton of guano, and applied two hundred and fifteen pounds to the acre. Not unfrequently plaster of Paris is mixed with it in the proportion of one eighth or one fourth ; but in order to test accurately the additional product of the land, unaided by any thing else, I mixed only with sand. This was done also to render its application more uniform.

The land upon which this experiment was made, was originally what might be termed lively, sandy, long-leaf pine land—the clay about eighteen inches from the surface—adjoining rich, rolling oak and hickory land. The field was cleared thirty-five years ago, and was completely exhausted by continued cultivation. It, however, had four years' rest previous to the experiment, and had produced a scanty crop of poor grass. This was burnt off in January, and the land broken up with a shovel-plough immediately afterwards.

Late in April, the rows were drawn off with a shovel-plough, pretty deep, and in these furrows the mixture of sand and guano was strewn, leaving out an acre about the centre to be planted without guano, which I and my manager, who is a man of excellent judgment, thought to be of the same quality as the rest. Beds were thrown up by passing on either side with the same plough, and the cotton was planted in chops about twelve inches apart.

The effect of the guano was manifest by the time the cotton was a week old, and was most marked during the whole season ; and the yield was astonishing. The acre without guano, and an average acre of the guanoed, were gathered carefully in good weather, and weighed when picked out, and the former produced 135 pounds of seed-cotton, whilst the latter produced 581 pounds. All will admit that the land was poor enough for an experiment of this sort. It will be ascertained that the guanoed acre produced 446 pounds more than the unguanoed acre ; and if three pounds of seed will make one of clear cotton, you will have 148 pounds of clear cotton, which, if valued at 8 cents per pound, is worth $11 84. The additional cotton seed I value at $1 as manure, making the total product of the guano $12 84. Deduct from this the cost of the guano applied to the acre, which was $6, and it will give $6 84 as the net gain. This is over a hundred per cent. on the amount expended in guano.

Nor is this all: It has certainly left the land in an improved condition, if present appearances are not deceptive. It is now at rest, and the growth of vegetation on it, up to this time, is as marked this year as that of the cotton was last. This is no small item in estimating its value ; and I go so far as to affirm that it would be economy to use it, if the overplus of cotton only remunerated you for the cost of the guano. The improvement to the land, and the labor saved in the cultivation of less land to the hand, in order to produce a given crop of cotton—added to the advantages derived from resting the land, which would otherwise be planted—will far more than repay for the trouble of putting down the guano.

I have five tons this year, which I will apply in the same manner, and hope to be enabled to give you as favorable an account of it.

I have been thus particular, Messrs. Editors, in order to give sufficient data to all to draw their own conclusions.

J. M. Dantzler.

St. Matthew's Parish, La.

COTTON-GROWING: AN EXPERIMENT.

The following experiment is published, first, for its own worth, and, secondly, for the sake of the example. We invite. and not only invite, but would urge our friends at the South to multiply statements of this sort. This is found in the *Southern Cultivator.*

"Some time during the month of February, in the spring of 1848, I had a small piece of ground (4 acres) broken up with a turning-plough in the ordinary way, covering up corn-stalks, pea-vines, and other litter pretty effectually. The quality of the land was tolerably good, capable of producing from 800 to 1,000 pounds of cotton per acre, of a seasonable year. On the first of April, I had it bedded up thoroughly, rows 5 feet apart, and planted on the 5th, having previously rolled the seed in ashes. As soon as the third and fourth leaves made their appearance generally through the field, I had it 'barred off' with the same turning-plough, running the bar next to the cotton, two of my best and most experienced hoe-hands following and chopping it in bunches, as near the distance of 18 inches as they could conveniently. It remained in this situation for eight or ten days, when I again had it "sided" with sweeps, running pretty close to the cotton and throwing a little dirt among it. The sweeps were followed by the hoes, this time chopping out *every other bunch,* making it *three feet* in the drill, and thinning out the remaining bunches to two or three stalks. I then had the middles deeply and well broken out with shovel-ploughs, running from six to seven furrows in a row. In a few days after, it was put to a stand—one stalk in a place. The after cultivation was with sweeps, hoes generally following to cut any stray weeds or grass that had sprung up among the cotton. The only difference in the management of this cotton from that usually pursued by planters, was the distance it stood apart in row and drill. Taking into consideration the quality of the land, it looked like I would hardly be able to make more than half a crop; and I assure you I felt somewhat crest-fallen in looking over my 'patch' after it had been put to a stand—it looked so 'few and between.' The season turned out to be a very favorable one for the crops generally in our immediate section of country, and fine cotton crops were made.

Now for result of this, my first experiment. The *first* picking, I gathered 1,348 lbs.; *second* picking, 2,236 lbs.; *third* and last picking, 2,044 lbs.; making in all 5,628 lbs., or 1,407 lbs. per acre. In the growth of this cotton I noticed one or two things worthy of note; the first was, it branched much nearer the ground, and the limbs were much larger than on cotton planted in the usual way; some of them being as large as the parent stem, and when straightened up were equally as tall. The next thing that attracted my attention was the increased size of the boll. It was fully a third larger than on my other cotton planted in an adjoining field; and lastly, though not of minor importance, it all opened and was gathered by the 10th of December. I attributed its early maturity to the free access of the sun and the free circulation of air, as the limbs barely interlocked between the rows. The yield of my other cotton—planted 4 feet by 15 to 20 inches in drill—was 1,038 lbs per acre.

I have another 'patch' of eight acres the present season, planted in the same way as the other, that is, 5 feet rows, and 3 feet in drill; and if it will be of any interest to the readers of the *Cultivator* to know how it turns out, I will give it to them this winter or early in the spring, provided you will give me access to a small corner of the *Cultivator.*

Yours, respectfully, A Small Planter."

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

SAVING OF MANURES.

Messrs. Editors:—We have alluded, in a former number, to the waste of manure in cities. In that article, our remarks were principally confined to a single item. There are many other sources of this waste, more than we can well particularize, which the health of the population and the fertility of the country require should be remedied. We say, the health of the people. The denizen of the city, who scarcely ever enjoys one of the greatest blessings, the pure, fresh air of the country, is little aware of the nuisance he inhales into his stomach and lungs at every breath, especially in the warm season, when decomposition and evaporation are in vigorous action on a thousand subjects. But let one unaccustomed to the pent-up air and decaying nuisances of the town, be transferred from the pure breezes of the country to such an atmosphere, and the effect upon the system soon manifests itself, and too often results in disease. In view of these facts, he ceases to wonder at the excessive mortality of the city, especially among infants and children. The air is unnatural and unhealthy; and instead of wondering that so many die, he may well wonder that any live.

Now, the miasmatic influence of this atmosphere may in a great measure be remedied, and the cause of it turned to valuable account, inasmuch as it arises from the putridity of matter passing off by decay, which, if it were carefully removed to the country, before this decay commenced, would become valuable, by giving fertility to the earth and plenty to its inhabitants.

What immense amounts of manures are constantly poisoning the air by the putridity that arises from privies, drains, where every thing is thrown in confused masses, sewers, the grand receptacles of drains, perishable substances thrown into the streets, including the waste and refuse of places of business! All this, if carried into the country, would not only lose its miasmatic influence, by being mixed with the soil, but would increase its products in a wonderful ratio, which would go back to the city in the shape of healthful and comfortable commodities, and furnished at a cheaper rate, for plenty always produces a reduction of prices. So, two great benefits would result to the city from the operation. First, the atmosphere would be improved by the removal, and this purifying would give an increase of health, and the productions it would increase would be afforded at a cheaper rate, which would throw them more plenteously within the reach of all classes. This, too, would promote the general health.

It has often been a matter of surprise to us, that boats fitted for the purpose have not been provided to remove these annoying substances from all cities and towns located on navigable waters. If this were done, an immense saving to the country as well as health to the city would be the result; for the boat-load, when once freighted, might without difficulty be transported any distance, at least as far as farmers eager for manures would permit them to pass, and bring remunerative prices. And the corporations might, when their carts were loaded, as easily deposit them on board of a boat as into a slip, where they would be for ever lost to all useful purposes. What would be better, a competition would be created in the business, so that eventually such cities and towns, instead of being taxed as they now are for the removal of these nuisances, might derive an income from this very source. This would create new inducements to thoroughness in the work, and every thing which could be applied to benefit the land would be saved, carefully saved, to be applied to that purpose.

If such a state of things should be introduced—and it eventually must be, in the very nature of progress—what an incalculable benefit would result to the country from the operation! Broad fields, now barren through want of strength to sustain a crop, would smile in all the beauty and wealth of abundant harvests. The city would be purified and the country beautified, and both enriched by the operation. Is not the object one worthy of the united efforts of city and country to effect?

Yours truly, W. B.

Richmond, Mass., Oct. 11, 1853.

FALL PLOUGHING—WHY BENEFICIAL.

We have repeatedly referred to this subject, and have shown how this practice operates beneficially upon the soil. There is still another view to be taken of it, worthy of *practical* consideration. It is perhaps true, in general, that when fields are ploughed in the fall, a *larger amount* of vegetable matter is buried in the soil, than when the operation is deferred to the spring. The browsing of cattle, and perhaps a more thorough consumption by swine, roaming freely over its surface, added to the effect of wind and storms, and the natural changes which take place, when left on the surface, essentially diminish the quantity and quality of the stalk and stubble, left originally by the reaper. This difference, in particular cases, may be of no little practical importance.

But there is another and more important difference. Green crops decay much more rapidly than dry stubble. If therefore green vegetable matter be ploughed in in the fall, the early spring growth receives a far greater benefit from it than if the same matter had been left upon the surface, there to become dry and more capable of resisting the appliances which should hasten its decomposition. Every farmer's boy knows the comparative readiness with which green hay, when in a confined state, takes on fermentation, while that which is well cured endures almost any treatment and still remains unchanged. Were the object only to restore the elements of fertility to the soil, without reference to the speed of its action, as already suggested, the argument would still be in favor of ploughing it in when green. But when its fertilizing properties are needed by the young shoots of the early spring, the importance of this point must be readily appreciated. For it should be ever kept in mind that health and vigor is of the utmost importance in the earliest stages of vegetable growth. Without a vigorous root and stem, there never can be a vigorous plant; and though the case is not utterly hopeless, when, in its first efforts, the young shoot is obliged to encounter even a severe struggle, it is far better to avoid this danger of its destruction. In general, the character of its early growth determines the character of its entire growth.

Probably every farmer knows that if, for a portion of the year, a sheep be but half fed, the growth of his wool for that period will be materially affected. The fibre will be more slim and weaker; and, as in the case of a rope, no greater strain can be put upon it than its weakest part can endure, so it will be as to the power of this fibre of wool. The vigor of any vegetable tissue is affected in a similar manner, not always, perhaps, beyond partial redress, but always to the injury of the plant.

Whatever then tends to a healthy and vigorous growth, when the seed first puts forth, performs a most important service. Green crops, when ploughed under, do perform this service in a much more speedy manner than dry stubble, and hence, the careful farmer will endeavor to avail himself of all the benefits he can thus secure to his land.

It is in accordance with this fact that in those districts where the art of agriculture is carried on in the most thorough manner, green crops are often raised for the very purpose of being ploughed under. Clover, buck-wheat, turnips, and various other crops are sown with this single design. Sometimes, two or three such crops are thus buried in the soil in a single season. It is on this principle, in connection with another which regards exact similarity in the character of the elements furnished and those demanded by the young plant, that a manure of the prunings of the grape vine is more efficient for grapes than almost any other application. In dry, loose, sandy soils, we doubt whether fall ploughing, of itself, is to be commended: all our philosophy is against it, and in practice we know of nothing which teaches a different lesson. But even on such soils, if the farmer will turn up the subsoil, which is often clay, and mingle that with the lighter sand upon the surface, fall ploughing will prove to be of great value. The frosts and storms of winter will promote a more thorough mingling of the elements now brought into contact, and the labor necessary in the spring to prepare it for seed will be comparatively light.

Our experienced and judicious neighbor, Mr. A. B. Allen, recommends that guano be spread broadcast in the fall of the year, at the rate of 100 to 300 lbs. per acre, and ploughed in from three to twelve inches deep, and then to replough in the spring. By this process, the guano effects a double purpose: it becomes well mingled with the soil, ere the seed requires nutriment, and without the danger of causticity, &c.; it also tends to promote the decomposition of the sod and other vegetable matter in the soil.

COLLECT THE LEAVES.

We have advised our readers on the subject of gathering leaves, and would now repeat the same counsel. One who lives in the neighborhood of a deciduous forest, that is, one which sheds its leaves annually, can secure a rich treasure, with very little pains. Those who have only a small garden to take care of, may supply a sufficient quantity of good manure from this one source. If annually collected, their beneficial effects will be felt every year. We have elsewhere spoken of the profit of ploughing in green vegetables; and though the action of dry leaves is much more slow, it is not the less sure. The whole benefit of the application will not be secured in the first year of their application, but by an annual supply a constant effect will be produced. If they can be collected and made into a compost, so much the better. But if not, if ploughed in during the fall, or covered by the spade annually, they will prove quite effective. Leaves are also useful in improving the physical condition of either hard or wet soils. They cause the earth to lie more loosely, and promote thorough evaporation.

NATURAL VEGETATION AND GEOLOGICAL STRUCTURE

A GUIDE TO THE QUALITY OF THE SOIL, AND THE AGRICULTURAL CAPABILITIES OF LAND.

WE are glad to follow up our own remarks on this subject by a matured and carefully considered essay which has appeared in the *Farmer's Magazine*, (England,) and which has just now fallen under our notice.

We are confident that these *scientific methods* of discovering the qualities of soil are not only too much neglected, but their actual value is much underrated. We commend this subject to general attention, and shall follow up the discussion as opportunity and convenience may permit.

"Enough is known respecting the relations subsisting between the natural vegetation and the composition of the soil, to render it certain that it may be made a useful auxiliary in judging of the quality of land. In order, however, to secure the full value derivable from this source, more accurate and extended observations are required than those which we possess at present; and to confer general benefit, it is necessary that those who describe plants as characteristic of certain soils, should all speak the same language.

The necessity for some general botanic nomenclature among agriculturists is strikingly exemplified by one of the papers on the characteristics of fertility and barrenness, in the *Journal of the Royal Agricultural Society*—that by Mr. Askell—in which some really good observations are deprived of their value, by being rendered unintelligible to those readers who are ignorant of the plants which are described under their local names of woodwax, moons, five-leaves, hard-heads, and carnation-grass. Mr. Bravender in his prize essay gives the botanical, as well as the local, names of the plants to which he refers. He says, that after he had resolved to follow out a series of observations on the quality of the vegetation on all the lands which he should have occasion to visit, he found that he could make no progress till he had applied himself to the study of geology and botany. He admits that time and labor are necessary to acquire a sufficient knowledge of these sciences—a difficulty which we think he rather overrates—to be used as tests of the quality of land; but he observes that this only shows the absurdity of calling in the assistance of persons who have never spent five minutes of their lives in the practical study of either.

We agree with him that the natural vegetation is more to be relied on, as a guide to the quality of the soil, upon pasture than upon arable land. Upon the former, he considers it the most certain guide of all; and he proposes to render it more definite by adding a description of the prevalent grasses and other plants of which the herbage is composed to such notes as the following, which are usually made by valuers: 'Herbage of bad quality;' 'Herbage short, but thick at the bottom;' 'Herbage coarse, sour, and peaty.' There are some species which occupy the ground, to the almost total exclusion of others, upon barren soils, and which disappear before manuring, draining, and other improvements, giving place to those which are the prevailing plants in pastures of great natural fertility. There is another test, however, which he proposes to apply, besides that of the species of which the sward is composed, and that is the number of plants growing upon a square foot. Of the species of grasses indigenous to Britain, about 150 in number, there are about twenty which appear to be the best, and which are nearly all present in fertile meadows, in greater or less proportion. None of these are so productive, when cultivated alone, as when associated with others. There are other inferior grasses, the presence of which in small proportions is by no means disadvantageous, as they fill up vacancies between the stems of the better sorts, or come to perfection at a different season. With regard to the number of plants present in a given area of sward, it has been observed that on the best natural meadows it amounts to 1100 on a square foot, which in water meadows is increased to 1800; while a square foot of arable land laid down with seeds contains no more than 80. An old pasture may be considered poor, says Mr. Bravender, which does not produce as much fodder as a piece of seeds of the second year. On arable land the natural vegetation is of less value as a criterion of the quality of the soil, because such land produces, or ought to produce, nothing but what the farmer has placed there. Recourse must therefore be had to the natural vegetation of the borders of the fields, or of adjoining uncultivated land—to the free or stunted growth of the white-thorn and other fence plants, and of the hedge-row timber. Timber trees, however, indicate, in our opinion, rather the nature of the subsoil and sub-strata, than of the soil, and are only useful guides, so far as these influence the quality of the land. But though the natural vegetation is taken for a guide with less confidence on arable than on pasture land, the stunted or luxuriant growth of many of the common weeds of the farm, which grow indifferently on good and bad soils, furnish reliable indications of the condition of the land dependent on cultivation, as also of its intrinsic quality. There are a few with which, when they appear in vast quantities, the cultivated crops struggle with difficulty on even well-managed land. Such plants are signs of the deficiency or excess in the soil of certain constituents, as sure as can be derived from chemical analysis, and perhaps more so, in consequence of the difficulty of selecting a sample of soil for analysis which shall represent the average of an entire field.

When land, for instance, on the sands and sandy loams of Norfolk, is much given to *Chrysanthemum segetum*, or corn marigold, it is held to be an infallible sign that it requires chalking, called there claying and marling; while an abundance of red poppy, *Papaver rhœas*, is an indication equally certain that it has been over-chalked. There are others again, as *Potentilla anserina* and Leopard's Bane, (*Doronicum pardialianthes*,) which indicate an excess of deleterious salts of iron in poor wet clays. The family of rushes, (*juncus*,) with colt's-foot (*Tussilago farfara*) and *marestails* and *horsetails*, (*Hippuris vulgaris* and *Equisetum arvense*,) are universally held to indicate an excess of moisture and the presence of springs. There are many other plants, from the presence, or rather prevalence of which, observation, aided by analysis of their ashes, might draw much valuable information respecting the defects of the soil, and the substances required to correct them.

In judging of the agricultural capabilities of land in an old country, the indications afforded by the natural vegetation and geological structure ought to go hand in hand. In a new country they are companions which cannot be divided. If either is to be adopted alone, it should be geological structure; because its indications are the same in all parts of the world, whereas the character of the vegetation varies with the climate, and till the settler has acquired experience of the sort of land indicated by the presence of the different members of the new flora, he is often extremely puzzled as to the soils of which the strange plants are characteristic, which meet him at every turn. Some interesting facts, bearing on the relations between the natural vegetation and the quality of the soil, are scattered through Professor Johnston's Notes on North America. The undulating upper portion of the valley of the Hudson contains much strong yellow clay, part of a wide-spread, erratic, tertiary deposit, which borders Lake Champlain, where it is 100 feet thick, and extends thence north and east, along the banks of the St. Lawrence. It consists, in the under part, of a stiff clay, resting upon rocks with polished and grooved surfaces, which geologists now very generally refer to the former action of ice, in part terrestrial, in part marine. Above this is a light-colored clay, containing shells of existing species, and over all a bed of yellow sand, sometimes loamy and fertile, but often barren and covered with stunted pines. The soils vary, as this upper sand remains at the surface, or has been removed by natural causes. The stiff clay produces in its unreclaimed state a native growth of hard-wood trees; but when cleared and under crop, it is apt to crack and harden in dry weather. The sandy loams which rest on the clays form broad pine barrens, in which the white pine prevails; while the sands and more sandy loams are covered with the yellow pine. Contrary to what might have been anticipated, it is found that when brought into cultivation, the loamy sands suffer less from the effects of heat than the stiff clays; but that the apparently purer sands bear the drought better than either. This is attributed by Professor Johnston to their greater porosity, and consequent superior capability of absorbing moisture from the air. To this absorption from the air he also ascribes the known fact that stiff clays which have been drained are really moister in summer than the same description of land undrained. This is one, but not the only reason. Undrained clays are like a turnpike-road, mud on the surface in wet weather, but at a certain depth impervious to rain, which runs off them, carrying the manure away with it into the ditches and brooks. Into drained clays, on the contrary, rendered porous by the process, the rain penetrates, with all its fertilizing accompaniments, to the depth of three or four feet. When saturated with moisture, it discharges the superfluity into the drains, as from a dripping sponge; and in summer it becomes, as it were, a damp sponge, retaining moisture by capillary attraction.

The butternut, *Juglans cinerea*, so valuable for its oily nut, delights in a calcareous soil, and is held to be indicative of a good wheat soil, wherever it occurs in abundance and luxuriant growth. It is not known in the woods of Nova-Scotia, and is only found in New-Brunswick in particular places. It has there given the name of Butternut Ridge to a thriving settlement on a ridge sloping gently to the west, and composed of thick-bedded hard blue limestone, which in many spots comes to the surface, and over a large extent of the slope is covered only by a thin soil. Here in its state of wilderness the butternut flourished, and attracted the early settlers as a sign of fertility.

These may be considered rules: let us now look at the exceptions. The presence of hard wood, as the broad-leaved timber trees are called, is deemed in North America a sign that the soil is sufficiently argillaceous to constitute good wheat land. This test, however, fails in the case of a second growth, which springs up after one of those fires which devastate extensive tracts of the forest. Under such circumstances, an interchange of vegetation takes place between the soils. Hard wood, consisting chiefly of poplar and birch, with a sprinkling of maple, takes the place of the pines, which then grow almost alone on the ridges formerly occupied by hard wood. This rotation in nature's cropping is always attended to by those who explore the woods for the purpose of ascertaining the agricultural capabilities of different portions of them; and they are able easily to discover the difference between a first and second growth by means of a few large trees, which show that some considerable time must have elapsed since a general destruction of the forest. Changes in the vegetation on the same soil are not confined to the timber trees. *Epilobium coloratum* and *Enchitites hieracifolium* have acquired the names of fire-weeds, from their rising abundantly upon cleared land, which has been neglected in the spring, after the timber tree has been burned. When the land, however, is ploughed, they disappear, and are replaced by the Canada thistle and hemp nettle, which become troublesome weeds. The Canada thistle is not indigenous, but is the *Enicus arvensis*, or thistle with a creeping root, which is the pest of the slovenly farmers of the Old World—a pest which they do not believe to be propagated by seeds, but bred by their land in common with many other weeds. To the same class of farmers, it forms an equally troublesome pest in the New World, where it has found a congenial home and a congenial state of husbandry, spreading with such rapidity, and taking such tenacious hold of the soil, wherever it establishes itself, as to have acquired the name of the 'accursed thistle.' The artillery of legislation has been brought to bear on it, in the form of an 'Act to prevent the growth of thistle,' which was passed by the Legislature of New-Brunswick with no better success than usually attends interference with such matters by Acts of Parliament. The thistle has spread, apparently in defiance of the Act, and has given increased annoyance even in the county of Gloucester, for whose special benefit the enactment was designed. Nothing, in fact, can arrest its growth, but the general spread of clean farming. Individual exertions can do but little. Of what avail is it that one man extirpates his own thistles, if liable to the invasion of a host of winged immigrants from his neighbors? It is a curious fact that in North America the European weeds are generally superseding those which are indigenous to the soil, particularly along the Atlantic coasts and the river borders. The common plantain (*Plantago major*) is called by the natives the white man's foot, whose steps it follows; and even the plants growing by the road-side are, according to Agassiz, all exotics; every where on the track of the white man, the native weeds disappearing before him like the Indian.

The *Lithospermum arvense*, corn-gromwell or stone-weed, is a European importation, brought in probably with some foul seed-wheat, from France, Germany, or England, which has spread with a rapidity equal to that of the 'accursed thistle.' In districts where it was unknown 30 years ago, it has now become nearly lord of the soil. Its seeds are purchased at the oil-mills of Yates county at the rate of hundreds of bushels, and would be bought at the rate of thousands, if the price were 8*s.* a bushel instead of 1*s.* 6*d.* The purpose to which it is applied is the adulteration of oil-cake for the benefit of unwary purchasers in England. The rapidity with which this weed spreads, arises out of several causes—the hardness of the seed, enabling it to pass uninjured through the stomach of an ox and even the gizzard of a bird; and the fact of its growing but slowly in the spring and pushing up rapidly in the autumn, so as to receive little check from spring ploughing, while its roots, which spread only on its surface, exhaust the nourishment which should be supplied to the wheat: these natural qualifications for rapid colonization are aided by the prevalent rude system of farming, which, raising wheat year after year on the same land without attempting to clean it, allows the pigeon-weed, as it is called in America, to grow and ripen with the wheat, and to seed the ground more thickly with every crop."

INTRODUCTION OF DOMESTIC ANIMALS INTO AMERICA.

The following account of the introduction of domestic animals into this country has been condensed from the late Census Report, and will be found to possess much interest:

"The first animals brought to America from Europe, were imported by Columbus in his second voyage, in 1493. He left Spain as admiral of seventeen ships, bringing a collection of European trees, plants, and seeds of various kinds, a number of horses, a bull, aud several cows.

The first horses brought into any part of the territory at present embraced in the United States were landed in Florida by Cabeca de Vaca, in 1527, forty-two in number, all of which perished or were otherwise killed. The next importation was also brought to Florida by De Soto, in 1539, which consisted of a large number of horses and swine, among which were thirteen sows, the progeny of the latter soon increasing to several hundred.

The Portuguese took cattle and swine to Newfoundland and Nova Scotia, in the year 1553. Thirty years after, they had multiplied so abundantly that Sir Richard Gilbert attempted to land there to obtain supplies of cattle and hogs for his crew, but was wrecked.

Swine and other domestic animals were brought over to Arcadia by M. L'Escarbot, a French lawyer, in 1604, the year that country was settled. In 1608, the French extended their settlement into Canada, and soon after introduced various animals.

In 1609, three ships from England landed at Jamestown, in Virginia, with many immigrants, and the following domestic animals, namely: six mares, one horse, six hundred swine, five hundred domestic fowls, with a few sheep and goats. Other animals had been previously introduced there. In 1611, Sir Thomas Gates brought over to the same settlement one hundred cows, besides other cattle. In 1610, an edict was issued in Virginia, prohibiting the killing of domestic animals of any kind, on penalty of death to the accessary, and twenty-four hours' whipping to the concealer. As early as the year 1617, the swine had multiplied so rapidly in the colony that people were obliged to palisade Jamestown to prevent being overrun with them. In 1627, the Indians near the settlement fed upon hogs, which had become wild, instead of game. Every family in Virginia at that time which had not an abundance of tame hogs and poultry, was considered very poor. In 1648, some of the settlers had a good stock of bees. In 1667, sheep and mares were forbidden to be exported from the province. By the year 1722, or before, sheep had somewhat multiplied, and yielded good fleeces.

The first animals introduced into Massachusetts were by Edward Winslow, in 1624, consisting of three heifers and a bull. In 1629, twelve cows were sent to Cape Ann. In 1629, one hundred and fifteen cattle were imported into the plantations on Massachusetts Bay, besides some horses and mares, several conies, and forty-one goats. They were mostly ordered by Francis Higginson, formerly of Leicestershire, whence several of the animals were brought.

The first importation into New-York was made from Holland, by the West India Company, in 1625, consisting of horses and cattle for breeding, besides as many sheep and hogs as was thought expedient."

CHEMICAL ANALYSIS.

Our readers will remember our remarks on this subject in the October number. We have since met with the following in the Baltimore *Sun*, and as it speaks *understandingly*, we give it place here. The difficulty of getting a true sample of the soil may be partially avoided by the course there recommended, that is, by selecting considerable quantities, "a quart or two," and from different localities. The chemist can then mingle thoroughly and use what he pleases.

We would not write too strongly against the importance of this application of science to agriculture under certain circumstances. The results have been of very great importance, and yet, as a general thing, we would rather withhold the chemist's fee and apply it on the manure-heap. If both were in our power, we would have recourse both to the chemist and to the making or purchase of manure. A writer in the *Sun* says:

"Within a few years, an expectation has prevailed that, by means of chemical analysis, the exact composition of soils could be ascertained, and thence we should learn what special application each soil might need to make it fertile. It is obvious that if this result were attainable, agriculture would become of the nature of an exact science; and, as might be expected, the general interest and great importance of these researches have attracted the public attention to them. The agricultural journals give notices of chemists who analyze soils for farmers, and give advice, founded on the analysis, for the application of manures. On the other hand, we have seen published the opinions of men of science, to the effect that such analysis, in the present state of chemistry, does not lead to useful results. In the address of Professor Hallowell, of Alexandria, to the Agricultural Society of Loudoun, Virginia, recently published, he expresses the opinion that the analysis of the soil is 'wholly useless for practical purposes.' His remarks on the subject are as follows:

'I have been requested to state my opinion of the advantage of analyzing soils, with the view of determining what manures to apply for their improvement, and I do so with pleasure, having had some experience in the practical part of the subject. The present state of chemical science is such as to enable the chemist to determine, with the *utmost precision*, the constituents of a body subjected to his examination; but a difficulty lies in getting a fair specimen of the soil to operate upon. The quantity usually taken to analyze is from fifty to one hundred grains, say half a teaspoonful; and how is so small a quantity to be obtained that shall be an exact sample of the field? If it should not be an *exact sample*—and it appears almost impossible it ever should be—then the result will necessarily mislead, and is wholly useless for practical purposes. On this account I place comparatively little reliance upon any benefits likely to arise from a general analysis of soils, though such an analysis may sometimes be very beneficial in determining the presence of some hurtful ingredient that may be diffused through the soil, and which may be neutralized by some substance readily determined and applied. I would rely much more on a knowledge of the *constituents of the associated rocks* from which the soil has resulted, and the mode of cropping and culture to which the lands have been subjected; and thus knowing what they originally contained, and what has been removed from them, we can readily infer what is left. If the money paid for analyzing a soil, as a general thing, were spent in the purchase of some guano, crushed bones, ashes, or lime, with which to experiment on different crops, *on a small scale*, it would be likely to lead to much more satisfactory and profitable results.'

To the same effect, as to the practical value of such analysis of soils, is the opinion of Boussingault in his Rural Economy:

'The qualities which we esteem in a workable soil depend almost exclusively on the mechanical mixture of its elements. We are much less interested in its chemical composition than in this; so that simple washing, which shows the relations between the sand and the clay, tells, of itself, much more that is important to us than an elaborate chemical analysis.'

But the most elaborate examination of this important question which we have seen is by an eminent chemist of our own country, Professor Booth, of Philadelphia. The distinguished reputation of this gentleman for learning and skill in every department of scientific and practical chemistry, gives great weight to his opinion. In a paper read before the Philadelphia Society for the promotion of Agriculture, he says:

'Having followed the path pursued by many chemists in Europe and America in analyzing soils, with a view to their bearing on the improvement of agriculture, I have become more and more convinced that chemistry has not yet advanced to such perfection that those analyses can have any immediate practical value.'

After giving his reasons at length for this opinion, the Professor says:

'But although soil analyses may not be useful at present to the operative farmer, they may be made available for the advance of scientific agriculture; and for this purpose the enlightened agriculturist should lend his aid by having analyses of soils most accurately performed; not one or two, but numerous analyses of the same soil under varying conditions. Such investigations, keeping pace with the advance of vegetable physiology, will the sooner tend to deliver husbandry from the thraldom of empiricism, and place it under the dominion of a rational system. Besides the analyses of soils thus performed, the analyses of ashes of plants and of manures, by throwing light on vegetable physiology, will contribute to the progress of rational agriculture. Above all other things, frequent and carefully-conducted experiments on manures of known composition, and close and continued observation of their effects on various crops, will accumulate a treasure of experience from which sound theory will draw her data, and which will then reäct most beneficially upon the culture of plants. Then may we look for a literal fulfilment of the expression that 'the desert shall blossom as the rose.'"

DEMAND FOR SEEDS.

At a meeting of the Farmers' Club at Bloomsdale, recently held, statements were made in reference to the immense demand for seeds. The meeting was at the house of David Landreth, Esq.; and the progress of this trade is vividly illustrated by the history of this gentleman and his establishment.

The father of the present Mr. L., who was the first in this country to systematically cultivate seeds for sale, commenced his operations shortly after the Revolution, on a very limited scale, but at that day sufficiently large to meet the demand, with the aid of occasional importations from Europe; and within the last quarter of a century, the grounds cultivated by this concern (then, as now, the largest in the Union) did not exceed 30 acres. Now the shipment of seeds is to far-distant points. California calls for supplies by almost every ship; Oregon and New-Mexico make occasional demands; South America and the West Indies are regular customers; and the British possessions in Asia obtain annual supplies. Within a short period prior to our late visit, Mr. L. had completed a shipment of *four tons*, ordered for distribution in British India! Thus has increased the commercial demand for one of our country's many products, and thus is answered a question which is very naturally asked on viewing the crops at Bloomsdale,—Where is market found for all these seeds? The amount of labor expended on the culture is evidently great; and though nearly all the crops are in drills, thus admitting of mechanical aid, still many hands are requisite to subdue the weeds, harvest and thresh the crops, and perform other operations incident to the business.

Eleven families now reside on the estate, (the single men boarding with the married,) each provided with a neat cottage and garden—keep their own pigs and cultivate their own vegetables and flowers. They are encouraged to keep all neat and trim; the inconvenience and temptations of remote residence are avoided, and as Mr. L. never changes his hands but on compulsion, they feel assured good conduct will insure permanent homes.

Since our last visit, a tank for collecting liquid manure flowing from the barn-yard has been erected; it is capable of holding about 50 hogsheads, durably built of stone, coated with hydraulic cement, and is emptied by an ordinary chain-pump, which discharges into a cask on wheels. This, though an economy almost universal among English farmers, is seldom resorted to in this country, though it could be with decided advantage by every tiller of the soil.

Among the additions to the live stock, we noticed a pair of Norman ponies, which are made to serve a double purpose—amuse the youngsters and cultivate drilled crops; they work within 16 inches, and possess sufficient power for the harrow. These, with mules for similar labor, and oxen and heavy horses for ploughing and cartage of manure, are the force employed.

The lawn at Bloomsdale embraces eight to ten acres, and though formed but five years, promises to be highly attractive, it being laid out with unusual care and judgment. It is planted with a carefully selected variety of indigenous trees, also many rare specimens imported from abroad for the position they now occupy.

We might express regret, that many among us who have expended largely in the erection of their mansions, have not decorated their grounds to accord therewith. True taste consists in an harmonious whole; the grounds and buildings, to be pleasing and effective, must be "in keeping." Even the *habit* of trees should be studied: certain trees suit certain styles of architecture. Flat-headed ones do not accord with pointed buildings, nor do spiral trees harmonize with Italian structures, the lines of which are mainly horizontal. On these subjects we have much to learn; let us meanwhile practise what we already know, and thus impart the information to others. This report further says:

"The multifarious character of the crops under cultivation renders it impracticable to particularize, and keep our report within suitable bounds. Among the more prominent ones we noticed *fifty acres in peas*, which, at the time of our visit, were assuming the hue of approaching maturity. The harvest of this crop is made with dispatch, and the same land immediately laid down in beans, which in turn are harvested in October. The process of culture at Bloomsdale may thus be seen; and though the land appropriated to *garden seeds* is nominally two hundred acres, yet the practical effect is to plough within the year at least three hundred!"

RAILROAD OPERATIONS.

Chicago, St. Charles, and Mississippi Air Line Railway.—This road is all under contract, and twenty miles of it west of Chicago it is expected will be completed and ready for running on the 1st of January, 1854. The location of this line preserves nearly the forty-second parallel through Illinois to Savannah on the Mississippi river, where it connects with the Iowa Central Air Line to the Missouri river. These companies are pointing to the South Pass, hoping and expecting to become the trunk line to the Pacific. The latter company is fully organized, and under good headway.

The Wisconsin North-western Railroad Company is preparing for the early construction of a road from Madison to the Minnesota line.

The Madison and La Crosse road bears the stamp of progress. This road will reach the Minnesota line near the south-eastern boundary.

The Milwaukie and Prairie du Chien Railroad is progressing rapidly, and will reach the Mississippi but a short distance below the Territorial line.

Indiana Central Railway.—The cars upon this road, as we learn from the Richmond, Ind., *Palladium*, are now making their regular trips from Dayton to Indianapolis. The amount of travel upon it, so far, has exceeded the expectations of its most sanguine friends. The cars have been crowded every day. It is the most direct route from Indianapolis to Cincinnati, and passengers are availing themselves of its facilities.

Rock Island Railroad Bridge.—The contract for the stone work of the bridge across the Mississippi river at Rock Island was taken by Messrs. John Warner & Co., contractors on the Rock Island Railroad, and for the superstructure by Messrs. Stone & Boomer, of Chicago. The bridge is to be finished by December 1st, 1854. The bridge is to have a draw for the passage of vessels, and will be 1,580 feet in length.

Springfield, Mt. Vernon, and Pittsburgh Railroad.—The Delaware *Gazette* says the track-layers are about commencing operations west of that place, to meet the party from that place to Marysville. Hopes are expressed that trains will run to the latter place by October, and to Delaware by November, but the state of the work, as represented to us, hardly authorizes it.

Panama Railroad.—From a correspondent of the New-York *Courier and Enquirer*, we gather the following particulars relative to this road: Five miles more of the track are nearly ready for the cars, and would have been in use ere this, but for the bridge over Chagres river having been swept away. The bridge is nearly rebuilt, and ere the close of the year, it is expected that the road will be completed to Cruces: thence a good road to Panama will make the crossing of the Isthmus tolerable, inasmuch as the boating upon the Chagres river will be dispensed with. From Cruces to Panama, but little has been done towards grading the road: the contractors have thrown up their contracts, and the Company have been compelled to resume the work. Plans are in operation for procuring men, and Colonel Totten hopes to have the work completed within the ensuing year.

The La Crosse and Milwaukie road is going ahead rapidly. A competent corps of engineers is busily engaged in prosecuting the surveys and locating the route beyond Rock river. The whole of the line from Milwaukie to Portage City, (about 100 miles) is under contract, and the contractors certify that thus far, for all work done, the estimates have been fully and promptly made. All the sections east of Rock river, a distance of 52 miles, have been sub-let, and between twelve and thirteen hundred men are at work upon them.

Pacific Railroad.—The Houston (Texas) *Telegraph* asserts that from recent surveys the fact has been revealed that a belt of country, varying from 10 to 100 miles broad, extends quite across the continent, from the Atlantic to the Pacific, which is so level that a railroad can be extended the whole distance without traversing a mountain range. The Pacific Railroad may be extended in an air line from Sacramento to San Diego, on this route, with as little difficulty as on an open plain.

Indianapolis and Shelbyville Railroad.—The railroad from Indianapolis to Shelbyville is finished. The Jeffersonville Company will run their trains all the way through from Jeffersonville to Indianapolis, for the present, via Shelbyville. This will make the route somewhat longer; but this will be compensated for by there being no change of cars as heretofore at Edinburgh.

New-York and Erie Railroad.—The Company have nearly completed the broad track to Jersey City, which will supersede the necessity of changing cars at Paterson. The Erie road is the greatest work of the kind in the world, and no one can pass over it without being deeply impressed with the vastness of the undertaking, and the perseverance necessary to secure its completion. It has brought Buffalo, Niagara Falls, and cities still farther west, within an incredibly short distance of New-York; and in point of speed and safety is not surpassed by any road in the Union. A telegraph extending the whole length of the road, and supplied with skilful operators at various stations, serves an excellent purpose in notifying of accidents or delays. We had a practical illustration of its benefits lately, in company with several passengers who had just arrived at Binghamton from a southern point, some going east, and some west. 'Which way are you going?' said the gentlemanly agent, as we entered the office. 'East,' was the reply. 'Then you will not be delayed,' said he; 'but the passengers going west will be detained one hour and forty-two minutes, on account of an accident to the road east of here, notice of which has just been communicated by our telegraph.' (The accident was occasioned by a drenching rain that had been falling in torrents since an early hour in the morning.) Notice of this accident was communicated to all points west, and thus the cause of the delay of the train was easily explained.

The business of the Erie Railroad is not half what it will be, as the resources of the region through which it passes are more thoroughly developed; and yet its receipts already amount to nearly *half a million of dollars per month!* The President, Homer Ramsdell, Esq., and the Secretary, Nathaniel Marsh, Esq., are gentlemen in whom the community have the utmost confidence; and all connected with the road, whether in an official or subordinate capacity, seek the comfort and safety of the thousands of passengers whom it daily transmits with almost lightning speed over its entire length, a distance of 484 miles!

Camden and Amboy Railroad.—We never pass over this excellent road without being impressed with the beauty of the scenery which surrounds it, and the excellency of its management; for the latter of which it is mainly indebted to Wm. H. Gatzmer, Esq., of Philadelphia, and Captain Ira Bliss, of New-York, its indefatigable and gentlemanly agents. The Company are running a train that leaves Philadelphia and New-York at 10 o'clock A. M., in which passengers have an opportunity of beholding the beautiful scenery on the Delaware river, the land carriage by this train being only between Amboy and Bordentown. The express train has always passed between New-York and Amboy through the New-York bay, running sometimes outside and sometimes inside of Staten Island, but in either case furnishing the passenger with a view the most beautiful ever witnessed, perhaps not excepting the far-famed Bay of Naples. There is a difference of one dollar in the fare between the express and the accommodation trains, the latter taking about one hour longer by passing between Bordentown and Philadelphia by water, but imparting additional interest to the traveller by giving him a view of the splendid scenery along the banks of the Delaware. The fares are \$3 on the express train, which makes the time between the two cities inside of four and a half hours, and \$2 on the accommodation train, which requires nearly six hours. But to those who are in no special haste, the additional time required is fully compensated for by the beautiful objects which constantly arrest the attention as you glide noiselessly over the Delaware on the 'Richard Stockton,' as beautiful a boat as ever floated since the invention of steam. On both trains, the comfort, safety, and speedy transit of passengers are provided for in matters of the smallest minutiæ; and we do not wonder that the Camden and Amboy Railroad ranks high in whatever promotes the happiness of the travelling community.

Philadelphia, Wilmington, and Baltimore Railroad.—We apprehend that the office of the President of the United States was not quite so annoying from hordes of office-seekers several years since, when a journey to Washington from New-York and Philadelphia was a work of days, and several of them at that, as it now is. Whatever of benefit railroads may have been to the community at large, they have not contributed to the quiet of the office of President, if we may believe the stories we hear about the annoyance he meets with from those who are besieging him for an appointment. The cheap and easy transit to Washington from the North, by way of the above railroad, has doubtless contributed very greatly to swell the numbers of those who have made, and who will yet make, a "pilgrimage" to the city of "magnificent distances." And this brings us to the subject-matter of our present article. The Philadelphia, Wilmington, and Baltimore Railroad has afforded the means for thousands to visit the capital of the nation, who, but for it, would not have enjoyed that pleasure; and it must be some relief to the feelings of a disappointed office-seeker to return to his home on an easy cushioned seat, in a handsome railroad-car, rather than to be jolted in a stage-coach for several days over a rough turnpike-road, as was formerly the case.

We have passed over the above road several times the present season, (albeit we are *not* office-seekers,) and have noted the improvements which have been and which are constantly making to render the means of transit quick and pleasant between Philadelphia and Baltimore. The Susquehanna river has long been the great and only obstacle in the way of accomplishing these desirable results. But thanks to the President of the road, Saml. M. Felton, Esq., this obstacle is soon to be removed. Mr. Felton has long sought the passage of an act by the Maryland Legislature granting the Company the right to construct a bridge across the Susquehanna, but until recently his most persevering efforts have been unsuccessful. The Company are now making the survey, and at no distant period, a substantial stone bridge across the Susquehanna will attest what can be accomplished by enterprise and perseverance. The road opens a direct route to the West and South-west, by means of its connection with the Baltimore and Ohio Railroad to Wheeling; and during our late visit to Baltimore, we conversed with several passengers who give this the preference over more northern routes.

The Company has the largest and finest dépôt at Philadelphia of any in the country, and during the year past, several powerful locomotives and a number of new and beautiful cars have been placed upon the road, for which, as well as the contemplated bridge across the Susquehanna, the travelling public are indebted to the 'administration' of President Felton. During the ensuing session of Congress, as well as during the entire term of President Pierce's administration, multitudes will visit the nation's capital. Many of these will be warm admirers of President Pierce; but of the thousands who will visit Washington over the Philadelphia, Wilmington, and Baltimore Railroad for the next four years, we opine that President Felton will have by far the largest number of friends!

THE GREAT EXHIBITION.

Does any body call it a failure? Perhaps it is; but if so, we would like to know what success would be In what respect can it be called a failure? It may not be thronged as many anticipated that it would be. There is no crowd there; and one reason why it is not thronged more, is because the people believe the jealous, envious, and false representations that some foolish pedant uttered, or printed, or heard and reported, in its early history. But the merit of the Exhibition is not to be measured by the number of its visitors. And yet it need not be ashamed of the result when judgment is pronounced on that basis, no other exhibition in America having ever been visited by the numbers that have been drawn to the Crystal Palace. It has not the neighborhood of its predecessor in Hyde Park, and the numbers there are no measure for what could be expected here. Besides, that in London was the first of the kind ever known. But of all the thousands of visitors here, we have not heard of one who carefully viewed this collection, who went away dissatisfied. The grumblers are exclusively those that have not seen it at all, or who have occupied only two or three hours in going over the entire building.

In what does it fail? In the useful or in the ornamental? In the foreign or in the domestic? In silk, woollen, linen, or cotton goods? In Plaster or marble, Japan ware or mosaics? In statuary we have all of the renowned works of Hiram Powers, and a score of others equally as good as those. In mosaics, we have the most perfect the world can furnish, one piece of which, by Guercino, is valued at $50,000, and which multitudes mistake for a painting of one of the old masters. In silver and gold ware, we have works so superb, that none but millionaires can dream of purchasing them, and from this downward to those at only a few hundred dollars the set. In porcelain we have the ancient Sèvres of M. Lahoche, his own fine manufactures, and many other qualities down to common ware. In needlework, we have the Gobelin tapestry, and the Beauvais, as well as the handiwork of the wives and daughters of our own yeomanry. In glass, Bohemia sends a few of her choicest specimens. In jewelry, we can suit all tastes, from a necklace worth $15,000, to common painted glass. In mirrors, furniture, pianos, carriages, and such like, we should be glad, but surprised, if better could be found. Watches and clocks surely are well represented, both from Geneva and from London. The agricultural department is very full and complete, from the fancy garden hoe for the young lady, to the huge reaper and raker, drawn by three or four horses. So also in broadcloths and other manufactured goods; the "Bay State" Mills, the manufacturers of Rhode Island, that hive of industry, and of Connecticut, not inferior, and on to Canada and across the ocean, the specimens of excellent products multiply till you are lost in the immense variety, as well as astounded at the excellence of the product. Ladies' apparel and the materials for making it, in all their variety, are fully represented. In flour, sugars, salts, and other eatables, the show is good, though not large. But there are neither cabbages, nor turnips, nor white blackberries. What a pity! In machines, the show is not as large as it ought to be, there being only about 400; but it is large enough for the visitor, and for the building. Patentees and proprietors, we think, in not sending more, have made a great mistake.

The quantity is less than was collected at Hyde Park, but one who carefully examines all these, will not complain that it is so. There is enough to excite the ambition of the aspiring artist, to enlighten the uninformed, and to gratify the curious; and, for ourself, we rejoice that there is so little mere lumber, whose entire office it is to occupy space and make a GREAT show. The picture gallery is more open to criticism than any other department, but even there is enough of real merit to pay the price of a ticket to the whole exhibition.

But we must proceed with our description of the various departments, as already proposed and commenced; and we resume our work on the lower floor, in the Italian and Austrian courts, opposite the French, already examined.

ITALIAN DEPARTMENT, (Court 6.) As you enter this splendid court, you observe on the right hand, near the entrance, a rural table, suitable for a summer-house or shaded lawn. Next, a series of superb mosaics, chiefly of wrought flowers, and other handsome patterns. On the left, among the beautiful statuettes described in our last number, is a splendid antique cabinet of mosaic on black ebony, representing the palace of the Medici at Florence. Each panel is ornamented in the centre with elegant mosaics, and the arms of the family of the Medici are wrought into the façade. This is from the manufactory of M. Enri Bosi, artist in mosaic and precious stones, Florence.

Beautiful silks and velvets hang from the sides of the court.

Opposite the entrance is a small figure, in silver gauze, representing Columbus; a beautiful work. Behind this, a carved, modern mirror-frame, resting on a table of similar workmanship. These pieces are in very florid style, and exceedingly rich.

Entering the next court (12) on the west nave, are rich mosaics for tables, one of which, of rectangular shape, and with a black ground, is worth $2650 in Paris. Specimens of marbles used in this department of art are also to be noticed.

In the centre are mosaics of wood, very rich. The manufacture of one of these occupied the artist six years, and is valued at $6000. It contains several historical pictures, views of public buildings, &c.

On the left are elegant silks and velvets; mosaic breast-pins, of great beauty, from the manufacture of M. Enri Bosi, Florence; elegantly wrought handkerchiefs, and paper-weights of rich mosaic, coral bracelets and pins, and ornaments of pearl and diamond, very rich.

Against the division between these courts, stands a MOSAIC PICTURE of JOHN THE BAPTIST, sent over by Pope Pius, which is perhaps the most wonderful work of art in the Crystal Palace, if not in the world. It is entirely of mosaic of marble, and though not for sale, is valued at $50,000. The little pieces of which it is composed are, perhaps, an eighth of an inch square, or about 64 to the square inch, and the effect is admirable. The features of the face are most expressive. The lifted eye is intensely eloquent. We can conceive of nothing more perfect. Such work is done now only at the manufactory of the Vatican.

AUSTRIAN DEPARTMENT.—The court adjoining that just described, number 18, is furnished with very rich goods. As you enter, on the right are very elegant glass and porcelain wares, transparent, white, red, blue, green, &c., exhibited by A. Patzebt, Turneau, Bohemia. Close by these is a tall centre-piece for dry preserves, the price of which is $6000. It is formed, not, as one might suppose, of glass, but of rock crystal, while its ornaments are gold. This would not generally be distinguished from other glass wares near it. A superb prismatic drop for a massive chandelier is close by. Bottles of various colors, representing pineapples, and of other fanciful forms, are in perfect taste. Artificial stones, of all colors and shapes, are exhibited by A. Patzebt. Samples of beads, buttons, &c., of cut glass, by Blaschka

& Sons, Liebenau, Bohemia. This court is lined with an assortment of Broche shawls, exhibited by L. Burger & Co. Elegant shawls are also exhibited by Charles Kanitz.

A variety of "Bohemian Produce," of a character similar to those we have described, completes the list found in this court.

In the interior court, numbered 19, we notice a great variety of scythes, sickles, and various cutlery, to which we shall refer again hereafter, also from Austria; maps, some of very large dimensions, and inscribed with various languages, from Turin; geometrical models in glass; a map *in plaster*, showing the surface, &c., of Switzerland; a geological section of the salt mines of that country; fossils, chiefly the ammonite, some very large, more than a foot in diameter, and all very fine; accordeons and other musical instruments, among which are a pellitone, a bombardon, a trumpet in G, with a mechanism for transposition into all keys, and a guitar with twelve strings, of new invention.

The outer court but one on this west nave, numbered 23, contains Japan and Holland goods. As you enter, are found handsome bronze tables, exhibited by L. Shutz, Zeyst, Holland. A handsome silver pitcher of rich design, wrought by the hammer from a single block of silver, an art of the seventeenth century. It is large enough to contain a quart or more of water, and is made by T. G. Grebe, Rotterdam. Elegant marble vases; carvings in ivory, very handsome, by Zeyst, Holland; delicate balances; plated silver, by Gilles Grevink, Amsterdam; elegant swan, goose, and grebe-skin furs, Dutch-dressed, by P. S. Catz & Co., Amsterdam; chamois gloves; tall shades, of glass of elegant quality, from the Netherlandt Company, at Dordrecht; books from Holland.

Japan goods, salvers, boxes, brushes, sandals, as curious as those of the Chinese. Some of these consist of a sort of framework, raising the foot four or five inches above the floor, the whole being fastened to the foot by straps or bands.

On the other side are large retorts of glass, the bowls of which are overlaid with thick copper, by means of electro-magnetism. These are from the metallurgical manufactory in the Netherlands, and are exhibited by J. R. F. Nevergeld, of Hague.

Next are elegant bows and arrows, for shooting-galleries, of most excellent workmanship, by Bressers Brothers, Tilburg. Several handsome models of winding stair-cases, from Holland, are worthy of special notice, exhibited by Gerret Becksez. Epaulettes and tassels, with braids, very handsome, exhibited by W. J. Van Heynsbergen, Hague. Elegant tables, and a superb screen, of Japan painting; a small wheel for spinning linen, of black ebony, ornamented with ivory, very elegant; a large bronze vase, very fine, by L. Schutz, Zeyst. Paper hangings, of various patterns, but exceedingly rich, are suspended from the sides of the court. Those on the right hand are imitations of silks and brocades, and those on the left hand are imitations of woollen velvets. These are exhibited by the heirs of Warnars Willink, Amsterdam. Rich furniture, carved and japanned, occupies the centre of this court.

The contents of the outer court (27) are chiefly from

Holland, and consist of church and ship bells; clocks and scales; a carriage, by Zehmen, of Rotterdam; earth-borer, by J. R. Sandermeyer, Rotterdam; plough and seed-sower, by Jenken, Utrecht; a pheasant's house of East India bamboo, by G. A Barker, Rotterdam. Morse's telegraph is located in this court.

Continuing on into the next court, we find other contributions from Holland, consisting of spermaceti, white lead, and litharge of gold; borax, madder, and other dye-stuffs; starch, glue, oils, prepared provisions, succory, sugars, arrow-root, &c., &c. One side of this court contains the contribution of

Hayti, sent by his Majesty Faustin I., Emperor of Hayti, through his Consular Agent, Henry Delafield, Esq. It consists of various productions of Hayti, among which are soaps, paper, castor oil, coffee, honey, starch, wax, castor-beans, chocolate-nuts, cloth from the bark of lace-wood and of pepper-wood, water-pots of stone-ware, log-wood, lignum vitæ, fustic, Brazil-wood, D'Haiti hemp and mineral coal. In the same court are contributions from

Liberia, of cocoa, coffee and sugar, and grain.

Havana, of segars.

This leads us into the court occupied by the products of

British Guiana. This court, though quite uninviting at first appearance, abounds with objects of interest. Specimens of maize, rice, coffee, sugar, vanilla, arrow-root, &c.; the fibre of the plantain, ochre, silk-grass, and palm; sections of wood, very handsome, from the Demarara river; a table-top containing 133 pieces of different woods, the growth of the colony; picture-frames of native woods; Indian manufactures, such as baskets, fans, mats, necklaces, beads, bows and arrows, war-clubs, &c. Besides these are preserved fruits, balsams, oils, essences, and chemicals.

From Guiana, we advance into Court 26, and observe hundreds of daguerreotypes, which are sent from nearly all our larger cities, many of which are very fine. But we do not hesitate to adjudge the palm of super-eminence to Masury & Silsbee, of Boston. This brings us also to a planetarium, very finely contrived for illustrating the movements of the planets, and various astronomical phenomena.

Penmanship. Several specimens of penmanship are exhibited by different teachers of the art. Some of these are very elegant, others only very curious. One card, of drawing-paper size, executed by A. H. Wheeler, of Broadway, is perfectly beautiful. It is very elegant in design, and seems faultless in execution. Another, by Mr. Bristow, is very handsome. A third, by Mr. Davison, is a representation of the Crystal Palace, in which all the lines and shades are formed by microscopic writing. Almost the entire Book of Psalms is exhausted for material. A fourth, called "The House of God," is similarly composed of the Proverbs of Solomon. Probably not one in five hundred would distinguish between these and ordinary drawings in outline. But here we stand by *the contribution* from

Newfoundland, which consists of a representation of a ship in the midst of ice and icebergs, and surrounded by their various animals, seals, hippopotami, and other sea animals; above these, in the *second story*, are the land animals and birds of the province. This show is well conceived and well executed, and is of great interest.

This court is lined with several pictures; but what and whence they are, we have not been so particularly interested as to inquire.

If we turn to the left, and enter Court 10, we find numerous specimens of

Bookbinding, which, though very good, and making great professions, do not appear to us particularly elegant. The same *wares* are exhibited in Court 17, in which are also a portion of the show of daguerreotypes.

Philosophical Apparatus.—In Court 17 are several pieces of apparatus, illustrative of geography and natural philosophy, including astronomy. An electro-magnetic battery is in constant operation, and furnishes amusement for multitudes who try the capacity of their muscles in enduring the contractile power of this wonderful fluid. Here, too, is the STORM INDICATOR, which consists of the electric bells seen in all our chemical cabinets, and which are connected with the lightning-rod outside of the building. The exhibitor says they will foretell a storm from four to seven hours before it is experienced. A gasometer; also, a very large piece of apparatus in appearance, a cylindrical spar for a vessel's use, used by our scientific engineers in the United States Coast Survey, for determining base lines. This brings us to the east nave. In following along the courts on the north side of the nave, we find in the first we shall naturally enter, (4,) goods from the

Hamilton Woollen Co., Southbridge, Mass.,
Dunnell & Co., calico printers,
Rochdale Mills, Rochester, N. H., elegant blankets.

In the next court, (3,) goods from

Lawrence, Stone & Co., Boston, their splendid Bay State shawls, and other goods;
E. Derby & Co.,
E. Slater & Sons, Webster, Mass.,
Edward S. Hall, Millville, Mass.,
John Slade & Co.

In COURT 2, we find contributions from

Manchester, N. H., Print Works,
James Roy & Co., Watervliet Mills,
Dorastus Kellogg, Skaneateles,
L. Pomroy & Sons.

One side of this court is allotted to

CANADA, and contains a carpet wrought entirely by hand, as if it were only a lamp-mat; chair-coverings and tidies in variety; and in the next court, No. 1, straw hats, shawls, snow-shoes, blankets of remarkable weight, and which would seem to defy even polar frosts; drugs are also exhibited, and flour from various kinds of grain. We have only had opportunity to examine that from buck-wheat, and must pronounce this equal to any we have ever seen. Furs of excellent quality are also exhibited from this province. A double phaeton, nameless, but of which the maker has no cause to be ashamed. There is also, near by, a new VENTILATING STOVE, which we purpose to describe in detail elsewhere, if possible. It is a very excellent design, and is invented by Mr. Ruttan.

Passing into the centre of this division, (D,) the only part not already described, we find the very valuable contribution from

DENMARK.—The one contribution from this country consists of the group, CHRIST AND THE APOSTLES, by Thorwaldsen.

This most interesting group of statues is the *original* of this great sculptor, which was placed in one of the churches of Italy, but which has recently been removed, and replaced by copies in marble. This collection is in plaster. The grouping of the apostles, in the Crystal Palace, is in bad taste, and for want of room, the figure of the SAVIOUR is too near for effect. It is larger than life, being intended for a position thirty feet from the rest of the group. St. Paul is "one of the twelve," by what authority we have not learned. This, however, is an exhibition sufficient of itself to attract crowds.

This completes our rapid sketch of the lower floor of division D. We will now ascend the central flight of stairs into the gallery above, and beginning at the eastern end of the row of cases of silver ware, will point out the more interesting objects.

Gold and Silver Ware from the United States, (Gallery, Division D.)

The products of our own country overrun the quarter of the Palace designated for them, and occupy space on this division on both floors. The first case of silver ware is from Bailey & Co., Philadelphia. A very beautiful centre-piece, an elegant castor, salts, &c., in elegant patterns, are worthy of especial notice.

Jones, Ball & Poor, Boston, furnish the next cases, with some of the richest goods in the Palace. The famous Webster Vase is among them. Next come Hallersly & Dickinson, Adams & Kidney, Albert, Coles & Co., Joseph Chamberlain, G. F. Atwood, J. & C. Berrian; Rogers & Brothers, Hartford, Ct., plated ware; J. T. Ames, Chickopee, Mass., very handsome; Ames Manufacturing Co., do., very handsome; John Foley, gold pens; G. Zenhore & Co., very elegant bog-wood jewelry; Ball, Black & Co., Broadway, exhibit very elegant silver ware, and also a superb set of California gold, exceedingly rich. They occupy two large cases.

On the left hand is a case furnished with a handsome set of chessmen, the white being solid silver, and their antagonists of gold. On the right, Whillock, of Troy, furnishes a case of Britannia ware.

Here is a point of very great interest. On your left hand is a small case, scarcely eighteen inches square, and three feet high, of very great value. It is from the Studio Curioso, and is exhibited by Mr. Moon.

The most prominent object in this case, is the marble statuette of a

Sleeping Cupid, carved from one piece of marble, with a veil of the same, partially covering the head and the shoulders. It is difficult to persuade one that this veil is not of ordinary lace. As a piece of art, this is very exquisite, seldom if ever surpassed. We understand the proprietor has refused $10,000 for it.

In front of the case, on the bottom, is a figure of

Prometheus chained to the rock. The figure and rock are one solid piece of gold, very finely carved. The body is one large pearl, and round the rock are carbuncles.

Four real ruby perfume-bottles, once the property of Ferdinand of Spain, and late the property of General Radsminski, are in the corners of the case.

Antique snuff-box, inlaid with gold, silver, and pearls of all colors, is on the right hand, in the rear. The top represents a farm-yard, birds, finely executed, a church, &c. On one side is a fox, wrought in gold, and a rabbit in silver. On another is Tower Hill, London; on a third, Shakspeare's house; and on the fourth, a peacock feeding. This too has been owned by some very distinguished personages.

Coral carvings are seen on each side of the case, on the top of inverted vases. That on the left represents Minerva, with her helmet and shield, and that on the right is the figure of Mercury. Each of these is about four inches long. Mercury stands upon a pedestal of *lapis lazuli.*

A watch, in the shape of a basket, inlaid with rubies and emeralds, hangs on a pyramid. Upon the face are small figures, playing on different instruments. It plays several distinct airs, and was worn by the present Queen of Spain.

An Opal, in the shape of a heart, "the largest and most beautiful ever seen in this country," lies in front of the Cupid, near the centre of the case.

An antique saucer, of red cornelian, very finely cut, from Russia, is near the centre.

A gold spoon, with a red cornelian bowl, from the Duke of Buckingham, is seen on the right.

A white mouse, in a morocco case, with key and brush, is seen at the left This mouse was the pet of Dolza Donez, a Spanish lady, who was so fond of it, that when it died, she had it preserved so that she could play with it, and by *clock-work* make it move round the room.

Brahmese Carving in Ivory, representing a plough, a ploughboy, and Brahmese oxen.

Florentine mosaics of birds and flowers, very fine, are in front of the perfume bottles.

Napoleon, in a ring, taken at Fontainbleau, and presented by Louis Napoleon to Lady Blessington, is near the centre.

Enamel ring of Napoleon—the face being shaded by figures representing living beings, the epaulette in the form of a hand, and on his breast, a map of the countries which he conquered. This is a little to the right of the saucer, in the lower row of rings. It requires a magnifying-glass to see these peculiarities.

A curious watch in a ring, worn by Napoleon. The watch is set in a stone of an oblong form. It is in the saucer to the left of the ring before referred to. It was sold from the collection of Louis Philippe, at Claremont.

Other rings contain the heads of notable persons, and have been owned and worn by those as celebrated. But we have not room for more particulars of this sort.

The front Portico of the Cathedral of Rheims, with its clock and spires, in miniature form, in gilt, stands upon the top of this case.

Leaving this attractive case, we next find on our right the silver and gold ware of Tiffany & Co., Broadway. A splendid centre-piece, of elegant design, weighs 1000 ounces. Porcelain cups with gold ornaments surrounding them are very superb. But the greatest attraction is a necklace, of a single row of pearls, with one splendid diamond, which is worth $15,000.

Marchand Ainé, Gaime, Guillemot & Co., furnish the next case, with very rich jewelry, diamonds, pearls, &c.

A case of far less pretension stands next in order, furnished with silks and velvets, which obtained the prize in the exhibition in Hyde Park. It is exhibited by Giacomo Chichiza & Co., of Turin.

We then come to a table furnished with marble mosaics, busts, statuettes, and paintings, from Florence, some of which are very handsome. Then "wood tresses" or braids, as we generally call them, sieves of horse-hair, &c., by A. Loker, Krainsburg, Illyricum. Patent leathers, elegant straw braids, watches and bracelets, and other jewelry from Switzerland.

This display of watches is very superb and also very extensive. Some are plain, many are enamelled and are jewelled, not only within but without. The jewels are both pearls and diamonds, the latter in the form of flowers. Some are painted, representing Cupids, &c. One of them, "the Lilliputian watch," is about the size of a three-cent piece, and is perfect. Some are "chronometers." The exhibitors are Messrs. Monlandon Frères, H. A. Farre, D. Bachelard & Son, Patek Philippe & Co., E. & A. Paillard & Frères, H. L. Matile, Jr., Gustave Dubois, C. Henri Groselande, Reigel & Petitpierre, Lequin & Yersen.

Passing down the other side of the same tables, we find

Austrian goods in variety, canvas, straw braids, muslins, shawls, tablecloths, &c.

Italy supplies the next table with elegant brushes, mosaics, paintings, and statuettes.

Entering the next narrow passage parallel to this, AUSTRIA exhibits bead-work, over-coats of very substantial material and superbly made, dress-coats of superb workmanship, musical instruments, wrought pipes and cane-heads, and straw-work.

SWITZERLAND covers the tables beyond with rich muslins, most beautiful cuttings and carvings in wood, which are among the most attractive exhibitions in the Palace; prints, pianofortes, a fine map of the several cantons of Switzerland, various paintings of Alpine scenery, engravings (colored and uncolored) of Geneva, figures in *terra cotta*, wood models, a wooden leg, "made on scientific principles," muff, tippet, and cuffs of Grebe's fur, muslins, silks, white lead, artificial pumice-stone, geometrical models, colors, models in crystal, artificial flowers, chemical apparatus, (glass,) wool, tobacco, oil in capsules, and most superb leghorns.

This leads into a court partially occupied by goods from

CHINA. These consist of ladies' work-boxes, tea-sets in variety, and many specimens of muslin, manufactured from the bark of the pine-apple. It is as fine as a e many samples of "India muslin."

Near by stands a case of "Paris mantillas," exhibited (and manufactured ?) by a Broadway house; also sundry quilts of common patch-work, unworthy a place in such an exhibition; pictures in worsted, *ditto;* a Brussels carpet, of fair quality, made by Higgins & Co., New-York. Some superb riding-saddles and military saddles cannot fail to attract notice. Specimens of the skill of the dentist are found here. Still farther on are very beautiful harnesses, the ornaments of which are wrought with turkey quills, which exceed any thing of the kind we have seen elsewhere, and which are valued at $500 a pair. The mounting is of silver. Most of these are from Newark, N. J. Many articles of like kind and of home productions occupy this part of this gallery. Turning to the right about, into the next passage-way, we meet with trusses and other surgical appliances, gold leaf, &c., coach laces and tassels.

This brings us to the head of the stairs where we were directed to enter this gallery; and though our account of its contents is but a sample rather than a description, we will follow on by the silver wares already described, and by the elegant Swiss watches, to the

GALLERY OVER THE NORTHERN NAVE.

The first case is furnished with very rich gold and silver ware, from M. Odiot, of Paris, consisting of several superb sets of silver, two or three of gold, a splendid centre-piece of silver of elegant design; fruit and cake-baskets, in taste and finish unequalled in the Crystal Palace.

On the next table is very splendid silver-plated ware. Some of it is gorgeous. This covering is laid on by electro-magnetism. The silver is in solution, the vessel to be plated is immersed in it and is then connected with the two poles of the battery, and thus the silver is slowly deposited upon the surface, and becomes thicker the longer the process is continued. A pair of tall vases, perhaps three feet in height, of very florid workmanship, stand, one at each end of the table.

An immense vase of silver, of very florid style, is without a label or other token by which its origin can be traced.

Next is the *Crystallerie de Clichy*, from Paris, of course, and very beautiful. We have here the most elegant collection of paper-weights we have ever seen. Some represent flowers, others portraits, and some groups of persons; a few contain dials and indices for the month, the day, &c., and are very convenient as well as ornamental. We have here also many superb specimens of the richest glass-ware and porcelain, elegant in form and in color. This is one of the most beautiful tables in the Palace.

Passing along, we find a display of Britannia ware, dentistry, microscopes, very fine jewelry, artificial flowers, and bronzes, very handsome. Returning on the opposite sides of these tables, are timepieces, candelabras, &c., and on your left hand are richly wrought veils, tassels, passementeries, metallic and silk, from Paris. You are almost deceived by noticing what seems to be a living and beautiful dog, and in a very pretty house just suited to him.

Porcelain ware, very handsome, is exhibited on the tables beyond, by Haveland & Cie., who have an agency at 47 John street. Wares of this description cover several tables, and are exhibited by different contributors.

Patent tanned leather, of excellent quality, boots and shoes of various *materiel*, bonneterie de laine, by Jaques Amos, bas rhin, wrought veils, muslins, &c., are also on these tables.

Carpets of various kinds are suspended from convenient points in this gallery.

Upon the tables, as you approach the western side of the south gallery, are varieties from the *German States;* gloves, perfumery, wrought shirts, etc., etc.

Gulliver among the Lilliputians, described in a previous number, excites much attention.

Near the end of this gallery, among a multitude of German toys, are some cuttings in ivory, very beautiful, chessmen, and handsome transparencies.

Turning into the next aisle, we find paintings from Holland in great variety, some of which are very fine; ivory cuttings and cuttings in wood are well worthy of notice; portemonnaies, bonnets and vestings; and as you advance, on the left hand, are woollen hose, caps and jackets, and on the right hand, combs, hair-work, fringes, woollen goods, a superbly-wrought lady's cloak, wrought shoes, &c., &c.

Beyond these are gold leaf, bronze powder, metallic leaf of various kinds, philosophical and chemical apparatus. Straw-work in variety is on the table at the end.

In the next aisle are surgeons' instruments, porcelain wares, worsteds, beads, shell-work, bronzes, some very excellent; gilt, silvered, and copper wire, pencils, toys, &c., &c., from Prussia, Bavaria, Saxony, and from Mentz.

(TO BE CONTINUED.)

STATUARY.

Since our catalogue of this department was prepared, we have noticed that two or three of these works of art have been removed to other places, and one group in the southern nave has entirely disappeared. We also omitted the huge statue of Washington under the dome.

WASHINGTON, sent by the State of Virginia, has recently been placed in the western nave. Also, a bust of Washington.

A half dozen have also been added, which are arranged about the base of the bronze "Amazon and Tiger," by Kiss.

On the right extreme of the row is

PRAYER, or SAMUEL, a most beautiful work, full of expression, by Guaccerini. Then,

A BACCHANTE, a bust, by Ives.

Maternal Solicitude, by Benzoni. This is a perfect gem. A beautiful boy is holding a little pet puppy in his hand, while its mother, on the other side of the boy, is anxiously looking up to see if all is safe. The posture and all the details in this group are faultless, and quite bewitching.

Ruth, by Ives, a bust, with a very beautiful profile, but not so perfect in its front view.

Bacco, a statuette, by Guaccerini.

Bacchante, a statuette, by Lucendi.

We had intended to add a few more explanations or illustrations of these statues in our October number, but our space was preöccupied. We give below a few additions of this sort.

Diana was the goddess of light, and represented the moon, as Apollo, her twin brother, did the sun.

Psyche is represented in the Palace by several statues. She was the youngest of three daughters of a king, and by her beauty excited the jealousy of Venus. She, to avenge herself, ordered Cupid to inspire Psyche with love for the most contemptible of men. But he himself fell in love with her. His visits being only in the night, she knew not what he was, and her jealous sisters attempted to persuade her that he was an ugly monster. To satisfy herself on this point, she obtained a lamp, and found that he was the most beautiful of the gods. But in her excitement, she let a drop of oil fall on his shoulder, which awoke him. Cupid censured her for her mistrust, and escaped. She wandered long in search of him, (and hence the idea of the 'Grieving Psyche,' under the dome,) and attempted to drown herself. At last she came to the palace of Venus, who detained her, and treated her as a slave, imposing upon her the hardest and most humiliating labors. But Cupid still loved her in secret, and invisibly comforted and assisted her, and by his help she overcame the hatred of Venus, was made immortal, and was united to him for ever. (This part of the myth is the foundation for the group, 'Cupid and Psyche,' in the nave leading from the Sixth Avenue.)

Mercury was the son of Jupiter and Maia, the daughter of Atlas. He is represented as a cunning thief, having, a day after his birth, stolen several of the oxen of Apollo. He also invented the lyre, forming it from the shell of a tortoise, and drawing strings across it. He was employed as the herald of the gods, and performed many important services.

Ceres was the daughter of Saturn and Rhea, and sister of Jupiter, by whom she became the mother of Proserpine.

Apollo was the son of Jupiter and Latona, and twin brother of Diana, and was represented in diverse characters; 1, as the god who punished; 2, as the god who afforded help and warded off evil; 3, the god of prophecy; 4, the god of song and music; 5, the protector of flocks and herds; 6, the god who fostered towns and civil institutions; 7, the god of the day, or the sun. The Apollo Belvidere, at Rome, is one of the most beautiful representations of him. (See bust in east nave.)

Paris was the son of Priam and Hecuba, and at his birth was exposed on Mount Ida. But he was nourished by a she bear. The shepherd who exposed him, afterwards found him and took him to his own home. The most celebrated act of his life was his abduction of Helen, wife of Menelaus, which led to the famous Trojan war. Bust in Italian court.

The names of the foregoing divinities, &c., were given in their proper place in our October number, but chiefly without explanation.

THE PICTURE GALLERY.

We have already suggested that this part of the Exhibition is most open to criticism, but it is true, nevertheless, that there are many very excellent pictures. Those we have mentioned in a short article on painting and painters, on another page, (310,) are enough to pay for visiting this department, were the rest only plain canvas. We have not occupied so much time as we could wish, perhaps some six or eight hours only, on this attractive section, but we believe we are right in commending the following paintings to the careful notice of the visitor. We follow in the order of the numbers of the "official catalogue." Some that are very excellent, but very simple, requiring but little comparative skill, are not mentioned in our list. A few pictures we have merely described as worthy to be classed in list No. 1, No. 2, or No. 3. No. 1 is of the highest merit, which, of course, includes but very few. The other two lists are inferior, but those of No. 3 are very decidedly superior to the average merit of the whole collection.

No. 5. Oil portrait of Shakspeare, artist unknown, England.

This is a splendid head, and is supposed to be 'an early copy from the "Chandos."'

8. The Royal Family of England, by H. Winterhalter, London.

As a piece of art, this is not remarkable, perhaps, though it is very creditable to the artist. As the contribution of one of the best and worthiest of the sovereigns of Europe, it demands most especial notice. It being sent by Queen Victoria herself, it may be relied upon as a faithful portrait of the personages whom it represents.

12. The Angel of Death bearing off a young girl.

This is by the great painter, Horace Vernet. It is quite original in its design. The angel is veiled, and in dark shadow. But his wings are in a brighter light, and are most exquisitely painted. The father is leaning upon the bed, with his face buried in its drapery. This picture belongs in the first class.

16. Deputation of Workmen before the City Council, by J. P. Hasenclever, Dusseldorf.

This is an admirable picture, and enough to place the artist in the first rank among modern painters.

27. Ieronimus Jobs, a night-watchman, by the same.

This belongs to list No. 2.

32. Scene in a school-room of the "Jobsiade," (a comic heroic song of 1800,) by the same.

This is less finished than No. 16, and is somewhat caricatured, but it is capitally done.

38. The Rising Thunderstorm, by Augustus Weber, Dusseldorf.

A beautiful picture. List No. 2.

42. Hasenclever, the artist of 16, 27, and 32, representing himself as "The wine taster." A very life-like picture.

87. Columbus, receiving a letter of recommendation to Queen Isabella, by A. Puccinelli, Florence.

This deserves a place among the best in the Palace.

98. St. Martin de Cluse, in the Dauphinée, by A. Dubuisson, France.

This we rank in list No. 2. It is a very fine view of mountain scenery, with its huts, cattle, shepherds, &c.

110. Revolution in the Studio, by John Wilms, Dusseldorf.

The whole design and execution of this is admirable. Here are the painter's easel, sword, gun, bullet-mould, cap, &c., &c., all laid up carefully in a pile, by the thorough chambermaid, preparatory to removal.

111. Neapolitan Gleaner, by Fiorazzi, Florence.

This little picture is at least in list No. 3.

115. The last moments of Tasso, by Theodore V. Oer, Dresden.

This ranks, in our judgment, with the Gleaner.

120. Sunset view, near Naples, by Louis Gurlitt, Vienna.

This landscape is exceedingly beautiful, and may be studied a long time.

126. Galileo before the Council of Urban VIII., by A. F. Ewald, Berlin.

The figure and countenance of the aged astronomer are very fine, while the members of the Council are very well represented.

128. Ruins of an ancient Temple, by M. Schmit, Germany.

In general merit this is like that of No. 120.

131. Bacchus presented to Silenus, by Giacomo Conti, Florence.

A well-grouped company of Bacchanalians, skilfully painted.

143. Execution of Marino Faliero, by F. Schneider, Munich.

This is excellent, and belongs on list No. 2.

144. St. Cecelia, by Guido Reni, Italy.

This painting is *certified* as a genuine original of the great master. It is certainly a capital picture, whether an original or copy.

161. The Mendicant, by Kassel, Breslau.

This picture is horridly and loathsomely perfect.

167. The Calculating Cook, by Moritz, Germany.

A very sage conception of a very important personage. She is making calculations for the day. It is painted by a good artist.

175. Judith with the head of Holofernes, by Conrad Hitz, Munich.

This is in a style unlike any other in the gallery, and is exceedingly well done. It should be ranked in list No. 2.

184. The Arch of Janus, in Rome, during an overflow of the Tiber, by F. W. Baker, England.

A good work of art, list No. 2, representing a very remarkable pile. The arch is double; that is, there are arches on all sides the square pile.

190. The return of Regulus to Carthage, by Cammuccini, Italy.

This is a superb picture, and ought to stand among the first in list No. 1. It represents Regulus, surrounded by his wife and friends and soldiers, at the moment when he is bidding them farewell.

212. Power of Music, by W. S. Mount, New-York.

This painting has been engraved. The musicians are in a stable, while the modest negro listens on the outside. It is a fine picture.

240. Greeks at Missolonghi, by Perignon, France.

A spirited battle-scene, illustrating one of the most terrible and important events in modern history.

255. Death of an Italian Volunteer, by Emilie Tapi, Florence.

This little painting deserves a location where its excellences can be better seen. It ranks in list No. 2.

257. Landscape, by G. Camino, Turin.

This is a fine picture of mountain scenery, with its deep chasms. List No. 2.

263. David calming Saul with the sound of his harp, by G. Maccio, Italy.

The figure and countenance of Saul are admirably represented, but the figure of David is indifferent. He never looked like the youth here painted.

266. French Squadron, marine view, by Morel, France.

This is one of the best pictures of the kind we have ever seen.

268. Portrait of "Father Gavazzi," by Fagnani, New-York.

This is clearly the most perfect likeness that we ever have seen on canvas. As such, it is without fault or defect. It is also good painting.

280. The Pilgrim, by Professor C. N. Carta, Rome.

As a work of art, list No. 2. But no *honest* pilgrim ever had so *carnal* a face.

296. Landscape, Swiss scenery, by Bernhard Fries, Heidelberg.

List No. 2.

301. Wreckers, by Ed. Luminais, France.

This is painfully expressive, and is unquestionably the work of a true artist. Were the touch a little more delicate, it would belong to list No. 1.

309. Landing of Columbus at Santa Cruz, by A. Colin, France.

A conception of doubtful propriety, as an historical fact, but exceedingly well done. Some very obvious anachronisms will appear to a careful observer.

314. Madonna and Child, by Carlo Dolci, Italy.

This is the property of Mr. White, of New-York. It is certainly an admirable work of art, and may be the original of this master.

325. Corpse of a female driven ashore, defended against the attacks of an eagle by two fisherman's dogs, by John Hilverdine, Holland.

This picture is sadly attractive, and shows great skill in the artist.

329. Landscape; view of a lake and Alps, by Tepping, Switzerland.

A fine view of lofty mountain scenery, and its quiet lakes.

334. Two ladies reading by lamplight, by P. Kiers, Holland.

List No. 2.

343. A steamer near the coast, by C. C. Kennemann, Holland.

List No. 2.

340. Landscape, by Tepping.

Very similar in merit to 329, by the same artist.

349. The Assumption of the Virgin, on parchment, by Correggio.

This is a design worthy of this great master; and the many figures represented within a very small compass, are exceedingly well done. It may be an "original."

365. The Temptation of St. Anthony, by "David Teniers."

This small picture is unique in its conception, and is perhaps an original. It stands in bad light.

370. Adoration of the Magi, by Carlo Maratti.

This may be an original: its merits are obvious.

372. Magdalen with Vase, by Francesco Barbieri, called also Guercino.

Perhaps more critical eyes would decide this to be an original.

373. Marine piece, by Jos. Vernet.

List No. 2.

374. Interior of a house, by Adrian Van Ostade.

This "original" of the great Flemish painter is not destitute of great merit.

401. Landscape in water colors, by Eugene Douler, France.

This is exceedingly pretty, and is the work of a good artist.

406. Mountainous landscape, by Michel Banquet, France.

List No. 2.

415. Mouth of a river in Holland, by A. Waldorp, Holland.

List No. 2.

419. The four ages of man's life, by Cæsar Paganini, Florence.

A fine design, capitally executed.

441. Town in Belgium, by Van Moer, Belgium.

List No. 3.

461. Landscape, by Geo. D. Brewerton, "United States."

List No. 2.

474. An inundation on the borders of the Loire, by A. Antigua, France.

List No. 2.

489. Seizure of Charlotte Corday, after she had killed Marat, by Madam F. O'Connell, France.

This is a very superior work, well designed, and in good keeping throughout. It belongs in list No. 1.

500. Cattle in a stable, by Auguste Knip, Holland.

This is manifestly by a practical man. It contains all the apparatus of old jugs, boots, lanterns, et id omne genus, which accumulate in the course of years in such a building.

510. Diogenes successful, by F. Anelli, New-York.

Somewhat marvellous in conception, but well painted. The head of Diogenes is very fine. List No. 2.

524. Midnight reflections on a skull, by P. Van Schendel, Belgium.

This young lady certainly had a very singular taste, but the artist has painted her with excellent skill. We are not sure, however, of the correctness of the portrait. Such a face would never reflect over a skull by lamplight.

533. The Flemish lawyer, by J. Getoni, Belgium.

Capital. List No. 2.

534. Portrait of Chief Justice Marshall, by J. B. Martin, "United States."

This is an excellent likeness, we are assured; and we are quite *sure* it is the likeness of one of the best and greatest of jurists, and is executed with great ability by the artist.

538. Cattle, by D. V. S. Backhuysen, Holland.

It was singular that he should detect that cow in the peculiar position here represented, to wit, between lying down and standing up. It is rather difficult to prove it faulty, but *quere.*

552. View on the Maas, Belgium, by Pierre T. Van Elvers, Holland.

List No. 2.

554. Rustic landscape, by Bodeman, Holland.

Very fair. List No. 2.

558. Fisherman's hut on fire, by Ch. Hubner, France.

This picture is full of expression, all true to the life. It ranks with the best works of living painters to be found in the gallery.

559. Setter and duck, by Leon Viardot, France.

This is a beautiful picture, among the best of the kind we have ever seen.

567. Family devotions, by Charles Hubner, Germany.

This exquisitely fine picture represents a family group, in a peasant's cottage, listening to the youngest child, a fine boy, as he reads aloud. The expression which the skilful artist has given to the different members of the family, various and yet all devout, is in admirable keeping, and the whole is unalloyed by a single defect. This painting must rank with 16, 110, 190, and the few of class No. 1 in this gallery.

579. Music, mathematical instruments, books, &c., on a table, by Damaresq, France.

This painting is not one that would excite the attention of the crowd, but a practised eye detects at once, in its grouping, so finely pictured, the skill of an artist. Nothing is distorted, and all the parts are harmonious. List No. 2.

585 and 596. The Adulteress at the feet of Christ, by Em. Signol, France.

These two represent the same scene at different moments of time. In the first, the face of the sinner is buried in the folds of her undress, as if utterly subdued with grief. In the other, the Saviour holds her arm by his hand, and she looks up to his face, her eyes full of tears, and her countenance expressing the hope she scarcely dares to entertain, of unexpected deliverance. List No. 1. The countenance of the Saviour is much better in 596 than in 585, in which the forehead is quite too low.

590. Woodland and brook, by Vanden Sande, Holland.

List No. 2.

591. Shipwrecked persons attacked by a shark, by Biard, France.

A small company are saved from drowning upon a raft. One man lies lifeless. A female has fainted in the arms of a friend, while another is striving to drive away a shark, whose jaws are extended to seize the limbs of the fainting woman. His hat is seen in the water. The grouping and the coloring are most excellent.

600. Landscape view in Norway, by C. Grolig, France.

List No. 2.

610. The bookworm, by Spitzwig, Munich.

This little picture, overlooked probably by the crowd, is a perfect gem. The countenance of the bookworm, his position on the steps, by the side of the lamp, reading metaphysics from a book in his left hand, while his right hand holds another, also open, and his legs hold a third—all are capital. It could not easily be improved. List No. 1.

611. Landscape, by Koekoek, Holland.

List No. 2.

616. Washington crossing the Delaware, by E. Leutze, United States.

This is a magnificent painting, particularly the figure of Washington. There is more presence in it, perhaps, than the truth would warrant, regarding it as a portrait, but the whole picture is very fine. It is just engraved in excellent style by Williams, Stevens & Williams, of Broadway.

626. Outside of a farm-house, by H. Huggens, Holland.

List No. 2.

629. Christopher Columbus at Salamanca, by A. Colin, France.

The hero of the picture is attempting to convince his royal and noble auditors of the existence of the unknown continent.

649. Madonna and child, by Murillo, Spain.

Very much defaced, and unfortunately *not* "restored" in keeping with the original.

651. Battle of Culm, by Professor Recklin, Berlin.

This huge picture is a capital representation of Marshal Vandam, surrendering himself as prisoner to Alexander of Russia and the King of Prussia, who were then *in retreat* before the army of Napoleon. The figure of the wounded marshal is admirable. This hangs over one of the stairways, of course out of the gallery.

652. Mary Magdalen, by Guido Reni, Italy.

This "original" was contributed by the British consul at Baltimore, Md. It is placed too high to be critically examined. It may be the work of this great painter.

St. Peter, by Carlo Dolce.

We have little doubt that this is an original of this great master. It hangs nearly opposite No. 1, quite low, and in bad light. It is a superb picture. It is not numbered.

There are other good pictures, but perhaps none of them exhibit so much skill in the artist as those here selected. Many others exhibit very excellent points, but have also striking defects, and hence the general effect is spoiled. Such is No. 435 of the official catalogue, and also 518, by the great artist, Rembrandt Peale. The body of the horse is out of proportion, and the curve of his neck unnatural. 606 is another instance of this kind. It is a farm-yard scene, in most respects very well done. But the legs of some of the horses are monstrous, even for draught-horses, as these are; and the proportion of some other animals do not speak well for the judgment of their purchaser.

These defects, though slight, are sometimes fatal. They remind us of a similar *blunder*, or something worse, in the architecture of a fine church in the Fifth Avenue, in which the entire frame-work which supports the upper roof rests on the tops of human heads!

UNITED STATES AGRICULTURAL DEPARTMENT.

We resume our description of the agricultural implements on exhibition in the South-East Gallery, commencing nearly where we concluded in the preceding number.

IMPROVED STAVE-CUTTER AND JOINTING MACHINE.

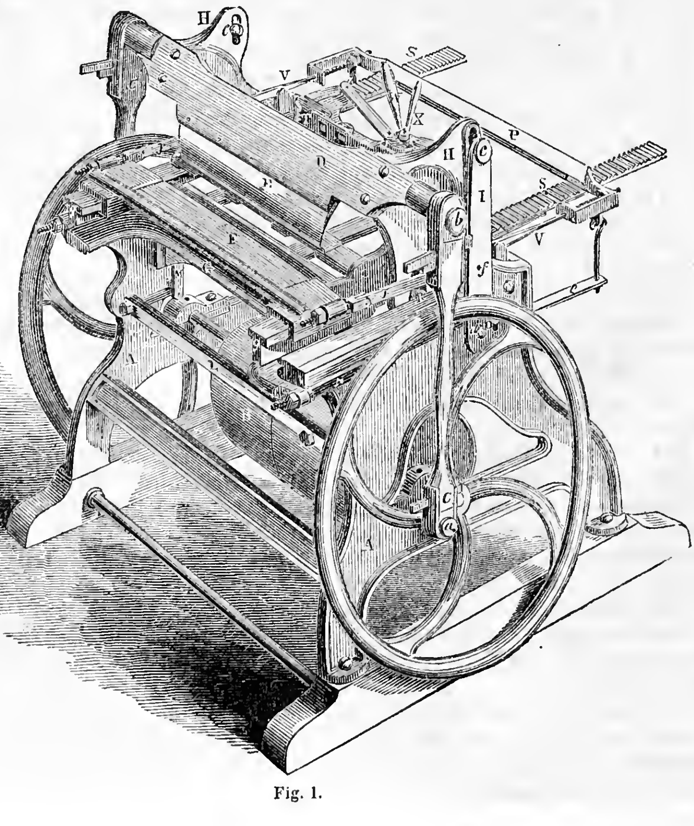


Fig. 1.

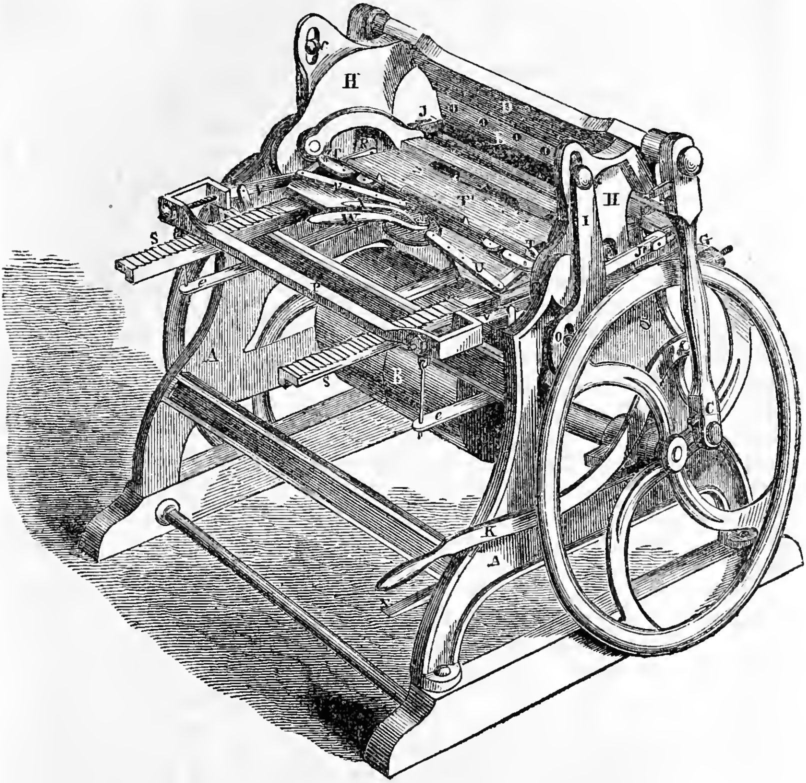


Fig. 2.

The annexed engravings are perspective views (figure 1 a view in front of the knives, and figure 2 a view behind the knives) of an improved machine for cutting and jointing staves, &c., invented by Charles Mowry. The assignees of the patent, with the exception of New-York State, are Messrs. Gwynes & Shefield, of Urbana, Ohio.

For this machine the logs are first sawn into a plank about four and a half inches thick, and then cut into bolts the desired length of the stave. The bolt is softened by steam or warm water, then placed on the machine, and cut and jointed while warm.

AA are the standards of the frame of the machine, and B represents a fast and loose pulley on the main shaft, for driving the machine by a belt, and for setting it free when required; C is a connecting-rod attached to the crank-pin, *a*, and to the wrist, *b*, of the knife-stock, D; E is the cleaving-knife. (There is a fly-wheel, connecting-rod, &c., on each side—the one a duplicate of the other.) The knife, E, receives a vibratory motion, and describes a vertical curve; *d* is the journal on which the arm, I, vibrates; *e* is a pin passing through a slot in the back of shoulders, H H, of the knife-stock, D. The said shoulders are fixed on journals to allow the knife-stock to vibrate, when the rod, C, moves up and down to raise the knife, E, and bring it down again upon the bolt of wood to be cut into a stave, &c.; F and G are the two stocks of the jointing knives, the separate operations of cleaving the stave and jointing it being performed through the agency of the same connecting-rods. The jointing-knives have a horizontal motion, and are placed one above the other; the arms that move them receive a vibratory motion, as follows: *f*, figure 1, is the pivot-joint of the rod, J, belonging to the upper jointing-knife, F. As the arm, I, is moved through the agency of the pin, *c*, working in the slot of shoulder, H, as said arm vibrates, the rods, J J, are moved in towards and from the bolt to joint the stave. The lower jointing-knife, G, has the inner end of its rod, N, hung on pivot-joints in the sides of the frame, and the pin, O, (one on each side,) projects through the slot in the lower part of the arm, I. When the said arm is vibrated, the lower jointing-knife will therefore receive the same motion as the upper one. These knives are made to cut the proper taper; *g g* are rails on which the guides of knife, F, slide. We have thus described the motions of the cleaving and the jointing-knives. We will now explain the feeding operations. Reference is especially made to figure 2. T is the bolt of wood to be cut into staves. It is placed on four iron bars, running lengthwise of the machine. The feed-carriage comes up behind the bolt and pushes it forward to the knives; T T are toothed clamps which have teeth that take into the ends of the bolt to hold it firm; U U are the levers that work these clamps. They are operated by the lever, W, which works the circle plate, to which the inner ends of levers, U U, are attached. The lever, X, is merely a wrench to screw the circle plate fast when the bolt is clamped; S S are the two racks of the feed-carriage, and arms, V V, and pall, P, is the feeder. The arms, V V, are secured on vibrating heads, R R, (one on each side,) secured on pivots in the sides of the frame, and they have pins projecting through curved slots in the shoulders, H H. When the shoulders, H H, vibrate, the pins at R, in the slots, are so acted upon as to move the arms, V V, back and forth, and thus make the broad pall, P, take into the racks, S S, notch after notch, and push them forward one notch for every stave to be cut. The bolt to be cut into staves passes under a guide-plate or swinging-bridge behind knife, E, in figure 2. When the bolt of wood is all cut up, by bearing down on lever Z, (letter turned,) it throws up the pall, P, and allows the feed-carriage to be moved back for a new bolt. The lever Z, therefore, regulates the feed motion.

The upper jointing-knife can be raised so as to regulate its position for staves of different sizes. In figure 1, L is a bar in front which vibrates in bearings in the frame, and is attached to suspended arms, M M, which are jointed to the swinging frame in which the knife-stock, F, is placed, and also the guide-bridge behind the knives. The lever, K, figure 2, is attached at one side to the bar, L, figure 1, and works it, therefore, by moving the lever to any desired point, up or down; the upper jointing-knife is placed so as to set the knives for operation, for staves of different widths; *e e* are simply screws working in bars, and are employed to make the pall, P, bite in the rack. The jointing-knives act before the descending knife, E, and when they recede, the said knife descends, cleaves out the stave, and it is then finished. The machine, although it may appear complicated, is really not so; a close attention to the figures and description will render its operation plain. It cuts and joints one hundred staves in a minute. We have seen a number of staves which were finished in one of these machines, and we can speak in the highest terms of the finish.—*Scientific American, April* 9.

This machine is made entirely of iron and steel, is about five feet in height, and some five feet square, simple in construction, strong and durable, and not liable to get out of order. It is driven by a belt from a pulley on a shaft, extending across the lower part of the machine, projecting some six inches on either side. On the shaft, at both ends, is a balance-wheel. The shaft crosses the machine underneath the feeding-carriage and cutting and jointing-knives. From a wrist or crank on the outside of each balance-wheel, a pitman of about three feet connects with a journal on the end of a cross-head, or knife-frame, to which is attached the main cutting-knife, and these connections give motion to all parts of the machine, the feed-carriage, jointing-knives, &c.

The bolt of wood, of proper length for the desired stave, is placed upon the feeding-carriage, firmly secured by merely moving a lever. The machine is not stopped to receive the bolt of wood, but being in motion, the carriage feeds forward the thickness of one stave at each revolution. Two jointing-knives, working forward and back, with great precision, and at nearly right angles with the main cutting-knife, work into the face of the bolt the thickness of one stave only at a time, as the bolt is fed forward, and while the main cutting-knife is rising upon the radius of a circle. The weight of the machine is about 3000 pounds.

As the pitmen pass their centres, and the main cutting-knife commences its downward movement, the jointing-knives are retiring out of the way; the revolution of the machine being completed, a perfectly dressed and jointed stave comes off, of the desired bevel and bilge, of uniform width, according to the thickness of the bolt, at the rate of 80 to 100 per minute, without a hand being touched to it, except to place and secure the bolt of wood upon the feeding-carriage of the machine. The bilge and bevel are easily altered, and the machine accommodates itself to the thickness of the bolt—say from $2\frac{1}{2}$ to 5 inches in width, which are the extremes for a good stave, and cuts both convex and concave surfaces.

The manufacturers have run these machines as fast as 120 revolutions a minute, but we think 80 to 90 revolutions full fast enough, as it accumulates them with sufficient rapidity; and for uniformity and smoothness, they are unsurpassed. No other machine in use for cutting staves feeds itself from a bolt of wood; and it is the only machine that joints the stave at the same time that it is cut and dressed, and without any handling; consequently, only about one third as much room is required as is necessary for other machines to perform the same work. The services of three men, at least, are saved, which services are indispensable where the jointing is a separate operation, thus not only reducing the amount of labor materially, and the space requisite for its performance, but excelling in rapidity, in the economy of timber, and economy of expense in running the machine.

The services of only one man are necessary to place the bolt and attend to the running of the machine. Five horse-power, either water or steam, is sufficient to drive the machine.

This machine can, with ease, cut, dress, and joint as many staves in one day, as one hundred men can set up into barrels in the same time. Any kind of timber that is fit for a stave may be used, even such as could not be rived into staves and worked by hand, such as Maple, Hickory, Hackberry, Elm, Beech, &c., &c. The cost of running the machine, carrying out and piling up staves, need not exceed, if it equals, fifty cents per thousand. One thousand feet of plank, board measure, will turn out three thousand staves. One cord of bolts (128 solid feet) will turn out two thousand staves. It has received the highest awards of the State Agricultural Societies of Ohio, Michigan, and Wisconsin, in the shape of medals, silver cup, premiums, and diploma.

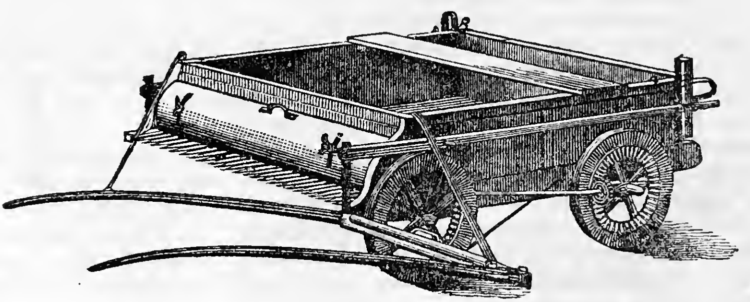
FARMER'S LABOR-SAVING MACHINE.—This is a very simple machine, which is designed to thresh, clean, and bag the various kinds of grain. There are various sizes. That before us is designed for two horses, and it is said will thresh, clean, and bag a hundred bushels of wheat per day.

A SCREW CHEESE-PRESS, manufactured at Belleville, N. Y., by Williams & Hackey, stands near that just described, in which the arrangement, in our opinion, is very judicious. A crank, on the axis of which is a small cog-wheel, turns a larger cog-wheel fixed upon the screw, by which the weight is raised or lowered. This must be a very efficient press, and one that will require but little repairs.

MCCORMICK'S REAPER.—This machine, which made so much noise at the Exhibition in London, and which has been so extensively advertised, needs no description from us. But we are by no means certain that it is the best in *our* Crystal Palace.

ATKINS' AUTOMATON SELF-RAKING AND REAPING MACHINE.—This is so arranged as to be in working order, and as it extends its huge wooden *arm*, with a rake attached, reminds us very much of the movement in Maelzel's Chess-player. It must require considerable power; too much, probably, for our common Northern farmers. Where horse-power is abundant, however, this is of little importance. The action of the machine seems satisfactory.

DENTEN'S REAPER AND SELF-RAKER.—The proprietor claims that this cuts a wide swath, and that it can be easily adjusted to any desired height, requiring the attendance of only one person. It is drawn and guided by the tongue. Four horses operate it with ease. The grain, as it is cut, is thrown back on the endless conveyor by the reel, and is carried by the conveyor over the driving-wheel, and thrown into the hopper, which turns at appropriate intervals, and throws the grain in suitable bundles on the ground.



WAGENER'S CLOVER AND TIMOTHY SEED HARVESTER.—This machine consists of a simple frame and box mounted on wheels, in front of which is a cylinder, set with spiral knives, acting in concert with curved spring teeth, in combination with a straight knife, which forms a perfect shear, and severs the head from the stalks, which are, at the same time, discharged into the box. The teeth being made to spring and vibrate, it is claimed that not a particle of clover, however stalky or thick, can possibly escape being cut, or allow the teeth to become clogged. This machine is so constructed that it can be made adjustable to the height of the clover and timothy. This is accomplished by a simple lever at the side. This machine is evidently moved by less power than either of those before described. The price, too, is more moderate, being from $75 to $100. A cut of it is here given.

HATHAWAY'S COMBINED MACHINE, for threshing, separating, and cleaning grain, clover, and grass seed. It is claimed by the proprietor, that this machine will thresh and clean from 600 to 800 bushels of wheat per day, and that by changing the position of the concave, it will thresh and clean from 500 to 700 bushels of clover-seed per hour. The machine is not in action.

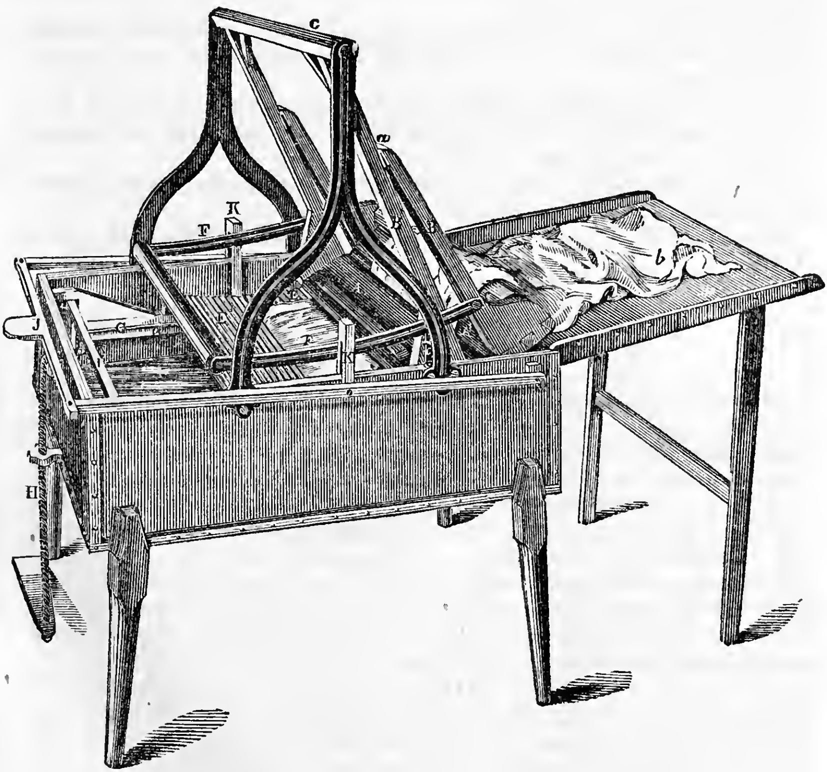
Gilbert's Thresher and Cleaner, it is said, "will operate as fast as a man can properly feed;" but what rate this is, does not appear; and as it is immovable, (in this exhibition,) we have no means for forming an opinion.

Ketchum's Patent Mowing Machine appears as well as any of its rivals, the general arrangement being more efficient, in our view, than that of some of the foregoing. "Still life," however, furnishes very imperfect means of determining the power of the bird in flight.

Manay's Mower and Reaper.—This, too, looks very well, and we should be glad to see it in action.

Phelps' Patent Bee Hive, described and illustrated in a late number, *in which the bees are at work*, is upon exhibition on an elevated stage in this gallery, and attracts much attention.

INDIA-RUBBER WASHING MACHINE.



This is a very good good machine, though very doubtfully named. It can be worked by a man or boy as well as by a woman. The benefit of all machines being to *transfer*, rather than to create power, this meets the demand better than most others which present themselves for the kind regard of housekeepers. The peculiar merit of this patent is, that it both pounds and rubs, and performs either service upon any particular portion of its contents, as the operator may desire. Its cost is from $12, upwards. A representation of the machine is on the preceding page.

We give more space to this than to almost any machine of moderate pretensions—moderate we mean in the scale of complex mechanisms—because it goes to promote the convenience and comfort of households, to aid the housewife in her numerous and often perplexing arrangements. We have in our minds the little ballad so familiar to all, entitled 'Washing Day.' Who ever makes sunshine then, is a public benefactor.

T. GILBERT'S ÆOLIAN PIANOFORTES.

These instruments, manufactured by the celebrated makers, T. Gilbert & Co., of Boston, are at this time too well known to require particular description.

The experience of eight or nine years has led to several important improvements, and they have now brought the Æolian to a degree of perfection not before attained. Its tones are unlike the seraphine, having all the softness and richness of the flute.

The fact alone of their having applied the Æolian attachment to some 2,000 of their pianos within the last eight years, is a sufficient proof of public appreciation.

The manufacturers use only the metallic frame in their pianos, and from the great care used to obtain only the best of material, confidently warrant them to stand any climate.

Messrs. Gilbert & Co. own the patent, and no other person has the right to manufacture them in the United States.

For particulars, apply to Horace Waters, sole agent, 333 Broadway, New-York.

PAINTING AND PAINTERS.

Painting and Poetry are twin sisters, and from "the beginning," the successful votaries of each have been ranked among the greatest and highest. From statesmen, orators, and even warriors, from the wise and learned, they have received their full share of honor, as well as of popular applause.

As in poetry, so in painting, there is the epic and the pastoral, the sublime and the beautiful, and each of these and of the other descriptions of painting, has its various styles or forms, in which it has expressed its ideas. Without attempting a critical essay on the subject, we have thought it well, especially in connection with The Great Exhibition, to give a short account of the different schools, with the names of a few who have been regarded as the founders and the ornaments of the class.

The Venetian School, in the sixteenth century, dazzled the world by the brilliancy of its coloring. In this branch of the art, the Venetian School surpassed all others. Titian, born 1477; Georgioni, born 1478; Giacomo Robusti, otherwise called Tintoretti, born 1512; and Paul Veronese, born 1530, were leaders among its great names. Georgioni made most important discoveries in the science of rich and natural colors, while Titian, the founder of this school, with his matchless skill, availed himself of those discoveries, to give still greater effect to his own wonderful conceptions and his finished execution. One picture in the Crystal Palace is said to be by Tintoretti.

The Roman School sprung up with Raphael. He was born 1483. He acquired a sublimity of manner that has never been equalled. This school was distinguished for the display of science and skill in its compositions, correctness in drawing, elegance of proportion, and for general beauty and refinement. Julio Romano, Sebastian del Piambo, Polidore de Caravaggio, Carlo Maratti, &c., were of this school, which disappeared with Raphael and his immediate scholars.

The Crystal Palace contains one picture, said to be by Carlo Maratti. It is called *Adoration of the Magi*, and is here numbered 370. He was born 1625.

The Florentine School is remarkable for its boldness and grandeur, and originated with Michael Angelo Buonarotti, of Tuscany, born 1474. He is the Homer of epic painting. Some of his productions are unrivalled in grandeur and sublimity. Among the eminent painters of this school were Leonardo da Vinci, Georgio Vasari, and Daniel Riccierelli, called also Daniel da Volterra, who was one of the greatest of them all. His "Taking down from the Cross" is ranked with the Transfiguration of Raphael.

The Lombard School, at about the same period, was very distinguished. Antonio de Allegri, called also Correggio, and Francisco Mazzueli, called also Parmegiano, were among the eminent painters of this school. Correggio stands first on the annals of *chiaro-scuro*, "those magic illusions of light and shade," and in all that is elegant and graceful. His Magdalen, 20 inches by 15, was purchased a few years since by the King of Poland, for 27,000 florins, or about $32,500. Of the latter of these it was said, "the soul of Raphael has passed into the person of Parmegiano."

In the Crystal Palace is a small "painting on parchment," numbered 349, said to be by Correggio. It represents the assumption of the Virgin into heaven. The design is admirable, and this at least, if not the painting, is doubtless that of Correggio.

The School of Bologna was a union of different styles, being remarkable for the fine design and drawing of the Roman, the grace of the Lombard, and the coloring of the Venetian. The Caracci, born near the middle of the sixteenth century, Guido Reni, and Domenichino, born 1581, are among its eminent painters. The last named, in color, design, and expression, has been ranked with Raphael. Of the Caracci, Annibal is the most brilliant.

In the Crystal Palace are two pictures which profess to be the work of Guido Reni, one numbered 144, St. Cecilia, and the other, Mary Magdalen, numbered 652. In the choice of his subjects, the purity of his coloring, in sentiment, and an elegance of expression which he has given the female character, and in all the higher excellence of the art, he stands among the highest. Francesco Barbieri was of this school. He was born 1590. One of his pictures is in the Crystal Palace. It is No. 372, and is called Magdalen with Vase.

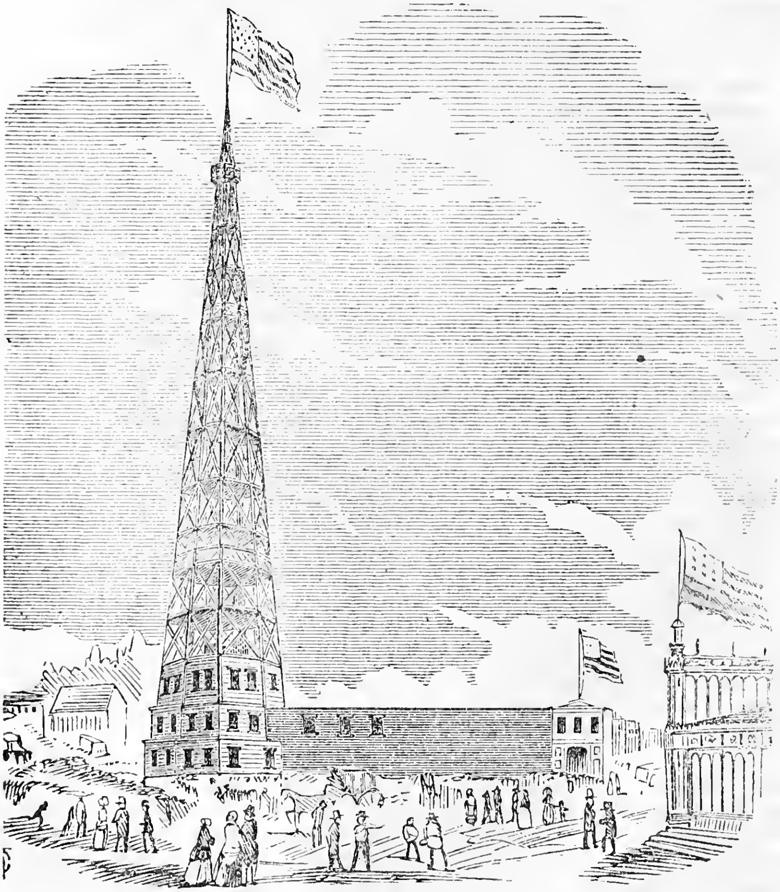
The Flemish School, like that of Venice, is chiefly eminent for its coloring. Rubens, Vandyk, and David Teniers, are among the greatest of this or any other school. Peter Paul Rubens was born in 1577, at Cologne. No painter ever surpassed him in richness of inventive powers, while in the versatility of his genius, facility of combination and beautiful blending of colors, he rivals the great Venetian masters. Vandyk has been called the Raphael of the Flemish school. He was born in 1599. Teniers, born 1610, was eminent for his facility of execution and pureness of coloring. His skies possess that clear and silvery hue, his figures that transparent and spiritual touch, which constitute a great part of the beauty of this master's art

The Crystal Palace contains one picture "by Teniers," the Temptation of St Anthony, numbered 365.

Adrian Van Ostade belonged to this school. He was born 1610. The painting numbered 374 in the Crystal Palace, was by this artist. It is called in the catalogue, "Interior." It is a view of an apartment in some cottage.

We shall take another opportunity to refer to the schools of Naples, Spain France, &c. Among these is the painter Velasquez, of great reputation, one of whose paintings, as it is said, is on exhibition in Broadway. We have neither seen the painting, nor the evidence of its authenticity.

THE LATTING OBSERVATORY.



This structure deserves careful consideration in various respects. It is a capital exhibition of architectural skill, and as such commends itself to the study of all practical artisans in that department. Again, it is worthy of attention as the highest structure, we believe, on the continent; and thirdly, as an observatory which commands an entire view of New-York and its environs.

The original plan was to construct it 350 feet high to the top of the flag-staff; but it was finally decided to erect it 300 feet to the iron bed on which is being placed the apparatus for the "calcium light," consisting of a lantern of iron, with neat iron palisades around, 10 feet in diameter, the lantern itself being 6 feet in diameter, leaving a two-feet walk at the height of 300 feet from the ground. The lantern reaches 15 feet above the bed-plate on which it rests, and is covered by a well-formed octagonal roof, or cap, diverging from a point at the centre, the entire height of which is 315 feet. This height is within twelve feet of that of St. Paul's Cathedral, measuring to the top of the cross. The height of St. Paul's Cathedral is 306 feet, so that the Latting Observatory is nine feet higher than the loftiest cathedral in Great Britain. It is of an octagonal form, with a base 75 feet in diameter, and it will be capable of accommodating 2,000 persons at one time on its various landings. The frame is composed of eight spars, each made of two posts, an inside and an outside post, the distance from the inside of the former to the outside of the latter being 6 feet. Each outside post is formed of 3 timbers, or planks, 3 inches by 12. These are so bolted together as to hold fast the ends of the short braces which, together with the inside post, form the spar. To see one of these spars separate from the building, would present the appearance of a gigantic ladder, 300 feet high, 6 feet wide, but with the steps placed across, so as to form diamond spaces between each, instead of squares. These spars are made strong by every joint in the timber being covered or lashed over by a strong portion of the neighboring timber—what, in technical language, is called "breaking the joint." Eight of these spars are placed leaning towards each other, forming a base of 75 feet diameter, and a curb at top of 6 feet diameter. These rest on a foundation of solid stone, overlaying the rock 7 feet below the surface. The spars are bolted to the foundation by means of iron strapping, 2 inches by $\frac{3}{4}$ inch, made of the best Ulster iron. This strapping runs from the bottom of the foundation to 14 feet above, where it is firmly bolted to the outside timbers.

These eight spars are supported inside by eight others of similar construction, running perpendicularly to the height of 200 feet, forming a well 15 feet diameter and 200 feet deep, in the centre of the tower. The inside spars are braced and bolted to the outside ones at every stage or landing, (of which there are three above the six floors from the basement,) and also at intermediate stations. In addition to all this, there are braces crossing each other on the outside, with ties, so as to keep the posts from buckling between the landings; and the bolts and ties are so arranged, on the principle of a tube or barrel, that as soon as any variation of climate causes the timber to shrink or to expand, two men can tighten or release the whole more easily than they could the hoops of a large barrel. This is an ingenious contrivance to avoid the danger which a timber building of this character would otherwise be liable to.

Mr. Nangle was the designer of this admirable plan, while Mr. Waring Latting, whose name it bears, originally suggested the idea, and employed Mr. N. to construct the plan. The other gentlemen engaged in it are Messrs. D. D. Deming, Daniel Sickles, and George and Charles P. Grosvenor. The stock of the Association is $150,000. It pays a good dividend.

The ascent is by a winding staircase, but so constructed as to tire, by the ascent, much less than one would anticipate. The frequent landings furnish convenient opportunities for rest, and present sufficient inducements to detain the visitor, even though he may not need the rest.

The entrance to the building is in Forty-second street, and opposite the Crystal Palace.

Among the various objects of interest within the range of vision from this tower, on the south, are New-York city, with its public buildings, spires, and streets. The Sixth Avenue stretches out like a ribbon from beneath you. Brooklyn is also in view, with a small portion of Greenwood Cemetery and Fort Hamilton. East of Brooklyn are Williamsburgh, Greenpoint, Ravenswood, Astoria, Newtown, the spires of Flushing, the tower upon Cypress Hills, &c. The East river is also visible for nearly the whole extent, with Randall's Island, Blackwell's Island, and its Asylum, Alms House, and City Prison.

Turning to the north-east and north, are a continuation of the city, with the Orphan Asylum for colored children, and the Arsenal, a stone building on the Fifth Avenue; the great Croton reservoir, much larger than the receiving basin by the side of the Crystal Palace, and almost under your feet; while still farther in the distance, when clear, you see Harlem village and the High Bridge, on which the Croton pipes cross the Harlem river. This bridge rests on eight arches, each of 80 feet span, and seven others, each being of 50 feet span, and is 114 feet above tide-water. The Palisades on the North river, with the silver surface of this beautiful stream, are also a view.

Again, towards the west, are the Hudson, the beautiful scenery of Hoboken and its "Elysian Fields," Jersey City, &c.

No stranger should visit New-York, and not ascend to the top of the Latting Observatory.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

ANALYSIS OF THE VEGETABLE OYSTER.

(TRAGOPOGON PORRIFOLIUS.)

BY J. H. SALSBURY, M. D.

This plant does not belong to the list of those used as food for stock; yet it is a plant of some interest in the way of the table, on account of its richness and peculiar flavor, which somewhat resembles, when cooked, that of the oyster.

The specimens examined were very large and tender. They were furnished by Mr. Douw, of Greenbush. The average widest diameter at the roots of six specimens was 1½ inch; their average length, 11 inches; average length of tops, 26 inches; average weight of each root, 4¼ ounces; average weight of the tops of each plant, 1½ ounce.

	Fresh Roots.	*Fresh Tops.*
Per centage of water, . .	81.220	84.460
" " dry matter, .	18.780	15.540
" " ash, . .	1.465	2.170
" " ash in dry matter,	8.333	13.964

6826 lbs. of fresh roots contain 100 lbs. of inorganic matter; 4608 lbs. of the fresh tops contain 100 lbs. of inorganic matter.

100 lbs. of the inorganic matter of the roots and tops contain, respectively:

	Roots.	*Tops.*
Carbonic acid, ...	24.60	21.90
Silicic acid, ...	0.60	8.65
Phosphoric acid, . . .	15.60	5.05

Phosphate of iron,	1.85	3.85
Lime,	4.95	7.05
Magnesia,	0.75	1.20
Potash,	5.80	6.30
Soda,	39.20	40.05
Chlorine,	2.45	0.55
Sulphuric acid,	3.90	5.15
Organic matter,	trace	none
	99.70	99.75

100 lbs. of fresh roots remove from the soil a little less than 25 ounces of inorganic matter; 100 lbs. of fresh tops remove about 35 ounces of inorganic matter. These amounts contain, in round numbers, as follows:

	25 ounces.	*35 ounces.*
Carbonic acid,	6.15	7.30
Silicic acid,	0.15	2.88
Phosphoric acid,	3.90	1.68
Phosphate of iron,	0.46	1.28
Lime,	1.24	2.35
Magnesia,	0.19	0.40
Potassa,	1.45	2.10
Soda,	9.80	13.35
Chlorine,	0.61	0.18
Sulphuric acid,	0.98	1.72

It may be regarded by some as quite unnecessary to enter into a series of calculations which show the amount and kind of each ingredient removed from the soil by a given weight of the fresh roots and tops, separately, of the vegetable oyster. Those, however, who live in the vicinity of large towns, and who raise this plant in quantities for market, we think, will find them valuable in the way of pointing out the kind and quantity of each ingredient removed by a crop, and hence, the kind and quantity of each necessary to add. The aggregate quantity raised is, to be sure, but small; nevertheless, it is highly desirable, and equally important, to have what are grown of the best quality. This is only to be effected, to any degree of certainty, by knowing what kind of a soil is best adapted to them. This is established by determining accurately the composition of the plant. Hence the practical value of these calculations.

One ton of fresh roots contains of inorganic matter, 31.16 lbs., which is made up of the following bodies, in the proportions given below:

Carbonic acid,	7.69 lbs.
Silicic "	0.19 "
Phosphoric acid,	4.88 "
Phosphate of iron,	0.57 "
Lime,	1.55 "
Magnesia,	0.24 "
Potassa,	1.81 "
Soda,	12.25 "
Chlorine,	0.76 "
Sulphuric acid,	1.22 "

These bodies are more than furnished to the soil by the following compost:

Ashes, ...	33 lbs.
Common salt, . .	10 "
Plaster, ...	5 "
Barn-yard manure, .	1 ton.

The ashes furnish all the inorganic matter removed, in sufficient quantity, except the soda, chlorine, and sulphuric acid. The salt and plaster furnish these. The ton of barn-yard manure is added to furnish organic matter to the plant, to increase the absorbing power of the soil, to elevate its temperature, and to render more soluble the inorganic matter added.

We now come to see the proximate organic composition of the roots, which points out to us their nutritive qualities.

	100 *parts of fresh roots.*	100 *parts of dry roots.*
Water, ...	80.610	
Fibre, ...	2.764	29.618
Sugar and Extract, .	3.665	39,279
Dextrine, . . .	1.435	15.378
Casein, ...	0.172	1.849
Albumen, . . .	1.066	11.426
Starch, ...	0.035	0.375
Resin, ...	0.180	1.929
Gluten, ...	0.014	0.147
	99.941	100.

The roots contain a large per centage of sugar, dextrine, and albumen, which accounts for their rich flavor. They contain about 5 per cent. of water more than the potato. Besides the above-mentioned bodies, they have a small quantity of a principle which gives them that peculiar flavor and odor when cooked.

Ultimate organic analysis of roots.—100 parts of dry roots gave of

Nitrogen, . . .	1.980
Carbon, . . .	42.809
Oxygen, . . .	41.014
Hydrogen, . . .	5.644

ATMOSPHERIC GAS-LIGHT.

Some months ago, a patent was secured for a new gas-light, the basis of which is humid atmospheric air, and a company is now organized for bringing it before the public. Henceforth, there is no necessity for huge retorts, stills, furnaces, &c., covering with a sooty cloud entire sections of the city; for each family and each individual even, is independent of any such assistance in illuminating his mansion, church, store, or counting-room. The point, which has so long been contested, is settled beyond controversy.

We have been personally conversant with this discovery from its earliest history, and we have long been certain, from the evidence of our own senses, of the truth of its pretensions. For many months we have had a two-ounce phial, containing the mysterious liquid, so arranged as to allow a passage of air into and out of it, and using our own lungs as the only machinery in connection with it, have exhibited, from time to time, to scores of our friends, its product, in the form of a clear, white, pure flame, free from smoke and other offensive or unhealthy quality, and which threw into shade all other lights with which it could be conveniently compared. We have used this same phial, *its contents being unchanged*, for more than a year, and are ready to show it to still other friends.

But what is it? How does it differ from other gas-lights, already in use?

It is produced by a current of "humid air," passing through a mixture, the principal ingredient of which is benzole, a highly carbonized fluid. Instead of using "carburetted hydrogen," prepared by expensive chemical processes, (which, being always impure, and abounding in sulphuretted hydrogen, has a most offensive smell, as every one knows who has been near a leaky gas-pipe, and is very unhealthy withal,) this patent employs atmospheric air, which, by a mere passage through the liquid, at ordinary temperatures, appropriates to itself, from the benzole mixture, all that is requisite to impart to its flame peculiar brilliancy.

But what is benzole, and how and at what cost can it be obtained?

Benzole is a "hydrocarbon" spirit, of liquid form, obtained by distillation from bituminous coal and other analogous substances, which are found or are easily obtained in every part of the world. The company to which we shall presently refer, propose to supply it, at present, in any quantities, by importation, at one dollar a gallon. But they purpose, hereafter, to manufacture it for themselves, and can then, no doubt, afford to sell it at a much lower rate.

This benzole is mixed with one or two other cheap ingredients, and a gallon of the hydrocarbon is fully equal to the production of 1,000 cubic feet of gas.

Hence, the gas cannot cost the consumer more than $1.25 per 1,000 feet, and probably it will be much less. But even at this rate, this gas is essentially cheaper than that sold by any company, in any city in the world.

In the use of this gas, there need be no middleman or company between the raw material and the consumer. No chemical apparatus nor chemical process is necessary to prepare the benzole for immediate use.

Every building, whether factory, store, dwelling-house, church, or other structure, and even a single room in a boarding-house, whether in city or country, may have its own fixtures for using this light. To provide an entire dwelling-house of ordinary size and requirements, would need but a comparatively cheap apparatus. The Company now organized propose to furnish every thing that is necessary, not occupying more space than two feet square and three feet high, at a cost not exceeding $70. This apparatus will require less than two minutes' attention, daily, to keep it in constant working order for an entire household. The pipes conveying the gas to the different parts of the house, as at present, would be arranged, of course, at more or less cost, according to the pleasure of each consumer. It will not be long, in our opinion, before ingenious mechanics will devise models for ladies' work-tables, or other household furniture, which will contain all that is necessary to furnish light to as many as can be accommodated around it.

The proprietors of this patent have already organized a company, under the name of The American Gas Company, the stock of which includes the two great States of New-York and Pennsylvania, and a good portion of which, as we are informed, is already sold. Their office is at No. 3 Broadway, where the proprietors of most of the other States may also be found. The shares are held at a low price, so as to bring them within the reach of those of moderate means.

We shall be happy to give any further information in our power to any of our readers who may send us letters of inquiry. For, though not interested in this patent to the amount of a single mill, we have felt a deep interest in the subject, and we believe this discovery will revolutionize, ere long, our whole system of lumination, and we are disposed to give it all the aid in our power.

Such is the obvious value of this discovery, that more than one who have been to some extent made acquainted with it, either by fair means or foul, have undertaken to avail themselves of the opportunity to secure a fortune, by adopting modified forms of the great principles involved in it, and already secured to the gentlemen who have organized this Company, by patent.

We purpose to illucidate this subject more particularly in our next number.

EDITORS' JOTTINGS AND MECHANICAL RECORD

New-Haven Railroad.—We take pleasure in recurring to this excellent inland route for eastern travel, as affording superior facilities and advantages to any who may have occasion to avail themselves of good accommodations, gentlemanly conductors, and careful engineers and attendants. Every attention is paid to the comfort and safety of passengers, and we are pleased to know that this is a favorite line of travel with the public generally. Under the present able management of this Company, we have no doubt of its continued success and prosperity.

Otis & Cottle's Boring and Mortising Machine.—We are gratified at the success of the Boring and Mortising Machine manufactured by Messrs. Otis & Cottle, and on exhibition at the late Fair of the American Institute, and also at the Crystal Palace. Besides the above mortising and boring machine, Messrs. Otis & Cottle sell every variety of machinery for carpenters, joiners, and builders. Office, Syracuse, N. Y.

Boston Museum.—Being in the "city of notions" a few days since, we "dropped in" to the Museum, and were so much interested that we staid until after the performance in the evening. The collection of natural and artificial curiosities is very large, and the performances very respectable.

Safes.—We have seen McFarland's Fire and Burglar-proof Safe that delivered up its contents sound and uninjured from the great fire in Pearl street, August 23, and do not hesitate to say to our patrons, that whatever will stand a fire like that, may be trusted any where. The manufacturers are confident of its superiority over all others, and modestly wait for time and fires to bring out the proofs. They are pressed with orders from all quarters.

Chilson's Patent Air-warming and Ventilating Furnaces.—The importance of pure air for respiration cannot be overrated. Every individual is interested to a greater or less extent in the successful accomplishment of this object. But to impart a general and agreeable warmth to the atmosphere in dwelling-houses, our school-houses, churches, &c., during the severe cold of our Northern winters, and yet to retain it in a pure state, is a problem requiring mechanical ingenuity and chemical science. Notwithstanding such difficulties, presenting objections to so many of the various kinds of warming apparatus now in use, Mr. Gardner Chilson, of Boston, after many years' close observation and strict preatical experience, has produced, as the result of his study and experiments, a combination hot-air and ventilating furnace, that we think is unsurpassed either in the simplicity of its construction, the excellence of its arrangement, or the pleasantness and healthiness of the warmth produced by it. This arrangement not only answers the purposes above described, but promotes economy in the quantity of fuel consumed, and is free from danger by fire.

Baltimore and Ohio Railroad.—This road was opened to through travel on the 1st of January, 1853, and is now become thoroughly settled and complete in all its appointments. It is 380 miles in length, and passes through a highly interesting and attractive country. Among the Alleghanies, the scenery is remarkably sublime. There are *no draw-bridges* upon the line, and the safety and comfort of the passengers are carefully provided for by competent and attentive officers.

Stone Tree.—There is a tree in Mexico called the *chijol*, a very fine wood, which, according to a writer in the *National Intelligencer*, (W. D. Porter,) becomes petrified after being cut, in a very few years, whether left in the open air or buried. From this timber, houses could be built, that would in a few years become fire-proof, and last as long as those built of stone. The wood, in its green state, is easily worked: it is used in building wharves, forts, &c., and would be very good as railway sleepers, or for plank-road stringers.—*The Pacific*, (*San Francisco Paper.*)

NEW BOOKS.

The Missionary of Kilmany; being a memoir of Alexander Paterson, with notices of Robt. Edie. By Rev. John Baillie. pp. 253. New-York: Robert Carter & Bros.

This little work was undertaken at the instance of Rev. Dr. Hanna and other prominent persons, who were anxious that the life of so useful a man should not pass unrecorded. It will be read with interest and profit. It is very handsomely printed, and in handsome covers.

Christian Progress; a sequel to The Anxious Inquirer after Salvation directed and encouraged. By John Angell James. pp. 180. New-York: Robert Carter & Brothers.

The works of John Angell James need no endorser. This small volume should be a companion to the other writings of the most excellent and able author.

The Law and the Testimony. By the Author of the "Wide, Wide World." New-York: Robert Carter & Brothers, 285 Broadway.

Our readers will not be able to appreciate this work but by reading it. It is a collection or classification of the mass of Scripture testimony, on each of the grand points of Scripture doctrines. The second article, upon the Divinity of the Saviour, is written with the tact and power of a theologian, clear and cogent.

Principles of Geology; or, the Modern Changes of the Earth and its Inhabitants, considered as illustrative of Geology. By Charles Lyell, M.A., F.R.S., Vice-President of the Geological Society of London; Author of "A Manual of Elementary Geology," "Travels in North America," "A Second Visit to the United States," &c., &c. New and entirely revised edition, illustrated with maps, plates, and wood-cuts. New-York: D. Appleton & Company, 200 Broadway. 1853.

This work of more than 800 pages is now offered, after being revised and enlarged by nearly one third of the whole, for the price of $2.25 per volume. It comprises a historical sketch of geology, defining its relation to other sciences; treats of observed changes in the inorganic world now in progress; of igneous causes or subterranean heat; of the geographical distribution of species, and theories respecting their creation and extinction, and the laws by or according to which we find them imbedded in volcanic, fresh water, and marine deposits.

It is indeed just the book that we are glad to meet with, coming down to our own time, full of instruction to the student, and matter for contemplation for the most profound. A book for all, and its price within their means.

List of Patents Recently Issued,

FROM SEPT. 7 TO OCT. 1.

M. W. Baldwin, of Philadelphia, Pa., for improvement in gear of variable cut-off valves for steam-engines.

John Chilcott & Robert Snell, of Brooklyn, N. Y., for improvement in India-rubber soles for boots and shoes.

John Chilcott & Robert Snell, of Brooklyn, N. Y., for improvement in cutting boots and shoes. Patented in Belgium, Sept. 16, 1852; in France, Sept. 17, 1852; in England, Sept. 30, 1852.

Pierre Demeure & Auguste Mauritz, of New-York city, N. Y., for improvement in bed bottoms.

Wm. P. Greenleaf, of Washington, N. H., for improvement in shape of scythes.

Z. H. Mann, of Cincinnati, Ohio, for improvement in safety-valves for steam-boilers.

George Potts, of Cincinnati, Ohio, for improvement in revolving mandrel for lining cylinders with metal.

Andrew Robeson, Jr., of Newport, R. I., for improvement in bucking cloth. Patented in England, Nov. 8, 1853.

Hervey S. Ross, of Cleveland, Ohio, for improvement in fences.

Samuel B. Sumner, of Grantville, Mass., for improvement in boot-jacks.

Frederick W. Norton, of Lasswade, Great Britain, for improvement in the manufacture of plain and figured fabrics.

James Rakin, of Detroit, Mich., for improvement in hanging mill saws.

John Chilcott & Robert Snell, of Brooklyn, N. Y., for improvement in screw fastenings for boots and shoes.

L. A. Stockwell, of Batavia, N. Y., for improvement in lard lamps.

T. J. Alexander, of Westerville, Ohio, for improvement in sawing sticks for broom-handles.

Jas. Black, of Philadelphia, Pa., for improvement in planetary hydraulic steam engine.

Uriah A. Boyden, of Boston, Mass., for improvement in turbines.

Uriah A. Boyden, of Boston, Mass., for improvement in hydraulic motors.

Alfred F. Chatman, New-York city, N. Y., for improvement in razor strops.

Isaac Fay, of Cambridge, Mass., for improvement in railroad car-seats.

David Freed, of Huntingdon, Pa., for improvement in toilet furniture.

Samuel Hulbert, of Ogdensburgh, N. Y., for improvement in ploughs. Patented in Canada, Sept. 20, 1852.

Samuel Jenkins, of Portsmouth, Pa., for improvement in seed-planters.

Oliver S. Leavitt, of Marcellus, N. Y., for improvement in hemp breakers.

Oliver S. Leavitt, of Marcellus, N. Y., for improvement in drawing-frames for hemp and flax.

Warren Lyon, of New-York city, N. Y., for improvement in metal drills.

James R. Nichols, of Haverhill, Mass., for improvement in fluid cans.

Henry Perrin and Wm. Rudduck, of Wilmington, Ohio, for improvement in seed planters.

Philo Sylla and Augustus Adams, of Elgin, Ill., for improvement in grain and grass harvesters.

Ancil Stickney, of Norwich, Vt., for improvement in blow-pipes for enlarging blasting cavities. Ante-dated May 10, 1853.

Ancil Stickney, of Norwich, Vt., for improvement in compound blow-pipe for enlarging blasting cavities. Ante-dated June 11, 1853.

Abel Shawk, of Cincinnati, Ohio, for improvement in steam generators.

O. Willis, of McDowell Co., N. C., for improvement in saw for water wheels.

George Gorman, of Lamar, Mass., for improvement in cotton stalk-cutters, or pulverizers.

Halvor Halvorson, of Hartford, Conn., for improvement in looms for weaving hair cloth.

Henry Hochstrasser, of Philadelphia, Pa., for improved sash-fastener.

Nicholas Mason, of Roxbury, Mass., for improvement in cooking ranges.

Henry McCarty, of Pittsburgh, Pa., for improvement in the manufacture of sheet-iron.

Jordon L. Mott, of New-York, N. Y., for improvement in cooking-stoves.

Jordon L. Mott, of New-York, N. Y., for improvement in bathing-tubs.

Christian Sleppy, of Newport, Pa., for improvement in making chains.

David Stuart, of Philadelphia, Pa., for improvement in annealing hollow iron ware.

Robert Waskey, of Mill Creek, Va., for improvement in smut machines.

Wm. Zimmerman, of Quincy, Ill., for improvement in smut machines.

Chas. E. John and Samuel Wethered, of Baltimore, Md., for improvements in the use of steam for actuating engines. Patented in England, May 25, 1853.

Wm. Brown, of Glasgow, Scotland, for improvement in preparing paraffine oil.

Caleb B. Burnap, of Hartford, Conn., assignor to Lucius F. Robinson, of same place, for improved method of veneering.

Daniel P. Fales, of West Poultney, Vt., for improvement in car wheels.

James M. Dick, of Buffalo, N. Y., for improvement in railroad switches.

Chas. H. Platt, of New-York, N. Y., for improvement in ships' blocks.

Wm. Richardson, of New-Orleans, La., for improved centrifugal draining machine.

Stephen E. Parrish, of New-York, N. Y., for improved clamp for laying floors.

The Plough, the Loom, and the Anvil.

Part I.—Vol. VI. DECEMBER, 1853. No. 6.

LABOR IN OBTAINING RAW MATERIALS, AND LABOR IN THE ARTS.

We have often referred to the fact, that countries confined to the production of the raw material have never flourished like those where the arts and manufactures have been fostered. This diversity is not accidental nor temporary. It is founded on the nature of things.

The net profit of agricultural labor and of other labor in obtaining the raw material is far less than in the mechanic arts. The price for a good workman on a farm will not average over $100 a year besides his board, and that board, on an average, costs less than $75 a year. This makes the annual price of a farm laborer $175.

The net profit of the proprietor who hires his labor at this low rate, seldom exceeds and often falls short of ten *per cent.* Learned discussions on this subject in agricultural meetings fully sustain the liberality, even, of this estimate.

The price of job-work in such departments, as a matter of course, must bear an almost exact ratio with the same labor employed on time.

On the other hand, the net profit of mechanical and manufacturing labor is comparatively high. A machinist values his time at $2 to $3, and even $10 per day. No one of this class, of ordinary capacity in his calling, can be hired for a price essentially less than we have named. The reasons why it is so are obvious. They are numerous too, but with these we have now nothing to do. Facts are what we would examine, and not philosophy.

And which of these two classes will form the most profitable customers for those who live on exchanges—those described in our October number as being supported by the producers? Who can buy of our town and city merchants their flour, sugar, cottons, woollens, spices, sweetmeats, &c.? There can be but one answer.

Who furnishes the best custom to him who increases the value of the material he works upon, as the shoemaker, tailor, blacksmith, &c.? Evidently, the same class as before. Who are not limited in their numbers and success by the necessity of preserving to themselves the exclusive use of large tracts of land? Who can be collected into villages, towns, and cities, and thus furnish vastly increased facilities of trade? Whose liberal income enables them best to support themselves and their families from the surplus crops of the husbandman? Not the laborer who raises those crops, as we have just seen, nor the fellow-laborer who digs up the raw material.

The price of job-work, readily obtained in these trades and occupations, as in the class already mentioned, is conclusive on these points. And what does the artisan charge you for an hour's work on your watch? Seventy-five cents or a dollar, and often much more than that.

But look at the material on which he works. That piece of rude iron, which you carried in your hand from the foundry, might have cost you twenty-five cents. Let Messrs. Jessup and Co., or some brother artisan, carbonize that piece of iron, and its worth increases to four times its former value. Another artist converts it into main-springs and hair-springs, and its value is raised to hundreds of dollars.

You find a piece of brass on the highway, and sell it to the first man whom you meet, who will give you a shilling. An artisan uses it for making the brass-work of a dozen watches, and with the little bits of that piece of steel which were not used in the main-springs, &c., he completes the movements of several watches, each worth more than $100.

A few ounces of this iron might have been converted into needles; and at sixpence a paper, what would be the value of those ounces, thus finished?

Do you reject these illustrations because we have valued them at retail prices? There we have you again. This same iron was bought at retail, though the purchase was of several pounds. Now it is retail, because it is sold in parcels weighing the fraction of an ounce. A purchase of a pound or two, or a few "gross," would become a "wholesale" trade.

Poor peasants, and entire classes of laborers whose pecuniary position is kindred to theirs, dig out and break up the white quartz, or collect the white sand, or collect the vegetable material from which potash is manufactured, at the lowest rate. The ultimate products of these labors are sold to the Bohemian glass-maker, and he reproduces them in the most elegant forms and colors seen in the Crystal Palace, either in New-York or in Hyde Park. He demands a price, too, corresponding with the changes made in their appearance.

A wool-grower sells his entire fleece at forty cents a pound, and "does better" in that trade than with his corn or potatoes. The manufacturer devotes less than an hour's work to a few pounds of it, and you buy back fine broadcloth at the rate of $20 or $30 per pound.

What form of labor in obtaining the raw material can be named, which pays in a ratio that compares with these?

It is not enough to say, in reply to all this, that such conversions of raw material into valuable goods require large "capital," and that without it, capital, these values could not be attained. We reverse the position, and say that not only does the labor of the artisan do what we have described, but it BRINGS INTO BEING EVERY DOLLAR OF THE CAPITAL WHICH IT EMPLOYS.

You hold in your hand a Leyden jar; touch the knob, and it does not affect a muscle. There is no activity in it. Turn that glass cylinder, yonder. "Well, I have done so; but see! nothing comes from it." Nothing did come from it. But apply the knob of the jar to that of the conductor of the cylinder, and bear upon that cushion while you turn, and the sparks are thick and bright. They are brought into being by these operations. So it was with this capital you talk about. The gold was in the mountain, and so was the lead, and the copper, and the tin, and the sulphur bubbled up from the spring. And there each might have lain or bubbled till the day of doom. What would have brought them forth? There might have been a few roughly-built ships to have carried corn and wheat and rice, and a very few other things, to some neighboring climate, and brought back fruits or roots that we were willing to pay for at such immense expense, (that is, if the ships could be found made to hand,) but there could be no other commerce. There are no silks, nor woollens, nor cottons, nor linens, nor other manufactures, of course, for if we had the material offering itself to our service, we have no machinery. Without any of these *arts*, we have not even the stone axe of the Indian. Now, where's your "immense capital," your hundreds of millions employed as a basis for the industry of the civilized world?

We might go farther, and say that without "the arts" there could not be even civilization. But we now have to do only with the economical part of this subject.

But again, a very large proportion of ALL capital depends exclusively on the arts for its very existence. John Jacob Astor owned some scores of houses in New-York city. Annihilate the knowledge of the arts and the values they have produced, and what would those houses now be worth, even were the population to remain for the time being just what it now is? Just what houses accommodating an equal number of people in the remotest farming district would be worth, and no more.

But the people must be driven away from these crowded streets, and seek the unoccupied fields and forests, where there is some hope of appeasing their hunger; for in crowded cities they all must starve. There is not land enough in New-York city proper, without the aid of the arts, to support one family! Now, compute the value of ALL this real estate. It is LESS than that of a single house in the country, which has not a neighbor within twenty miles!

But suppose (an impossibilty) that capital does exist, eagles and sovereigns and doubloons are piled and counted by hundreds of millions. What are they good for? Merely to pass as representatives of the value of sundry vegetable products. *They cannot produce the arts.* If they could, even with the aid of existing science and arts, there is many an ignorant man rolling in wealth, who would apply even all that he has, to acquire the knowledge of them. Our own ears have repeatedly heard from gouty occupants of stuffed chairs the emphatic utterance, "I would give all I am worth for your active muscles." Equally impracticable would it be for capital to create the arts.

On the other hand, it is the office of the arts to produce capital. It is their legitimate and necessary work. They have created that now in existence; not all, exclusively, but not a dollar has been created without their indirect aid.

There is a sense in which there is "capital" among the most degraded tribes. The land supports all animal life, and might support a few, without any knowledge of the arts, *technically* so called. The bow and arrow, the stone hatchet, the dressed skin, &c., with the spontaneous growths of tree and shrub and plant, might feed and clothe several of the millions scattered over the world's broad surface. But for how much could you then buy a hundred miles square of this goodly earth? The past proves that a few trinkets, no matter whether gold or pewter—for the value of each is the same—and a few baskets of shells and the like, would be quite ample.

There is, then, no mystery in the statement, and no doubt can be entertained of its correctness, that society progresses only where the arts are fostered; that the laborer on the farm is the best husband of his own estate who, increases his present possessions by multiplying the number and variety of laborers in other pursuits, in his own neighborhood. If artisans are driven to foreign lands, there to pursue their trades, while their places remain vacant at home, the farmer loses, with each emigrant, a portion of his capital. With each such departure, value disappears from his own title-deeds.

But there are much more influential considerations connected with this subject.

Suppose an ingenious mechanic should contrive a machine which could be placed close by the field of the agriculturist, which would take his corn and grass and roots, and convert them by some speedy and sure process into almost any form or substance which the farmer should desire. He utters some "magic incantation," and *presto*, the wheat becomes broadcloth, the cabbage and the potato become linen and cotton goods, while the refuse is in exactly the right condition to fertilize the land and qualify it for new crops. Who would not pay an annual rent for such a marvel? But this is not all. Let this same machine, by changing one of the wheels, be competent to turn out the rye, oats, corn, fruits, &c., &c., in the form of quarter eagles or gold dollars, with now and then a small pile of genuine Washingtons. What an excitement would be raised! What wonderful results would be "sure to follow" such a discovery! But stop, reader; the whole array of artisans and manufacturers do this identical thing. And they do more: they pay a good share of your taxes, and of all the expenses of schools and of religious institutions. Without enlarging this list, the reader may now extend it, as he may judge the facts will warrant.

RUSSIAN INDUSTRY.

We purposed to extend the leading article in our November number, with the information contained in the following paragraphs, but were accidentally prevented from so doing. Hence, we invite a second time the attention of the reader to this important subject. We are indebted for them to Bayard Taylor.

The *Bourgeoisie* forms the middle class in Russia, as in other civilized countries of Europe; that is, it stands between the nobility and the peasantry. Individually, they are styled citizen burghers, (*burg-ers.*)

Some of the requisitions here set forth seem arbitrary, and a few of them are so, but most of them conduce materially to the good order of the community. In fact, something like them exists in some of the New-England States. We have personally known an applicant, in Vermont, refused the "citizen's oath," which gives the right to vote, on the ground of immoral character. There is such a thing as being too lax as well as too strict; and we believe all our States deny the right of citizenship to convicted felons. We know not why many an unconvicted felon is not as undeserving as many declared felons, and we are sure that he is more dangerous to the community. So candidates for "naturalization" must be proved to be of good moral character.

The burghers of a city, town, or borough consist of—

1. Those born in it, or those who have settled there, established in any business, as tradesmen, artisans, &c. 2. Persons possessing houses, lots, or any description of real estate in the locality. 3. Those registered in one of the three guilds, or any other local corporation. 4. All those who, in the city where they live, have fulfilled duties of personal service, who are recorded in the general register, and have accordingly paid the communal taxes.

This body of citizen burghers is divided into—

1. The class of the corporation legally called merchants. All of them must be inscribed in one of the three guilds. 2. Respectable citizens. 3. Citizen burghers not inscribed in any of the guilds; artisans, mechanics, belonging to special handicraft corporations. 4. Freemen, such as discharged soldiers, emancipated serfs, and all others of free condition not belonging to any special corporation, but registered in the general one of the city inhabited by them. 5. Workmen, and all other inhabitants owning houses in cities, but not registered in the general or in any of the special corporations, can, if

they choose, be called citizen burghers, without, however, losing their privileges, if from the order of the nobility, or acquiring those of burghers, if still belonging to rural communes.

The three guilds or companies into which the merchant class is divided, are formed according to the amount of capital employed and declared by those wishing to get an inscription, on which an interest of about six per cent. is to be paid yearly into the treasury. The sum necessary for an inscription in the first guild is about $20,000; for the third or lowest, about $6,000.

Aside from this order of merchants, all other burghers form a general body, whatever their trade or occupation. A handicraft corporation is formed of masters, foremen, and apprentices. The members of such a corporation are either for life or temporary. To the first belong those born as citizen burghers; to the second, foreign artisans, free peasants, and serfs who have learned the special handicraft, or are received among the masters in the corporation, being thus inscribed for a certain time, without belonging to the general class of citizen burghers. The body of workmen is composed of all registered in the records of the town, and not belonging to any of the above-mentioned classes; of men unfit for the military service, or those having finished it; of foreign immigrants, artisans, or apprentices, but excluding those of bad character, and all those expelled for bad behavior, or for the non-payment of communal taxes, or the evading to fulfil personal duties.

Any one enjoying the right to make a selection of a corporation, trade, or occupation for life, can enter the class of citizen burghers, abandoning thus his inferior position, and passing over to this superior one. For this he must be legally and officially accepted by the community which he wishes to join. Exceptions exist for some artisans, where the legal assent of the community to the act of admission is not necessary. Thus, cloth-weavers, dyers and dressers, and machinists, can join a general city corporation or community, without obtaining the formality of its assent.

Free or crown peasants can join the corporation of burghers individually or with their families, and so can rural communes, if they are traders, mechanics, artisans, or manufacturers, but not as agriculturists. Individuals passing thus from one state to another, must obtain the assent of the commune which they abandon, as well as the acceptance of that which they enter. When this is to be done by a whole rural community, the permission of the Government is necessary. Widows and daughters of free peasants can, under certain conditions, become incorporated among the citizen burghers.

Independent agriculturists, (a kind of free yeomen,) as well as emancipated serfs, can join a city corporation with its assent.

Jews, and seceders from the State, or orthodox Greco-Russian Church, can only join corporations in transcaucasian cities. Asiatic nomads, of all races and kinds, Kirguses, &c., can, at their choice, enter any city corporation whatever, and no objection can be raised to this by the commune.

The members of a municipal commune can hold legal meetings for the debating and settling of objects of general interest, necessity, and utility. These meetings are either general, formed collectively by all the various members of the general city corporation, or special, for each special corporation; as, for example, for merchants, burghers, or workmen, a general meeting is held every three years, being called together by the Governor of the county, and presided over by the Mayor, who is called *gotowa* or head. The legal age for the exercise of the right of voting is 25 years. At such triennial meetings, the community elects members for its internal administration, as the Mayor, the Common Council, called *Duma*, the magistracy or Board of Aldermen, a special Board for affairs relating to artisans, a Board to superintend the recruiting of soldiers, and a Board of Deputies to look over the administrative accounts. The community of any city can also erect a communal bank according to the prescriptions of special laws.

No citizen burgher can be deprived of his standing or special privileges otherwise than by the verdict of a criminal tribunal. In all civil as well as criminal matters, if both the parties are of the same class, the case comes first before the Board of Magistrates.

Merchants of the first guild, or their children, when the parents have belonged for 25 years uninterruptedly to the guild, have the right to enter the civil or military service under the same conditions as the children of personal nobles. Merchants of the second guild, or their children, cannot enter the civil service at all, and the military only as volunteers, that is, with the right to leave it again at any time. All other merchants, citizen burghers, or their children, are not admitted into the civil service on any condition whatever, and when they enter the military, do not enjoy any privilege whatever, but are treated like all the common recruits. A citizen burgher registered in one of the three guilds is free from the general recruiting to which all other burghers are subject. He also does not pay to the State the capitation tax, called *poduschnoe*, (from the soul,) as he already pays an interest on the capital for which he is inscribed in the guild. All other commercial taxes are paid by the burghers in common with the rest of the inhabitants. Any citizen burgher can own houses or other real estate situated in cities or villages, or lots of naked land, that is, land without serfs. Citizen burghers not inscribed in any guild, but owning houses in cities valued above $5,000, are obliged to register their names at least in the third guild, and pay the interest on their capital. Such houses can be owned by widows or unmarried daughters of the class of merchants, but on condition of registration in a guild. Merchants can belong to and be registered in rural communities according to certain prescriptions of the law.

If a merchant, or in general any citizen burgher, inherits landed estates with serfs on them, the serfs are to be sold immediately to the crown domains at the average price of from $150 to $200 the soul—the right of owning serfs being reserved exclusively to the nobility. The citizen burghers can be deprived of their property only by the judgment of a civil tribunal.

No citizen burgher registered in the general, or in any of the special corporations, can step out of it, and abandon the city where he is incorporated, by settling in another, without the assent of the community or the permission of the Government. Any citizen burgher can pass into the close corporation of the merchants, on declaring the amount of capital required to be inscribed in one of the three guilds, and paying to the treasury the interest thereon.

Each community can exclude any member under criminal condemnation, or of notorious bad character. The city of Moscow has alone the privilege of giving up such individuals to the Government, either as recruits, to be reckoned as furnished in any future levy, or for the colonization of Siberia. Children of such convicts, above fourteen years of age, have the option either to follow the father or to remain in the community. Minors not having a mother, never follow the parent when sent to Siberia.

Above all the subdivisions of the bourgeoisie, and thus above the close corporation of the merchants, even those of the first guild, rises the legal privilege of the respectable citizen, *postchotnoi grazdanin*. This is a privilege eithe· enjoyed for life or hereditary. Children of personal nobles become hereditary respectable citizens.

One who, in virtue of the social position of his father as a merchant of the first guild, or as a savant, a physician, &c., has acquired the right to complete a course of studies in one of the universities of the Empire, can petition the Government to be included in the class of respectable citizens, on producing testimonials of having finished the higher studies, and of good conduct during his stay at the university. The same is conceded to artists when they produce testimonials from the National Academies of Art; to children of merchants of the first and second guilds, who have passed with special distinction through the studies of the universities; to pupils of special commercial schools; to artists who are foreigners by birth, &c.

COTTON TREE.

A WRITER in the *Flag of our Union*, Jackson, Miss., gives the following account of the cotton tree growing in Navigator's Island, and of the island in general:

"The tree was about 30 feet high, its body about a foot in diameter, and the breadth of spreading of the limbs making a very bushy top of perhaps 30 feet in diameter: the bolls before bursting are very much the shape of the cotton bolls raised in the United States, but probably near the size of a goose egg. In *each* boll there are *three* of the pieces I here enclose. When the cotton is in bloom, my friend informs me it presents a most magnificent appearance, and seems as if it was a mammoth *snow-ball tree*, seen in the gardens in the United States. The staple of fibre of the cotton seems to me to be of good length; whether it is of that silky fineness desirable in such an article, I cannot pretend to judge, my residence having for more than a quarter of a century been in the State of Missouri, and yet I have spent many winters down South; and it occurs to me that it might by possibility be of some use to the people of the South to have some of the seed with the cotton attached. The tree on the island grows wild and luxuriantly; perhaps the seed might produce a shrub in Mississippi of some value, and if so, I shall be pleased to have been the medium of introducing it. If it should be thought, on inspection of the samples sent, that it was desirable to be better informed concerning it, or if more seed is desired, my being resident here will enable me to gratify any wish of that kind, as there is likely to be not only a constant but increasing trade between this port and Australia, and the Navigator's Island is almost on the direct route, and if not already, will soon be made a general calling-place between the two places. From here to the Sandwich Islands—nearly a direct calling-place—is one third, and the Navigator is another third of the distance between here and Australia. These islands, nine or ten in number, of pretty good size, and many smaller, are exceedingly valuable, and lie in about 14 deg. south latitude, and longitude about 171° west of Greenwich, and belong to no nation—have a sort of patriarchal government by chiefs of different grades, mostly maintaining separate organizations, and are often at war. They are not *cannibals*.

These islands are going to be of great importance, as they lie on the route between the two great gold continents, and it does seem to me (although a stubborn Whig, dyed in the wool) that they ought not to fall into the hands of any European nation. They probably contain 100,000 inhabitants; and yet if one or two hundred discreet, just men were there, and join in, in some of their wars, with the better sort or class, a government might easily be established there, after the fashion of the Sandwich Islands. These islands have some good harbors, and at present furnish a pecuniary prospect for a few energetic capitalists, that would pay enormously. The inhabitants live almost entirely on the fruits and vegetables that grow wild and spontaneously. The climate is not colder than 75 degrees, nor hotter than 81 or 82 degrees; and as to health, no country on earth more so."

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

NOTES FROM THE FAR WEST.

The Western farmer may truly be said to be a go-ahead man. Nothing daunted by the want of those accommodations which the Eastern States offer, his ingenuity and tact are never at a loss to supply these deficiencies. If his harness breaks, he has the tools at hand for the necessary repairs. A set of carpenter's implements is almost essential to the agriculturist in those parts of the far West.

The great scarcity of hands, and the demand for the use of mechanics and other handicrafts, makes it very desirable that a new settler should be a *jack-of-all-trades.* And really, no one is aware how soon new duties and employments become not only practicable but easy when necessity calls for their accomplishment.

We are now having most delightful weather, although the mornings and evenings are cold and frosty. The first frost this fall was rather earlier than usual, namely, on the 10th of September. It stopped the further growth of much of the late-sown corn, but most of that planted early was too far advanced to be much injured. I see here the great importance of putting the seed into the ground as early as possible in the spring, that it may escape these early frosts. Buckwheat especially needs early attention.

Every kind of harvest has been saved here, corn excepted; and as around us there are but few barns, you see the crop put up in round stacks, or what are often called Irish mows; and the country around, being dotted with these signals of plenty, affords a picturesque and pleasing sight. But they remain for a short time only, as all the threshing is done by machinery, generally driven by eight horses, and thus it makes short work of a farmer's crop. The wheat produce is heavy and good just around me, most of it being summer wheat. Winter grain does not succeed well.

We have two railroads progressing on each side of us, which will be greatly prized by the agriculturist.

Horses and all other live stock are dear, particularly sheep, which, if at all good, bring two dollars per head; but this evil will eventually correct itself, as every farmer is raising and increasing his cattle as fast as possible. Provender being so plentiful here, it is not difficult to winter almost any quantity of cattle; and as hands are difficult to obtain, this branch of farming is more easily attended to, and, in the end, is the most profitable.

To an Eastern man, the method of farming here appears very careless and wasteful. Corn is husked from the stalk as it stands, and the cattle are turned into the whole piece to eat what they choose, and tread down the rest, which is burned or ploughed under in the following spring. Most of the grain is threshed out in the open fields, and the greater part of the straw is left to rot, or sometimes it is set fire to, to get rid of it.

Cattle are apt to commit depredations, as but few farms are well fenced, particularly swine, which never ought to run loose, as fencing against them is impossible. Nor is there any thing gained by it, as a hog kept up eats less than when at large, and gains more flesh.

The Indian summer, which I have witnessed in Canada, is here unknown, although the weather in this month and in a part of the next is often calm and lovely; and if the winter commences somewhat early, the quickness of vegetation in spring makes up for it. Potatoes which I planted in June, I dug for the table just two months after. An early sort, brought from Jersey, thrive well, as also some corn; but the latter, I think, is rather too tender for this climate. Pumpkins here attain an immense size. One that I measured reached 51 inches in circumference; ruta bagas, 26; and carrots nearly one foot.

The seeds of the catalpa, the alanthus, and the locust trees, which I planted in the middle of June, vegetated luxuriantly. Some of the plants have reached upwards of three feet in height. These ornamental trees are a great desideratum, as we have none of these kinds in our woods; nor do I observe any evergreens in my neighborhood, although I hope to obtain some next spring, and set an example to my fellow-agriculturists to ornament their dwellings.

The locust tree has been planted here to form a hedge, as a fence. I hope to try some next spring, as also the Osage orange; for, as we have no chestnut timber, and wood is not always plentiful on our prairies, the sooner some substitute for fencing is provided, the better.

The opinion here is that peach trees will not succeed, but I think it is a wrong impression. I have a few in my garden, six or seven years old, and these are luxuriant and healthy, and bear fruit. Several young trees which I set out thrive well. I think, with a little protection in winter, with straw over their roots, they would not be injured. The fact is, these trees shoot too luxuriantly in summer, and have a great quantity of young and tender wood, which is not proof against the severity of the winter, and thus they need a closer pruning here than in the more Eastern States.

Our county fair, which was recently held at Janesville, did us credit. The ploughing-matches were entered into with spirit, and the show of cattle, fruit, farming implements, &c., &c., was by no means behind that of other Western States. These exhibitions are of great use, and stimulate the community in laudable efforts to improve their agricultural skill. AGRICOLA.

October.

FARMERS IN PUBLIC PLACES.

THE press has been burdened of late years with lectures and sermons and satires, addressed to agriculturists, reprobating the fact that, on public occasions, as cattle-shows, &c., when speeches are to be made, they fall into the rear, and speak only by proxy. Facts are as stated. We have a word to say as to their propriety.

We remember that Lord Mansfield is reported to have said that he should be as much ashamed to know statute law as not to know common law. The reason is obvious. Statutes are constantly changing, and not one in a hundred is ever called to the notice of a lawyer. Hence, to study them so as thoroughly to understand them in all their relations, would be time thrown away, and labor without profit.

It is so, in our opinion, with the entire catalogue of working-men. If any one has the "gift" of public speaking without study, or experience, or science, we know not why he may not *show it up*. For the sake of the bar and the pulpit, and for their clients' and hearers' sake, we wish this faculty did "come by nature." But we are persuaded that it is not thus that men are eloquent, or persuasive, or instructive. Such qualities are only the result of much reading, of careful and close study, and no little experience. Hence, if farmers do make speeches, the presumption is, that the result will be about as happy as if a lawyer were to undertake some of the most difficult and intricate of farmer's work, or a clergyman were to undertake to play mechanic.

True, we have some lawyers and some doctors, and some men of leisure, who enrol themselves on the list of farmers. Some are educated at college, or other equally useful institutions, so as to make them conversant with language and with science; and thus, and *thus only*, are competent to acquit themselves handsomely in public speaking.

But not one half the lawyers, nor one half the ministers, nor one half the doctors, can make a good speech at a dinner-table, or at a public anniversary. Our Benevolent Societies, annually meeting in New-York and Boston, are obliged to use over their old stock, and that, too, several times within our own recollection, and even then fail to sustain the interest with which they first began. This is a matter of notoriety. Under such circumstances, to laugh at farmers for not exposing themselves as volunteer bores, is far from being judicious or in good taste.

The farmer who toils all day, and at night makes plans for to-morrow, how can he be expected to become a good and acceptable speaker? If he has acquired the art before he becomes a farmer, or the mechanic before he becomes a working mechanic, it is all well. We wish many, *a multitude*, might thus qualify themselves before they commence these arduous pursuits.

Besides, our farmers are proverbially modest men. Different causes conspire to make them so. We should regret a change, and nothing would so thoroughly effect this change as frequent public debate. We have known a few absolutely ruined by this very process. They "outgrew their shoes." They substantially outgrew their dresses and their entire habits, and, like some of old, did nothing but hear or *tell* some new, and yet thrice told story.

We commend these considerations to our agricultural friends, and to the press. It is not necessary to be a good public speaker in order to be a MAN. At the same time, some of our most fluent "orators" are, and are regarded as, very small men, while those who are always speaking in public are always laughed at. Of this, the last, we never knew an exception.

RED CLOVER AT THE SOUTH.

It is a mooted question whether the crop of red clover is suited for the South. The following is a very satisfactory statement on the subject, by Mr. Croom, of Greensboro, Ala., in the *Soil of the South:*

MESSRS. EDITORS:—I very cheerfully comply with the request communicated in your polite letter of the 27th ult., in sending you some of the results of my experiments with red clover, animated with the hope which has been awakened by your suggestion, that it will subserve a very large public interest.

I came to Alabama in the spring of 1837, well indoctrinated in the calcareous theories and experiments of Edmund Ruffin, Esq., the great Nestor of an improved Southern agriculture. With such information it was not to be wondered at that, so soon as I became acquainted with the lime lands of Green and Marengo counties, the conviction should be forced upon me, that they were well adapted to the growth of red clover. It was not long before I made some experiments which removed every possible doubt. As, however, my cleared land was all fresh and highly fertile, and the woodland was covered with a luxuriant growth of cane, covering even the summits level between the water-courses, there was no demand for clover either for pasturage or improvement. This state of things continued for some seven years, when the disappearance of the cane created a necessity for looking out for some substitute for feeding stock. In clover I have found that substitute.

I have used this grass for grazing, more or less, for the last eight or ten years, gradually increasing its cultivation as there was a demand for it. And I may add, that I have become more and more pleased, I might more properly have said, enthused its advantages every hour. I esteem it far more valuable here than in a Northern climate, for two reasons: one is, that it does not require as frequent resowing; the other, that it furnishes good grazing during the winter and early spring months. These are important advantages.

My clover lots are as luxuriant the eighth and ninth years, as during the second and third. They are a little scant too when the first growth dies out in June, and during some short spells of very rigorous weather in mid-winter; at other times they furnish a liberal supply for continued grazing of the richest kind. My engagements on the plantation do not permit me to mow any for hay, which I might however do, if there was a necessity for it. There is no difficulty in saving seed by pulling off the heads from a few acres, and putting them away in that form for future use; about three bushels of these heads, well rubbed between the hands and sowed like oats, will secure a good stand on an acre of land. As clover is a biennial plant, it is necessary to have the seed renewed in the standing lots every second year. This is done by the seeds which annually and semi-annually drop—the matured heads which escape the cattle and hogs.

In the article communicated last January to the *Southern Cultivator*, I mentioned the amount of grazing derived from a five-acre lot of red clover; I will now detail to you as nearly as I can what has been done by a twenty-five-acre lot of seven or eight years in clover:

Early last spring, my overseer put on it about one hundred and fifty fattening hogs, some beef cattle, and my brood mares and colts, and some old horses, &c. Now, I believe he will attest, that during all that time to the present moment, they have all kept fat without any other food but corn enough to the hogs to keep them gentle and obedient to the call. I believe he will further say, that in June, when the clover matured, half of it or more dried upon the ground, enough for a good dry carpet. I have sometimes believed that it would not be extravagant to say, that an acre of my clover furnished more stock food than would be supplied by 100 bushels of corn; there can be no hazard in saying, half that quantity.

I have not yet satisfactorily tested its benefit to the soil, which, however, can scarcely be called a matter of experiment. I sowed, last fall, a lot which had been in clover some eight years, in wheat, and many pronounced it while growing the finest wheat in the country; but from thick seeding, very wet weather, or some other cause, the yield was an ordinary one.

In speaking of the grazing of the twenty-five acre lot, I forgot to say there was no rain on it from the 20th of March to the 1st of July. It should be also stated that it has afforded abundant grazing to the present time. It sprung up again very soon after maturing, and owing to the irregularity of its maturity and renovation, there is moderate grazing even during June. I asked my manager a few weeks ago, about the middle of August, whether his fattening hogs required much corn; he told me he only had a little given to keep them gentle, and they often refused to eat it, they were so full.

I have had some fifty or more head of horses and mules on other clover lots, since my crop was finished, which lots were sown last February.

I will next say a few words as to the mode and time of sowing, the quantity per acre, and the lands adapted to its growth.

The land should be deeply ploughed, well pulverized, and then six quarts of clean seed or three bushels of the rubbed heads sown to the acre, then covered with a harrow or brush, and well rolled.

I prefer February to any other time for sowing, so soon as the danger of hard freezes is past. The air and ground are then warm and moist, and it readily comes up and grows off rapidly.

It should be sown on open land, and alone, if in the spring. It may do to sow it with wheat in the fall, but if sown with oats, it is kept back until oats are removed, when its sudden exposure to the hot sun is apt to destroy it. Clover delights in sunshine when it has taken root, and when it has with the sun sufficient moisture. Its deep tap-root—and especially is it so in lime land—enables it to bear drought far better than most other grasses.

The chief elements of this plant being lime and sulphur, the soil for its successful growth must also contain a proper quantity of these minerals, furnished by nature or by art. As I have no experience in an artificial preparation of land for clover, I will not speak on this subject; but the experience of others authorizes me to say, that any one who has a good clay or loam soil can, by the proper use of lime, gypsum, and guano, succeed with clover.

Thus, my dear Sir, have I, *currente calamo*, imperfectly complied with your request, by giving you an inkling of my experience and views regarding red clover. If there be any omission or defect which I can supply, most cheerfully will I do it upon your suggestion. If it shall aid you or the great cause you are so commendably engaged in advancing, it will be to me a source of heartfelt pleasure, and a rich compensation for the small trouble it has cost me. Yours very truly, H. CROOM.

Greensboro, Ala., Sept. 6th, 1853.

CARE OF SHEEP.

MR. S. A. JEWITT, who has great experience in every thing connected with animals, writes as follows:

Docking Animals.—In cutting the tail of a sheep, you will find three arteries, two upon the upper side, close to the bone of the tail, and one near the centre of the tail, on the under side; this one is much the largest, and the one out of which most of the blood flows when cut asunder.

It is perfectly safe, as to loss of blood, if you tie up the large artery before cutting the tail. First slit down the skin lengthwise, about an inch. The artery, if in a lamb, will be seen about the size of a common knitting-needle. Draw a thread of waxed linen or silk under the artery, with the common straight needle, or one a little crooked at the point is better. Tie up tight before you cut off the tail, which you will sever just below the knot. This is all done very easily, and with but very little loss of blood. You may sprinkle a little dust or pulverized alum on the wound to advantage.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

NATIONAL HORSE EXHIBITION,

WITH A DESCRIPTION OF THE PASS OF THE GREEN MOUNTAINS.

FROM Pittsfield, the Western Railroad runs easterly about three miles across the beautiful valley of the upper Housatonic. Now, the 19th of October, the meadows of this valley are exuberant in all the verdure of summer, and as beautiful herds are grazing upon them as ever graced an agricultural fair. From the eastern limit of this valley commences the heaviest grade between Albany and the *Summit*, and two miles brings us to Dalton, renowned for its paper-mills, its beautiful meadows, and on the north, its lofty and heavily-timbered mountains. From this station to Hinsdale, three miles, the ascent is more gradual, though the traveller still finds himself " rising in the world" at an unusual rate. This town, once considered a mountain town, has of late participated much in the enterprise and prosperity of the age, and may well boast of its fertile meadows, watered by the young Housatonic, as well as for its manufacturing establishments and its flourishing academy. The rock here is gneiss; the soil on the surface is apparently composed of drift, or a sand formed by a detrition of the rocks, and in some places brought together into hillocks, as though the surface had been subject to the action of floods. Five miles further brought us to Washington, famous for the deep cut in the solid rock, which attracts the attention of every traveller, and where the grade descends easterly and follows the waters of the Westfield river, crossing them at frequent intervals, until some twenty or more bridges are passed, and all the way through a narrow defile, frequently through walls of rock which nature erected, but through which man in his ambition forced a passage for the iron horse and the stately chariots he propels; then by high mountains, deep chasms, with occasionally an outlet to some unseen region, formed by a tributary of the noisy, beautiful stream, which is your almost constant companion, until it fairly introduces you to the world-renowned valley of sweet waters, and for ever bids adieu to its mountain-home and myriads of cascades it had beautified, and grottoes to which it had given its cool refreshing influence as its waters lay in quiet slumber. The features of the country east of the mountain, until you reach Westfield, are not such as to warrant any high expectations of agricultural monopoly in those parts; yet, through all this defile, there is much to invite enterprise to bestow her energies, and will probably one day woo her to these mountain fastnesses, and reward her labors with wealth and prosperity. Already the manufacturer has drowned the music of the water-fall with the ominous music of spindle and the loom; and there are yet untold sites, where the waters may easily be induced to turn aside to give motion to machinery in varied forms and for many purposes.

The rocks that wall in our way, and frown with such indignity at the assault that man has made upon them, will one day yield their places, and be removed far hence to be wrought into the stately mansions of the rich; and so it will be seen that there are no by-places in all nature's realms, and no object of her creation, which cannot be adapted to the purposes of refined social life.

Springfield, our place of destination, the beautiful city of rural homes, the residence of wealth, talent, and enterprise, is *very pleasantly* situated on the east bank of the Connecticut. Here the Western and Connecticut River railroads intersect each other, and thus make it a favorite centre of travel from all directions; and so great an amount of business is done on these roads, that there is scarcely an hour, by day or night, when the shrill voice of the whistle or the puffing of engines does not announce the arrival and departure of the cars. Immediately in front of the station-house, is the "*Massasoit House*," which, for its elegant accommodations and gentlemanly host, need not fear comparison with any hotel in New-England. Main, the principal business street, extends easterly from the depot of the several railroads, and is bounded by many buildings that would ornament an older city, or one of more aristocratic pretensions. About half a mile from the Massasoit, this street is intersected by State street crossing it at right angles, and by turning into State street on the left, you are soon brought up the hill to the beautiful well-kept grounds of the United States and the arsenal buildings, from the principal of which arises a high observatory, from which a view of the city and the Connecticut valley is obtained of a most charming and picturesque character. Beneath you is the city, nestled in quiet shades; on the south, the vision extends far into Connecticut; west, the Green Mountains, growing dwarfish as they extend southward, bound the horizon. Away in the north, are seen the highlands of Vermont and New-Hampshire; and east, the hill-country of Worcester. Directly contiguous to the grounds is *Government Square*, an area of about twenty acres, where was held the "*First National Exhibition of Horses*" that ever found a place in our history. The arrangement, as also the general features of the ground, were admirably adapted to the occasion to which they were devoted. Within the enclosure, and connected with the fence, were several hundred stalls fitted up for the safety and comfort of the animals exhibited. On the south, and in close proximity to the course-ground, were elevated seats, sufficient to accommodate four thousand spectators—an arrangement adapted to promote the comfort, and at the same time insure the comparative safety of all who were disposed to avail themselves of a sight in them, at the extremely low price of a shilling. This arrangement was a happy one, and we hope it will be adopted more generally at all our great gatherings. In front of these seats, and within the course-ground, a large platform was raised for the accommodation of committees, guests, &c., and in the centre of the ground was the large tent of John Wright, the well-known and highly acceptable caterer, whose provisions for the inner man, whether in kind or quality, are always ample; while, at a little distance, *Tremont House* hung out its broad banner and spread its sumptuous board to invite and regale the weary and hungry.

Circumstances did not permit us to reach Springfield until the evening of the 19th. Of course, we could not enjoy the luxury which the exhibition offered until the morning of the 20th. As related to us by a friend, the opening scene was of a brilliant and memorable character. A full description of it has gone before the world, and it will live in the minds of the many who witnessed it.

We were early on the grounds on Thursday morning, and the opening of the second day's exercises was announced by the ringing of a large bell, arranged for that purpose near the Committee's platform, followed by music of the Springfield brass band, stationed on the platform near by, and who were in constant attendance, frequently discoursing sweet music. The ground was early occupied by horses and horsemen prancing to and fro in every direction, some in pairs, some single, in buggies, gigs, or under the spur and lash of the rider. The first exercise in the programme was the exhibition of matched horses, of which there were thirty-three entries. As they passed before the judges' stand, the numbers were announced by Colonel George Dwight, President of the Board of Managers, and the indefatigable Marshal of the exhibition. After passing in review, they were ordered to pass four times around the track, making a distance of two miles, that their travelling qualities might be developed, after which they were ordered to another locality, for further examination of the Committee.

At eleven o'clock A.M., the bell was rung to announce the hour for the exhibition of colts, which were divided into the following classes: First, stallions of three years, of which there were 17 entries; fillies of three years, 2 entries; stallions of two years, 8 entries; fillies of two years, 1 entry; stallions of one year, 7 entries. They were a fine lot of colts, and if we could believe that they were a fair specimen of colt-dom, we should suppose that none but first-rate horses would be seen after a few years. At twelve o'clock the bell announced the exhibition of *fancy* matched horses, and here was a feast for the eye to dwell upon. There were 17 entries in this class, and after the usual performance of passing in review, circling around the track, &c., they were drawn off to make room for the great display of the day—the exhibition of stallions, of four to seven years old, of which there were 33 entries from five States, and 3 from Canada. After passing in review before the Committee, they trotted twice around the course, presenting an agreeable and formidable display.

At three o'clock, came off the exhibition of geldings, of which there were 109 entries, and of course, many fine, very superior animals.

In the evening, a brilliant levee was given by George M. Atwater, Esq, who, as we are informed, was the originator of the exhibition, at his pleasant and tasteful residence, in Chestnut street, at which many distinguished strangers and citizens were in attendance. It was a highly interesting scene, for many of the statesmen and civilians of the land were there; it was interesting, because happiness and calm enjoyment were there, and manifested their presence in the many cheerful countenances speaking out the feelings of the soul within. Mr. Atwater has a soul as large as the universe, and if we may judge of the variety of viands on his table, he must have scoured the universe to secure materials for so diversified an entertainment. The brass band were in attendance to drive off dull care if he threatened intrusion. But no fear of that. The haggard monarch understood too well the enchantments of the scene to turn his footsteps that way. After relieving Mr. Atwater's table of its luxurious fruits and dainty bits, and themselves of many a timely joke, the company dispersed, each, no doubt, happier for the social pastime.

Friday morning, bright and beautiful weather. The hour of eight or time of opening the exhibition was announced by a salute of thirty-one guns, given by a detachment from the armory, by four brass pieces brought upon the ground for that purpose. Then came the ringing of the bell, followed by music from the band. The seats were early filled to their utmost capacity, a great proportion of their occupants being ladies. They now formed an interesting feature of the exhibition, and a subject of universal admiration. From the variety of colors, they resembled at a distance an immense boquet of beautiful flowers. No doubt, the thousands of husbands, lovers, &c., in attendance, will say our similitude is quite correct. Then came on a grand parade of all the horse-family on exhibition. They formed a complete circle on the course-ground, moving slowly at first, then more rapidly, until they exhibited the violence of commotion. During their march the band played, which the horses seemed to understand as expressly for them, and it was difficult to decide which exhibited the most pride and self-complacency, the horses or their owners.

Next came off the exhibition of ponies, of which there were 21 entries; then of thorough-bred horses, of which there were seven entries, and among which was Lady Digby, owned by James Turner, of Boston, sired by imported horse Trustee. She went twice around the course, a mile, in two minutes and two seconds. Jenny Lind was in this class, but not to exhibit her vocal powers. Then, as a finale, came the exhibition of stallions, of seven years old and upward, numbering 56. It was a grand and formidable display, and as it passed away, we passed off too, for the clouds were portentous of a coming storm.

The entries, as we were informed, were as follows:

1. Draught horses in spans, 4 entries; 3 from Massachusetts and 1 from New-York. Single team, 1 from Connecticut.

2. Breeding mares, 48 entries; of which 26 were from Massachusetts, 5 from Connecticut, 11 from Vermont, 3 from New-Hampshire, 2 from New-York, 1 from Rhode Island.

3. Mares with foals by their sides, 9 entries; of Massachusetts 4, from Vermont 1, Connecticut 2, New-Hampshire 1, New-York 1.

4. Matched horses, 33 entries; owned in Massachusetts 14, in Vermont 3, in New-Hampshire 2, in Connecticut 4, in Rhode-Island 1, in New-York 5, in New-Jersey 2, in Pennsylvania 1, withdrawn 1. Total, 33.

5. Colts, stallions, of 3 years old, entries, 17; from Massachusetts 5, from Vermont 5, from Connecticut 4, from New-Hampshire 1, from New-York 2. Total, 17. Fillies of 3 years old, 2 entries; of Massachusetts 1, of Vermont 1. Total, 2. Stallions of 2 years old, 8 entries; of Massachusetts 3, of Vermont 2, of New-York 2, of Louisiana 1. Total, 8. Fillies of 2 years old, of Massachusetts 1. Stallions of 1 year old, 7 entries; of Massachusetts 2, of Vermont 3, of New-York 2. Total, 7.

6. Fancy matched horses, 16 entries; owned in Massachusetts 7, in Vermont 3, in Connecticut 4, in New-York 1, in New-Jersey 1. Total, 17.

7. Stallions from 4 to 7 years old, 33 entries; owned in Massachusetts 9, in Connecticut 4, in Vermont 8, in New-York 6, in Canada 3, withdrawn 3. Total, 33.

8. Geldings, 109 entries; of Massachusetts 68, Vermont 8, New-Hampshire 1, Maine 2, Rhode-Island 2, Connecticut 13, New-York 9, Pennsylvania 1, Canada 1, withdrawn 3. Total, 109.

9. Ponies, 21 entries; of Massachusetts 7, from Vermont 2, from New-York 2, from Connecticut 4, from Canada 1, from New-Hampshire 1, withdrawn 4. Total, 21.

10. Thorough-breds, 7 entries; of which of Massachusetts 3, from Vermont 1, from New-York 1, from Canada 2. Total, 7.

11. Stallions of 7 years old and upwards, 56 entries; of which were of Massachusetts 19, of Maine 6, of Vermont 5, of New-Hampshire 7, of Connecticut 6, of New-York 6, of New-Jersey 1, of Michigan 1, of Canada, 1, withdrawn 4. Total, 56.

The whole number of entries was 407, and were from the following States: Massachusetts, Vermont, New-Hampshire, Maine, Rhode-Island, Connecticut, New-York, New-Jersey, Pennsylvania, Louisiana, Michigan, and the Province of Canada East. So it will be seen, that if every State was not represented, the extremes of North and South were, and probably nearly every State *was* represented *in men*, the noblest growth of this realm.

Of horses, the Morgan family was most numerously represented, it being stated that there were 103 members of it present for a certainty, and we should not wonder if many more had claim to relationship. We are not quite certain, but this exhibition was got up by the family in accordance with modern usage to call all its members to the "old homestead," to repeat their histories and prove consanguinity.* Be that as it may, they are a noble race of animals, and worthy to inherit more of the land than they now possess. The Blackhawks stood next on the list of numbers. May the race of each be multiplied.

The people of Springfield are certainly entitled to much credit for their perseverance in getting up this exhibition. Discouragements met them in the outset, sufficient to discourage ordinary minds. But the matter was in right hands, resting with those who having once taken hold of the plough in a good cause, do not look back. They have opened a deep furrow on the public mind, and sown goodly seed thereon, which will assuredly produce an abundant harvest, to the advantage and honor of the nation.

It is to be regretted that our nation, in its love of progress, has paid so little attention to the improvement of horses. But the day of delay in this matter is gone by.

And those noble-minded men, who originated and carried out the grand project, whose result has been so triumphant, what triumphant satisfaction, what honor is theirs! In this first conquest they have achieved a nobler victory than Alexander or Napoleon could ever boast. They have done their country a nobler service than a legion of ranting politicians can perform.

Yours truly, W. Bacon.

Richmond, October 27, 1853.

FOR THE PLOUGH, LOOM, AND ANVIL.

FAIR OF THE MARYLAND INSTITUTE.

Messrs. Editors:—The annual fair of the Maryland Institute closed its session, of three weeks, on the evening of the 31st ultimo.

I doubt not you will deem the doings of this Society of sufficient importance to claim a small space in the columns of your valuable journal. I shall attempt to notice but few of the many objects of interest which I saw.

The *first* Maryland Institute was formed in 1825, and incorporated, by the Legislature, in 1826. It continued in successful operation, diffusing valuable information through the whole community, and, more particularly, among the mechanics and laborers, for whose special benefit it was instituted, till 1835, when, in the burning of the Athenæum building, the library, apparatus, and other valuables of the Institute, were destroyed, and the Society disbanded.

The former Institute, no less than the latter, owed much of its efficiency and usefulness, if not its existence even, to the intelligence, zeal, and untiring industry of Jno. H. B. Latrobe, Esq., a name, which will be fondly cherished so long and so far as the influence of these literary associations shall be felt.

After the lapse of twelve years, in 1847, the first movement was made for

* It is stated in the *Springfield Republican*, that in 1798, Mr. Justice Morgan, of that town, took a three years' old colt to Randolph, in Vermont, and it is supposed that from this colt the valuable race of Morgan horses originated, a fact which ought to be chronicled for the benefit of all admirers of the horse.

the formation of a new society, or the resuscitation of the old one. On the 22d of December, a Committee previously appointed, submitted a report, embracing the form of a constitution, which was adopted; and the Institute was duly organized, by the choice of officers on the 12th of January following. The first exhibition, or fair, was held in October, 1848. The gross receipts for admission to the fair amounted to $3,163. The receipts, from the fair of 1850, were $5,604. The number of members was then 610, and the number of depositors 951. These numbers have been gradually increasing at each successive fair.

In 1850, the Institute was incorporated, under the title of "Maryland Institute for the Promotion of the Mechanic Arts." Its sixth fair has just closed. Its success thus far, and its prospects of influence and usefulness, for the future, must meet the expectations of its most sanguine friends.

The hall of the Institute is worthy of notice. As a specimen of architecture, it ranks among the first in our country, which certainly has not much to boast of in that line. The ground occupied is 60 feet front, and 355 feet deep. Underneath the hall, is an arcade, having 70 pilasters, with archways, leading to the market-stalls, by which it is occupied. This basement has a 20 feet ceiling, supported by 100 cast-iron columns. A more beautiful, spacious, and commodious market-house probably cannot be found in the United States.

The hall of the Institute is entered by a broad stairway, from Baltimore street. The hall has a 32-feet ceiling, and is 250 feet by 55. It has 20 windows, each 17½ feet by 7; a gallery extending quite around, 7 feet wide on the sides, and 10 at each end, elevated 14 feet above the floor, and supported by brackets attached to the walls. The fresco painting upon the ceiling and walls is much admired. It is said that two thousand persons may stand upon the floor of the promenade galleries, and six thousand more upon the main floor of the hall, and that four thousand may be seated.

These estimates evidently contemplate a jam. The capacity of the hall is very great. Its form, however, is such as to make it more suitable for balls and institute fairs, than for public lectures or deliberative assemblies. When lighted up, as it was each evening of the fair, by 132 gas burners, and viewed from either extremity of the gallery, it was "a sight to behold." The whole area, above and below, was filled with happy faces, which seemed to be illumined by the brilliancy of the occasion and move in time to the band, which was discoursing sweet music; and, at the same time, inspecting the works of art, with which the *rest* of the hall is filled. It was a practical and material illustration of the remark, "Distance lends enchantment to the view." It came well-nigh a realization of my childhood's vision of the palace of Aladdin.

The members of the Institute are divided into four classes.

1. Members over 21 years of age, who pay an initiation fee of $2, and an annual assessment of $3.
2. Junior members, minors over 14, who pay one half of the above.
3. Life-members, who become such by paying $25.
4. Honorary members.

Connected with the Institute is a "school of design," in which, for four months in each year, instruction is given by a professor of the art, to such members as choose to be taught.

Also, a library and reading-room, which is accessible to all the members.

Also, a mineralogical cabinet and laboratory of philosophical and chemical apparatus.

Also, a chemical department, which is not yet in operation; and once each year a fair is held, the design of which is to foster genius, develop artistic skill, and promote the cause of popular education. The fair is also depended upon, mainly, to defray the current expenses of the Institute.

I have left but little space for the recent fair, about which I might "write a book." But as this is an age of fairs and palaces, and most persons, especially those so intelligent as the readers of the "*Plough*," have visited these shows, and know what is usually exhibited there, I shall not particularize. Suffice to say, the exhibition was worthy of the Society and the great city of Baltimore.

I noticed this difference between the fair of the Institute and the fairs which I have visited in New-York and New-England. In the latter, the useful greatly predominates; in the former, the ornamental.

A steam-engine, manufactured by Messrs. Poole & Hunt, of this city, a perfect model of its kind, was in operation in the hall every evening during the fair. To this, were attached various machines, some of Maryland, and others of northern origin. Of flouring-mills, I noticed several models. In one of Major Downing's letters, it is said of General Jackson, that he designed so to simplify the Government, that he could take it into a one-horse wagon and carry it all over the United States. Experimenters in flouring-mills seem to have a similar object in view. Many of these models are portable, requiring from two to four horse-power, and occupying no more room than an old-fashioned clock-case.

I noticed an improvement upon Page's saw-mill. The name of the patentees, I did not obtain. The improvement consists in placing the log *underneath* the saw. By this arrangement, the saw cuts *with* the grain, and not *against* it, consequently, requiring much less power, leaving the board comparatively smooth, needing but one turn of the log before completion, whereas Page's requires three.

There was a Yankee notion, in the form of a wooden-bowl machine. It turned out its ware so rapidly that, if supplied with timber, the whole nation might soon be able to take a hasty *bowl* of soup.

There was also a machine for making plug tobacco. Were I to try my hand at invention in that department, I should wish to incorporate the principle of annihilation.

But I have not time to enumerate. In the agricultural department, there were some good specimens, but they were few in number.

In wearing-apparel, both for men and women, there was a fine display.

Most kinds of furnishing-goods, cabinet-ware, surgical and dental implements, perfumery, pickles, preserves, and hams were in great abundance, and of superior quality.

In needlework, plain and ornamental, the display was truly imposing. There were also good specimens of daguerreotypes, crayon drawings, and oil paintings. Pianos also, and stoves and furnaces, of excellent finish. Cedar ware also, made by Horace Magne, of this city, which cannot be surpassed in the United States. There were also stoves and other useful articles, made of soap-stone, by the Maryland Soap-stone Company, whose factory is in this city. This Company furnish more stone, and for most purposes of better quality, than is obtained from any other quarry in the States.

Among the curiosities was a live Yankee, who styled himself the "New-England Card-Writer," and wrote Baltimore thus: Otimore. Also a curious clock. Besides keeping time, it runs eight days, strikes the quarters, on four bells, of different tone, gives an alarm to waken the master, lights his lamp, lights a fire in the stove, rings the servant's bell, until she rises, and closes her curtains to dress. J. C. Morrill, of this city, is the inventor and manufacturer.

During the progress of the fair, an address was delivered before the Institute, by Judge Cushing, which was very well received. His subject was the Progress of the Mechanic Arts. An allusion to the labors of the Jesuits, in Christianizing the natives of this country, reminded the audience that the speaker, in becoming attorney, had not sunk the politician.

The closing address, by the President, Mr. Vassant, recently elected to Congress, from this city, was chaste and appropriate.

For most of the facts I have been able to communicate, I am indebted to the politeness of Mr. Selby, the actuary of the Institute.

Yours, &c., R. B. H.

Baltimore, November 4th, 1853.

FRANKLIN COUNTY (O.) AGRICULTURAL SOCIETY FAIR.

This enterprising Society had a very gratifying exhibition. This is not surprising, when we notice that the officers are full of zeal and of enterprise, and that their list of premiums is large and liberal. It is through the influence of some of these gentlemen that the State Society have increased the number of their premiums in the *farm* department. The Franklin County Society awarded more than two hundred premiums. The President writes us a very gratifying statement of the influence of the Society. He says:

"Our people have learned that good stock pays best. They have yet to learn that it will pay to cultivate their lands in the best manner. When this is accomplished, the Agricultural Society will have fulfilled their destiny."

In one respect besides, they have, in our judgment, set a good example to their sister Societies, to wit, in awarding nearly forty volumes of our journal as premiums to the successful competitors. We commend the habit as a good one. This, indeed, is not the only instance of the kind, nor this the only season, in which similar awards have been made, but, so far as we recollect, this is the most numerous of our lists of this description.

We give a full account of the farm of Mr. Samuel Brush, who received the first premium on farms, and say to all his fellows, "go and do likewise."

"Farm No. 2.—Samuel Brush. This farm is bounded on the north by the Ohio Central Railroad; east, by Big Walnut Creek; south, by the Columbus and Granville Plank-road; and west, by a county-road. The farm contains 60 acres of improved land, about 60 acres in wood, all enclosed. The improvement consists of 30 acres of bottom land, divided into two fields of about 15 acres each, one in corn and the other in pasture; about 25 acres of upland divided into two fields, 10 acres of meadow and 15 acres lately in oats, potatoes, orcharding, avenues, &c. The unimproved is nearly all underbrushed, and the down timber cleared up, and is intended to be sown in blue grass for pasture; the residue, about 5 acres of side-hill, is used as a stock-yard. We find no waste land on the farm, as the side-hill is used for a stock-yard in lieu of the level land that can be cultivated. This farm was purchased four years since, and at that time had 12 acres of cleared land, 7 of which was on the bottom, and 5 on the upland. The residue, 48 acres, has been cleared since. When purchased by the present owner, it was covered with ponds of standing water, which presented an unwelcome appearance, and prevented the raising of crops remunerative to the tiller. By a judicious system of drainage, ditching, and subsoiling, the quantity of crops has not only been nearly doubled, but the farm presented an attractive and beautiful appearance.

We examined the corn field, and suppose it would average from 70 to 75 bushels per acre, and if the stumps on the part newly cleared were removed, would make 100 bushels. The pasture land, being newly cleared, could not be profitably cultivated, and upon inquiry, we ascertain that it is as profitable as the cultivated land. There are 125 young apple trees of the best variety, in a thrifty, healthy condition; about 25 cherry trees, and from 50 to 100 ornamental trees, including three kinds of evergreens, which will soon add much to the value and beauty of the farm. On the east side, next to the creek, which in periods of great floods, occurring once in about 15 years, overflows the bottom land, Mr. Brush has constructed a levee or bank from 16 to 20 feet wide at the bottom, 2 feet wide at the top, and 5½ feet high. On the top of this is a board fence, about 3 feet high. On each side of the fence is planted the Osage orange for a hedge, to enclose, and become a substitute for the board fence. Half way down the bank on each side is planted another row of the orange; the outer row next to the creek is intended to grow up as trees, to protect the bank against drift-wood, &c. The levee is sown in blue grass. This levee is three quarters of a mile in length, extending from the bank of the plank-road to the bank at the railroad. We understand this embankment cost at the rate of $2.70 per rod of 16½ feet. At first, this levee and fence seemed to us an expensive concern; but when we inquired and found, first, that there was a ditch inside, caused by excavation, to make the levee worth at a low estimate 60c. a rod; 2d, the permanency of the levee and hedge, making an everlasting fence; and 3d, the necessity to keep out the creek, and the saving of labor and timber in fences that would be liable to be carried away by high water, we came to the conclusion that in a permanent view this levee and fence was the most economical and profitable expenditure on the farm. The buildings are log, consisting of a dwelling, stable, &c.; also a very superior stone milk-house, which we pronounce perfect. It is built below a spring, with a projecting roof to cover the spring on the hill-side. The water is raised in the spring by a stone wall, laid in water-lime, and carried through an iron grate into a stone trough into the building, and out through another grate. We understand that Mr. Brush intends carrying the water to the foot of the hill for the use of stock. We find the farm remarkably clear and clean of weeds, and in good order and condition for so new a farm. The arrangement of the fields is admirable, dividing the different qualities of land, and an abundant quantity of spring water can be had in each. Mr. Brush's stock is thrifty, and we find that he adopts the plan of a judicious change of pasturage, so much neglected by farmers generally in this part of the country: by this system his pastures are always fresh, and yield an abundance of feed. Being fully aware that mismanagement or a want of knowledge has always been the cause of our farmers not reaping that rich reward which their labor and industry so well merit, we have thus gone into a more detailed account of the system of drainage, &c., adopted on this farm, well satisfied that a reasonable outlay judiciously applied in drainage, will make our low lands the most valuable and productive in the country.

We cannot refrain from giving it as our opinion that Mr. Brush is a scientific farmer; and we are satisfied that his farm is well cultivated and well managed, and as profitable as it could possibly be made, for the short time he has owned it."

FOR THE PLOUGH, LOOM, AND ANVIL.

FAIR OF THE MARYLAND AGRICULTURAL SOCIETY.

The annual cattle-show and fair of the Maryland Agricultural Society was held, during the last week, near this city. Having spent a part of one day in the enclosure, I will give you the result of my observations.

The ground occupied by the Society is a plat containing, I should judge, about twenty-five acres, situated one mile from the Washington Monument.

This field is enclosed on three sides by sheds, or stalls, substantially constructed and neatly whitewashed. These stalls are numbered, and so varied in form as to be adapted to the different kinds of stock. On the remaining side is a high, tight fence, which entirely excludes outsiders from a view of the wonders within.

Near the centre of the lot are a number of buildings, occupied by offices, and the exhibitors of agricultural and mechanical implements.

An admission fee of twenty-five cents was exacted of all non-contributors. The amount thus received is reported to be *four thousand dollars*.

This is to me a novel feature in the management of cattle-shows. In the New-England States, this farmer's festival is as free as the light of the sun and the dews of heaven. Reasons, however, exist for adopting a different course here. The Society receives no aid from the State. Her resources are wholly inadequate to defray the expenses of the annual fair. Then, the expenses incurred are much greater. The fixtures are more permanent and costly. The ground, being near the city, and being entirely devoted to the interests of the Society, is subject to ground-rent. The amount paid in premiums is much greater than by the County Societies of New-England. *Thirty-five hundred dollars* was distributed by this Society last week.

Furthermore, there are multitudes in a great city like this, who know nothing about agriculture, and care as little. These persons will attend the cattle-show to gratify an idle curiosity or have a row. It seems proper that they should be made to pay for their entertainment.

Near the centre of the enclosure is a *stadium* or *hippodrome*, where the horses are shown up. It is about an eighth of a mile in circumference. The track is covered with tan-bark, and the whole is surrounded with a railing, to keep back spectators.

Near by is the plat devoted to ploughing-matches. The ploughing I did not witness, but the land gave no evidence of having been *well* ploughed. To the ploughing was added a *harrowing*-match. This is a good idea. There needs good ploughing *and* good harrowing to secure a good crop.

But I must to the show. First, of *horses*. The number exhibited was not large, but there were some very fine specimens. Farmers in this State, especially in the eastern portion, have heretofore paid but very little attention to the raising of horses. Better horses, either for draught or for the road, I have never seen, than may be found in Baltimore. But most of them were raised in Virginia or Ohio.

Neat Stock.—Of this there was a large collection, though not a great variety. Of working oxen, or steers, I did not see a single pair, though I was told that some had been exhibited. Of bulls, milch cows, and heifers, there was a large number, and some choice specimens.

Of varieties, I noticed the Durham, the Devonshire, the Ayrshire, the Alderney, and the native. Of each there were fine specimens. For the stall, the Durhams, I opine, deservedly rank highest; for the dairy, the

Ayrshires; for beauty and hardihood, the Devons; and for all three combined, the natives, as we Marylanders say, "can't be beat."

A better show of *sheep*, I have never witnessed. Bakewells, Southdowns, and Merinoes were among the best. Why may not Maryland compete successfully with Vermont in wool-growing?

In this climate, the sheep need never to be housed. The expense of keeping cannot be more than one half as much as in New-England. The wool may not be quite as good, but the mutton must be better.

I was happily disappointed in the appearance of the *swine*. There were the Berkshire, the Suffolk, the Chester county, and the native breeds. The Berkshires are preferred by many, on account of their hams. With a Marylander, the ham is by far the most important part of the hog. Let that be right, neither too fat nor too lean, and they care little about the "middlings." The Suffolk breed has been but recently introduced. They were much admired by the farmers, and sold at a very high price. The Chester stock is from Chester county, Pa. They grow very large, are coarse and ill-shapen, the body being disproportionately long; and the flesh must, I think, be coarse. Of the native breeds, there were some good specimens, and many, that had better been permitted to grub on at home. But what interested me most in this department, was a pen of fifty-one hogs, belonging to a gentleman by the name of Nelson, of Virginia. These grunters were all of nearly the same size, weighing, it was estimated, when dressed, little if any less than four hundred pounds each. They were but sixteen months old. In the eye of a farmer, it was a rare spectacle. I was told by the tender, they had never had any meal; their food being unbroken corn and water.

The show of POULTRY was *tall*. I had supposed that the great "hen convention," held in Boston, some two years since, could not be beaten. But this exhibition was certainly not inferior to that, either in number and variety or quality.

The Celestial Empire was fully represented by "Imperials," "Chittagongs," and "Shanghais." Egypt, Italy, and Spain were also there. Poland too, though long since dismembered, and known only as among the things that were, was represented. The stately "Dorking," the pert little "Bantam," exhibiting more of the *suaviter in modo* than of the *fortiter in re*, the sombre-looking "Jersey Blues" and the modest, but no less useful natives, were all there. Also geese, ducks, turkeys, peacocks, Guinea-hens, doves, and lop-eared *rabbits* were permitted to speak for themselves. "Tom Hyer," too, was among the crowd. Not the New-York pugilist, of unenviable notoriety, but a feathered biped of good reputation, which, in consequence of his contempt of the *higher* law of love to all, has been dubbed "Tom Higher." How infinitely more excusable and more worthy of respect is a game-cock—a fighting chicken—than an animal having the form and lineaments of a man, who takes delight in that which demons would blush to own themselves guilty of! How humiliating the reflection that man, created in the image of his Maker, should become so degraded as to contend with game-cocks and bull-dogs!

Of *agricultural implements* there was a great display. There was a large collection of ploughs of every conceivable variety. A favorite plough with Pennsylvania farmers, made entirely of wrought iron, and turning the furrow to the left, was there. There were deep-tillers, side-hill ploughs, and shovel-ploughs. The latter are in general use in this State. In the cultivation of corn, also in covering seed, they are very serviceable.

I did not notice the Michigan plough, and think it has not been introduced.

There were many good specimens, but upon the whole, I think the ploughs much inferior to those manufactured and used farther north. Good ploughs, however, are being introduced, and the more intelligent farmers are learning to appreciate them.

Of machines for mowing, reaping, threshing, cleaning, grinding, making brick, pressing hay, sowing wheat, planting corn and other seeds, sawing wood, cutting hay and vegetables, and shelling corn, there was a great variety. Most of the articles in this department were manufactured in this city, and are as perfect in their kind as can be obtained.

Among the many things and animals which I saw to admire, was one which I was sorry to find there. At a cattle-show we look for brute animals, and are glad to see them; but, I deem it not a fit place for that which makes brutes of men.

The address, by Mr. Holcomb, of Delaware, was highly laudatory of the agriculture of the States, and especially of the Middle States. The speaker gave a very interesting and graphic description of the agriculture of Western Europe, which he had recently visited, and drew therefrom many valuable reflections for the instruction and encouragement of American farmers.

Suffice to say, this exhibition was highly creditable to the Society by which it was gotten up, and the State of Maryland; and proves most conclusively that agriculture is progressive here.

Yours, &c., R. B. H.

TOPPING CORN.

Habit, with most people, is law. Educate one to pursue a particular mode, and especially if all his neighbors do the same, through all the years of his boyhood and youth, and you have thereby placed him under bonds stronger than those of judicial tribunals, never to prefer any other mode to this.

This well-known fact has an important and perhaps controlling influence with many people in the treatment of their crops; and a large fraction of exceptional cases are of that other class, that would deserve to be called *fanatically scientific*, did not their fanaticism far outstrip their science. Every thing in the books, however absurd and contradictory, is honored as unimpeachable and unquestionable authority.

The proper treatment of ripening corn has received, and deserves to receive, most careful attention, and has called forth many zealous writers, some of them very able, in defence of their favorite theory. We do not add our own name to this list, with the expectation of discovering or of receiving any more consideration than many others. But there are a few unquestionable facts related to this subject, which must be allowed to deserve some attention in coming to a just conclusion upon it.

It is safe to say, in all cases, in the growth of plants, that nature never blunders. Not only each plant, in its natural condition, retains its own peculiar properties, but it has its own way of doing it, and that way is, for that plant, the best way, and the only safe way.

For example, we do not think it would be an improvement of the pine, and spruce, and hemlock, &c., to provide them with leaves like those of the oak or the grape. We might make a "better tree," but not a more *perfect* *pine-tree*, by such a process. Such a change might introduce qualities which would adapt the pine to other uses than those to which it is now suited, and that is all. It might also destroy the tree.

Trace for a moment the physiological changes which such a change of leaves might produce. All perfect plants have an exact adaptation among their several parts. The root, the trunk, the leaves, &c., sustain very important relations to each other. Should the leaves perspire too freely, the sap, too concentrated and condensed, might be unable to circulate further. Of course, the tree would die. If too much water was absorbed, the sap would be too dilute, and the new wood might become soft and spongy. Thus, many trees, when deprived of their leaves, will die. They cannot recover themselves. Most plants can be killed with excessive watering, quite as effectually as by the severest drought. These illustrations are sufficient for our present purpose.

What point does Nature seek to accomplish in her operations, as the ultimate good? We do not hesitate to say, *the perfection of seed and fruit.* Flowers are often beautiful, though growing in a desert, and the odors of some surpass any power of art, though it have at command all the elements known to the chemist. But these and other points, we cannot doubt, are all incidental, the perpetuity of the species being the end in view.

Now, if nature does not act blindly in these matters, she knows when to order that leaves shall be *deciduous*, and when *persistent*, that is, when they shall shed themselves, and when remain perpetually green. Hence, to correct or improve nature in these matters, would seem a hazardous attempt.

But we nowhere have seen, in any species of plants, a habit of *shedding entire branches*, as a preparation for perfecting her fruit. That is a form of *deciduousness*, not yet discovered under nature's operations. Hence, for men to practice it, would not seem, *à priori*, to promise very happy results.

There is another class of operations, which seem kindred to these, but which are essentially diverse from them. These are instances in which we would secure an unnatural, or in some sense artificial, product. The culture of *celery*, for the table, is of this sort. We wish here to secure an unnatural tenderness of stalk, and hence we adopt artificial means. So with some of the edible roots; we cultivate, not for the fruit, but for the root, and *may* sometimes succeed at the cost of the most perfect fruit. Or again, we may prefer extraordinary size to other qualities, and then we nip off a portion of the young fruit. Fancies of various sorts lead us to adopt other artificial modes for securing our special object, in the cultivation of flowers.

In the cereals, however, the fruit is the object of the farmer's plans and labors, or in other words, the perfection of the seed. Here then he has the same end in view that nature has, and if he resorts to unnatural processes, he will ultimately discover his mistake.

But in raising corn, the farmer sometimes has a double purpose. He uses not only the fruit, but the leaf and the stalk. Hence, he has regard to both in his style of culture. To secure his stalks in their best condition, he must cut them before they begin to decay. But unless nature habitually blunders, this will be at the expense of the fruit. If cut at the moment when their vegetative functions cease, perhaps no loss is sustained.

"All this is very well," says one, "but facts are against you. The corn is, in fact, improved by cutting the stalks." Very well, only be sure of this, and we will admit that nature ALWAYS errs in this particular. Is any other inference possible?

If we and nature, both, are wrong on this point, we wonder why it was not *so ordered* by a merciful Providence, that stalks of wheat, rye, &c., could be cut too, and thus these grains be improved? What splendid loaves would such *improved wheat* furnish! We cannot see why the cases are not analogous.

Unnatural tillage sometimes produces "monstrous" growths of stem, herb, or fruit, which require something equally unnatural to counteract it. This is not unfrequently seen in rich gardens, but we see no analogy between these phenomena and the case before us.

The corn may swell more or less, in a given case, the accidental result of circumstances, such as atmospheric moisture, condition of the stalks when cut, &c., but these, in our view, are only incidental, and do not materially affect the substance of the grain. Vegetation is at an end already.

COMPARATIVE VALUE OF DIFFERENT KINDS OF FIRE-WOOD.

To those who are in the habit of using wood as a principal article of fuel, a knowledge of the relative comparative value of the various kinds in market cannot be unimportant, particularly as the consumer is thus enabled to judge of the comparative difference in each, and consequently to select the *cheapest*, or that which is offered in market at the lowest price in proportion to its relative value. For this purpose we have compiled the following table, originally prepared from careful experiments, conducted on the most correct and strictly philosophical principles. It shows the weight of a cord of different kinds of wood, when dry, or *seasoned*, and the comparative value of the same, assuming as a standard the shell-back or white-heart hickory:

	lbs. in a cord.	*Prop. value.*	*Comp. value.*
1. Shell-back Hickory, -	4469	$1 00	$7 40
2. Common Walnut, -	4221	95	7 03
3. White Oak, - - -	3821	81	6 09
4. White Ash, - - -	3420	77	5 70
5. Swamp Whortleberry,	3361	75	5 55
6. Shrub Oak, - - -	3337	74	5 47
7. Apple Tree, - - -	3115	70	5 18
8. Red Oak, - - - -	3083	69	5 11
9. Black Oak, - - -	3102	66	4 89
10. White Beech, - - -	2936	65	4 81
11. Black Birch, - - -	2815	63	4 67
12. Yellow Oak, - - -	2818	60	4 44
13. White Elm, - - -	2692	58	4 29
14. Maple, - - - - -	2668	54	4 00
15. Buttonwood, - - -	2449	52	3 85
16. Spanish Oak, - - -	2391	51	3 77
17. White Birch, - - -	2369	48	3 56
18. Pitch Pine, - - - -	1904	43	3 18
19. White Pine, - - -	1868	42	3 11
20. Lombardy Poplar, - -	1774	40	2 96

Each cord of wood, when *green*, is estimated to contain 1443 lbs. of *water*. The farmer, then, who takes a cord of green wood to market has a load not much less for his team than his neighbor who should put on with his cord of dry white oak, three quarters of a cord of seasoned pine, or make up his load of more than *two cords* of dry white birch. We have always considered the carting of *water* to market, especially over rough and heavy roads, an unwise and unprofitable business.

SETTING FRUIT TREES.

In regard to the time of setting fruit-trees, there is a difference of opinion. Some prefer the spring for this purpose, others the fall season. For those who neglected setting their trees last spring, the proper season to do it is any time from the falling of the leaves until the earth begins to be frozen. Dig the holes for the roots sufficiently large and deep, and put in a layer six inches deep of rich soil. Place the tree with its roots as nearly in its natural position as possible, the same depth as it originally stood upon this layer of soil, and keeping the trunk in an upright position, fill the hole with rich, well-pulverized earth, taking care that every root and fibre shall be firmly imbedded therein. After this earth has been firmly pressed or trodden in its place, throw up a small mound of gravel (to be removed in the spring) around the trunk, and place a few stones upon this, which will steady the tree, and prevent the too frequent freezing and thawing of the roots while the earth is loose. Instead of this, each tree may be kept steady by staking with two stakes, each being driven into the earth about two feet from the tree, sloping in opposite directions, crossing near the top on each side of the trunk, which should be surrounded by a bandage or cushion of moss, coarse wool or cloth, &c., and firmly bound between the stakes to its place. This will support a young tree better than any other method which we have seen tried

WHAT HUMAN LABOR CAN DO.

Mr. Stephenson, the Engineer who designed and executed the famous Tubular Bridge over the Straits of Menai, said in a speech at Toronto:

" We ought not to forget that we have called to our aid that class of men called contractors, a number of scientific and mechanical men, many of them positively engineers. These contractors now come to the aid of the engineer in all difficulties ; so that the engineer has little more to do than to conceive, and they realize. One circumstance connected with this fact might be mentioned. In connection with the Tubular Bridge, there were nearly two millions of cubic feet of masonry required, yet without his concerning himself at all with the masonry, it was turned over to a thoroughly practical man, well acquainted with all the appliances which science had placed at his disposal, and so well were these appliances used, that in three years the two millions of cubic feet of masonry were brought from the quarry and put together, and raised into a magnificent edifice. The work amounted to this, that three cubic feet of masonry were set every minute for twelve hours in each day, for three hundred days in a year, and for a continuous period of three years. (Applause.) Nothing that I ever heard or read of equalled that; yet I will almost pledge myself that more than that will be done at Montreal. (Tremendous applause.) He mentioned this circumstance in regard to the time in which so much work was performed by ingenuity in the application and use of tackle; but they must not overlook the fact that other things are brought to bear in other countries which nearly rival any thing that we can do as regards the amount of work done. A case of the kind came under our notice in Egypt: an embankment was to be constructed over the Delta of the Nile, extending over one hundred and forty miles, and in eighteen months the embankment, eight feet high, and twenty-five feet wide, was constructed, an operation which struck him as remarkable for the systematic application of human labor properly divided. There was one road from Cairo to Benau, thirty miles long, forty feet wide, and eight feet high, fitted for carriages, accomplished on this occasion. (Applause.) This was done, too, in what was called a barbarous country; but he has never seen it excelled in any country, however civilized! Therefore, it was well not to laud themselves too much in regard to their success in science; for there are parties, who, although not so far advanced in civilization as we are, have the means of promoting works speedily, as any to which we have attained."

MANURES, PEAT, AND MUCK.

Dundonald, in a work upon agriculture, published in 1795, says, "The most efficacious method of applying peat to poor, barren soils, is to mix it with the urine and dung of cattle; on failure of these articles, with alkaline and other salts, and lastly *with lime*."

In making a compost of peat with lime, Dundonald says, "This object is best attained by mixing newly-made and completely slacked lime, with about five or six times its weight of peat, which should be moderately humid, and not in too dry a state. * * * This preparation of lime and peat is in a peculiar manner conducive to the growth of clover, and of the short, and as they are called, sweet kind of pasture grasses. The soil, also, by the application of it, acquires such a predisposition or tendency to promote the growth of such grasses, as to prevent its growing afterward rank, coarse, or sour herbage." "Notwithstanding," he says, "that this preparation of lime and peat is certainly, when properly made, a valuable manure, yet the advantages that may be derived from alkaline salts, instead of lime, are of much greater importance and general utility."

PROF. MAPES' MODE.

Professor Mapes practices another method of composting muck or peat. He says: "The chloride of lime and carbonate of soda is made by slacking three bushels of shell-lime, hot from the kiln, with one bushel of common salt dissolved in water. Common salt being composed of chlorine and soda, the lime combines with the chlorine, forming chloride of lime, which in turn receives carbonic acid from the atmosphere, and becomes carbonate of soda. The mass should be turned over every day for ten days, at the end of which time, it is ready for use. Four bushels of this mixture, thoroughly divided through one cord of muck, will decompose perfectly in ninety days in winter, and in a proportionately less time in summer. When this muck cannot readily be procured, any other organic matter will answer the same purpose; pond-scrapings, river-mud, decayed leaves, or even head-lands, with one twentieth its bulk of stable-manure, or weeds will answer well."

PROF. DANA'S METHOD.

Of a compost of peat with salt and lime, Prof. Dana thus speaks: "Take one bushel of salt, one cask of lime; slack the lime with the brine, made by dissolving the salt in water, sufficient to make a stiff paste with the lime, which will be not quite sufficient to dissolve all the salt. Mix all the materials then well together, and let them remain together in a heap for ten days, and then be well mixed with three cords of peat; shovel well over for about six weeks, and it will be fit for use. Here then are produced three cords of manure for about the cost of $2.10 per cord.

Salt, - - -	$0 60
Lime, - -	1 20
Peat, - - -	4 50
	3)$6 30($2 10."

LORD MEADOWBANK'S METHOD.

This process has been the basis of most of the experiments in the use of peat or muck as a manure in this country, for the last twenty years. "Lay the cart-loads of it (peat or muck) in two rows, and of the dung in a row between them, the dung thus lies on the area of the compost dung-hill, and the rows of peat should be near enough each other, that workmen in making up the compost-heap be able to throw them together with the spade. In making up let the workmen begin at one end, and at the extremity of the row of dung, (which should not extend quite so far at that end as the rows of peat on each side of it do,) let them lay a bottom of peat, six inches deep, and fifteen feet wide, if the ground admits of it. Then throw forward, and lay about ten inches of dung above the bottom of the peat; then add from the side rows, about six inches of peat; then four or five of dung, and then six more of peat; then another thin layer of dung; and then cover it over with peat at the end where it was begun,—at the two sides and above. The compost should not be raised above four feet and four feet and a half high; otherwise it is apt to press too heavily on the under part, and check the fermentation; unless the peat, when dry, be very puffy and light; and then a much greater height is desirable.

THE POTATO ROT.

The potato rot has for a number of years past been a scourge to the crops of New-England farmers, and many inquiries have been made as to its remedy, in all the agricultural papers; but as yet I have never seen any thing which appears to answer the purpose of saving the crop. Now I propose to send you the results of three or four years' experience, in which I have been eminently successful. While my neighbors have lost many, if not all of their potatoes, mine have remained sound, and kept well. The rule that I enjoin is: plant your potatoes just as early as the ground will admit, and put nothing but a spoonful of plaster in the hole with the seed. After the ground is once well clear of frost, there is not much danger of its being frozen deep enough to spoil the seed; and if the crop is grown so early in the season, it will lie in the ground in the fall, and be *sound*, while later grown and manured ones will rot. In this way of planting, I have this year taken my seed from the same bin as my neighbor, and from twelve bushels of seed shall have at least one hundred and fifty bushels of sound potatoes; while *his*, with only a fence between us, are scarcely worth the digging. Last year I carried a lot of fine ones to market, and was asked, "Why, how in the world do you have such potatoes as these, while I have scarcely any?" I gave my way of raising them, and told my friend that I had lost none to speak of, but had a large yield, and had sold them for seventy-five to eighty cents per bushel. If you would ask to know more, you have my address.—*Boston Cultivator.*

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

NECESSITIES OF RAILWAYS.

WANTED, Ten thousand able-bodied men to be employed in the different railway stations, in pitching, hauling and capsizing baggage. Persons of suitable qualifications will be liberally rewarded; others need not apply.

They should be gigantic in stature, muscular and athletic in form, and possess sufficient physical energy to seize a well-filled trunk of the largest size by one handle, and hurl it, pell-mell, from the car to the platform, or from one side of the station-house to another.

Preference will be given to those who have some practical knowledge of grand and lofty tumbling, as that is the department in which they will be mostly employed.

Persons who are not proof against those antiquated frailties of human nature, called civility and politeness, are not wanted. They must be made of sterner stuff than to yield to such weaknesses, or take notice of trifles.

When a gentleman or lady points out a trunk, valise, or box, and politely asks for it, they must show their independence by minding their own business, and leave the inquirer to learn a lesson in meekness.

The lessons to be learned are few and simple. They may be concisely expressed as follows:

1. Railway proprietors do not guarantee the safe delivery of baggage. No such thing. Passengers should be thankful if they get through with the *trunks* of their own bodies safe, even if divested of their fair proportions by the loss of a limb or two. As for baggage, 'tis enough it they get the handles, the lock, and the label. That will suffice for identification.

2. The railway station is a kind of public bowling-saloon, where the company's agents exhibit their dexterity, and test the strength of trunks and boxes by pitching, kicking, rolling, and tumbling, for the edification of hackmen and loafers, and the special gratification of the owners thereof.

3. Public carriers should practise no favoritism. Trunk and valise-makers are a worthy class of men, and deserve patronage. Ergo, here goes the old trunk.

The followiug simple rules should be committed to memory:

1. Always set down a trunk with *emphasis.* It will establish your authority over it, and your undisputed right to thump it. Further, if it contains a torpedo, or any other infernal machine, it will cause it to explode, and give you the benefit of the discovery.

2. Never let a trunk rest upon its bottom. Turn it bottom up, if possible; at least on its side. Always to rest upon the same foundation is decidedly *hunkerish.* The old saw, "Let every tub stand upon its own bottom," don't apply to trunks.

3. When you have occasion to move a trunk, either roll it or pitch it, or, seizing it by one handle, drag it forcibly across the floor or over the pavement. It serves to remove asperities both from the floor and the trunk. As certain physicians say, "it equalizes the circulation."

4. In stowing away baggage, always place the smallest and frailest articles at the bottom. If the contents are volatile, it will prevent their escape.

5. In the distribution of baggage, speak up as though you were on the tented field, at the windward side of a whole brigade, and wished the whole world to know that you are an *assistant* baggage-master.

Many other useful hints will be given when initiated.

Application may be made to any railroad station or on board any steamboat. VIATOR.

PEARS AT BOSTON.

ACCORDING to the last number of *Hovey's Magazine*, the show of pears at the late exhibition of the Massachusetts Horticultural Society far exceeded that of any former year. In common with many other parts of the country, the season at Boston seems to have been unusually favorable to this fine fruit, specimens of Diel and Flemish Beauty measuring eleven to twelve inches in circumference, and of the White Doyenné and Beurré d'Anjou, ten inches in circumference.

The extent of the collections may be inferred from the fact that Hovey & Co. presented specimens of 300 varieties; M. P. Wilder, 310; J. S. Cabot, 120; Samuel Walker, 100, &c. Many of these would be, of course, of little value; the Society accordingly offered large prizes for the twelve best selected varieties and best grown: the names of these we give below, and they show what the general favorites are in that place:

From W. R. Austin: Le Curé, Easter Beurré, Duchess Angoulême, Beurré d'Anjou, B. d'Aremberg, White Doyenné, Bezi de la Motte, Vans Mons Leon le Clerc, Passe Colmar, Louise Bonne of Jersey, Bartlett, and Urbaniste.

From Jos. Richardson: Beurré d'Anjou, B. Easter, B. Diel, Louise Bonne of Jersey, Urbaniste, Bartlett, Belle Lucrative, White Doyenné, Flemish Beauty, Le Curé, Duchess of Angoulême, and Dix.

From Jos. Stickney: Louise Bonne of Jersey, Winter Nelis, Bartlett, Easter Beurré, Marie Louise, Le Curé, Beurré Diel, Urbaniste, Glout Morceau, Belle Lucrative, Thompson, and Flemish Beauty.

From Hovey & Co.: Gray Doyenné, White Doyenné, Swan's Orange, Beurré Bosc, B. Diel, B. d'Anjou, Glout Morceau, Flemish Beauty, Doyenné Boussock, Bartlett, Duchess of Angoulême, and Louise Bonne of Jersey.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

A BAD PRACTICE.

MANURE.—Drawing out manure, and allowing it to remain in your fields, under the rays of a hot sun, to be evaporated, is a bad practice, to say the least of it. It is quite too common a practice, with many farmers, to draw out their manure on pastures, spreading it, of course, and it remains exposed to the sun until there is not substance enough in it to revive a pig-weed. Though it is preached up as a fact, by many scientific farmers and agricultural journalists, that a great amount of the strength of manure goes down into the ground, yet I am persuaded that much more of its nourishing qualities goes up than down, particularly where it is allowed to lie on the surface of the ground, exposed to the intense heat of the sun.

It is a very good practice, if you are abundantly supplied with fine manure, to draw it out upon your wheat fields just before sowing your wheat, or before you prepare your ground for the drill. By this practice, you intermix the manure with the soil, and thus your wheat at once receives the advantage of the application. I am confident that this is the best way to apply fine manure, as you get some good from it; whereas, if you draw it out upon your meadow lands in a coarse state, many times in large lumps, you lose much of its intrinsic worth, which otherwise might be saved by judicious application. I have known lands to be covered with manure in the fore part of the summer, and I have known it to remain in this waste-like condition until winter, upon pasture lands. I should like to know what real benefit can be derived from thus applying fertilizing matter? Certainly no great; for, forsooth, most of it is lost by way of evaporation, and by the washing rains. Cattle do not like to eat grass growing out of manure-heaps, though they frequently eat it in the form of hay, in the winter season.

The best way, on the whole, in my estimation, to apply coarse manure, intermixed with straw, &c., is to draw it out upon your plough-fields, and plough it in as fast as you draw it. If it is very coarse, and you are bound to have it ploughed in, let a boy follow after the plough, and haul it into the furrow; but don't let it remain in the field until its main substance is gone to the four winds, to fall some where, you know not where.

W. Tappan.

RULES AND FORMULÆ

FOR CONSTRUCTING MACHINES AND PARTS OF MACHINES.

We have given, in previous numbers, several "rules and formulæ," taken from the *Polytechnic Journal*, which were originally prepared for the readers of that learned work, by Messrs. Gritzner & Fleischmann, editors. We select a few more from the September number.

[The symbols are used as in the April and June numbers; d for diameter; N, the effect which the axis transmits, expressed in horse-power; n, the number of revolutions of the axis per minute.]

Long Transmission Axes, and especially those used in spinning and weaving factories, ought to be so constructed that the angle of torsion will be the same for axes of large as well as of small diameters, and in proportion to the length of the axes.

For such axes we have—

$$d = 6.299 \sqrt[4]{\frac{N}{n}}$$

The angle of torsion will be $= \frac{1}{627}$ for cast iron, and $\frac{1}{949}$ for wrought iron.

For the construction of an axis of a walking-beam, which is supported on both ends, and the weight applied in the middle of it, let P be the pressure of the walking-beam upon the middle of the axis; d, the diameter of a journal; l, its length; D, the diameter of the axis next the walking-beam; L, the distance of the walking-beam from the middle of the journal.

Then we have—

$$d = 0.077 \sqrt{P},$$
$$l = 0.3428 + 1.21\, d$$
$$D = d \sqrt[3]{\frac{L}{\frac{1}{2}\, l}}.$$

THE GREAT EXHIBITION.

This immense show magnifies its apparent dimensions, as one undertakes to give even its general outlines. But frequent visits and repeated observations on this subject satisfy us that the public *taste* is less educated than the intellectual faculties. Crowds pass by the Gobelins and the Sevres ware, and the scarcely less attractive goods now manufactured by M. Lahoche, and the beautiful Florentine mosaics, without any apparent consciousness that these are any thing more than they see every day. The Pope's *St. John* actually seems less attractive to the masses than the colored engravings of a shop-window. We say this not by way of complaint, of course, but of regret, and as we have watched the movements of the crowd, we have wished that some "public demonstrator" or skillful lecturer might take each little party of visitors, and, by explanation and comparison, illustrate the peculiar points of those objects chiefly worthy of note. If some superintendent of public instruction would employ a few scores of teachers competent to this task, we are sure he would do the State much service. We only add in this connection, that we discover very little difference in these matters, between the residents of city and country.

But we must proceed with our descriptions, commencing where we were obliged to stop in our November number, viz., at the entrance of the gallery over the south nave, from the tables occupied by the German States.

Our readers will remember an account of the statuettes of Charles T. Copeland, in our September number, p. 174. We have surveyed that table many times since then, and have not changed our opinion of the peculiar merits of those works of art. They have been reärranged, and may now be seen upon a single table.

China ware and porcelain, by Charles C. Leigh, Agent of John Rose & Co., of London. These are of superior quality. The show includes vases, pitchers, ewers, tea and dinner sets, &c., in various styles, and of different materials. Some of them are of great value. On the first table, at the end of it, is "the Queen's pattern vase," being a copy of one in her Majesty's possession, of blue and gold.

Sundry statuettes in groups are among these wares, which possess great merit. Valor protecting Innocence, Sir Calapin rescuing Serena, "the Fairie Queen," Tam O'Shanter and Soutter Johnny, Brito Martis releasing Amoret, the fairie queen, &c., are among the most attractive.

Passing by the miniature steam-engine, standing upon an English sixpence, in the same case with the elegant watches of B. J. Warner, London, (Platt & Bros., Maiden lane, agents,) we reach the show of English silver and gold wares.

The first case contains magnificent workmanship and designs, by Hunt & Roskell. An immense candelabrum is most prominent among these. On each corner of the base is a representation of living groups, and the standard consists of or is surrounded by other groups, (four stories of them in all,) with a vase for flowers on the top. The same manufacturers fill other cases near by, with salvers, cups, tea-sets, water-bottles, a mirror, &c., with two beautiful monumental designs of silver; there is also jewelry, exceedingly rich, with diamonds, opals, emeralds, &c., of most superb styles, and dressing-cases, furnished with articles for the toilet, with gold handles, and another, silver-mounted, liberally furnished with perfumery bottles, &c. An elegant watch in a square frame is in each.

ELKINGTON, MASON & Co., Birmingham and London, fill the next cases, with gold and silver electro-plated wares, of very rare workmanship, of Egyptian and other antique styles.

The large glass case contains electro-plated wares, among which are a large centre-table ornament, designed expressly for the New-York Exhibition. Rock base, with oak branches supporting lights, and silver shells for fruit; the whole supporting glass bowl for flowers. Sea tigers on the triangular base. Flower stand, sea horses and glass shell. Set of three centre-pieces, Louis Quatorze. Flower-stand, shell, supported by coral and sea-weed. Rich dinner service, consisting of dish-covers, entrée dishes, soup tureens, wine coolers, &c., in the Arabesque style. Set of three centre pieces, modelled from the Egyptian Lily. Tea-trays or salvers. Large centre-piece, for eight lights, in the style of fifteenth century, with figures supporting baskets for fruit. Centre-piece for dessert service, with figures of Winter and Summer. A centre-table ornament, the national games of England. Inkstand, Rebecca at the Well. Inkstand, "Please remember the Grotto." Flower-stands, salt-cellars, spoons, forks, &c.

The next, a square glass case, containing works in silver oxide, silver, and gold, by the same manufacturers. Among these, are a sideboard dish, in silver relief, gilt, the subject of which is from the "Iliad." Set of three candelabra, after the antique. Race plate, designed by Gunkel, modelled by Rossi, at Rome. The bas reliefs, on the frieze, represent the three characteristic virtues of practical life, "Strength, Swiftness, and Prudence." In the centre appears a mask of the fair Goddess of Love, who looks out from a rich arabesque flower, as the incentive to every noble strife, and the promoter of all prize competitorship. Sideboard plate, representing the parable of the "Prodigal Son," a reproduction by electro-deposition. Fruit plate, in the Alhambra style. Celebrated cup, an electrotype copy in pure silver, from the original one of the Benvenuto Cellini, now in the British Museum. A dish, of fine workmanship, obtained and copied for Messrs. Elkington, under the direction of the Chevalier de Schlick. The eight subjects in bas relief, represent Minerva, Astrologia, Geometrica, Arithmetica, Musica, and Rhetorica. The centre figure represents Temperance, surrounded by the four elements: as made, mounted as a table, for her Majesty, Queen Victoria. Mirror, in oxide silver, electro-gilt; similar to one purchased by Her Majesty, Queen Victoria, at the Dublin Exhibition. Cups and vases, beautifully embossed with figures of centaurs, ivy, and vine wreaths, &c.; electrotype copies of originals discovered at Pompeii and Herculaneum, and now in the Museum at Naples. Plate, representing seven days of the week, modelled by Duc du Luynes. Inkstand, slaughter of the "Niobe." Inkstand, designed to commemorate the London Exhibition of 1851.

Bronzed wares, also electrotyped, fill the next stand. Among the more attractive articles are: Cupid, with the Lyre, from original, by Thorwaldsen. Dish, representing Trojan Horse entering Troy; copy of a fine old silver chasing. Vase, from original in British Museum; Copy of celebrated Warwick vase. Sideboard dish, subject from the "Iliad." Busts, of Homer, Sophocles, Aristotle, Demosthenes, &c., from antique sculpture. Cup, the Apotheosis of Homer, from Pompeii.

These gentlemen are the patentees of the process of gilding and plating metals, by the agency of electricity, commonly called electro-gilding and plating.

This patent was granted in March, 1840, and since that time the manufacture of articles by this process has become an important branch of industry, and is rapidly increasing. The patentees employ about five hundred work-people, and, necessarily, some of the first designers of the day. "To show the industrial importance of the manufacture, it may be stated, that in addition to the immense productions of the patentees, the process is extensively adopted in France, and other foreign countries; and there are also about thirty other manufacturers in England, licensed to use the process, the patentees, of course, having no control over the quality of the articles produced by those so licensed.

The advantages which plating by this process possesses, are:

1st. The application of a white metal, approximating silver, in hardness and color, as a base instead of copper, and upon which the pure silver is deposited.

2d. The removal of all restraint as to form. The most elaborate ornaments, and the most complicated designs which can be produced in silver, are equally obtainable by this process.

3d. Permanency of plating, the coating of silver becoming, by the agency of electricity, one body with the metal on which it is deposited, rather than a mere covering.

4th. Economy in first cost and durability; in the multiplication of works of art of the highest character, this invention is now taking an important position; and the patentees have established a branch manufactory for such objects, and are now producing, with equal precision and perfection, copies from the smallest gem to the colossal statue, possessing all the accuracy and beauty of the original design."

Angell, 10 Strand, London, displays rich silver and gold wares in the next case. Among these is the group Sir Roger de Coverly and the Gypsies, the "Æsop Service," ornamented with illustrations of Æsop's fables, the ornaments of which are separate from the service, and may be removed from it, and the service used perfectly plain. Other ornamental pieces representing, The Halt in the Desert, The Cellini Vase, Etruscan claret jug, Vintage do., an antique tea caddy, Shakspearian inkstand, antique ale-tankard, &c., all of superb workmanship.

Carrard furnishes the next case. Among these works of art are a huge candelabrum, vases, pitchers, salvers, ewers, &c. The group, "Don Quixotte," in which the hero himself, Sancho, and the Don's Dulcinea, with Rosinante and Sancho's horse, are excellently well grouped and executed.

The Landing of the Pilgrims, in massive silver, belonging to Mr. Thayer, of Boston, and manufactured in London, is seen still farther on.

Passing by the prize-cup offered for the best article on Jurisprudence, we come to the last of this show, the case from

Smith, Nichols, & Co. These are rich wares, but inferior to some of those we have mentioned.

This series of cases contains more massive wares, and wares more floridly ornamented than those of the American manufacturers described in our last. A few of them are probably superior as exquisite works of art. But for chaste designs, elegance of pattern, and quality of material, we think the American compares very well with the English ware. We say this not to disparage the English, but as a fact, which may be fairly stated to the honor of our own manufacturers. Still we ought not to pretend to compete extensively in this department with the English, for our manufacturers must have produced the richest of these samples at a great risk of loss, since we have not—or *should not have*—one purchaser for them, where the English have many. There are many Englishmen, each of whom could "buy out" a score of our wealthiest men.

Passing to the opposite side of the stair-way, by the large and very substantial Axminster Carpet, suspended there, let us commence a *return* along the row of tables parallel to the route just passed. The show of HAYES' Royal Irish linen thread need not detain you. The cases beyond are more attractive. The first is filled with wares manufactured by CHAS. H. FARQUHAR & SON, Edinburgh, consisting of goods for the use of hunters, &c., of excellent workmanship. In the next is Malachite and Pebble jewelry, by AARON, BROTHERS, England. Next we see hair and bog-oak ornaments of superb workmanship, by John Fletcher, Sligo, Ireland.

SKIDMORE & SON, Coventry, exhibit church metal-work; chalices, patens, &c.

WM. WYON, R. A., chief engraver to the royal mint, exhibits, in the next case, some very handsome medallions, coins, &c., from the royal mint.

WATERHOUSE & CO., the Queen's jewellers, Dublin, exhibit a great variety of emblematic jewelry, among which are, The Harp, the Oghum brooch, royal Tara brooch, Conynghame brooch, silver Templar's and Knight Templar's brooch, &c.

CORNELIUS COGGIN, Dublin, exhibits a case of bracelets of bog-oak, and emblematic brooches of the same, such as the wreath-shamrock, the sprig-shamrock, Irish pearls; also horse-hair ornaments of perfect workmanship, and brooches of Connemara marble.

J. & C. BERRIAN, Sheffield and Birmingham, exhibit silver plated wares.

Opposite these tables are shawls in variety, by A. ORR EWING & CO., Glasgow. Silks in variety, by WILSON & CLARK, Manchester.

Passing on, we come to several tables covered with various china and porcelain wares, by T. & J. MAYER, Longport, Staffordshire. On the floor stand several *logs of wood*, as any one would presume, but examination proves them to be of porcelain. Sundry urns, statuettes, vases, bowls, &c., occupy tables. One of those bowls is very superb, the painting being of the highest style of art. It is of large size, holding several gallons.

We are now by the side of a small CHURCH ORGAN, by F. HECHENGER, from the German States, apparently inclined to *harmonize* with its English neighbors. The key-board is upon the back-side of the organ, and is elevated several feet above its base. The bellows are entirely outside the organ, and connected with it only by a wind-tube.

Further on, we find the beautiful show of MINTON, from Stoke, upon Trent. His statuettes are very beautiful, equalled, in the Crystal Palace only, by those of COPELAND. The selection of subjects represented is also very fine. Among these are Prometheus, Shakspeare, Christ blessing little children, the three Marys, Naomi and her daughters-in-law, Venus and Cupid, Child playing with her mother, the wounded Indian, Flight into Egypt; Cellini ewer and plateau, by GUINOT; the Verulam jug, Parian, red and gold; Nelson, Wellington, Temperance; Parnassus vases, royal purple with wreaths of roses; Harewood bottles, vase with the bronzes of Cyrus, &c., &c. He has two superb flower-pots, very large, and other rural designs.

Encaustic tiles for floors are suspended from the eastern side of the nave, by the same exhibitor.

Following the course thus designated, we reach the case of T. & R. BOOTE, which contains some exquisite specimens of Waterloo pottery, worthy of very especial notice. Also, some beautiful statuettes.

SAMPSON, BRIGWOOD & Co., and THOMAS DIMMOCK, Jr., & Co., both from Staffordshire, exhibit various china wares.

SWAINE & ADENEY, Picadilly, London, have a splendid show of whips.

AINGE & ALDRED, London, a beautiful assortment of bows and arrows, fishing-tackle, &c.

Turning the corner into the eastern nave, towards the picture gallery,

JAMES PAUL, of Glasgow, exhibits the prize Plush of the London Exhibition. It is very beautiful.

Passing rapidly thence along the tables, we notice mathematical instruments, globes, maps. a fine barometer, optical instruments, clocks and watches, very superior, by E. D JOHNSON, London, with a marine chronometer. Superb watches also from R. F. COWDERRY, London, optical instruments again, a beautiful show of "ornamental water-marks," or paper transparencies, by T. H. SAUNDERS, and maps of physical geography, by WM. S. ORR, London; daguerrian views of the Crystal Palace in London, Hydrometers, and other objects in variety, too numerous and unimportant to mention in detail.

On one of these tables, is a fine assortment of Tunbridge ware, SHEPHERD's safety lamp, sundry soaps of D. & W. GIBBS, London, in great quantities, glass transparencies, &c.

Turning away from the picture-gallery, we find fringes, tassels, &c., of silk, gold, and worsted, by HAMILTON HYDE & Co., London. Still further on are rugs in great variety, numerous enough to furnish a large store, and at the end of the table is a fine display of articles for the toilet, by TAYLOR & SON, perfume distillers, &c., King's Road, Chelsea, London.

On the opposite side of the court are knit woollen goods, by JOHNSON, BROTHERS & TOWNSEND.

The remaining courts of this section are occupied by numerous contributors, who exhibit a great variety of female wearing-apparel, such as robes, (infant's,) stays, hose, gloves, handkerchiefs, under-clothing, boots and shoes, fancy cloth and gingham dresses, also shirts, fronts, gloves, &c., &c., for gentlemen.

Among these is an elegant wrought handkerchief, a present for the wife of President Pierce. There are also some very rich lace dresses from Dublin, the handsomest of the kind in the palace, various elegantly-wrought goods, "richly embroidered by poor girls," from Belfast, Ireland, and other matters which we lack skill to describe.

This brings us to the picture-gallery, which we have already described. We therefore pass on to the other side of the nave, and leaving the agricultural wares for their own appropriate chapter, we specify a few interesting objects that belong to the

MISCELLANEOUS DEPARTMENT—UNITED STATES.

In the north-east gallery, as our readers already understand, a large space is occupied by the comparatively cumbrous tools of the farmer, forming the United States agricultural department. But extensive *territory* is also occupied by goods of every different description. We specify a few, all that our limits will, at present, permit.

BONNETS.—Broadway, Division street, Chatham street, and some other streets, are here represented by all sorts and conditions of goods of this description. The plain Quaker drab at one extreme, and at the other, all sorts and kinds and qualities, whether gaudy and tawdry, or brilliant, or elegant, or rich, dashing crimson, the joyous pink, the beautiful blue and green, the chaste white, and all other shades and varieties of hue, are here side by side. We will not force ourselves into the seat of a judge, on these goods, lest we be charged with interfering with woman's rights. We only remark, that fit representatives are found in this assortment for "all sorts and conditions" of people, from the top of the Fifth avenue to the humblest dweller in Cross or Mulberry streets.

Boots and Shoes, Gloves and Hose, in large quantities, and in great variety, are displayed here, and on the whole the show of these manufactures is very fine.

But these are met with in all places of merchandise, and we will not stop *here* to describe or to criticise them. We may do so by and by.

Ashard, Brothers, manufacturers of the perfumed oriental crystal, 28 Abington place, N. Y., have in this gallery a very tasteful display of a very attractive article. In a glass miniature Crystal-Palace, Mr. Ring, the agent, exhibits a great variety of perfumery, confined in Liliputian glass. A few drops of the liquid perfume are enclosed in very small, thin tubes, hermetically sealed. One of these is grasped in the folds of a handkerchief, the glass is shivered, and the fragments shaken out, while the odor manifests itself very distinctly. By this process, there is no danger of loss by evaporation, the necessary consequence of a frequent opening of larger bottles. These "crystals" are neatly arranged in paper boxes, and may be purchased in various quantities.

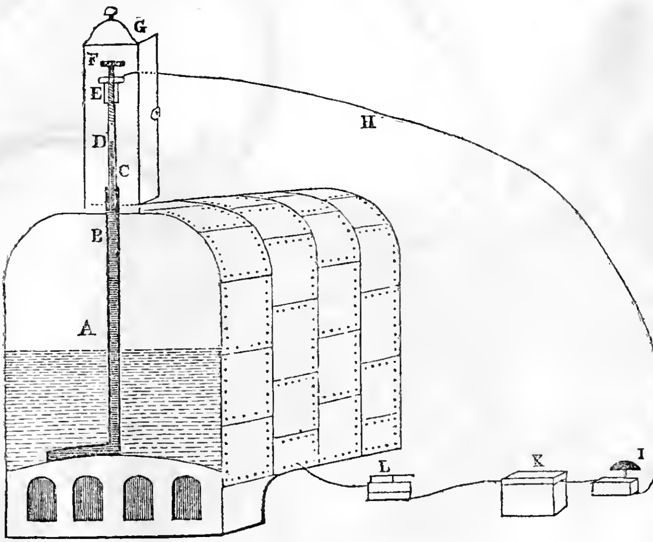
Prof. Widdows, Thompson street, N. Y., exhibits, in small vials, a liquid cement, styed *Metropolitan Crystal Cement*, very highly commended for mending broken glass. If a tumbler, lamp, or other glass vessel is broken, the edges that were separated are to be moistened with this cement, rendered more fluid by immersing the bottle in hot water. The parts are then held together awhile, after which the vessel must be left a few hours for the cement to harden, when the excess of cement may be rubbed off. The joint, of course, is visible, but the vessel is not discolored, and it will bear, afterwards, even hot water with impunity.

Bennington Wares.—In the same section with these last two articles is the fine show of recent wares manufactured at Bennington, Vermont, These are various not only in their forms and colors, but also in their material. the result of a different proportion of the clays of which they consist. This material is a variety of kaolin or porcelain clay, which is found only at Bennington, although, of other varieties of porcelain clay, there are numerous deposits in this section of the country. It is a peculiar mixture of flint, quartz, and feldspar. The manufacturers have a patent for their enamel, or the burning in of their colors, which produces a brilliant glossy surface, which resists the action of all acids.

The New-England Glass Company.—These wares are also on exhibition by the side of those just described. The excellence and beauty of these manufactures demand a more particular notice than we now can find room for, and we therefore leave them for the present. We allude to them because they are too important to be passed by in silence, among the other manufactures in the same section.

UNITED STATES AGRICULTURAL DEPARTMENT.

Steam Gauge Telegraph for the Prevention of Boiler Explosions. Dunn's Patent.—This electric telegraph is intended to give alarm, before the water gets so low in the boiler as to be dangerous, to the operating engineer. On steamships, another instrument is placed in the state-room of the chief engineer, and both are notified at the asme time. It also supplies a telegraphic key for communication from the operating to the chief engineer, should any thing require his presence at the engine, without the operating engineer leaving his post, or detaching a messenger from his duty, or causing alarm to others. It can also be used for steamboats, land engines, &c., with a communication to the chief in his office, or to any other point, at any distance—the connection being made by any iron or copper wire.



This apparatus is connected with the steam-boiler, A, by an upright iron tube, B, (bent at right angles in close contact with the flue surface) closed at the lower end, and filled with mercury up to the glass tube, C, with which it connects—the mercury as high in the glass tube, C, as the mark D. The glass tube, C, supports a ferule, E, with an adjusting screw, F, through its centre, for the purpose of regulating the space between the surface of the mercury and the lower end of the screw. G is the case to protect the end of the tube from injury, and may be kept closed and locked, as it need never be opened except when the engineer chooses to adjust it; a wire, H, connects the screw, F, with the *bell instrument*, I, also with the *battery*, K, in connection with the *telegraph key*, L, and finally, with the boiler, A, to complete the circuit of the electric current.

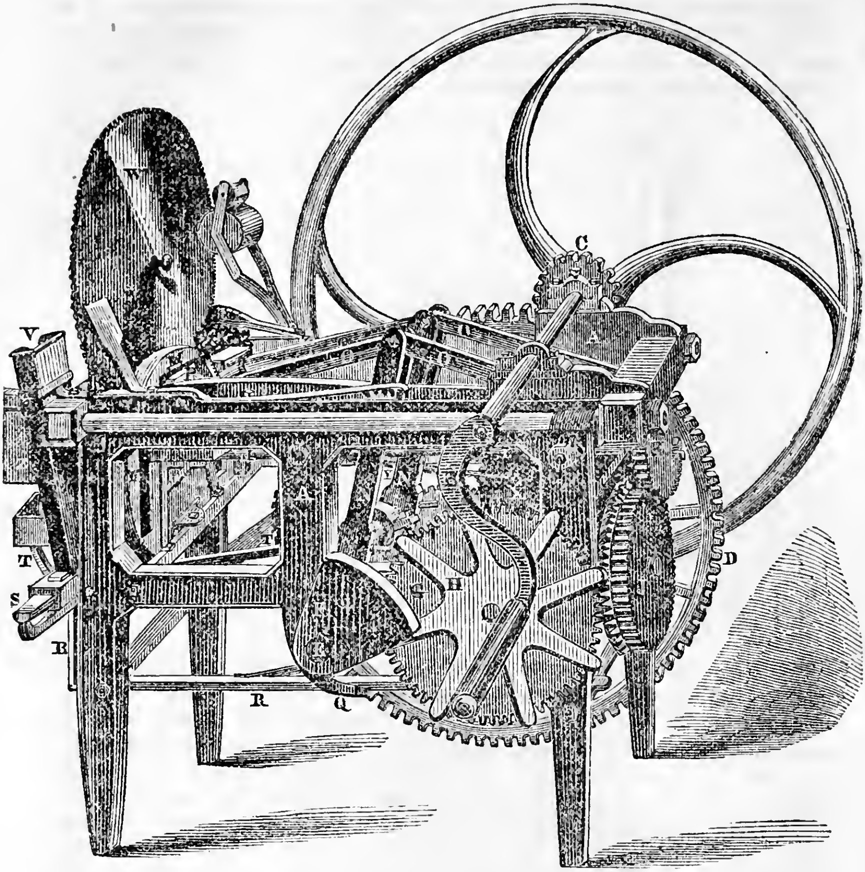
OPERATION.

When the water commences to fall below a definite point in the boiler, *established by the engineer-in-chief*, an increase of temperature takes place which expands the mercury in the tube, B, and raises its surface into contact with the point of the screw, F, thereby closing the circuit of the electric current. At that instant the bell commences ringing to give an alarm that the water is getting too low, in time to prevent an accident.

For further particulars, application may be made by letter, or otherwise, to Pease & Murphy, Fulton Iron Works, foot of Cherry street; to Mr. Quintard, at Morgan's Iron Works, foot of Ninth street; or at the Company's office, No. 20 Nassau street.

The prices for different applications of these gauge telegraphs, including the instrument and full directions for its use, complete and set up in working order, vary from one hundred to three hundred dollars, according to the number of boilers in use, &c.

PARKER'S PATENT TOBACCO PLUG-PRESSING MACHINE.



The annexed engraving is a perspective view of the machine for pressing plug tobacco, for which a patent was granted to A. A. Parker, of St. Louis, in 1852. This machine is on exhibition at the Crystal Palace, and as the tobacco trade of our country is very extensive, it attracts the attention of all engaged in the tobacco business.

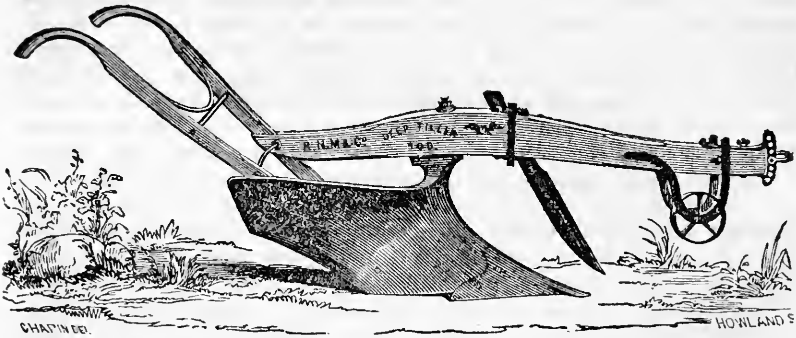
A DESCRIPTION OF THE MACHINE, AND ITS MODE OF OPERATION.

A A is a frame of the machine, and B is the driving handle of the main shaft; on the opposite end is a fly-wheel for the purpose of keeping up a regular motion of the machine. This shaft can be driven by belt and pulley, as in the Crystal Palace; C is a pinion-wheel gearing into and driving the cog-wheel, D, on the shaft, E, of which it may be said all the peculiar motions are transmitted; F is a sector cam on this shaft; it has two pins on its inner face, and as it revolves, these pins take into the arms of the star-wheel, H, which moves said wheel two arms for every revolution of cam F; G is a wheel on the stud of H, it gears into a wheel coupled with the one J, which gears into the pinion, K, and revolves its shaft, L. On the other extremity of this shaft is secured the mould or cell disc, M, in the compartments of which the tobacco is pressed. By the motions described, it will be observed that the mould disc, M, has an intermittent rotary motion, and that one quarter of it (one cell) is moved every revolution of the shaft, E; N N are pitmans secured on the shaft, E, and attached to the toggle-jointed levers, O O. These levers press the tobacco in the moulds, for as the shaft, E, revolves, the pitman, N, being placed eccentrically on it, as they draw down, they make the levers, O O, force a pressing-head into the cell or mould of M, and press the tobacco firmly in the same; the toggle-jointed levers will recede when the pitman, N, changes their position in rotation. There are four pressing sinkers as heads, P, they are secured to the ends of the levers, O, and rotate with an intermittent motion on a small slide shaft. The reason for this arrangement is, that after a presser-head or sinker has pressed about twelve plugs, its face gets gummed up, and will not press well. To obviate this difficulty, a clean presser-head is presented after twelve plugs are pressed, by the dirty one being turned down by a rod operated by a small pinion; the unclean sinker dips into a trough of water below, and is scrubbed with a small brush, and so on, the presser-heads rotate, press, get dirty, and are cleaned. At the back of the cell or mould disc, M, is the revolving plate wheel, W, the bottom of which forms the solid back of the mould or cell, in which the plugs of tobacco are pressed. When a plug is pressed, the levers O O, recede, and that cell or mould rotates, until it comes opposite to the receiving compressing box, Z, behind, into which the pressed plug is discharged or forced by a plunger attached to the thrusting rod, Y, which is secured to the wheel, X, eccentrically, which gives it a reciprocating motion. The mould-boxes are filled or fed from hopper, V, into which the loose roll of tobacco is placed by two feeders, S and T, the one, S, receives it from the hopper, and carries forward as much as will be a plug, to the one T, which then takes it forward and forces it into the back-side of the lower cell or mould of M. The feeding motions of T and S, are by levers, R and T: the one, R, is operated by a cam, Q, on shaft E, which forces it forward, and then it springs back to feed forward another plug. Thus there is one cell or mould of M, filling, one in which the tobacco is being compressed, one being discharged, and one passing empty to get filled, all the time. The back of the pressing cell—the plate-wheel, W, is kept clean and free from gum, because it gears into teeth on the back of M, and revolves. As this wheel revolves it is met with a sponge at one side, and above that it is oiled with a roller rubber. This softens the tenacious gum of the tobacco, which is then easily scraped off by the broad scraper seen at the left hand side. This enables the moulds or cells of M always to have a clean back. This is essential to the successful working of the tobacco-pressing machine. The common presses for pressing tobacco are very defective; this one is entirely new in principle, construction, and all its operations.

The receiving compressing box, Z, into which the plugs are discharged from the moulds or cells, embraces a principle essential to the success of a tobacco-pressing machine. If the tobacco was freely discharged when quickly pressed into plugs, it would soon lose its form and compactness. This receiving compressing box or contractor, has its bottom, top, and sides composed of endless belts, and it is of such a size as to hold the plugs under pressure while confined for about half an hour, during which time the plugs lose their elasticity, and always retain their form after they are discharged. This machine presses about twenty plugs per minute, and the receiving compressing box contains a great many plugs, as it is somewhat long. When full, as one pressed plug is thrust in by the lever, Y, one is discharged at the upper end, ready to be packed up, and so on, continually.

The pressing power of the press can be increased by extending or diminishing the distance between the back and front ends of the levers, they being attached to the cross-bar at the back of the machine, which can be shifted forward or back by the large screw rods, one of which is seen passing through them. This is a good arrangement for graduating the pressing power.

PLOUGHS, &c., BY RUGGLES, NOURSE & MASON.



THIS enterprising house displays a greater variety of implements of their own manufacture, and of most excellent quality, than any other exhibitor of agricultural implements in the Palace. We specify a few of these:

PLOUGHS, in series.—These are of all sizes from the deep-tillers, " No. 77," with a capacity to carry a furrow from 9 to 13 inches deep, by 15 to 17 inches wide, to those 5 to 8 inches deep, by 9 to 13 inches wide. Then we have their sod plough; plough for stiff soils, turning furrow, 6 inches deep by 9 inches wide; the swivel or side-hill plough; plough for stubble land; the double plough, or soil and sub-soil in one, &c., &c.

The list, if complete, would be too much extended. The forms of their mould-boards are peculiar, being determined by mathematical calculation and by actual experiments, with reference not only to the power of draught, but also the condition in which they leave the furrow.

The engraving represents the Eagle Plough, No. 71½. Its mould-board is of a long, gentle curvature, specially designed and finely adapted for ploughing the loose, porous, dry, sandy, and gravelly loams. It turns sod-furrows from 5 to 8 inches deep, by 11 to 13 inches wide, on so long and easy a twist as to avoid unduly opening and disuniting their constituent parts. The defect of such soils is, that they are already too open and porous, and therefore too readily give up their moisture and fertility by evaporation. They greatly want more condensation and compactness of parts; and hence the powerfully pulverizing plough is not the best plough for working them. They are best ploughed in perfectly flat furrows, the edges of which are closely matched in, and the cohesion of the parts of which is so preserved, that the ploughed land lays even, smooth, and firm, and not too loose, open, cracked, and uneven. The best and most experienced cultivators of light dry lands have found that thus ploughing them, and then compressing the furrows closely with a heavy roller, insures the best germination of seeds, the best stand of crops, the best protection of the growing plants from the parching and withering influences of drought, and the excessive heat of American summer seasons.

It is confidently recommended for the working of loose, dry, sandy, and gravelly soils.

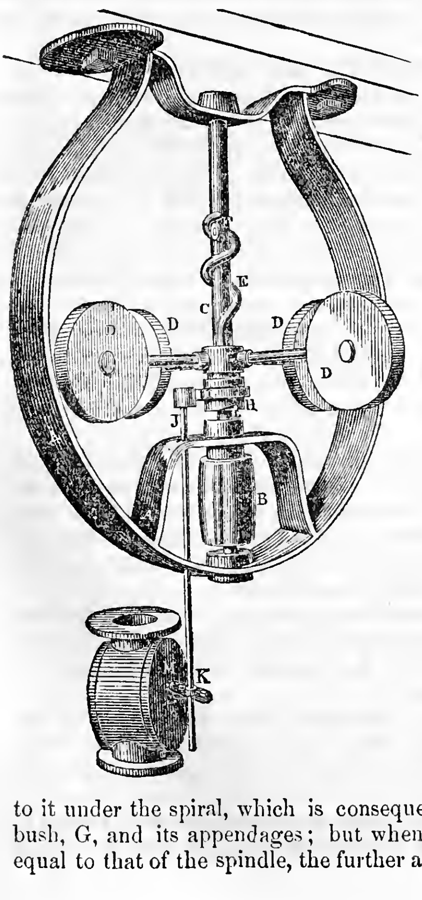
Harrows.—The same firm exhibits a variety of these: the improved hinged harrow, the Geddes harrow, the expanding and reversible harrow, the Scotch harrow, and the triangular, folding, or chandler's harrow.

Cultivators are also exhibited by them in variety.

Cotton sweep, cotton scraper, horse-powers, rollers, seed-sowers, cradles, garden engines, tan mills, hay, straw, and corn-stalk cutters, corn shellers, corn and cob-crushers, cotton gins, improved patent grist-mill, sugar mill, and almost every variety of tool or machine in use upon a farm, is in the catalogue exhibited by these gentlemen.

Hitchcock's Combination Iron Pump is one of the newer forms that have fallen under our notice. This consists of a movable India-rubber "valve" in the top of the pump, connected with the lever, and which therefore rises and falls with it, produces the vacuum or the pressure; for it may be made a lifting or forcing pump, at pleasure, and avoids much if not all the friction which is commonly attendant upon pistons and valves.

TREMPER'S PATENT PNEUMATIC GOVERNOR, AND REGULATING VALVES, FOR STEAM-ENGINES, WATER-WHEELS, PROPELLERS, &C.



This regulator and steam-economizer is on an entirely new principle, simple, cheap, and not liable to get out of order. The action of the governor is so quick, that the steam is applied precisely as the work is put on the engine, and cut off at the instant the work is taken off, keeping the power and work equal, a point in regulating no other regulator can do. In simplicity, regularity of its work, and saving of fuel, it is claimed to be superior to any other regulator.

Explanation.—A A is an iron frame for supporting the spindle, C, which is kept in motion by a belt running on the driving pulley, B. D D D D are four heavy metallic discs, presenting considerable surface to the air; these are fixed to the ends of flexible bars which radiate from the bush or socket, G, this latter turns loosely upon the spindle, and can also slide up and down it. Affixed to G is the curved or spiral rod, E, whose action is simple and efficient. For when the governor is put in motion the spindle will impel the roller, F, attached to it under the spiral, which is consequently forced up, drawing with it the bush, G, and its appendages; but when the discs have acquired a velocity equal to that of the spindle, the further ascent of the spiral will cease. Should the speed of the spindle diminish, the velocity of the discs will not slacken, on account of their acquired momentum, and in consequence their weight will induce the spiral to descend. The valve inside the valve-box, M, is operated by means of a rod, J, which, by the intervention of I, (constructed in the usual manner,) partakes of the traverse of the bush, but not of its rotary motion. H is a stop to limit the descent of the discs, &c., this stop is secured to the spindle by the pin, L. The mode of attaching the rod, J, to the valve stalk, is shown at K. The valve is not shown here, but it will doubtless suffice to observe that it is perfectly balanced, so that it works as easily under any pressure of steam as when not in use, needs no packing, cannot get out of centre, and is free from every objection that the most critical might allege against its efficiency. A governor of this description for a 100 horse-power engine weighs only 15 pounds.

THE RAILWAYS OF RUSSIA.

A French journal publishes from the Augsburg *Gazette*, an interesting account of the progress which has been made within the last few years in the prosecution of railways in Russia. From this article we gather the following facts:

The first railway in Russia was that leading from St. Petersburg to Tsarskozela and Paulowski, two imperial residences, a distance of 17 miles. This road was opened in 1836, by a company consisting in part of British capitalists; and the shares, which cost $40 to $50, are now worth $60 to $70. This was soon followed by the great enterprise undertaken by the Emperor, in which he took a deep interest, of a first-class railway from St. Petersburg to Moscow, 607 versts in length, or just about 400 English miles. In the prosecution of the work, it is well known by the friends of the late Major Whistler, who was one of the efficient engineers in the Western Railroad, in Massachusetts, that he was invited thither through the agency of M. Bodisco, the Russian Minister, and was employed in a very responsible situation in the conduct of the work, until his death, which took place a short time before it was finished. Under the agency of Mr. Whistler, a large number of American mechanics were invited to Russia, and employed in the construction of locomotives and machinery.

This work was constructed under the direction of the Minister of Public Works, Count Kleir Michel, aided by Major Whistler, and was opened on the 1st of November, 1851. It is found to be of immense benefit to the commerce of the country, and the business upon it is daily increasing. The passage is made from the one capital to the other in 22 hours, which previously occupied four days in diligent travelling day and night.

The Augsburg paper goes on to relate that this line had been hardly finished, when the Emperor ordered the construction of another gigantic road between St. Petersburg and Warsaw. The track has been laid out, and thousands of laborers are now engaged in grading it.

This road will be 1,010 versts, or 668 miles, long. It will pass by the cities of Louga, Pskoff, Dunabourg, Wilna, Grodno, Vilcka, Duna, Viala, Niemen, and Narev. General Gertsfelt, of the corps of engineers, directs the works of this road.

While this great railway is in prosecution, a company has been formed at Riga for building a branch, which is to unite the seaport with the city of

Dunabourg, and thus connect Riga with the two capitals of Russia and Poland. This branch, the track of which was laid out by the engineer Gonzenback, will be about 138 miles in length. It will keep along the right bank of the Duna, and will pass near the cities of Johobstadt and Fredericstadt. The capital is fixed at nine millions of rubles, and it is hoped that the Government will grant a guaranty of interest at 4 per cent.

Another line, which is not yet begun, is to unite Dunabourg by Smolenski, with Moscow, and establish a direct communication between this ancient Russian capital and Warsaw, by the route which was pursued by the advance and retreat of the French army in 1812.

In the south of the empire, the Government is about, it is said, to authorise a company, by granting a guaranty of 4 per cent., to undertake the construction of a railroad between Kharoff and Odessa. This road will cross the Dnieper at Kreineetchong, above the rapids, which obstructed the navigation of the river. This road will benefit the commerce in grain in the same manner as the line from Dunabourg to Riga is destined to help forward that of timber.

Finally, in the kingdom of Poland, where, for some years, the line from Warsaw to Mysolvitz, in Prussian Silesia, has been in full activity, two other lines are thought of: one from Warsaw to Bromberg, the other from the same capital to Posen; but the arrangements necessary to be made with the Prussian Government for this purpose have not reached a satisfactory result. The line from Warsaw to Mysolvitz, a little more than 200 miles in length, puts the capital of Poland in communication by railway with Vienna and Berlin, and consequently with Paris. When the line which is to join Warsaw to St. Petersburg is open for travel, which it is expected will be in about three years, the immense distance which separates France and Russia may be travelled over in four or five days.

MONUMENT TO MR. SKINNER.

Mr. Editor:—Yours of August 29th was received on the 13th, for which I thank you very kindly. I certainly have nothing but the kindliest regards for *The Plough, the Loom, and the Anvil:* permit me only to except its articles which bear so strongly on the Tariff. I could not do otherwise. It has John S. Skinner for a father. "And why should I like it on that account?" will you or any other one ask. I moved to Mississippi in 1830. In January, 1831, I moved to a spot within ten feet of that where I now write, and during the year I began my agricultural reading under J. S. Skinner. Soon—probably in 1832—I bought the old series, then published, of the *American Farmer*, and continued taking every paper he put his hands to, until our Master took him hence. I have ever felt that I was more indebted to Mr. John S. Skinner than to any man alive. Feeling thus, I have, on one or two different occasions, proposed to honor his name by aiding in erecting a monument to his memory.

I will again propose it. Will the agriculturists who were subscribers to Mr. Skinner's works consent to honor his name by some memorial? Could we as his friends be permitted to provide a stone for the Washington Monument, with an inscription somewhat of this character; viz.: "The admirers of the persevering efforts of John S. Skinner to build up the agricultural interests of America, as shown by the *American Farmer*, &c., &c., and his untirng labors in the cause of agriculture until his death, provide this slab to honor alike the beloved Father of our country and the Father of American agriculture." Suppose a marble stone costs *even* $500, certainly there are 500 who will pay $1 each, or 100 who will pay $5, or 50 who will pay $10. Send up your names to the editors of *The Plough, the Loom, and the Anvil.*

Will the Trustees of the Washington Monument permit this? Will this measure suit the friends of Mr. Skinner? Let us do something.

Yours very respectfully, M. W. PHILIPS.

Edwards, Miss., Sept 15, 1853.

REMARKS BY THE EDITORS.

WE have received several letters similar to the foregoing since the decease of Colonel Skinner. Since the above came to hand, we have mentioned the subject to many prominent friends of agriculture, and a plan is about matured by which we think the proposed object will be attained. Meanwhile, we shall be very glad to hear further from any of the friends of Colonel Skinner, or any of our readers, in relation to the subject.

A NEW METHOD OF MODELLING IN PLASTER.

HIRAM POWERS has written an interesting letter to the editors of *Putnam's Magazine*, descriptive of his new mode of plaster modelling for sculpture. As it is a subject in which every artist will take deep interest, we lay a brief description of his plan before our readers. The principal tools used in the work consist of chisels, scrapers, and trowels, the blades of which are of gutta percha, set in metallic backs, and elastic, so that the plaster can be put on with them somewhat as with a brush; and *perforated* or *open files*—every tooth having an opening in front of it, through the body of the instrument, so as to allow the dust and filings to pass through and escape, leaving the teeth unclogged and free to act. The files are of various forms and sizes, being curved, round, flat, &c. The material used is common plaster of Paris.

In projecting a human figure, a pair of irons, reaching nearly as high as the hips, and corresponding in general direction to the bones of the legs, must be set up on a platform, and around these a base must be formed, to hold them firmly, by pouring a sufficient quantity of mixed plaster to produce it. With these for a nucleus, the statue is then commenced, to be built up with *bricks* and *mortar*. The bricks are made by pouring a quantity of plaster on a piece of oil-cloth, and as it begins to harden, scoring it deeply with a knife or chisel, so that when quite hard it may be easily broken into fragments of a desirable size. Courses of these bricks are built up around the irons, and above them, until finally the entire body is finished in this rough manner, the layers being cemented together by plaster-mortar. The chisels are then brought into play for the purpose of roughing the figure (consisting of legs, body, and head) into the general human shape. A long brick is then dipped in fluid plaster, and the end applied to the shoulder. It soon adheres, and forms the nucleus of the upper arm. To it another brick is attached to form the fore-arm. When these are filled out with plaster, the whole body is covered with a coating of the same, and the files brought into use, which soon produce an even surface, taking off all irregularities.

The advantages of these models over the ordinary clay models which are generally constructed, are, first: A clay model cannot be changed materially after it has once been commenced, for the iron skeleton which sustains every part of it is a fixture; but in the plaster-work the iron frame is only in the legs, and all the rest can at any time be cut apart and varied from the original design in accordance with any after-thought of the artist. The plastering neither shrinks nor swells from exposure, and does not require wetting or covering it with cloths to keep it in order. The process is less tedious than clay modelling, for by means of the *open files*, more can be accomplished in a day than with clay in several days. And again, no moulding is necessary to transform the form from clay to plaster; the plaster figure, as it came from the artist's hands, is itself the model. Mr. Powers says, modelling in plaster is not new; he only claims his way of doing it as new. He considers the chief merit of his contrivance to consist of the open file, which is an instrument of his own invention, and by aid of which, a high perfection of finish can be easily attained.

IMPROVEMENTS IN THE MANUFACTURE OF GAS.

Messrs. Barlow & Gore, in England, have secured a patent for certain improvements, which they have made in the manufacture of gas, which are highly spoken of in the London *Mining Journal.* "The processes are based, first, upon an improved method of rendering luminous the gases, resulting from the perfect decomposition of water or steam; and second, upon the conservative influence which hydrogen exercises in protecting the matter upon which the illuminating power of gas depends, from decomposition by heat."

We are not informed of the processes which are employed in securing these results, although we are told that the first point is gained by condensing the water gases, and then passing them through a heated retort containing carbonaceous matter, and afterwards, we are told, these gases are "admitted in regulated quantities into retorts, where carbonaceous matter is undergoing distillation or decomposition, and by which they are rendered highly luminous."

These patentees suppose that upwards of fifty per cent. may be added to the volume of gas yielded by all descriptions of materials ordinarily used for that purpose without any diminution of the illuminating power, so that 15,000 cubic feet will be the probable future product from one ton of Newcastle coal, and 75,000 cubic feet of London gas, from the same quantity of Boghead Cannel.

The discoveries here set forth may be of great importance, in view of the ordinary modes of manufacturing gas, and in this fact we have very satisfactory evidence of the value of any discovery like that which we described in our last number. Several letters and personal applications on the subject show that the public understand its importance, and are disposed to avail themselves of any real improvement in the mode of lighting their houses.

Taking this subject in connection with that of heating buildings, public and private, we have a very wide scope, and if successful, we do the public great good. We have lately seen some alleged discoveries in reference to this latter process, that seem quite promising, but we are not sufficiently familiar with the claim to make any statement on the subject. It will be published as soon as it is properly prepared, without doubt. Meanwhile, we advise all to take heed of all pretenders, and thoroughly investigate the subject, to see whether the alleged improvement is really such, and also whether it is the property of the claimant. We are inclined to think that large amounts have recently been thrown away upon claims that are utterly worthless.

BREEDING CATTLE.

The following judicious remarks in relation to the breeding and management of cattle, are taken from the *American-Herd-Book*, an able work, by Lewis F. Allen, Esq.:

"To such as intend to breed cattle of decided excellence—and they, we hope, constitute all—we recommend them to select bulls of only *moderate size*, coupled with all the *fineness* of bone and limb, consistent with a proper masculine vigor and energy, coupled with *fullness* of carcass, and ripeness of points, so as to embody great substance within small compass. In addition to this, let him be as deeply bred, that is, of as pure blood, and of as long ancestry, (not depending on the herd-book altogether for that, as many of the very best class of animals have comparatively short *herd-book* pedigrees,) as possible; and above all, let him be descended of good milking stock, when milkers are to be bred in his progeny. Your cows, we will presume, are such as your opportunities enable you to procure, but of approved blood. If the bull selected *breed well to your cows*, have no fears to continue his services to a second, or even a third generation of his own get. Such practice will produce uniformity, and uniformity is one great excellence. No matter for the color, so it be within the short-horn colors. Above all things avoid coarseness, looseness, flabbiness, and a general tendency in the animals to run their valuable points into offal. Such cattle, of whatever breed, are great consumers, bad handlers, light provers, tender of constitution, and unsatisfactory altogether. If you have an occasional production of this sort, transfer it to the shambles or elsewhere, with all dispatch. On the principle that "like begets like," which is an unerring law of nature in the long run, with the presence of such in your herd, you will be perpetually afflicted with the production of animals, which, by hereditary descent, sympathy, and the thousand accidents springing from association, will be neither creditable to your good breeding, nor satisfactory to yourself.

Feed well, not lavishly. Your cows should be in good breeding and milking condition, nothing more, and your bulls in fair working order. Such is the condition most consonant to nature, and productive of the highest animal health. The scale of points laid down in our introduction, with the occasional remarks on the practice of good breeders, as we have passed in our history, detail what a good animal should be. These, together with a close examination of the general figure of good cattle, as illustrated in our plates, will aid the judgment of the breeder. With a well-balanced judgment of his own, and a sound experience, they will be a safe guide, and he may go on his way rejoicing.

A single word to such, if any there be, into whose hands these pages may fall, as deride the value placed on superior cattle by their breeders, and such as know their real worth. Breeding *good* animals is a subject of great labor and incessant care. Such labor cannot be bestowed for nothing. To breed successfully, requires skill, talent, research, observation, and all of these of a high order. Let the breeding of our fine stock fall into unworthy hands, and hardly a single generation of man will pass before the real lover and promoter of the matchless herds which now so proudly embellish many of our rural estates—a source of pleasure, of pride, and of comfort to their possessors—will mourn their degeneracy, and which the time of another generation with great labor and constant solicitude would scarce suffice to reïnstate in their former splendor and excellence. Talent and labor of this kind cannot be had for nothing, and without remunerating prices be maintained, the downfall of the short-horns, in America, will sooner or later be at hand.

CHINESE MAGIC MIRROR.

The description of the metallic mirrors manufactured in China, given in the *Cosmos*, will be read with interest. A deal of attention, says the writer, has been given in Europe to certain metallic mirrors fabricated in China, in which, forms of letters, flowers, and animals are embossed on the back, which is not polished. On looking directly and as closely as possible on the polished face, no trace of these figures is seen; but if the mirror is made to reflect the rays of the sun upon a wall or screen, the ornaments on the back are plainly seen in the reflected light. Many attempts have been made to explain this phenomenon, but hitherto unsuccessfully. On the 1st of April, however, M. Biot exhibited to the Academy of Sciences, in Paris, one of these mirrors made by M. Lerebours. It appears that in 1847, MM. Arago and Biot suggested an explanation, founded on the fact that, as the embossing of the back surfaces gave different thicknesses, and therefore different resistances to the metal, when the face came to be polished, the surface opposite the raised portions would be more resistant, and would be raised in a convex form, while that opposite the hollow would, under the same pressure, be slightly concave—these effects being so slight as to be invisible to an ocular examination of the surface, but becoming manifest by the deviations impressed on the reflected rays. To test this theory, M. Lerebours took an ordinary daguerreotype plate of copper plated with silver, and on the copper back he engraved a crescent, and then polished the plate. Looking directly on it, and as carefully as possible, nothing is seen; but when the sun's rays were received on the plate and thrown on a screen, the form of the crescent was clearly defined on the reflected image, darker or lighter than the rest, according to the distance of the mirror from the screen.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

USEFUL PROBLEMS.

TO FIND THE FLOW OF WATER THROUGH TUBES.

What quantity of water will be discharged in twenty-four hours by a tunnel 5 feet clear in diameter, twenty-eight miles long, descending 18 inches in each mile, starting with a head of 12 inches above the top of the inside of the culvert?

Also, what quantity of water will be discharged in twenty-four hours by an iron pipe 30 inches clear in diameter, of the same length, and the same head and fall?

The first, I find, will discharge 20,649,600 gallons, and the second will discharge 3,650,400 gallons in twenty-four hours.

The calculations are made on the supposition that the tubes are perfectly straight and cylindrical, so as to cause no eddies, and permit no air to lodge in the upper parts of bends, which, if permitted, would materially diminish the discharge.

The formula used in the calculation is derived from experiments detailed in the *Edinburgh Encyclopædia*, art. "Hydrodynamics," and may be expressed thus:

Let d be the diameter of the culvert or tube; h the total head and fall ot water, or the height of the water in the reservoir above the middle of the lower end of the pipe; l the length of the pipe, all in inches; then the velocity in inches per second, with which the water will flow in the pipe, will be $v = 23\frac{1}{3}\frac{\sqrt{57\,h\,d}}{l \times 57\,d}$, which, in the first case, by calculating, I find to be 23+ per second; and in the second case, 16.9 inches per second.

Now, 23+ inches per second will give 57,360 yards per day; and as it is known that a cylinder of water 1 inch in diameter and 10 yards long, is one gallon, it follows that each yard of the culvert, 60 inches diameter, contains 360 gallons; but $360 \times 57{,}360 = 20{,}649{,}600$, as before. In like manner, one yard of the 30-inch tube contains 90 gallons, and the velocity through this pipe of 16.9 inches per second, gives 40,560 yards per day, and this multiplied by 90, gives 3.650,400 gallons per day.

By a similar calculation, I find if a 60-inch tube, with a similar slope, is only thirteen miles long, the velocity of discharge will be 24.78 inches per second, and will therefore discharge in twenty-four hours 21,330,000 gallons. In like manner, it will be found that a tube of 20 inches diameter, and 4 miles long, with a head and fall of 100 feet, will discharge about one sixth more water than three tubes of 12 inches in diameter of the same length, with a similar head and fall.

TO FIND THE LENGTH OF AN ARC OF A CIRCLE CONTAINING ANY NUMBER OF DEGREES.

Rule.—Multiply the number of degrees in the given arc by 0.0087266, and that product by the diameter of the circle.

The decimal above is found by dividing the circumference of a circle whose diameter is 1, by 360 degrees; the quotient will be the length of the arc of one degree: that is, $\frac{3.1416}{360} = 0.0087266 =$ arc of one degree of a circle, whose diameter is 1.

Example.—What is the length of an arc of 10 degrees 15 minutes in a circle whose diameter is 68?

$$10^\circ\ 15' = 10.25 \times .0087266 \times 68 = 6.082396 = \textit{Ans.}$$

ESTABAN.

PROFITS OF WOOL-GROWING.

MR. MCCORMIC, a wool-grower of Pennsylvania, communicates to the *Western Plough-Boy* his experience as to the profit of wool-growing. He says:

"I shall confine myself more particularly to my experience with a small flock of extra Saxon Marinoes, of 15 head, which I purchased of Mr. McCeaver, of Washington county, Pa., for which I paid him $125, in April, 1851. The 15 head sheared in June, 1851, 58 pounds of well-washed wool, for which I received 75c. per pound. That season I raised but 8 lambs, 10 of said ewes only were with lamb, the other 5 being but two years old.

In 1852, I had with the old stock and the 8 lambs, 23 head to shear; they sheared 86 pounds, for which I received but 60c. per pound—wool being lower than in 1851. I raised 12 lambs, and sold them in July for $3 per head, thinking they could not stand the drive to this State. I sheared said sheep about two weeks since; they sheared nearly four pounds average, some of them shearing as high as five pounds, and I have 14 lambs, worth $3 per head.

I have not sold my wool, but I shall ship it to Licking county, O., where I expect to get 80c. per pound, wool being higher this year than for some years past, and no doubt will remain so for some years to come. Now, Sir, I will figure a little, and see if I have made any thing, after paying $8 33⅓ cents per head for my sheep.

Cost of sheep April, 1851, - - - - - - -	$125 00
Expense of pasturing from April till June, 1851, - -	1 50
Received for 58 lbs. of wool, June, 1853, - - - - -	43 50
Raised 8 lambs in the year 1851, - - - - - -	40 00
June, 1852, the 23 sheep sheared 86 lbs., at 60c. per lb., -	51 60
July, 1852, sold 12 lambs for - - - - - - -	36 00
Cost of keeping from June 1851 to 1852, - - - -	32 00
June, 1853, sheep sheared 88 lbs. at 75c. per lb., - -	66 00
This year have 14 lambs, at $3 per head, - - - -	42 00
Cost of keeping from June 1852 to 1853, - - - -	34 00
The old stock still worth, - - - - - - - -	125 00
	403 00
Deduct cost and keeping, - - - - - - - -	192 50
Net profit from April, 1851, to June, 1853, on $125, - -	$211 00

The expense of washing and shearing I have not calculated, it would not exceed, for the three shearings, $10."

STOCK AND FARM PRODUCE OF THE CANADAS.

In a letter from W. L. Mackenzie, published in the Denville *Independent* we find the following in relation to the production of the two Canadas:

In all Upper Canada, there are 99,860 occupiers of land, of whom only 3,080 occupy above 200 acres; nearly 10,000,000 acres are then occupied, of which over two thirds are cultivated.

The crops of 1851 were, wheat, 12,692,862 bushels; oats, 11,193,844 bushels; Indian corn, 1,696,613 bushels; potatoes, 4,987,475 bushels; turnips, 3,644,942 bushels; hay, 681,782 tons; wool, 2,699,764 pounds; maple sugar, 3,581,505 pounds, &c.

Other products, &c., were butter, nearly 16,000,000 pounds; cheese, 2,226,746 pounds; beef, 817,646 barrels; pork, 528,129 barrels; fulled cloth, 527,466 yards.

There are in Upper Canada, 193,982 bulls, oxen, and steers; 296,024 milch cows; 254,988 calves and heifers; 203,300 horses; 968,822 sheep; 569,257 pigs.

Lower Canada has 94,449 occupiers of 8,113,915 acres of land, of which 3,605,517 are cultivated. The crop of wheat last year was only 3,075,868 bushels; of oats, 8,967,504 bushels; of potatoes, 4,456,111 bushels; of hay, nearly a million tons; nearly a million and a half ponnds of wool; six million pounds of maple sugar; nearly ten million pounds butter; 223,870 barrels of pork, &c.

Lower Canada also manufactured 780,860,950 yards fulled cloth; 889,523 yards linen; 860,550 yards flannel.

GERMAN AGRICULTURE.

Each German has his house, his orchard, his road-side trees, so laden with fruit, that if he did not carefully prop up and tie together with wooden clamps, they would be torn asunder by their own weight. He has his corn-plot, his plot of mangold-wurtzel, or hay, or potatoes, or hemp, &c. He is his own master, and he, therefore, and every branch of his family, have the strongest motive for constant exertion. You see the effect of this in his industry and his economy.

In Germany, nothing is lost. The produce of the trees and the cows is carried to market; much fruit is dried for winter use. You see it lying in the sun to dry. You see strings of them hanging from their chamber-windows in the sun. The cows are kept up for the greater part of the year, and every green thing is collected for them. Every little nook, where the grass grows by the roadside and brook, is carefully cut with the sickle, and carried home on the heads of women and children, in baskets, or tied in large cloths. Nothing of any kind that can possibly be made of any use, is lost; weeds, nettles, nay, the very goose-grass which covers waste places is cut and taken to the cows. You see the little children standing in the streets of the villages, in the streams which generally run down them, busy washing these weeds, before they are given to the cattle.

They carefully collect the leaves of the marsh-grass, carefully cut their potato-tops for them, and even if other things fail, gather green leaves from the woodlands. One cannot help thinking continually of the enormous waste of such things in England, of the vast quantity of grass on banks, by road-sides, in the openings of plantations, in lanes, in church-yards, where grass from year to year springs and dies, but which, if carefully cut, would maintain many thousand cows for the poor.

To pursue still further this subject of German economy; the very cuttings of the vines are dried and preserved for winter fodder. The tops and refuse of hemp serve as bedding for the cows; nay even the rough stalks of the poppies, after the heads have been gathered for oil, are saved, and all these are converted into manure for the land. When these are not sufficient, the children are sent to the woods to gather moss; and all our readers, familiar with Germany, will remember to have seen them coming homeward with large bundles of this on their heads. In autumn, the falling leaves are gathered and stacked for the same purpose. The fir-cones, which with us lie and rot in the woods, are carefully collected, and sold for lighting fires.

In short, the economy and care of the German peasants are an example to all Europe. They have for years, nay, ages, been doing that, as it regards agricultural management, to which the British public is just now beginning to open its eyes. Time, also, is as carefully economized as every thing else. They are early risers, as may well be conceived, when the children, many of whom come from a considerable distance, are at school at six in the morning. As they tend their cattle or their swine, the knitting never ceases, and hence the quantities of stockings and other household things which they accumulate, are astonishing.

EDITORS' JOTTINGS AND MECHANICAL RECORD.

PHILADELPHIA, WILMINGTON, AND BALTIMORE RAILROAD.—Since the issue o our November number, in which we noticed the increased travelling facilities furnished on the above road, we have received authentic information that arrangements are making by which the speed will be greatly increased, and the fare reduced, so as to place a trip to Washington from New-York, within every body's time and means. Indeed, at this time, the necessary arrangements are made with the Camden and Amboy Company, and are only awaiting the action of the Baltimore and Ohio Company, to be at once perfected, and announced to the public.

The Company propose to sell a through ticket from New-York to Baltimore, at *five dollars*, and a round trip ticket, giving the passenger about three days, for *eight dollars and fifty cents.* They also propose to sell a through ticket, from New-York to Washington, for *six dollars*, and a round trip ticket, giving the passenger from three to four days, for *ten dollars!* Arrangements are also making to have a line or train run from New-York to Washington, and vice versa, inside of *ten hours!* If these arrangements will not be combining economy with speed, we know not what will do it.

The Company have completed a track through the south part of Philadelphia to the Delaware river, by which the ferry-boats of the New-York line will run directly to the wharf with all through passengers, where cars will be in readiness to take them and their baggage to the Baltimore depot, corner Broad and Prime streets. This is a decided improvement upon the old plan of omnibus transit, which has so long been prevalent.

The Company are adding largely to their stock of cars and engines, and have fitted up a couple of cars expressly for night-travel. The seats are very easy, and inclined at such an angle as to support the head and feet of the passenger, and allow him to sleep almost as comfortably as he can in his own bed! These seats require more room in the cars than the old ones, as only about forty can be made in a space which usually holds sixty. We doubt not but that the traveling public will testify their appreciation of these facilities for their comfort, by an increase of patronage.

The new bridge across the Susquehanna, at Havre de Grace, will be commenced as soon as the surveys are completed. The Company propose to lay about twenty miles of double track in the course of the ensuing year, and to continue additions to it until the whole length of the road from Philadelphia to Baltimore, is furnished with as good facilities for safe and speedy traveling as any road in the Union.

The "administration" of President Felton has marked a new era in the history of this road. His efforts have been untiring for the promotion of the welfare of the passengers, and the Company have been peculiarly fortunate in the selection of a gentleman to preside over its affairs, whose ability and experience enable him to contribute so largely to the comfort and speedy transit of the passengers, and at the same time, increase the revenue of the road.

FALL-RIVER LINE TO BOSTON.—The travel over this line is immense, and the Company are obliged to build an additional boat to meet the increasing demands of the traveling public. A boat of huge dimensions is now on the stocks, and will be put upon the route during the coming season. Her length of deck is 345 feet; breadth of beam, 45 feet; beam over all, 82 feet; depth of hold, 15 feet; tonnage, 2,300; with 116 state-rooms, and sleeping accommodations, including state-rooms and berths, for one thousand passengers! The engine, which is in process of building at the Novelty Works, is 105-inch cylinder, with 12-feet stroke.

To one unacquainted with the amount of travel over this route, a boat of such dimensions and accommodations might seem superfluous; but we can assure the reader that it is none too large. We have seen over six hundred passengers on the Bay State and Empire State, and that too when the Company was running the State of Maine between New-York and Newport, as a day-boat, to relieve the other two boats from the press of passengers at night. The Fall-River route is the most popular, having by far the finest boats, under the command of able and experienced captains, and must continue to be *the* route between New-York and Boston. The approach of cold weather does not affect, materially, the amount of travel, if we may judge from the numbers that were crowded on board the Bay State during a late trip. The route is preferable at all seasons of the year, the boats having been built expressly for running on the Sound. With such a gentlemanly agent as WILLIAM BORDEN, Esq., of New-York, the excellent accommodations which always characterize this route will be continued, to the gratification of the thousands and tens of thousands who testify to its preference over all others.

FINE APPLE-JELLY.—Take half a bushel of good pippin, bell-flower, or other fair sub-acid fruit, carefully cut out all blemishes, and without peeling or coring, quarter them, and throw them as they are cut into a pan of cold water, to preserve the color. When all the apples are thus prepared, take them out of the water, and without wiping or drying them, add to every pound of the fruit one pound of best loaf or crushed sugar. Put all together into a large preserving-kettle, with water barely sufficient to keep them from burning, and mix among them the rind of half a dozen lemons, cut into very small pieces, together with the juice of the same. Boil the mass as rapidly as possible, without burning, until the apples become perfectly soft or boiled to a mash; then put the whole into a jelly-bag, and if wanted for immediate use, run the liquid into moulds; but if intended for keeping, run it into jars in the usual manner. Jelly made by the above method, will be beautifully transparent and delicious to the taste, and presents to the connoisseur one of the richest delicacies of the season.

GUANO.—It is stated that there were at the Chincha Islands, on the 1st of August, loading with guano for the United States, 44 vessels, with an aggregate of 31,328 tons. There had sailed from the islands prior to August 1, and not yet arrived, 26 vessels, with 15,415 tons of guano on board. These vessels are all destined for the United States.

HORTICULTURAL EXHIBITION.—The annual exhibition of the Horticultural Society of Maryland commenced in Carroll Hall this morning, and will be continued on Thursday and Friday. The display is of the most extensive and attractive character, embracing many of the rarest and most choice specimens of Flora's favors, whilst the display of fruits is large, and the Floral designs unsurpassed. The efforts made by the members of the Society to present a collection, surpassing all similar exhibitions in the northern cities, should secure to them a liberal encouragement on the part of our citizens.—*Baltimore paper.*

WHEAT-DRILL WITH A GUANO ATTACHMENT.—We have seen a certificate of several gentlemen of the county of Clarke, Va., to the effect that Thomas F. Nelson, Esq., of said county, has invented a machine for sowing guano which can be easily attached to an ordinary drill, and that 42 lbs. per acre applied by this machine have produced as much effect as two hundred pounds would have produced if sown broadcast. This is a very important statement, especially if made after a fair comparison of the two modes *side by side.* No doubt the gentlemen who made it believed it fully, as they are persons of the highest respectability, and we do not gainsay it, but only call their attention to the necessity of a more precise statement than their certificate now gives. Mr. Nelson has applied for a patent.

FERTILITY OF NILE MUD.—The celebrated microscopic philosopher, Ehrenberg, has examined this mud, and finds its great fertility to be owing, not so much to any peculiar mineral contribution, or to the presence of vegetable matter, as it is to the vast accumulation of extremely minute forms of microscopic animals, which, by their decomposition, enrich the soil.

SOMETHING FOR FARMERS.—We saw, yesterday, the model of a machine for cutting corn in the stalk. It is partially on the plan of Mr. McCormick's reaping-machine, and is designed to cut two rows of corn at a time. Between two wheels there is an axle, to each end of which is attached a knife for cutting each row of corn. To the axle are also attached shafts for the horse which pulls the machine. The horse walks between the rows of corn, and the knife just on the inside of each wheel cuts the corn, which falls on a bed or plate to catch it, in a manner resembling the operations of a wheat-reaper. The bed which catches the corn, opens in the centre, at the pleasure of the operator, to discharge the corn in bundles. We are informed that with one man and a horse, the machine will cut twenty acres of corn per day. It is the invention of a citizen of Illinois.—*Richmond Enquirer.*

THE BEST TIME-KEEPERS.—Under the caption of "Greater Security," the editor of Swan's *Elevator* states that Wm. H. Clement, Esq., Superintendent of Little Miami and Columbus and Xenia Railroad, has contracted with Messrs. Blyan & Baldwin, jewelers, of Columbus, to furnish twenty-four watches for the use of the conductors on those roads at the cost of the Company." This, we regard as a first-rate *movement*, and if Mr. Clement will just order twenty-four tee-total temperance men to carry the watches, the arrangement will be complete. There is little use in a watch keeping time if the watcher sees it through a whisky fog.

CAMPHOR VS. PEA-BUGS.—Having observed, in the *Horticulturist*, an inquiry relative to seed-peas damaged by bugs, I will offer a remedy, perhaps not new, but new to me. Four years ago last spring, my seed-peas were more than half destroyed by bugs, the largest and best varieties being most injured. The summer following I had boxes made, one for each variety, with a cover; and when the peas were gathered, I put into each box, with two quarts of peas, from six to eight bits of gum camphor, the size of a large pea, and mixed them together, and closed the box. The next spring there was not a pea injured. I have pursued the same course every year since, and have not had one pea affected by bugs.

THE RICHEST MINE.—The manure applied to the soil of England amounts to three hundred millions of dollars, being more than the value of its whole foreign commerce, and yet the grateful soil yields back with interest all that is thus lavished upon it. And so it would be here, if we would only trust the soil with any portion of our capital. But this we rarely do. A farmer who has made any money spends it not in his business, but in some other occupation. He buys more land when he ought to buy more manure, or he puts out his money in some joint-stock company, to convert sunshine into moonshine. Rely upon it, our richest mine is the barn-yard, and whatever temptation stock or shares may offer, the best investment for the farmer is live stock and ploughshares.

DECLIVITY OF RIVERS.—A very slight declivity suffices to give the running motion to water. Three inches per mile, in a smooth, straight channel, gives a velocity of about three miles an hour. The Ganges, which gathers the waters of the Himalaya mountains, the loftiest in the world, is, at eight hundred miles from the mouth, only about eight hundred feet above the level of the sea, that is, about twice the height of St. Paul's Church, in London, or the height of Arthur's Seat, near Edinburgh, and to fall these eight hundred feet in its long course, the water requires more than a month. The great river Magdalena, in South America, running for a thousand miles between two ridges of the Andes, falls only five hundred feet in all that distance. Above the commencement of a thousand miles, it is seen descending in rapids and cataracts from the mountains. The gigantic Rio de la Plata has so gentle a descent to the ocean, that in Paraguay, fifteen hundred miles from its mouth, large ships are seen, which have sailed against the current all the way, by the force of the wind alone; that is to say which, on the beautifully inclined plane of the stream, have been gradually lifted by the soft wind, and even against the current, to an elevation greater than that of our loftiest spires.

ENGINEER'S RAILWAY CLOCK.—John N. Robertson, of Columbus, S. C., proposes a time table-clock for engineers on locomotives, which is worthy of attention as a most useful improvement. He has sent us a diagram of this "timepiece," with a folding dial, on the outside circle of which, on one side is the time table of the Charlotte and South Carolina Railroad, for the up, and on the other side a like time table for down trains. The distances between the stations are laid out on the outer circles, and the hands of the clock point to the hours and minutes which are laid out on an inner circle. The clock is to be made perfectly tight, and secured to the locomotive in front of the engineer. It may be regulated and locked by the local superintendents, which will prevent disasters arising from a difference of time in the different watches of the conductors or engineers. By such a clock, the engineer will know at a glance the rate at which he should run his engine to arrive at the exact time at every station.—*Scientific American.*

EFFECTS OF INTERNAL IMPROVEMENTS.—The town of Fayetteville, N. C., situate in a great agricultural region, has for years had to depend for its supply of hay on the New-York and other northern markets. Recently the Western plank-road, connecting with that city, has been finished, and a few days ago they received over 10,000 lbs. of hay, (of the North,) brought in from Forsyth co., N. C., at $1 25 per 100 lbs. The Fayetteville *Observer* says:

"We learn that such hay has been abundant in that county at 30 cents. per 100 lbs., but that since that article has been brought here at a profit, it has risen to 50 cents. The meadow from which this hay came, has yielded at the first cutting this year about 2,500 lbs. per acre—of herds-grass, clover, &c. At the second cutting it will yield fully as much more of blue grass. Five thousand pounds, worth formerly, at 30 cents, $15 per acre, worth now at 50 cents, $25 per acre. This shows a clear gain to the farmer of $10,000 per annum per acre, or interest equal to an increase in the value of his land of $166.66 per acre."

KILLING INSECTS.—At a recent discussion by the members of the Massachusetts Horticultural Society, the value of sulphur and quicksilver in destroying insects was thus estimated. We know these gentlemen well, and their opinions are reliable.

Dr. WIGHT stated that he had satisfactorily tested the value of quicksilver and sulphur in destroying insects. Three years ago, he bored a hole in an apple tree, pouring in quicksilver, and plugged up the hole tight. One year after, he opened the hole, and found the quicksilver in the same state and the same quantity as when put in; it had not undergone the least change whatever. In another tree he bored a similar hole, and inserted roll brimstone. A year afterwards, it was opened with the same result as the other experiment; not the least change had taken place; the sulphur remained as when put in.

Mr. C. M. HOVEY thought this a perfectly convincing proof of the utter falsity of such experiments. Dr. Wight was a careful observer, and accurate in all his experiments; and he trusted he would for ever set at rest, at least with all reasonable men, the nonsensical idea that the quicksilver or sulphur would be decomposed and absorbed by the sap, and carried throughout the tree, poisoning the insects which fed upon the leaves. It was an *annual* paragraph for the newspapers, and underwent *annual* trials by persons who believed all they read in them, especially upon agricultural or horticultural topics, and who always reported successful results. If these discussions elicited such facts as these, their importance could not be questioned.

MASSACHUSETTS COAL-FIELDS.—President Hitchcock's report to the Massachusetts Legislature, in relation to the coal-fields of this State, has been published. The coal-field covers an area of some five hundred square miles, and has been wrought in fifteen or twenty different localities.

GOLD BRICK.—We are informed by the *El Dorado News* that the clay which a Mr. Herwick is using for the manufacture of brick contains considerable gold. One day a miner took a wheelbarrow, and conveyed the dirt some distance, and made three dollars in half a day out of this clay.

Trains out of Boston.—One hundred and forty-two railroad trains leave Boston, daily, viz: by Old Colony, 17; Providence, 18; Worcester, 25; Fitchburg, 26; Lowell, 15; Boston and Maine, 30; and Eastern 11. This of course, includes all the branches. The same number return daily, likewise.

The New Tunnel Borer built at Hartford, works well. Instead of leaving a core to be removed by blasting, as the Hoosac Machine does, it cuts an entire circle, and is so constructed that the chips of the rock can all be removed while it is in motion. The cost of the machine is about $25,000.—*Exchange.*

We are not quite sure that not "leaving a core" is a gain over the action of the Hoosac Machine. If the time of the Machine and the wear of tools is to be used up in doing what a blast of powder will do in less time than the machine requires, the gain will prove a *minus* quantity. In such machines it is emphatically true, that actual experiment is worth much more than the finest theory.—Ed. P. L. & A.

Discoveries in Iron Working.—The National Intelligencer says that an important announcement in England, and which is exciting great attention, is a development of new principles in iron metallurgy. The general opinion of those who are competent to judge, says the Mining Journal, is that the inventions and discoveries referred to will open an entirely new era in the manufacture of iron, not only with regard to its various multiplications, but to the construction and arrangement of apparatus also. Immense quantities of very valuable ore have lately been discovered in Northamptonshire, also in Yorkshire and in the west of England, within easy reach of the iron masters of Monmouthshire and South Wales. If half these rumors be correct, the iron trade will be revolutionized.

To Prevent the Putrid Fermentation of Urine.—A small quantity of muriatic acid should be poured into or upon it. It unites with the ammonia, and forms the muriate of ammonia.

Fruit Trees and Gas.—The leakage of gas-pipes is found to be destructive to trees growing near them.

Thunder in Limbo.—An exchange says, a gentleman in Iowa proposes to keep cities free from thunder-storms "for so much per year." To most people, this offer would be looked upon as preposterous, and yet it is not. We have no doubt whatever that an outlay of $10,000 would keep New-York as isolated as a glass table with sealing-wax legs. What a gentleman in Iowa proposes to do for us, has already been done for the vine-growers in the south of France. By means of a well arranged system of lightning rods, a whole district has been rendered inaccessible to those destructive hail storms which so frequently follow in the train of thunder showers. What has been done in France, can be done elsewhere. If we can teach lightning to write, we can teach it to behave itself.

Economy in Feed.—To feed an ox to one thousand two hundred pounds weights, usually takes five years; while the same weight of poultry can be made ready for the table in about three months, and at less than half the cost in food. So says an English poulterer.

Gum Arabic.—In Morocco, about the middle of November, that is, after the rainy season, which begins in July, a gummy juice exudes spontaneously from the trunk and principal branches of the acacia tree. In about fifteen days it thickens in the furrow, down which it runs either in a vermicular or worm shape, or more commonly assuming the form of oval and round tears, about the size of a pigeon's egg, of different colors, as they belong to the white or red gum tree. About the middle of December, the Moors encamp on the borders of the forest, and the harvest lasts six weeks.

The gum is packed in very large sacks of leather, and brought on the backs of bullocks and camels to certain ports, where it is sold to the French and English merchants. Gum is highly nutritious. During the whole time of the harvest, of the journey, and of the fair, the Moors of the desert live almost entirely upon it; and experience has proved that six ounces of gum are sufficient for the support of a man during twenty-four hours.

PORTRAIT-PAINTING.—MRS. SPENCER.—Amid the numerous collections o* paintings that we have visited, we have seldom been so much attracted by exhibitions in this department of art, as by those of Mrs. Spencer. They are quite superior and life-like. The elegant style of her work has led us repeatedly to inquire the name of the artist. Specimens of her painting may be seen at the rooms of the Art-Union, and at her studio, 193 Bleecker street.

NEW BOOKS.

GOLDEN LINK, or, Poems and Tales for the Young. By W. OLAND BOURNE, A. M. New-York: Charles Scribner. 1854. 256 pages.

The songs of a nation, according to universal belief, materially control the character and action of a nation. How much more do the books, in poetry and prose, placed in the hands of children, and which they read and *devour* as they do their dinners. If the food promotes the growth of the body, so does such mental food modify and control the mind and heart.

Mr. Bourne not only understands this, but knows how to profit by his knowledge. He loves children, and he admires goodness, and he uses his talent in an efficient manner. This book is evidence of all this. His tales are very interesting, and each involves important truth. Thus, "The Broken Mast" illustrates from history, the fact that the break'ng of a mast, though a trivial event in itself, may overthrow a State. "Bill Smith's Fourth of July" shows that Liberty does not involve the right to do wrong. "The Scotch Quarry Boy, or, The Boy who wrote his name on the Sandstone," illustrates the importance of writing one's name so that it will tell something, and he uses the life of Hugh Miller, the great geologist, as an example. The book, as a whole, deserves a conspicuous place in every child's library, and in every Sabbath-school library in the world.

List of Patents Issued,

FROM OCT. 7 TO NOV. 1.

Joel Barker, of Boston, Mass., for improvement in car-wheels.

Elihu R. Benson, of Warsaw, New-York, for improvement in slat machines for window blinds.

Gardner A. Bruce, of Mechanicsburg, Ill., for improvement in corn-planters.

A. A. Dickson, of Griffin, Ga., for improvement in machines for topping cotton in the fields.

Mark Fisher and John H. Norris, of Trenton, N. J., for improvement in apparatus for polishing anvils.

Joseph F. Flanders, of Newburyport, Mass., for improvement in machines for rubbing and polishing leather.

Joshua Gibbs, of Canton, Ohio, for improvement in machines for grinding plough-castings.

Robert A. Graham, of New-Paris, Ohio, for improvement in ploughs

Thomas C. Hargreaves, of Schenectady, N. Y., for improvement in corn-husking machines.

William Horsfall, of New-York, N. Y., for improvement in annunciators for hotels.

Richard Ketcham, of Seneca Castle, N. Y., for improvement in straw-cutters.

Zadok H. Mann, of Newport, Ky., for improvement in car-wheels.

Benj. Rutter and Henry Rowzer, of Pique, Ohio, for improvement in smut-machines.

John C. fr.) Salomon, of Washington, D. C., for improvement in rotary steam-engines.

George S. G. Spence, of Boston, Mass., for improvement in cooking-ranges.

Edward Brown, of Ringe, N. H., assignor to Josiah Norcross, M. D., of South Reading, Mass., for improvement in burglar alarms.

Ephraim L. Pratt, of Worcester, Mass., assignor to James Sargeant and Daniel P. Foster of Shelbury, Mass., for improvement in machine for paring apples.

Joseph C. Strode, of East Bradford, Penn., for improved hydraulic ram.

. Henry Vandewater, of Albany, N. Y., for improvement in turbine water-wheel.

James A. Woodbury, of Winchester, Mass., and Joshua Merrill and George Patten, of Boston, Mass., for improvement in air engines. Patented in England, 5th January, 1853.

Elizur Wright, of Boston, Mass., for improvement in stopcock.

John E. Anderson, of New-York, N. Y., for improvement in throttle valve arrangement.

Edmund H. Graham, of Biddeford, Me., for improvement in magazine guns.

Levi B. Griffith, of Honeybrook, Penn., for improvement in plough-beams.

Archibald S. Littlefield, of Portland, Me., for improvement in self-acting switches.

Leonard S. Maning, of Westport, Mass., for improvement in cutter for boring wheel-hubs.

Hiram Powers, now residiog in Florence, Italy, for improvement in files and rasps.

Philip P. Ruger, of New-York, N. Y., for improvement in machine for turning spiral mouldings.

John Headdington Ward, of Sonora, Cal., for improvement in gold washers.

Charles Treat Paine Ware, of New-York, N. Y., for improvement in propellers.

William C Dean, of Jacksonville, N. Y., for improvement in guide for doweling felloes for wheels.

Marshall Finley, of Canandaigua, N. Y., for improvement in daguerreotype plate holder.

Charles B. Hutchinson, of Syracuse, N. Y., for improvement in machines for joining staves.

J. Augustus Roth, of Philadelphia, Pa., for improvement in process for dechlorinating bleached fabrics.

James H. Murrill, of Richmond, Va., for improvement in looms for weaving coach lace.

John P. Hayes, of Boston, Mass., for improvement in cooking ranges.

Ozias J. Davie and Thomas W. Stephens, of Erie, Pa., for improvement in machines for punching metal.

John Newel, of Boston, Mass., for improvement in camphene lamps.

Richard H. Frindell, of Fayette county, Ky., assignor to William J. Thurman, of Washington, Ky., for improvement in planing-machines.

C. R. Brinckerhoff, of Batavia, N. Y., for improvement in ploughs.

H. P. Bryam, of Louisville, Ky., for improvement in hullers of grass seed.

John B. Cullan, of Reading, Pa., for improvement in detachable lining for the fire boxes of steam-boilers.

Gilman Davis, of Roxbury, Mass., for improvement in ash pans for locomotive engines.

S. G. Dugdale, of Richmond, Ind., for improvement in opening and closing gates.

Chas. Goodyear, of New-Haven, Conn., for improvement in covering iron with gutta-percha.

N. Harrison and J. W. H. Metcalf, of Bridgeville, Va., for improvement in hill-side ploughs.

Joseph Harris, Jr., of Boston, Mass., for improvement in driving circular saws.

Daniel Hill, of Bartonia, Ind., for improvement in attachment of a harrow to a land roller.

T. B. Jones, of Carloville, Ala., for improvement in cob and stalk cutters.

H. M. Keller, of Newark, Ohio, for improvement in winnowers of grain.

J. J. Parker, of Marietta, Ohio., for improvement in straw cutters.

Samuel Snow, of Fayetteville, N. Y., and Alexander Hine, of Lafayette, N. Y., for improvement in rotary root-digging cultivator.

Jacob L. Van Valkenburg, of Ogdensburgh, N. Y., for improvement in shaking shoes for winnowers.

Horace W. Woodruff, of Watertown, N. Y., for improvement in treating metals while in the molten state.

D. H. Whittemore, of Chicopee Falls, Mass., for improvement in vegetable cutters.

H. G. Robertson, of Greenville, Tenn., for improvement in washing machines.

Banford Gilbert, of Pittsburgh, Pa., for improvement in griddles.

A. B. Latta, of Cincinnati, Ohio, for improvement in oscilllating engines.

Leiland Foreman, of New-York, N. Y., for improvement in life-boats.

Wm. Stephens, of Pittston, Pa , for improvement in valve motion of oscillating engines.

John A. Elder, of Westbrook, Me., assignor to John E. Coffin, of Portland, Me., for improvement in cutting binders' boards.

L. M. Whitman, assignor to S. G. Wise. of Weedsport, N. Y., for improvement in cultivating ploughs.

George S. G. Spence, of Boston, Mass., for improvement in cooking ranges.

Ebenezer Beard, of New-Sharon, Me., for improvement in propellers.

Edwin B. Bowditch, of New-Haven, Conn., for improvement in sofa-beds.

Wm. Crighton, of Fall River, Mass., for improvement in shuttle motions for power-looms.

Henry S. Crider and David Williams, of Lancaster, Ohio, for improvement in attaching artificial teeth to the metallic plate.

James J. Clark, of Philadelphia, Pa., for improvement in self-winding telegraph-registers.

Chas. Flanders, of Boston, Mass., for improvement in steering apparatus.

Benj. Frazee, of Durhamville, N. Y., for improved mode of operating mill-saws.

Robert Griffiths, of Newport, Ky, and George Shield, of Cincinnati, Ohio, for improvement in machines for making railroad chairs.

Geo. W. Griswold, of Carbondale, Pa., for improvement in implements for cutting cloth.

Thos. Hinkley, of Hallowell, Me., for improvement in instruments of plotting.

Daniel Lynahon, of Buffalo, N. Y., for improvement in cutting boots.

Wm. Mason, of Taunton, Mass., for improvement in power-looms.

Norman Millington and Dennis J. George, of Shaftsbury, Vt., for improvement in machines for figuring carpenters' squares.

John Pender, of Worcester, Mass., for improvement in power-looms.

Benj. F. Rice, of Clinton, Mass., for improvement in looms for weaving fancy-goods.

John Scott, of Philadelphia, Pa, for improvement in air beds.

Nathan Thompson, Jr., of Williamsburgh, N. Y., for improved life-preserving bucket.

Nathan Thompson, Jr., of Williamsburgh, N. Y., for improved life-preserving seat.

Thomas E. Warren, of Troy, N. Y., for improvement in iron car-bodies.

J. W. Weatherby, of Kingsville, Ohio, for improvement in carpet-stretchers.

Linus Yale, of Newport, N. Y., for improvement in door-locks.

Harry Whittaker, of Buffalo, N. Y., for improvement in the application of high-pressure engines to screw-propellers.

Calvin Adams, of Pittsburgh, Pa., for improved window-shutter, fastener and holder.

G. T. Beauregard, of New Orleans, La., for improvement in self-acting bar-excavators.

Ezra H. Jones, of Litchfield, Me., for improvement in devices of a convertible dung-fork.

Frederic P. Dimpfel, of Philadelphia, Pa., for improvements in propelling vessels.

Agustus Eliaers, of Boston, Mass., for improvement in lounges.

Agustus Eliaers, of Boston, Mass., for improvement in library step-chairs.

Wooster A. Flanders, of Sharon, Vt., for improvement in bee-hives.

John D. Filkins and Wm. H. De Puy, of Lima, Ind., for improvement in attaching horses to ploughs.

Samuel Hutchinson, of Rockport, Ind., for improvement in cutting and planting potatoes.

David S. Mackey and Jarvis R Smith, of Batavia, N. Y., for improvement in winnowers.

E. G. Matthews, of Troy, N. Y., for improvement in machines for dressing stone.

Chas. Perley, of New-York, N. Y., for improvement in ships' side-lights.

Alphonse Quantin, of Philadelphia, Pa., for improved valve-gauge for bottles.

Henry L. Russel, of Hudson, Mich., for improvements in metallic piston packing.

Wm. W. Richards, of Philadelphia, Pa., for improvement in making shovels, spades, &c.

Benj. P. Sargent, of Sutton, N. H., for improvement in expanding horse-shoes.

Jacob T. Sargent, of Sutton, N. H., for improvement in garden and other hoes.

David M. Smith, of Springfield, Vt., for improvement in spring-clamps for clothes-lines.

James Trees, of Salem, Pa., for improvement in propellers.

Albert Vose, of Pittsfield, Vt., for improvement in ox-yokes. Ante-dated Aug. 10, 1853.

Wm. Wheeler, of West Poultney, Vt., assignor to Chas. H. Kellogg, of Troy, N. Y., for improvements in cutting the bars and teeth of curry-combs.

Wm. Coughlin, of Baltimore, Md., for improvement in soda fountains.

Nelson Crocker, of Sandwich, Mass., for improvement in attaching the head-eringle to the yards of vessels.

Nathan C. Davis, of West Jefferson, Ohio, for improvement in seed-planters.

Daniel Noyes, of Abington, Mass., for improvement in machine-hammers.

Samuel Pratt, of Boston, Mass., for improvement in screw-nails.

Samuel Sweet, of New-York, N. Y., for improved spark-arrester.

Kasimer Vogel, of Chelsea, Mass., for improvement in looms for making weavers' harness.

Wm. Ballard, of New-York, N. Y., for improved protecting bulwarks for war vessels.

Calvin Carpenter, Jr., of Pawtucket, Mass., for improvement in magneto-electric machines. Patented in France, April 18, 1853.

A. P. Chatham, of Canoga, N. Y., for improvement in car-coupling.

Gilbert S. Clark, of New-York, N. Y., for improved pen and pencil case.

Jno. W. Cormack, of Quincy, Ill., for improvement in cane and maize cutters.

Benj. Crawford, of Pittsburgh, Pa., for improvement in condensers for steam-engines.

Chauncey O. Crosby, of New-Haven, Conn., for improvements in machines for sticking pins.

David Demarest, of New-York, N. Y., for hose protector.

Joseph Farnsworth, Jr., of Madison, Ind., for improvement in car-wheels.

Luther R. Faught, of Macon, Ga., for improvements in regulating the speed of steam-engines.

Christopher P. Kelsey, of Livingstonville, N. Y., for improvement in grain-cradles.

Edmund Morewood and Geo. Rogers, of London, England, for improvement in coating sheets of metal.

Russel S. Morse, of Dixfield, Me., for improvement in adjustable springs for carriages.

Howard Perkins, of North Bridgewater, Mass., for carpenters' brace and bit fastener.

Henry M. Ritterband, of New-York, N. Y., for improved gold-washer.

John A. Taplin, of Fishkill, N. Y., for improvement in straw and grain separators.

Wm. H. Towers, of Philadelphia, Pa., for improvement in metallic pens.

Increase S. Waite, of Hubbardston, Mass., for improved machine for turning cylinders of wood.

Peter H. Watson, of Washington, D. C., for improvements in generating and condensing steam. Ante-dated May 2, 1853.

Jacob V. A. Wemple, of Chicago, Ill., for improvement in grain separators.

George Calvert, of Upperville, Va., for improvement in bee-hives.

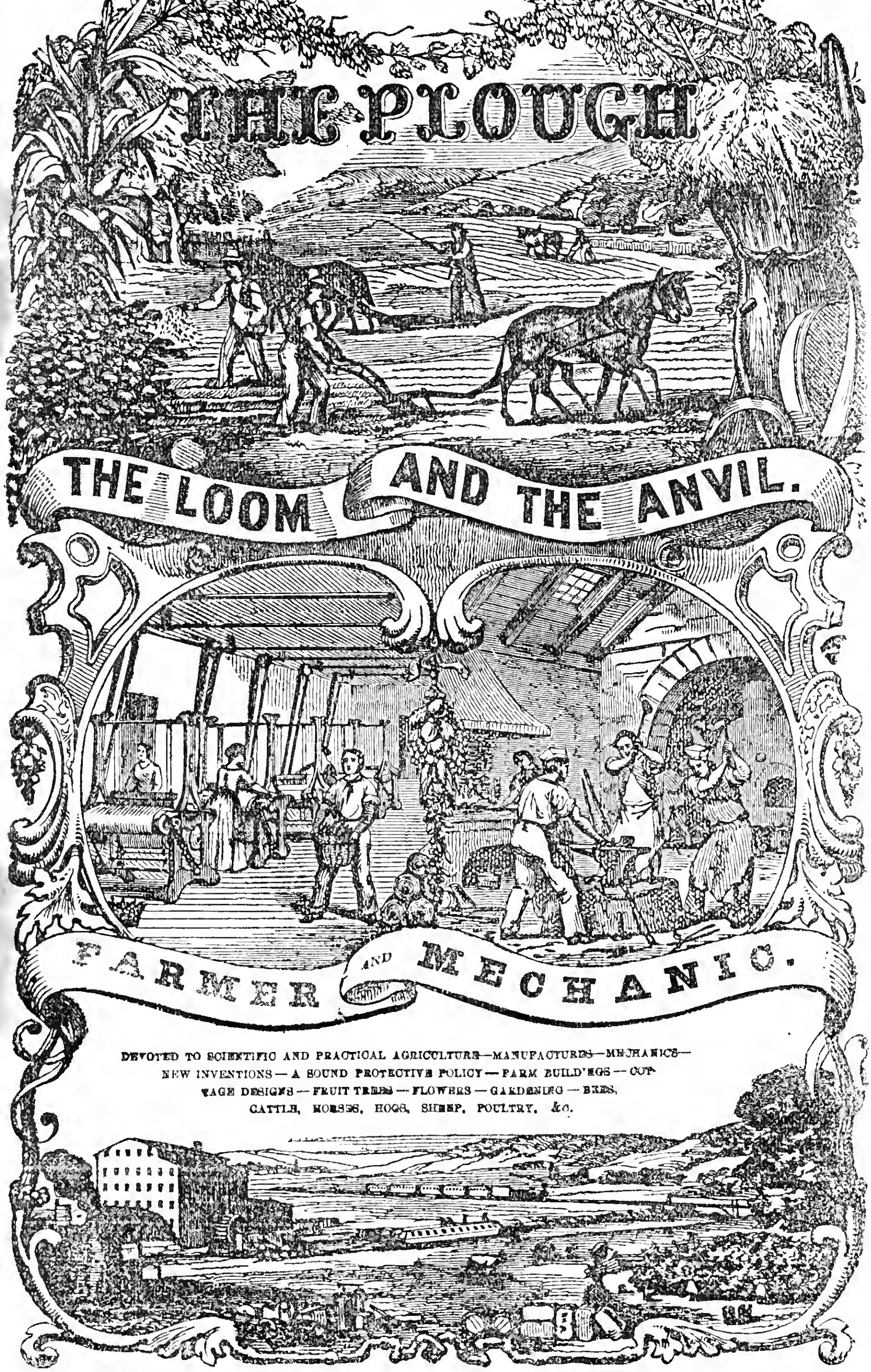
Seneca Lapman, of Salem, Ohio, for improvement in devices for steering cultivators.

Wm. B. Leonard, of New-York, N. Y., for improvement in fluid metres.

Wm. T. Merritt, of Hart's Village, N. Y., for improved mode of opening and closing gates.

Geo Williston, of Brunswick, Me., for improvement in machines for straightening and curving rails.

PART II.—VOL. VI.



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INDEX TO PART II., VOL. VI.

From January to June, 1854, *inclusive.*

[See also Index to Editors' Jottings and Mechanical Record, at the end of this table.]

INDEX TO EDITORS' JOTTINGS AND MECHANICAL RECORD.

The Plough, the Loom, and the Anvil.

PART II.—VOL. VI. JANUARY, 1854. No. 1.

AGRICULTURAL PROSPERITY.—THE MANUFACTURE OF IRON.

WERE all the people farmers, society could not long exist but in the most degraded condition. Our own Indians or the wandering Arabs are the best illustrations of the rank which, after the lapse of years, they must inevitably occupy. Why? Because they would be reduced to the necessity of using only the rudest tools, and would be confined to the most simple kinds of clothing, as skins and vegetable products, essentially unchanged in form or texture.

The first step in the elevation of a nation thus reduced would be the acquisition of the convenient tools wrought by the educated artisan, and a knowledge of their uses. In other words, skill in the manufacture and uses of iron is the first and essential step towards improvement. No other road has ever been opened by any nation that has emerged from barbarism to civilization. Not having the ability at first to manufacture for themselves, it would be for the interests of such a nation to cross the ocean, or to pay others for crossing it, who would bring to them these magic implements, and instruct them in their uses, though it should be at the cost of a large part of their scanty harvests.

But it does not follow that it would be wise for them to pay more than was absolutely necessary, in obtaining these supplies, nor to continue such an arrangement an indefinite period. This is very obvious.

Hence, we infer the truth of the fundamental article of our creed, that the artisan should have a place by the side of the planter and farmer, and receive his food from the granary, with the least possible cost of transportation or inconvenience of any kind.

We ask the attention of the reader for a moment, while we look at the changes which are necessarily involved in carrying out the doctrine, so zealously advocated even in our own day and our own country, that it is for our interest to become dependent upon foreign nations for various products of the arts and manufactures.

The decree is made, we will suppose, that *Whereas* labor is so much cheaper in Great Britain than in this country, and whereas, the entire cost of this metal is the cost of LABOR ONLY, the rough material being dug out of the earth, *therefore*, IRON shall no longer be manufactured in any of the States of this Union. Every furnace and forge must be closed forthwith and for ever. (We will see presently whether this is merely a fictitious case.) The most obvious results of such a movement are—

1. A large body of men are thrown out of employment. They are left without any means of support.

2. Their families are deprived of all their present resources. The landlords, under whose roofs they have slept, and at whose tables they have been

fed, and who have thereby secured their own daily bread, are equally helpless. So, too, are the butchers and bakers, who have furnished them meat and bread; the tailors, who have clothed them; their shoemakers, hatters, merchants, &c.; all who have dealt with them; the doctors who have tended them in their sickness, and who have healed them when wounded; the instructors who have taught their children, and all the various classes of people who have been employed in their domestic and other family affairs.

Again, all these bone-and-sinew men paid taxes of various kinds, in company with others, who are now left to bear them alone. The number of schools must be diminished, and those who continue to attend them must travel greater distances. The Sabbath congregation is too much reduced in numbers and strength to sustain its usual services, and its minister must be dismissed. Many such cases not only must necessarily occur, with the change proposed, but have already occurred in many communities. How many such incidents do you suppose we should witness, on the occurrence of the event supposed, in old and staid Massachusetts? Our own personal knowledge of this section enables us to count up nearly thirty villages, towns, and cities, that have sprung into being in that State, and collected a population of more than 80,000 souls, with all the array of churches, schools, and other important institutions, which, but for the arts and manufactures there located, would never have had a being, and the destruction of which is inevitable, the moment that the beat and hum of the loom and spindle shall cease to be heard. In New-Hampshire, we can count such a population to the amount of some 30,000 more. But we purpose now to confine ourselves chiefly to a single branch of industry, in its connection with agriculture, the

MANUFACTURE OF IRON.

This branch of industry, as all our readers know, is carried on in the State of Pennsylvania far more extensively than in any other section of our country. Still, this interest is by no means unworthy of notice in many other States.

Thus, by the census of 1850, the capital invested in this manufacture is as follows:

	Pig-iron.	*Wrought-iron.*
New-York, - - -	$605,000	$1,131,300
New-Jersey, - - - -	967,000	1,016,843
Pennsylvania, - - -	8,570,425	7,620,066
Maryland, - - - -	780,650	1,420,000
Tennessee, - - -	755,050	1,021,400
Ohio, - - - - -	620,800	1,503,000
Total of six States, -	$12,298,925	$13,712,609

The sum total of the capital invested in the manufacture of pig and wrought-iron, in all the States, is $31,841,645, while the value of the entire annual products is $29,495,851.

The amount invested in iron castings in several of the States, is as follows:

Massachusetts, - - - - - -	$1,499,050
New-York, - - - - - -	4,622,482
Pennsylvania, - - - - - -	3,422,924
Ohio, - - - - - - -	2,063,650

In all the States, it amounts to $17,416,361, while the annual products are estimated to be $25,108,155.

Destroy the value of this kind of labor by some system of legislation competent to effect such a result, and this capital would not be merely diverted into other business, but a great share of it would be entirely destroyed.

But again, the number of hands employed in this labor is not inconsiderable. From the same source, the census of 1850, we find that the number of persons employed in the manufacture of

Pig-iron, is - - - - - - -	20,448
Wrought-iron, - - - - - -	13,257
Iron-castings, - - - - - - -	23,589
Total number of hands employed, - -	57,294

The entire average value of monthly wages is set down at $1,412,597,76 or the enormous amount of $16,951,173,12 per year.

Then take another view, and see the "harmony of interests" in the various industrial pursuits. Besides its intimate connection with various employments, as already suggested, the manufacture of iron requires an immense amount of coal, both hard and soft. The sum total of these articles annually consumed in this manufacture, is 1,274,196 tons of mineral coal, and 71,089,814 bushels of coke and charcoal. What an army of men, with their families, are supported by the labor of providing these iron-makers with their fuel!

Run over these long rows of figures once more, and try to form an estimate of their true value. Look through some optic glass till you can see the villages peopled by these workmen, scattered over all the land, now occupied by moral, industrious, and contented men, well provided with food and clothing and home, rearing and educating their families to become respectable and perhaps influential citizens. Blot these villages out of existence, and quench these fires, and they become wanderers, struggling for a precarious support, and their families and themselves even tempted to habits of vice, and to become dangerous members of society. They cannot, in such event, be consumers of your produce, for lack of means. They have been deprived of their livelihood, (no imaginary scene,) and are left helpless, and often in a "strange land."

And are the agriculturists of our country not affected by these revolutions of our national industry? Their burdens are increased, and they lose the means of sustaining them in the same day. They must deliver their "tale of bricks," though they are cut off from the necessary supply of straw.

But this view would by no means do justice to the importance of this form of industry. We should look, not only to its actual, but to its possible extent. For example: with all the increase which has happened to it, (and it has increased materially even since the census of 1850 was prepared,) we imported into the United States, in the year 1852, foreign iron to the amount of $21,626,993. With the large increase in our domestic manufacture, an increased amount has been imported over the amount imported in previous years. The wants of the country are increasing in a still greater ratio. The demand for iron rails, required by the railroads now in process of construction in this country, is greater than the possible supply of all the furnaces in the world, allowing five years for their completion. Who ought to reap the benefit of these immense contracts—ourselves or foreigners?

We have confined this view to a single branch of labor, and are unable to illustrate the numberless connections which this one sustains to other forms of industry. We must leave this for the reader to do as he may. It is obvious, however, that all the arts are dependent on this one. The whitesmith and the blacksmith furnish nearly all the tools in all departments of mechanical industry. So intimate is the connection of this one metal with the well-being of society, that were we materialists, believing the soul and the intellect to consist of any *substantial essence*, we should be inclined to regard iron as its chief element.

He who ponders continuously over any of the evils which prevail in communities, begins to measure their length and breadth and depth in a manner that approximates towards a correct appreciation of their importance, while all other evils retain their original pigmy dimensions. This gives rise to most of the *isms* of the day. So it is with the subject we are considering. We have looked at the value of one form of labor, and it increases in its proportions till they are gigantic. A similar result would follow, should we pursue a similar course with other departments of industry.

He who does this, probably holds in higher estimation many things which others regard with entire indifference. But we shall be the better prepared by such process to decide whether it is for the interest of the agricultural laborer to destroy our own industry, and depend on "the great workshop" across the ocean for those articles which we can supply for ourselves, if we will.

We say again, as we have in a recent number, that we do not pretend to establish, by such views, the necessity of high or low tariffs, but only the duty of *essential protection.* Whatever this actually demands, is abundantly urged by such views as we have here taken. What amount of tariff is actually required by different trades, belongs to another part of the subject. We are satisfied if we have deepened the conviction in the mind of the reader that these branches of industry are by far too valuable to be thrown away, and that the one determination of every true American should be PROTECT AMERICAN INDUSTRY. The contrary doctrine can only be described as practical insanity and wholesale suicide.

Nor is it a man of straw that we have been constructing for the mere purpose of destroying it. The value of these interests to our country is not perhaps denied; but we are told that we tax other interests for the benefit of one, and that this is unfair and unjust; that all should buy as cheap as he can, &c. This assessment of others for the benefit of the manufacturer is denied, and appeal is taken to the "prices current" under the various policies of different times. But suppose it to be true. We ask again, were a subscription paper circulated among the farmers within ten miles of Lowell, Manchester, Lawrence, &c., or around Pittsburgh and other places in which the iron manufacture has acquired a prominent position, how much per centage on their present taxes would each one pay, before he would suffer those places to be depopulated? Scarcely one that would not pay double and threefold his State and county taxes, while many would pay ten times, and even *fifty* times that amount. And the propriety of this action would be fully justified by a regard to the pecuniary interest of each. It is to much more than this amount for their present profit to retain such a market as these centres of trade open to them. Indirectly, and to some extent, all enjoy this benefit, if they have any thing to sell. Like the circling ripples in the brook, which are scarcely lost but with the sands which confine them within given limits, so the influence of these gatherings of the people in compact masses, all or most of them being consumers and not producers of agricultural products, give an increased value to them even at points quite distant. This distance will in time be substantially annihilated. Communications will be opened, and the tide both of population and of food to sustain them, will alike flow in with increasing rapidity. Can you dam up the waters of the Mississippi or the Hudson, so as to cut them off from the ocean? You may compel them to force their way through new channels, wrought out by their own forces, and this is all you can do. So it is with human enterprise. Whatever pursuit our citizens may elect, they have long ago resolved to belong to society, to the State, to the nation. And they act accordingly. They take an interest in the great questions that have a special interest only in distant sections of the country. But it is their country, and the measure is to be conducted by the rulers in whose election they were active, and it is for the benefit of fellow-citizens that they urge on the project. Such men will make a way for the transportation of their merchandise any where, if there is a market at its termination, at any thing less than ruinous prices. Probabilities in their favor are all they demand ere they assume the most gigantic projects.

It is, then, one of the great duties of the friends of American industry, or in other words, of Americans, to establish markets, centres of trade, where the producer can meet the consumer at the least cost, and, without paying commission agents or factors, receive into their own hands the full value of that they have to sell.

Farmers and all classes are "taxing" themselves continually, and often at no small rates, for the sake of being, practically, neighbors to the manufacturer and other consumers of their produce.*

Establish such centres of trade all along our streams, and even "elsewhere," wherever the steam-engine can be made to act its part, and then these "favored men," the manufacturers, will build their own railroads, while the farmer finds a market at his own door, not only for his own crops, but for the purchase of what he wishes to buy.

AGRICULTURAL TRUTHS FORCIBLY EXPRESSED.

At the recent cattle show, in Dayton, Ohio, Governor Wright, of Indiana, made some very excellent remarks, from the report of which we select the following:

He began by saying that he had just returned from Yankee-land, which he had visited for the first time in his life. He had attended several New-England cattle shows and fairs, especially in Vermont. He was struck every where with the appearance of comfort and independence that on all sides met his eye. The hum of business was heard in all directions. He never saw so industrious a people. Every body seemed to have something to do, and to be at work. This would make a poor land rich. The farms were not so good, but the farmers were better than in the West. Owing to their

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* Taxes are assessed, in some form, on every thing. The housekeeper, whatever other pursuit he may follow, buys corn of the agriculturist, and *pays him for raising it.* He then pays another "tax" to the miller for grinding it, and a third to the baker, &c., and would pay at higher rates than he is now charged, rather than dispense with these services. He pays another tax to the wood-cutter, and another to the charcoal-dealer, and so on, through an endless round; and each receives taxes from others in his turn. The partner of a mercantile house insures not only the honesty and efficiency, but the health of the other members of the firm. The sickness of either of them is substantially a tax on the house. It is the peculiar glory of democratic institutions, social, political, &c., that all good of whatever kind receives from the many some consideration in return, while we all pay something, in some shape, for value received, though often far less than the good it brings us, the chief cost being paid by those most especially and directly benefited. If our neighbors improve their houses, it makes the neighborhood more desirable, and the value of our own is increased, but our *taxes* also are increased.

economy and industrious habits, he verily believed the farmers of New-England lived better, enjoying more of the comforts and luxuries of life, than the same class of people in any other part of the Union. He had searched for the secret of this prosperity, and had found it, as he believed, in the *order and system* of the people. There is more of this in the East than in the West. The hap-hazard, helter-skelter policy is not prevalent. The labors of individuals and of bodies of workmen and of whole communities are systematized and divided off, and this system is carefully carried out. This insures success. In the West, every man fights on his own hook, and he lives more by fighting and brandishing his arms, than by steady working. Idleness and want of system on the richest soils are sure to breed poverty and vice; whereas industrious and frugal habits are the sure road to competency and wealth.

There was, too, a pride of *home* in the North—a desire to make that beautiful and happy—which lay at the foundation of all social excellence and all public good. From a love of home, all true patriotism proceeds till it reaches the State and National governments. It was not so in the West. Governor Wright declared that one of the greatest evils of the West, one which he would labor to correct above most others, was to think first of the national capital, at Washington, and then the patriotism of the politician descended till it reached himself as an aspirant for public office. Every man in the West has the whole national government on his shoulders. He wished they would first take care of their *homes*, and then the government at Washington would be best taken care of. He mentioned an anecdote that took place in Vermont whilst he was in that State. The State elections had just come off, and the Whigs, though naturally in the majority, had for the first time for many years been beaten. A good old Whig farmer came home with a sad heart, and related the dreadful news to his patriotic wife. What, exclaimed she, has our dear old Vermont fallen into the hands of the enemy? It is, alas! even so. Well, then, ejaculated she with an emphatic sign, if *Vermont is gone, the Union is lost!* That is the principle, said Governor W. He wanted every man to feel as if every thing centered in his own home, his own town, county, and State, and that if *that* suffered, the nation was in danger. He verily believed that the town system of New-England was the seed-bed of true democracy. People legislated at home. They met in their school districts, to see about educating their children together; they all understood one another and their families; then, if a road between neighbors was to be made or repaired, or a bridge was to be built, the people all got together and legislated upon the subject. This was a popular democracy, and it was here our free institutions were born. The school-houses of New-England were our republican line of fortifications. From these school districts and town-meetings, emigrants have gone forth all over the Union, that have spread free principles every where. Cold and sterile as New-England was, she was rich in good principles, and rich in her enterprising and intelligent men. Said Governor Wright, "*If what is now this nation, had been settled two hundred years ago in the valley of the Mississippi, we should have had no New-England; and if we had not had a New-England, we should never to this day have been a free Republic.*" It was one of the most beneficent ordinations of Providence, that this country should have been originally settled on the rock of Plymouth. The coldness of the climate and the sterility of the soil created that very necessity which is the mother of invention and the stimulus of effort; and these have filled the land with hardy, enterprising, well-educated men.

[The effect of the system of town corporations is not overrated by Gov. Wright. The town meeting, and the score of little circles which so often collect around a New-England town-house, in which all discuss with zeal and earnestness, untrammelled by parliamentary rules, are the primary schools of democracy. They teach men to appreciate the true meaning of liberty, and to examine for themselves the soundness of any policy which is commended to their attention. Having acquired thus the habit of investigating questions affecting school districts and townships, they insist upon the privilege of investigating and of approving or condemning all the political doctrines and systems of doctrines that are promulgated, whether by senators or by presidents; whether urged by candidates for office in their own district, or by members of Congress in the capitol of the nation. It is in these schools, too, that the leaders of great political parties on the high places of our nation first acquired or so successfully cultivated the ability to use the gift of speech so fluently and efficiently.

We have long thought of penning a chapter on this subject, and may very possibly be "moved" to do so at an early day, by the suggestions so happily made in the foregoing extract.—Eds.]

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

SOUTHERN AGRICULTURE.

Mr. Editor,—*Dear Sir*,—My friend, Colonel R——, has paid me an undeserved compliment, and could himself have much better discharged the duties requested than I can. I will, however, to the best of my limited abilities, drop you an occasional letter on *Southern Agriculture*. My time, by the way, is much taken up with the labors of the farm, and when the day closes, I am generally too much fatigued to be a profitable correspondent, my reading and writing being generally done by candle-light. I do not keep a manager, but superintend my farm, &c., personally, and have done so for the last twenty years.

I am what may be termed a book farmer. From 1820 to 1845 I was engaged in the mercantile business, but read much on the subject of farming. In 1834, I withdrew from the active duties of the counting-house, and shortly after purchased a poor farm, of some 250 acres, which had starved out the original proprietors. I here laid out some $5,000 in necessary buildings, stocking the farm, &c., and for the first five or six years barely made a support, and was often ridiculed for my book notions, as some of my good neighbors were pleased to term them. I, however, continued to read Ruffin's invaluable Register, the *Cultivator*, by Judge Buel, and other journals. By deep ploughing, close attention to business, and proper system, with regular rotation of crops, my farm began to pay in 1840.

The farmers, as a mass, in Virginia farm badly. Our farms are too large, and I hesitate not to say, that every acre of farm land in our State could be made to produce double as much as it now does, under proper cultivation. Too little attention is paid to making manures, and properly applying them. We plough too much land, we plant too much, we sow too much. Ten acres well ploughed and manured are worth twenty or even thirty poorly tilled, and yet it requires as much labor, nay, more, to plough ten acres of poor, as ten of rich land, the latter always being more friable and more easily tilled.

Our staple grain crops are wheat, corn, rye, and oats. We cultivate potatoes, turnips, mangol-wurtzels, carrots, parsnips, and other root crops, but they are minor articles. Cattle, horses, sheep, and swine are raised in considerable numbers. The county of Rockbridge, near the centre of the State, in the Valley of Virginia, will compare favorably with any county in the State, in point of intelligence or agriculture. There is, indeed, much broken and thin land, but the county is finely watered, and I might say, with almost unlimited water-power. On all the streams there are fine bottom-lands, the best of which are worth $100 per acre. The best up-lands, with bottom, average $50 prime up-lands, limestone, $30; thin lands range from $5 to $20 per acre. Fine, or rather good flouring-mills are numerous. Furnaces, forges, and foundries are convenient. The central railroad passes through one end of the county, a plank-road and mud pike-road pass through near the centre, and soon the North river will be canalled to Lexington, one of the prettiest small inland towns in Virginia. Here is situated Washington College, richly endowed, (the Father of his country having in his day donated to it $10,000,) with able professors, at the head of whom is Dr. G. Junkin. The Military Institute is also located here, with some 150 cadets. Colonel F. H. Smith is at the head of this Institution, supported by a staff of accomplished officers. There are also classical and mathematical schools, of the first order, in other parts of the county, Brownsburg boasting of a very good one.

Brownsburg, Va., November 23d, 1853.

FLAX CULTURE.

Prof. Wilson, in his late lecture delivered before the New-York State Agricultural Society, adopted the following conclusions in relation to flax-culture:

1st. That flax is not an exhausting crop; that its peculiar suitability to different soils and climates, the short period it occupies the soil, and the market returns of an average crop, render it a valuable addition to the ordinary rotation.

2d. That the recent improvements in the process of treating flax, whereby the fibre is prepared at an *immense saving, both in time and labor, all nuisance avoided*, and the *waste products beneficially utilized*, offer great inducements for the establishment of small factories in suitable districts; thus directly encouraging an increased cultivation by insuring to the grower a ready and constant market for the produce.

3d. That a large breadth of flax is annually sown in the United States, of which the seed only is rendered available as a market produce, the straw being only used to a very limited extent for the preparation of fibre, the rest remaining on the field or being carted home for rough litter.

4th. That a very large sum, about $14,000,000 to $15,000,000, is annually expended by the United States in the purchase of linen goods from Great Britain, which country is obliged to procure the raw material for their manufacture from other countries with which the United States has no commercial relations.

5th. That it would appear expedient that the United States should utilize the large quantity of flax straw already grown, and increase her production sufficiently, at all events, to supply the quantity in a manufactured state which she requires for the consumption of her own population.

GERMAN AGRICULTURAL SCHOOLS.

Mr. C. L. Fleischman, who was educated in one of the German agricultural schools, and is one of the editors of the *Polytechnic Journal*, says:

Who is not acquainted with the history of the wars which enervated Germany, which exhausted all her pecuniary means, and brought her to the verge of utter ruin? Germany was after the close of the French war in a pitiable condition; and had it not been for her kind soils, which for thousands of years enabled her to stand the severe calamities which befell her during that long period, Germany would now be a second Greece. She adopted, at an early period, various means to improve her agriculture. Professorships of agriculture were instituted at the universities, periodicals and journals were published to disseminate modern improvements, fairs and meetings were regularly held to encourage the farmer; but all that gave not the desired results. A thorough education was found necessary, practical and scientific education, which enables the farmer to enhance the value of his landed property, as circumstances and condition allow it, to give them the knowledge to improve and change the various modes of culture, *and to be more than a mere imitator*. Proper agricultural schools were wanted, and the monarchs of Germany spared no means to accomplish this important object. The ablest men were selected for the institutions, and nothing was spared to induce them to take charge of them. The late King of Prussia, who, like his ancestors, paid great attention to all improvements in husbandry, was the first to establish such an institution. He invited Thær, the celebrated German agriculturist, to settle within his kingdom, and introduce agricultural schools. Thær accepted his offer, and left Cella for Berlin. The other monarchs of Germany followed the example of the King of Prussia, and Germany had, in 1847, 62 large institutions. With some of them Forests and Veterinary schools are connected. Austria then had 9; Prussia, 12; Saxony, 5; Bavaria, 16; Hanover, 2; Wurtemburg, 8; and other States, 14; in all, 62.

THE MINERAL RESOURCES OF BOLIVIA.

From an article in the New-York *Courier and Enquirer*, we gather the following facts in relation to the mineral productions of this State:

Gold abounds in various portions of Bolivia, and is worked with profit; but it cannot be reckoned among its most prominent sources of wealth. Tin mining, although comparatively a new business, is now among the most profitable of pursuits. The richest and most numerous veins of tin are found in the region of the Onero river, in the central portion of the high table-land. The ore is an oxide of the crystallization, and in most cases may be wrought with ease. The Indians are the principal laborers. They sell the products of their toil to the foreign merchants, who carry on a lucrative trade in the article.

Copper occurs in various parts of the country, both in the metallic state and as an ore. In the province of Lipes, particularly, the ores are very rich, and the metal is easily extracted. At Coracora, in the northern part of Bolivia, the metal occurs in small metallic particles, diffused through a friable gray rock. This rock is ground, the earthy portion washed out, and the remainder, which is sold as *barilla*, yields 90 per cent. of bar copper. The owners of several of the copper mines are said to accumulate fortunes more rapidly than any other men in the country. The Indians, however, are the chief workers of the mines, selling the ore, or barilla, which they procure, to the merchants.

But the silver mines should perhaps be regarded as constituting the essential wealth of Upper Bolivia. The extraction of this metal requires more capital and more skill than that of tin or copper, and is therefore never entirely in the hands of Indians. Previous to the long distraction of the country during its contest with Spain, there were probably worked ten thousand valuable silver mines; but as the Spanish difficulties turned the public attention in another direction, made labor more difficult to obtain, and drove a large amount of capital from the country, the mines were gradually deserted, and at the present time it is estimated that but one hundred and fifty are wrought. At least two-thirds of the abandoned mines have not become exhausted or diminished in richness. The inducements for the reöpening of these mines by enterprising capitalists are manifest. They contain ores of silver of good quality, which can be procured at a moderate cost. In some of the mines, steam-pumps must be used to keep them free from water; in others, tunnels are to be cut; but this outlay *is not in the way of experiment;* for the kind of ore, the breadth of the vein, and the depth to be reached, are all known before-hand. The titles to the mines, too, are perfectly safe. If a mine is neglected more than a year by its owner, it reverts to the government, and the government will re-convey it to any one who will carry on the work. This is for the purpose of encouraging foreigners, with skill and capital, to reöpen the works.

AGRICULTURE IN VIRGINIA.

A State Agricultural Fair was recently held in Virginia, which appears by the published reports to have been the largest, most enthusiastic, and most interesting gathering of the kind ever held in this country, and one which promises to be of immense importance in advancing the interests of agriculturists in that State. We have had some brief accounts of this fair. It commenced on the 1st of November, when, however, only the officers and members of the Society were admitted within the enclosure. On the 2d, the gates were thrown open, and not less than twenty thousand of the best population of the State were admitted. Every body was not merely gratified, but astonished, as well at the immense concourse as at the extraordinary display of the agricultural and mechanical resources of the State. The annual address was delivered by John R. Edmunds. On the 3d, there was a ploughing-match, at which Madame Sontag, the vocalist, gave $100 as a premium to the successful plough. Half the premium was given to the colored ploughman, (a slave,) and half to the owner of the plough and team. On the 4th, the exhibition was brought to a close by the award of premiums, and these were by no means few nor small, and the valedictory address was pronounced by Ex-President Tyler.

But the most enthusiastic portion of the performances was exhibited in the nightly meetings of the Agricultural Society during the week, at Metropolitan Hall. Of this, the *National Intelligencer* says:

"On the second night, a proposition was introduced by Lewis E. Harvie, Esq., of Amelia, to raise $20,000, to be invested in State stocks, as a permanent endowment of the Society. This was responded to in the most enthusiastic terms, various gentlemen putting down themselves and their whole families, to the third generation, as *life-members* of the Society, and others pledging their respective counties for from $500 to $1,000. The meeting was protracted to the hour of twelve, and before adjourning, the sum of $39,000 had been raised!

The same scenes were enacted on Thursday and Friday nights, and the enthusiasm was kept up in a practical manner, until upwards of $60,000 were subscribed! A suggestion that the Legislature should be called upon for a subscription was promptly put down, several members declaring that the farmers of Virginia, now that their spirit was aroused, needed no help of that kind, but would rely upon *themselves;* yet, during the proceedings, it was found that professional men, mechanics, and merchants, all claimed the right to aid in putting Virginia agriculture upon a firm and enduring basis. A wag declared that, so far from asking Legislative help, the Society was now ready to *shave the State debt!*"

EXPERIMENTS ON MOWING-LANDS.

Rev. Mr. Clift, of Stonington, is an intelligent and educated farmer. He recently published the result of sundry experiments, in the *Agricultor*, which we lay before our readers, with his remarks in connection with them. He writes as follows:

I have just concluded an experiment, designed to test the comparative value of coarse and concentrated manures, as top-dressings for mowing-lands. Two acres were selected that had been laid down to grass about five years, cutting in ordinary seasons from one and a half to two tons per acre. I recently came into possession of this plot of ground, and know little of its past treatment. The underlying rock is granite, the surface-soil black loam, the sub-soil a deep yellow loam, with gravel below this, and the whole soil well strewn with boulders. The lot was in the form of a long parallelogram, and was divided crosswise into parcels of a quarter acre each, and numbered from one to eight. The lot extended across a gentle slope, so that no manure would wash from one plot upon another. No. 1 was left without dressing, to show the natural yield of grass, and to give a standard of comparison. No. 2 was dressed with five one-horse cart-loads of coarse, unfermented manure from the cow-stable, worth about $3, including expense of carting and spreading, or at the rate of $12 per acre. It was put on early in March. No. 3 was dressed while the snow was on, with twenty pounds prepared superphosphate of lime, costing 50c. or $2 per acre. No. 4 was treated in April with ashes, sown at the rate of thirty-two bushels to the acre, worth about $4. No. 5 had twenty pounds of guano mixed with three bushels of charcoal cinders. These were thrown out from furnaces of locomotives, and in this case were made from Virginia pine wood, and were probably of little value, except to absorb and retain the escaping ammonia. They were mixed several weeks before use. Value, $2 per acre. No. 6 had twenty-five pounds of guano mixed in the same way, worth $2.50 per acre. No. 7 had a superphosphate of lime of home manufacture. Bones were digested in sulphuric acid put in whale oil-casks, after Professor Way's recipe. The bones had been dissolving four or five months. About four quarts of the liquid were added to twenty pounds of guano and one peck of salt, and the whole intimately mixed with three bushels of the charcoal cinders. As the bones cost us nothing, the value of the whole was estimated at $1, or $4 per acre. No. 8 was dressed with two barrels of droppings from the hen-house. As charcoal cinders and plaster of Paris are constantly kept under the fowls, no accurate estimate can be made of the quantity of pure manure. But it was estimated at two bushels, which, at 50c. per bushel, would make the cost for an acre $4. These last four dressings were applied April 4th, during a rain.

Now for the results. Early in July, the grass from two square rods in each of the plots of ground was carefully weighed in the green state, and one of these parcels cured and then weighed again, and the dry weight of the remaining parcels calculated from this one.

[For the convenience of a reference, we here arrange the experiment in a tabular form.—Ed. Agr.]

No. of plot. Application to each quarter of an acre.	Cost per acre.	lbs. Hay per acre.	lbs. Gain per application.	Gain per acre.	Loss per acre.
1.— Nothing.		3,920			
2.—5 one-horse cart-loads of green, unfermented manure, applied in March........................	$12 00	4,880	960		$7 20
3.—20 lbs. prepared superphosphate of lime, applied upon snow, in March........................	2 00	4,960	1,040	$5 20	
4.—8 bushels ashes, applied in April	4 00	3,920			
5.—20 lbs. guano, mixed with three bushels of charcoal cinders, from R. R. engine, sown April 4th, during rain........................	2 00	4,000	80		1 60
6.—25 lbs. guano, mixed and sown same as No. 5.................	2 50	4,720	800	1 50	
7.—20 lbs. guano, 1 peck of salt, 3 bushels of cinders, and 4 quarts of dissolved bone liquid, applied April 5th, during rain................	4 00	5,280	1,360	2 80	
8.—About two bushels hen manure, contained in 2 barrels of plaster, &c., applied April 4th, during rain	4 00	5,440	1,520	3 60	

These experiments perhaps do not determine any thing with perfect accuracy, and yet enough of them bringing out similar results, would demonstrate—

1st. That concentrated manures are far preferable to stable manure for dressing mowing-lands. Eighty pounds of prepared superphosphate of lime in No. 3, or one hundred pounds of guano in No. 6, produce larger results than $12 worth of stable manure. The estimate given of the comparative value of these manures in the *Country Gentleman*, that one hundred pounds of guano is about equal to a load of manure, does not do justice to guano as a dressing for mowing-lands. It sustains the opinion advanced by Colonel M. P. Wilder and others, that it is cheaper to buy guano at the market price, than to have stable manure given to you, if you have to pay for carting and handling.

2d. It is shown that there is good economy in using larger quantities of guano than eighty pounds to the acre. While this quantity in No. 5 did not pay expenses, one hundred pounds in No. 6 gave a very handsome profit. It is believed that there would be increasing economy in its application up to two or three hundred pounds per acre.

3d. It is shown that farmers have a cheap method of doubling their crops of hay on all lands that do not now produce over one and a half tons an acre. Five dollars worth of guano suitably composted, and applied early in March, or what is better, in November, could hardly fail to add one ton and a half of hay to the yield of each acre.

4th. That the prepared superphosphate of lime in No. 3 and No. 7, is among the cheapest and best of manures. The return is larger for the capital invested than from any other manure.

5th. It is shown that bones dissolved in sulphuric acid, is not only a very powerful manure, but that where farmers can get bones for carting, or at a small cost, it is good economy to manufacture superphosphate of lime themselves.

6th. It is shown that hen-manure is an article of very great value as a fertilizer. Farmers are perfectly safe in having large flocks of poultry, a place to keep them, and abundance of loam, charcoal dust, and plaster of Paris, as absorbents.

7th. The experiment suggests to farmers that more capital invested in manures would make their farming far more profitable. If any one doubts it, let him invest a few dollars in guano, or in some good prepared superphosphate of lime, and apply it to any of his exhausted mowing fields this fall. I believe the returns will rarely fail to be more satisfactory than that of bank stock.

Similar experiments to the above will be continued hereafter.

TOBACCO CROP OF CUBA.

A correspondent of *Hunt's Merchants' Magazine* describes this as follows:

The tobacco plants are generally upon the margin of rivers, yet there is a large quantity of good tobacco raised upon high-lands distant from rivers, but the former situation is preferable.

The quantity of land cultivated depends altogether upon the means of cultivation, and the product of the crop differs in value according to quantity and quality; as high as $30,000 has been realized by some of the heaviest planters from a single crop of tobacco, whilst the expenses attending its cultivation are considerably less than those incident to the raising of sugar-cane.

When the tobacco is gathered, it is hung upon poles about fifteen feet in length to dry; the leaf is allowed to remain a short time in the air after it is ripe, to dry a little, but not so much as to cause it to break during the operation of hanging.

As soon as the tobacco is dry it is piled, selecting a day for that purpose a little damp, that the leaf may not be liable to be broken in the handling; the pile, when made, is carefully closed from the air; the floor of the piling-house is made of wood, and elevated from the ground, that the moisture may not rot the tobacco; the pile is formed with symmetry, and in such a manner that the leaf may not be broken. This operation of piling is made that the tobacco may acquire a good color, and it is never allowed to remain more than two months in this way, when, by this time, and often much before, the selection and preparation for market is made.

The preparation of the tobacco for market is as follows, viz.: The largest, most perfect, and best quality leaves are first selected, and are called *Libra*, and are superior to all the others; the next is called *Primera*, and is nearly equal to the former; and then comes the *Segunda*, a little inferior to the *Primera*, and so down to the *Sesta*, or sixth, which is the last section of the tobacco called *Principal*. From this there is likewise taken the *Quebrado*, or damaged, to which class belongs all the large leaf which is broken, or worm-eaten in the field.

The *Principal* is composed of all the tobacco taken from the plants for the first time, as the leaves of the second gathering produce another class of tobacco, which is called *Capadura*, and is inferior to all the former-mentioned kinds.

There is likewise a kind called *Libra de Pie*, which is made up from the first leaves, or those which come in contact with the ground, and is the poorest quality of the tobacco.

After the selection, as above expressed, the tobacco is packed by forming the leaves into bunches, as follows, viz.: The *Libra* and *Primera* is composed of 25 leaves, the *Segunda* of 30, the *Tercera* of 35, and the *Cuarta* of 40, which are the classes used for wrappers; and the remainder are composed of 45 leaves, and are used for fillings; these bunches are then packed into bales of about one hundred pounds weight.

The most destructive worms feed upon Tobacco at night, hiding during the day; they are pursued at night by the planters with torches made from pitch-pine slivers. Your obedient servant, A Subscriber.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

THE COTTON CROP.

Messrs. Editors,—Since mine of the 16th of September was published in 264–266 pp. of your magazine, there have been important changes, greatly reducing the crop of cotton; and having your general invitation, I make bold to intrude.

The thermometer in my piazza, with a southern exposure, stood, at 6 A. M., on the 23d September at 52°; on 24th, at 42°; 25th, at 34°; 26th, at 52°; 29th, 38°; 31st, 38°. Ice was seen on 24th, and cotton was killed; small bolls were so frosted that they have not opened. Last year, the freeze was 15th November, three weeks later. This, with at least ten days' loss in the spring, makes one month's difference. All persons conversant with the cotton crop, can appreciate what I may calculate as a loss.

Last year, with 22 effective hands, I gathered and sent off 195 bales. This year, with 28 to 30 hands, I have no idea I can make 160 bales, being 35 bales less, with an increase of one-quarter effective force, or a difference of one-third loss. Should this be general, the crop cannot reach 2,200,000 or 2,300,000 bales.

I have just returned from Columbus, where I saw friends from various portions of the State, attending the Baptist State Convention, as well as an old planter, who travelled across the country from Jackson, Miss., to Marion, Ala., thence to Columbus. And to-day I saw my brother, A. K. Montgomery, from his plantation in the Louisiana swamp. From all I saw and heard above, and from what I can learn east and west, I believe my crop to be over the average. I can buy 100 acres of cotton with 10 bales; 300 acres with 40 or 50 bales, and not at all unusual. In the swamp, where they made 15 to 17 bales per hand last year, they are now nearly done, and make only 10 bales.

I was nearer done picking on 1st of November, than last year on 1st of December. Have now only children picking; my able hands are in the woods.

I now reduce my figures to a loss of one-sixth, allowing for increased culture, and put the crop at two and a half millions, and do not think it will reach two millions and three quarters. M. W. PHILLIPS.

Edwards, Miss., November 21, 1853.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

MANUFACTURE OF AXES IN COLLINSVILLE, CT.

THE importance of this branch of domestic industry will, in some measure, be realized, when we learn the extent to which the business is carried by a single establishment, which has been in operation about twenty years, under the supervision of Messrs. Collins & Co., in Hartford, Ct. The works of the Company are located at Collinsville, on the Farmington river, to which place a branch of the New-York and New-Haven Railroad extends, connecting with the main road at New-Haven.

This Company is incorporated by an act of the Legislature, and has a capital of $300,000 invested in the business. The machinery employed is of the most powerful description, ingeniously constructed, and skilfully adapted to the various purposes for which it is intended.

The entire works of the Company are kept in operation, and all the machinery driven by thirteen large water-wheels. Twelve hundred tons of iron, 200 tons of cast-steel, and 2,000 tons coal are annually consumed at this establishment. The Company employs about 350 men, and manufacture from 1,500 to 2,000 edge-tools *daily*, and the reputation of all articles bearing the mark of "Collins & Co." is of the highest order. Their trade is rapidly extending, and their sales are very extensive not only throughout the United States, but also in Canada, Mexico, Cuba, South America, and other foreign countries.

To those who have never seen the axe manufacture in all its various departments, a brief description of the *modus operandi*, by which the rough materials are transformed into the beautifully-finished and highly-polished axe, ready for the workman's use, will not be unprofitable or uninteresting.

More fully to illustrate this, the reader will imagine himself quietly seated in the accommodation train, from New-Haven to Collinsville. After a pleasant ride over an easy track, surrounded by picturesque scenery, he suddenly finds himself in the immediate vicinity of this thriving little village, snugly and beautifully situated amid the surrounding mountains. Here is a thrifty population of nearly 1,500 inhabitants, depending mainly upon the edge-tool business for their maintenance. Two churches, and a neat and convenient school-house, where 200 to 250 children regularly receive the benefits of an excellent education, add essentially to the attractions of the village, while the pleasant dwellings and beautiful shade-trees which adorn the streets, give an air of comfort and contentment to its general appearance.

Entering the extensive and admirably arranged work-shops of the Company, the visitor is struck with the perfect system and regularity which are exhibited in all the various departments. Much of the labor-saving machinery in use at the works of the Collins Company was invented, patented, and constructed here, and is unlike any other in use. The iron, after being properly heated, is carried to a machine which cuts it to its proper shape, forms it, and punches the eye to receive the helve. The steel (previously cut into the necessary size and shape) is welded to the iron under trip-hammers, and drawn down to a more perfect form. After this, another workman examines each axe, and regulates the eye, and also takes out all the crooks and irregularities of the edge. It is then taken to another shop, and by a powerful machine, (invented at the works,) *shaved down* by a cutting operation to a nearly perfect edge, and is now ready for *hardening*.

The process of properly tempering edge-tools is one of extreme practical difficulty. Indeed, by the old method, it is nearly impossible to arrive at the precise point of temperature, and give the requisite hardness without leaving the axe too brittle for general use. This difficulty, however, has been obviated by the invention of a new plan, based upon a principle by which the most unerring results are obtained. Every tool is subjected to a uniform heat, produced by means of ovens peculiarly arranged, and is regulated by thermometers in the most perfect manner, by which the temper is most accurately and uniformly *drawn*, and a fine and permanent cutting-edge produced.

After the axe is sufficiently *tempered*, it is taken to the polishing shop, when the surface of the cutten portion below the eye is finely polished on emery wheels. By this means an even surface is obtained, the axe receives a fine polish, and any defects or flaws in the steel are rendered visible, and may be readily detected. The axes are now carefully examined by inspectors, whose sole duty it is to attend to this branch of the business, and every tool having the least flaw or imperfection that would injure it, is rejected; and only those which are perfect are allowed to receive the mark or stamp of the Company upon them. By this means, the axes of Messrs. Collins & Co. have attained a reputation at home that is well founded, and their superior qualities are known and appreciated abroad. After stamping, the *head* of the axe is dipped in asphaltum to prevent its rusting, and a *label* with the signature of Samuel W. Collins is put on every tool, the more effectually to guard against counterfeiting. After being weighed, the axes are enveloped in paper, and packed, a dozen in a box, ready for market.

Although we have more particularly described the manufacture of *axes*, Messrs. C. & Co. do not confine themselves to making these alone. Edge-tools of various descriptions, such as adzes, coopers' tools, hatchets, &c., &c., also picks, sledges, and mining tools generally. These are all of the most perfect finish and superior quality, as hundreds of those who have used them, can attest from their own experience.

Such establishments as this are an honor to the country, and creditable alike to the proprietors and to the skilful mechanics in their employ; and we trust the time is not far distant when similar manufactories of articles of general utility will be seen springing up in all parts of our country, and prove a source of wealth and prosperity to all who embark in the enterprise. Some of the best cutlery in the country is now manufactured by our own artisans, from the product of our native mines; and with our mountains teeming with coal, and the richest ores in the world, there is no good reason why we should be dependent on the importation of a single article of cutlery or hardware from foreign countries.

GOOD MILCH COWS.

There is no field that promises a richer harvest than that which secures a supply of good milch cows. The present condition of the milkers, in this country, is very far below what it should be, and pays a very small profit to the farmer, compared to that which he might and ought to have.

A writer, in the Albany *Cultivator*, says that a good cow worthy of the name should yield, on the average, for the first 100 days after calving, 7½ quarts at a mess, or 15 quarts per day, amounting to - - 1,500
For the next 100 days, she should average 5 quarts at a mess, - 1,000
For the succeeding 100 days, do. 4 quarts do., - - - - 800

Total number of quarts, - - - - - - - 3,300

—giving her a respite of 65 days before calving. 3,300 quarts of milk, at 3 cts. per quart, is very near $100. The cost of keeping may be reckoned as follows:

For pasturage, the season, - - - - - -	$12
Two tons hay, - - - - - - - -	26

This or a proximate condition may be reached not only by the purchase of valuable cows, at the outset, but by the improvement of the breed by the best of those already purchased. The selection of a good bull is quite as important as the choice of a good cow.

Still, there is a great difference in the different breeds, and sundry experiments have been made to test their comparative value. We present one or two of these below:

AYRSHIRES AS MILKERS.

Mr. Edward M. Shepard, of Norfolk, in this, St. Lawrence county, is a breeder of Ayrshires, says the *Cultivator*, and while he has made no experiments with particular or individual cows, like your correspondent "P., of Sennett, N. Y.," which, by the way, is not a proper method of testing the value of breeds, unless the whole herd be taken, has yet permitted to be published in the papers of this county, at the solicitation of myself and other friends, trials of his *whole* herd, the substance of which is here submitted.

Mr. Shepard had 14 cows, Ayrshires and their crosses on natives, half-bloods, six heifers, *milking for the first time*—time, the third week in June—feed, grass only.

Allowing one cow for family use, and deducting 40 per cent. from heifers, and his trial stood thus:

Cows, - - - - - - - - -	8
Heifers 6, reduced to cows, is, - - - -	3·6
	11·6
Deduct one cow for family, is cows, - - -	10·6

The product for the week was 12 lbs. 12 oz. per cow. The first week in July, feed grass only, and much affected by drouth, he milked twenty, *eight* of which were heifers, milking the first season, and this trial stood thus:

12 cows, less one for family, is, - - - - -	11·
8 heifers, 40 per cent. off, is - - - - -	4·8
Full cows, - - - - - - - - -	15·8

The product for the week, per cow, was 14 lbs. 13 oz., and a fraction over.

But, lest your correspondent might think my allowance for heifers too much, which, however, is considered a just allowance by the dairymen of th county, the result of the last trial, *without any deduction* for their being heifers, and four of them only two years old at that, was 12 lb. 5 oz. and a fraction per head, for the week.

I am advised by Mr. Shepard, that for the purpose of testing the merits of these breeds for the dairy, he will select some five or ten cows from this Ayrshire herd, and place them for some one week next autumn, or next June, against an equal number of any *other pure breed* of the same respective ages, owned by any one breeder or dairyman of the State. The cattle to feed upon grass only during the week, and for two weeks prior to the trial. The time to be notified through the *Country Gentleman.* The time to consist of seven days, fourteen morning and evening milkings, each milking to be weighed, and each day's product churned and weighed by itself, and the final test result to be in the aggregate, containing not over one ounce of salt per pound of butter.

Another writer, in the same journal, gives the following account of his experiments:

SHORT-HORNS AS MILKERS.

I never owned an Ayrshire; but for the last fourteen years, having milked short-horn grades, I send you the results of several trials made with them, previously remarking, that as we intend to make only just sufficient butter for family use, we have been at no trouble to prepare a suitable "milk-house."

Cow No. 1, fourteen years old, made in one week, in the month of June, 9½ lbs. butter—again in October, made 9 lbs. 2 oz. same time; this cow was always fat.

No. 2, three years old, made at the rate of 12¼ lbs. per week.

Nos. 1, 2, and 3, made 33 lbs. in one week of the month of June.

No. 4, three years old, with her first calf, made 11 lbs. 2 oz. in six days—the feed of these cows was grass pasture, and *nothing else.*

Gipsey 2d, thorough-bred, in the month of January, on hay feed, no roots or grain, gave 24 quarts of milk per day. The only trial ever made of the *quality* of this cow's milk was during the season of 1850, when her calf was allowed to take one half of her milk, no more; he weighed at seven months old, 700 lbs.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

CULTURE AND GROWTH OF THE PEACH-TREE.

MESSRS. EDITORS:—Your correspondent, "R. B. H.," on p. 270, says, in closing the penult paragraph, "The stone of a peach from a seedling is little, if any, less certain to produce its like, than is Indian corn." I dissent. I have been planting seed of corn and peaches these many years, and have seen very many-fold more varieties of the latter than of the former. I put out some fourteen or fifteen years ago a young orchard of over 500 trees, and thought I had saved the stones of the choicest varieties I could find. They were put out by rule, cultivated well, staked, &c., &c. In 1843 to 1845, I cut them all down, and began to bud, because not over fifty or sixty trees were of any account, and only three or four varieties at that; the most of the good ones ripened at the same time. I had a very superior yellow free-stone, ripening 1st of August, of which I planted some twenty-five seed, and have fruited them. They are all yellow, ripening within ten days of each other, some with globose glands, uniform and serrate, giving me some half dozen varieties, and not one fit for the orchard. From some fifty trees of that variety, I have had but one to equal the parent.

Where did the countless varieties of peaches spring from, Mr. R. B. H., if the peach is as certain as corn? I have been engaged in growing corn these twenty-five years; housed this year 5,000 bushels; and I dare you or any man to find over six distinct varieties of that, though I planted a mixed variety. Such sweeping remarks injure a good cause. They deter young men from progress. Some varieties of the peach will grow the same fruit, yet not always so good. The Heath, Columbia, &c., illustrate. By planting 100 pits of the Heath, you will get perhaps a dozen equal, and of a million, perhaps not one superior. Of the Columbia, you will get color, time of fruiting, the peculiar mark on the stone, the color of limbs, and shape of tree, but no better fruit, and ten to one if it is as good. I have in my orchard some 150 varieties, and though in possession of the choicest of earth, I continue to grow seedlings, hoping to aid the cause. I have given forth two of our best varieties, as a small return for the dozens I have been blessed with from others. I have peaches usually as late as November, and as early as the middle of June. I hope I may be excusable for defending my favorite pursuit.

MELACATUNE.

——, *Miss., November* 21, 1853.

[NOTE.—We do not wish to take this interesting question out of the hands of our able contributors, but hope to hear from R. B. H. and others also. Yet we beg leave to suggest the *possibility* of a mistaken construction of the language of R. B. H., whose position was that *native* peaches would generally produce their own kind, and that the natives were or might be equal to any foreign. Possibly, the opposite results of the experiments of wise men may be the effect of a difference in reference to this fact. But we hope the subject will be thoroughly treated by these, and also by others equally able.—EDS.]

SHEEP-BREEDING.

WE commend the attention of sheep-breeders to the subject discussed in the following paragraphs, which were published in the *Ohio Cultivator:*

"Now is the time for flock-masters to look well to their ewes, selecting such as possess those characteristics which they desire to perpetuate, and rejecting those that are fit for nothing but the butcher. Sufficient attention is seldom given to this point, for though it is perfectly true that the male, in all animals, is of more importance than the female, yet for the production of perfect animals, it is absolutely necessary that both male and female be well bred, and, if not individually perfect in every point, the conformation of the *two* should be such as, when combined, form the animal desired. Good breeders understand this matter well, and assort their flock into several lots, procuring a buck for each lot with those points strongly developed in which the ewes are most deficient. But a vast proportion of farmers who keep more or less sheep, neglect this matter altogether. They often procure a buck, which, however useful he might be for other flocks, is totally unfit for that which he is intended to serve. Again, in a large flock of ordinary sheep there are often two or more kinds of ewes with characteristics entirely different from each other; hence, a buck that might be beneficial to the one would be altogether unsuited to the other, and more likely to propagate imperfections than to neutralize them; yet how common is it to let the whole flock run together, and have the indiscriminate use of the same bucks. With judicious selection any of our ordinary heterogeneous flocks might, in a few years, be vastly improved without any more expense than is incurred by the present heedless, careless, and unprofitable system of breeding.

The present high price of mutton has led many, in this vicinity at least, to cross their common merino sheep with a Leicester or Southdown buck, for the purpose of obtaining good-sized lambs for the butcher. We believe good mutton will always command a good price, higher than at present, and that this system of crossing fine-wooled with mutton sheep, will be the most profitable species of sheep husbandry. We do not like to recommend any one to breed from such a cross, yet we are not sure but a little Southdown blood would improve the size, constitution, and fattening qualities of our *common sheep*, without materially injuring the quality of wool.

The time to place the bucks with the ewes depends upon the locatio, then breed, and the object of the breeder. As a general thing, it is not desirable to have lambs before there is some grass for the mother, and as ewes go from 22 to 23 weeks, it is easy to calculate in any individual case. In Western New-York, the first of November is considered best. At this season-grass is scarce and innutritious, and as it is particularly desirable that ewes be well kept while the buck is with them, it will be advantageous to give them a little clover, hay, oats, peas, or oil-cake, and to keep them at night in dry, warm sheds. It is well to give the buck a little extra grain or oil-cake separate from the ewes. Care and attention to the flock at this season, and during the winter, will be amply rewarded by an increased number of large and healthy lambs, and by more wool of a superior quality. Remember that warmth is equivalent to food, and that salt and water are essential to health, while regularity in feeding is very desirable."

Another writer, in the same paper, has well expressed an opinion we have long entertained, in reference to horns on sheep. We would extend the inquiry to all animals. Horns on the living are good for nothing but to wound and destroy. We, hence, go for *short-horns*, and eventually, for an improved breed with no horns at all. For wild animals, they are useful for defense; on domesticated, they are good for nothing. The writer referred to, says:

"There are two reasons which induce me to offer a few remarks to the farmer on the subject of polled sheep. One is, I believe, a decided advantage may result to the wool-growing community from a consideration of the subject. The other is, I am now compelled to buy horned rams for a cross of blood, because I cannot get such polled ones as I desire, that are not nearly allied to my own stock.

I believe that nearly all middle and long-woolled sheep are polled, while the males of the finer woolled varieties are usually horned.

I have for many years regarded horns on sheep in a domesticated state, as not only a useless, but a troublesome and expensive appendage; and in 1845, fortunately getting hold of a very superior polled ram, I commenced to try to breed a flock which should be hornless. I proceeded by not only selecting polled rams, but so far as practicable, perfect polled ewes also; and here let me remark, a ewe that appears to the casual observer to be without horns, is not always a perfect poll. There must be a cavity, instead of a fullness, where the horn usually attaches, or she cannot be depended upon to produce polled lambs with certainty, although the sire be polled.

The result of my eight years' labor is, I do not now have but one horned ram lamb in about ten or twelve; and I do not believe that I have sacrificed one iota in form or constitution, or in quality or quantity of wool.

Some of my objections to horns are briefly as follows:

1. The substance that goes to make horns is the same that enters into the composition of wool.

2. If rams are polled, you may let all the pure-blooded ones run *entire* to the age of one or two years, and then, any that are rejected as rams, will make as good wethers as if gelded while lambs.

3. Where horned rams run in a flock in summer, they are sure to fight, and if they do not kiil each other outright, loose the skin about the horns, become fly-blown, and without constant care, more or less of them die.

A gentleman, who has been engaged in wool-growing over twenty years, and who keeps near one thousand sheep, told me he annually lost enough rams from these causes to pay all his taxes.

4. Horned rams frequently strike ewes in the side, bruising them, loosening their wool, and occasionally causing them to cast their lambs.

5. You can shelter and feed about double as many polled as horned rams in a given space.

In conclusion, I would say I am always open to conviction. Has any one a reason why sheep in a domesticated state should have horns?"

EXPERIMENTS WITH SPECIAL MANURES IN SCOTLAND.

The account of these experiments is given in one of the agricultural journals, "The Quarterly Journal of the Transactions of the Highland and Agricultural Society of Scotland." They appear to have been very skillfully planned, and carefully carried out.

The experiments, fifty in number, were made upon clover and rye-grass, barley and wheat, and three varieties of turnips. The fertilizers experimented with were yard-manure, dissolved bones, nitrate of soda, sulphate of ammonia, muriate of ammonia, refuse saltpetre, Peruvian guano, sulphate of potash, sulphate of soda, sulphate of magnesia, Richardson & Currie's manures, and disinfected dry manure. These various substances were used separately, and in various combinations. By the side of each application, a plot of the same kind of soil was left unmanured, with which the products of the manured portions were compared. Great care appears to have been taken in securing uniformity of soil and treatment, and in making an accurate estimate of the products, both of grain and straw, and of roots and tops. These special manures were only used in top-dressing, and were in all cases sown broadcast. In some cases, the whole dressing was applied at one time, and in others it was divided into two and three portions, and applied at successive periods.

Experiments on Grass.—The soil selected for these experiments was of moderately tenacious clay, thoroughly drained three years previously, and manured the preceding year with sixty loads per acre of "lime compost," the seed being sown with barley. The profit and loss per acre is calculated by estimating the value of the excess products gathered from a manured imperial acre, over those gathered from the ground similarly treated, only not manured, the cost of cultivation being deducted. The following table is the result of the experiments most noticeable, the pound-sterling being reckoned at $5:

Applied per Acre.	Net Profit per Acre over Unmanured Land.
115 lbs. Sulphate of ammonia, 115 " Nitrate of soda,	$14 25
100 " Dissolved bones, 130 " Nitrate of soda,	9 15
115 " Muriate of ammonia, 115 " Nitrate of soda,	8 45
40 " Nitrate of soda, 60 " Sulphate of ammonia, 70 " Sulphate of potash, 40 " Sulphate of magnesia, 20 " Sulphate of soda,	7 42
115 " Refuse saltpetre, 115 " Sulphate of ammonia,	6 14
115 " Dissolved bones, 115 " Nitrate of soda,	5 95
	Loss per Acre.
230 " Sulphate of potash,	3 48
100 " Dissolved bones, 40 " Sulphate of magnesia, 70 " Sulphate of potash, 20 " Sulphate of soda,	1 80

Experiments on Barley.—The soil, like the preceding, clay, with an impervious sub-soil, and thoroughly drained. Among the results reported, were the following:

Applied per Acre.	Net Profit per Acre of Manured over Unmanured Land.
88 lbs. Muriate of ammonia, 142 " Nitrate of soda, 38 " Saltpetre refuse,	$14 09
142 " Muriate of ammonia, 88 " Nitrate of soda, 38 " Saltpetre refuse,	10 42
38 " Muriate of ammonia, 88 " Nitrate of soda, 142 " Saltpetre refuse,	6 85
142 " Sulphate of ammonia, 88 " Sulphate of potash, 38 " Sulphate of magnesia,	1 87
100 " Dissolved bones, 134 " Nitrate of soda, 34 " Sulphate of magnesia,	1 86
112 " Dissolved bones, 40 " Sulphate of magnesia, 50 " Sulphate of potash, 34 " Sulphate of ammonia, 52 " Nitrate of soda,	1 27

32 "	Dissolved bones,	1 00
116 "	Sulphate of ammonia,	
75 "	Sulphate of potash,	
25 "	Sulphate of magnesia,	
		Loss per Acre.
100 lbs.	Dissolved bones,	3 94
134 "	Sulphate of potash,	
34 "	Sulphate of magnesia,	

In the experiment last cited, the loss arose from the high cost of the manure used, which exceeded the value of the increase of the vegetable product.

Experiments on Wheat.—The following are some of the results reported, the soil being the same as in the experiments with barley. The preceding crop was potatoes, manured with 30 to 35 tons of home-dung, 60 cart-loads per acre of lime-compost being applied before the wheat was sown.

I. DIVISION.

Sulphate of Ammonia per Acre.		Net Profit per Acre.
74 lbs.	May 18th,	$30 02
74 "	May 30th,	
76 "	June 9th,	
224 "	May 18th,	27 27
112 "	May 18th,	4 00
112 "	May 30th,	

II. DIVISION.

Nitrate of Soda per Acre.		Net Profit per Acre.
74 lbs.	May 18th,	$38 70
74 "	May 30th,	
76 "	June 9th,	
224 "	May 18th,	32 76
112 "	May 18th,	24 09
112 "	May 30th,	

III. DIVISION.

Sulphate of Ammonia and Nitrate of Soda in equal parts.		Net Profit per Acre.
224 lbs. of mixture,	May 18th,	$8 25
74 "	May 18th,	4 45
74 "	May 30th,	
76 "	June 9th,	
112 "	May 18th,	3 25
112 "	May 30th,	

IMPROVEMENTS IN THE SOUTH.

In many parts of the Southern States, an increasing energy, in connection with the various industrial pursuits, is conspicuously manifest. This is well; it is more, it is glorious. But lessons of warning may be learned from the North, as well as examples of enterprise. The North has thrown away millions in useless projects. One such case has just now reached "the beginning of the end." One of the principal railroads in Vermont is surrendered into the hands of its mortgagees, whilst the other scarcely survives. Perhaps the advice we are about to give may partake, to some extent, of the character of certain discussions of "fundamental" doctrines in theology, as to the necessary priority of certain acts and emotions; but still we are quite sure that by far the easiest way, if not the safest, is to show the actual necessity of the improvement proposed. If success is only prophesied, there may be found many unbelievers. But show the public the business which is to support the road, and all will subscribe to its stock. Destroy the factories on the Merrimack, and what would those three railroads, now so valuable, be worth? Not forty cents on the dollar. They are now worth a large advance.

With extensive business on the line of a road, this mode of conveyance can compete even with a direct water communication. Thus the Eastern railroad, and the Boston & Portland railroad, though scarcely shorter than the route by sea, sustain themselves quite successfully. But it is by rapid traveling and cheap freights. It is also with the help of numerous manufacturing villages scattered along and near its track. The "lower" road passes through Salem, Ipswich, Newburyport, near Amesbury, through Portsmouth, N. H., and Berwick, all engaged extensively in manufactures, and some of them of extensive trade; while the "upper" road runs through or near Medford, Andover, Bradford, Haverhill, Lawrence, Exeter, N. H., New-Market, Great Falls, Salmon Falls, and Dover, to Berwick, all manufacturing towns, where the two roads intersect and are continued into Maine, receiving the freight of the extensive mills at Saco and Biddeford, and so on. No road will pay large dividends, without some such means of support.

At the same time, it is true that such facilities of transportation often create business. Factories will be built at suitable points, when they are brought into tolerable proximity to the great markets. But the location of these centres of industry is not a thing of mere accident. A large trade cannot be created merely by a railroad, but the iron track must connect something to be sold with a market equal to its necessities.

Hence, while we rejoice at all these indications of progress, as illustrating a spirit of enterprise, we also shall rejoice if no project shall be undertaken without reasonable evidence that the *stock* will find a market, after the ardor inspired by a new and hopeful zeal for improvement shall have passed away; and that the stockholders will get reasonable dividends. We rejoice, indeed, in some instances, where the public are gainers at the cost of stockholders. We know of many enterprises that sunk almost the entire amount of their first cost, which passed into other hands at a fraction of that cost, and paid good dividends on the second valuation, and now greatly accommodate the public. But when funds are scarce, such a course is ruinous to all parties.

Among the projects now exciting attention at the South, are the following: To connect Savannah, Mobile, and New-Orleans by a railroad, and another to connect Charleston and Savannah. A convention has also been recently held at Elyton, Ala., having in view internal improvements in that State. In Texas, the same subject is exciting general attention. In Virginia, rapid progress has recently been made. At the late State Agricultural Fair, a very large fund was subscribed for promoting this branch of industry. The Covington and Ohio railroad has been commenced; the Norfolk and Petersburg Railroad Company ask for proposals, and indeed, there is a general and active interest awakened on these subjects. There is a continuous railroad now built or in progress from the extremes of New-England to New-Orleans! Beginning at Augusta, Me., the lines are now built to Portland, 90 miles; thence to Boston, 100 miles; from Boston to New-York, 236 miles; thence to Philadelphia, 90 miles; to Baltimore, 98 miles; thence, on the Baltimore and Washington railroad, now in operation; the Alexandria and Lynchburg road, 160 miles long, half of which is provided for; the Lynchburg and Tennessee road, 209 miles long, of which 70 are in operation, and the rest under contract; the East Tennessee and Virginia railroad, 110 miles in length, now under construction; the Georgia and Tennessee railroad, 120 miles long, nearly or quite completed; the Charleston and Memphis railroad, under construction; the Selma and Tennessee River railroad, 250 miles long, under construction; and thence onward by several roads, now under construction, to New-Orleans, making an aggregate distance from Augusta, Me., to Baltimore, of about 611 miles, and from Baltimore to New-Orleans, about 1,250, or less than FIVE DAYS' ride from Augusta to New-Orleans.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

EAST TENNESSEE.

MESSRS. EDITORS:—It may be that many of your readers have never visited this delightful country, East Tennessee. In the recollection of many of our surviving inhabitants, it was a wilderness waste, trodden only by the savage Indian and by the deer, wolf, panther, bear, wild-cat, &c.

East Tennessee lies in lateral valleys, and on gently-rising summits, ranging from north-east to south-west, with here and there a looming mountain-cap, which seems to kiss the clouds, and along whose base there sweeps the most transparent rippling stream of pure water.

See, too, the neat, white-dressed farm-house, with its tasteful yard. See the broad-brim, quaker-like barn, covering nearly forty square rods. Look at the acres covered with clover, timothy, corn, wheat, and oats. See her forests, the earth literally clad with building-timber, and other timber for useful purposes; the poplar or tulip-tree, mounting one hundred feet in the air, without a knot or branch; the oak, with his sturdy boughs waving in the breeze, over one hundred feet from the ground, the trunk as straight as a gun-barrel, which will cleave into boards, shingles, lath, rails, &c., like a Louisiana cypress. Our forests abound in many other valuable timbers. Our hills and mountains yield largely of that very valuable root, ginseng, which is so much in demand in foreign markets. Imbedded in her hills and mountains, are inexhaustible quantities of coal, iron-ore, and last, though not least, the finest and purest marble in the known world, quantities of which are now quarried for shipment to your northern cities. Her march is still onward. Already are many of her hills razed, her mountains tunnelled, her rivers bridged, and over these, with accustomed speed, the famed iron-horse brings in the necessaries and luxuries of other lands, and carries out the rich products of her fertile soil.

Not many years will elapse ere the Old Dominion and our own Tennessee will join hands, by connecting railroads at King's Meadows, near Abingdon; and then, nearly a bee line will take us to you, the acknowledged emporium of commerce for the Union.

But what of the crops of the year 1853? The wheat crop in Eastern Tennessee is rather better and more abundant than usual. Consequently, prices are drooping. The same might be said of the hog crop; last year's prices cannot be obtained. The corn crop, in some localities, is light, but abundant in the aggregate; prices may be steady. The root crop, generally, is abundant, as are the hay and fodder crops. Oats may be said not to average so well, having suffered for want of rain in ripening. But ere long, East Tennessee must be a Germany for wheat. When our farmers learn, as they should, to sub-soil, plough, and bed their wheat-lands, then East Tennessee will yield her forty or fifty bushels to the acre. A word worthy of note to your thinking readers: "*Bed your wheat lands;*" drain them by the centres of their beds. Try it, brother farmer, and test its advantages.

With respect, A. L. B.

Mill Bend, Tenn., Nov., 1853.

DEPTH OF SOIL.—ITS IMPORTANCE.

If 50 be assumed as the value of a given soil, when it is six inches deep, its value when of different depths is estimated by Thaer as follows:

If 3	inches deep,	it is worth	38
4	"	"	42
5	"	"	46
6	"	"	50
7	"	"	54
8	"	"	58
9	"	"	62
10	"	"	66
11	"	"	70
12	"	"	74

Hence, each man may make an estimate for himself, with regard to every variety of his soil, whether the cost of increasing its depth will equal or exceed its value, after the task is completed. It is certain that all soils, in all situations, will not return the amount required to render them fertile to a considerable depth.

GATHER THE LEAVES.—IMPORTANCE OF DECOMPOSITION.

We have often urged this service, and do not hesitate to repeat it again It might be well were it written in large letters over the stable-door.

There is, however, a difference in the qualities of the leaves of different trees, which is worthy of consideration. Some decompose much more readily than others, and some contain ingredients when the leaves are green that are injurious to young plants. *Oak leaves* are of this description. They decompose slowly, and contain an astringent quality before decomposition, which is injurious to vegetation. So also the *beech*, *walnut*, and *chestnut* leaves should always be mixed with dung, and decomposition be secured before they are allowed to come in contact with vegetation. The leaves of the *alder*, *willow*, and *poplar* possess but little value as manure, but they serve a very good purpose as litter. *Reeds*, *moss*, &c., if mixed with dung when green, decompose rapidly. But if they are first dried, the process is very slow.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

WOOD AND TIMBER LANDS.

In many sections of the country, the scarcity of timber for the practical and economic purposes is presenting an alarming feature. In many portions of the country, too, the use of fuel is so fast increasing, that the inquiry, How are coming generations to be provided? is much more than an idle question. Yet the axe is still swift in its work of destruction, and, what is more lamentable, the useless manner in which wood-lands are allowed to remain, in too many instances, furnishes but poor reason to anticipate their renewal.

With many it is a practice, in getting their annual supply of fuel, to get one tree in this place and another in that, thus running over the territory of trees, and, of course, marking the whole with paths, which, if multiplied, become waste land, and occupy an alarming portion of the wood-lot. Then, again, where the solitary tree is taken, a quantity of smaller timber is broken down, so that, in fact, the getting of a single tree amounts to a clearing; and a clearing it is apt to remain; the grass comes in, and in due time, the premises exhibit the appearance of a pasture.

We are pleased to see, that with more observing and careful owners of wood-lands, a better system of things is introducing itself. Instead of practising this wasteful, ill-looking system, they commence clearing, or cutting every thing clean in a remote part of the lot, and thus, each year, working nearer home, until the whole is cut over. A new crop springs up on land thus cleared, which, if protected from animals, will, in from fifteen to thirty years, according to soil and locality, yield a heavy burthen, and again invite the axe-man to its shade. The advantages of this system are obvious. The new growth is an even one, and there is no loss of timber from high winds, as is always the case in these forests, as the new growth protects itself from their influence.

There is a great saving of lands in the matter of paths; for one path through the lot is sufficient, and, as the operation advances homeward, that becomes useless, and itself grows up to trees. The new growth shades itself, and thus retains sufficient moisture in times of drought, and also protects itself from grass and weeds. As the timber increases in size, the feebler shoots die out, and themselves become, by decay, food for those that remain.

Nature dictates the time when forest-trees should be cut off, in order, either to kill the germinating principle, or to renew themselves. We have long noticed that when trees are cut while the sap is in a half active, half dormant state, as through the freezing and thawing season of spring, or for a few weeks after the fall of the leaf in autumn, reproduction is hardly to be expected. The vital energy of the roots all runs out in the flow of the sap, or bleeding from the pores. But any time in winter, chopping may be safely performed with a view to reproduction; so too from the time of the development of the leaf to its fall. Timber cut in June, if divested of its bark, acquires, by seasoning, great firmness and durability. Wood cut in August and September, if seasoned in the open air, is more valuable fuel than that cut in March; for it has ample time for seasoning, and retains all its goodness. In addition, the growth of a season is saved by allowing it to stand over summer.

Yours truly,

December 14, 1853. W. Bacon..

SUBURBAN RAILROADS.

Among the many projects for making money, there are very few that are more successful than suburban railroads. In all large and enterprising cities, rents are high, house-lots are held at enormous prices, and the streets are crowded. All the land is used for building purposes, and the inhabitants scarcely have a yard large enough to accommodate the operations of the laundry.

In the neighborhood perhaps there are beautiful tracts of land, far more eligible as building spots, at a much lower cost, and with ample room to accommodate a large population. But there is no regular or frequent communication between this neighborhood and the city, and hence these advantages are lost, and the entire mass of people, whose business is in the city, must reside within its limits.

But connect these by half-hourly coaches, or the far more convenient railroad car, and what is the consequence? The value of the land rises, while at these increased rates, multitudes are glad to purchase and build tenements, reserving a liberal quantity of land for purposes of convenience and of health, and though the city scarcely seems conscious of any loss, a large and prosperous village has grown up in an hour.

Who has "*made* any thing" by this process? Every body who has any concern in it. The original owners of the land have received double the former value of all their land for only a portion of it; the owners of the railroad now receive liberal dividends on the cost of the road; thousands are accommodated with comfortable and convenient tenements, and breathe a pure air, who were before shut up in close and inconvenient rooms, and were surrounded by an impure atmosphere. Children would celebrate the day which brought such a boon to their bodies and their minds. Taxes are probably diminished; and ere long, there is not only a village, but a township, where lately it was silent as the grave.

Look at the villages around New-York, all of which had an origin like this. Long Island is dotted all over with them for twenty and thirty miles. Where cars cannot run, the steam-boat supplies their place. So, too, on the territory between the North and East rivers. Within twelve miles of the City Hall are some six or eight villages, where, within two or three years, neighbors' houses could scarcely be seen from any body's windows, and the aggregate population must be 12,000 to 20,000. We say to all in like situation, Go and do likewise.

SCIENTIFIC OBSERVATIONS.

Mr. Joel W. Andrews, of Albany, during the past month, has made a series of barometric observations from the tide-water to some of the principal mountain-summits in Rutland county, Vt. As soon as the observations are reduced to measurement, they are intended for the Rutland county map. By an observation of the sun's meridian latitude, with a sextant and quicksilver horizon, the latitude of Killington Peak is 43 degrees, 46 minutes, and 14 seconds North.

The distribution of vegetation in a perpendicular direction from tide-water to the summit of some of these mountains is also noticed.

At an elevation of about two thousand feet above the level of the sea, the chestnut and walnut disappear. Five hundred feet farther upward, oaks and elms become scarce. Thorn-bearing plants cease to grow at an elevation of about two thousand feet; although some of the same kinds are here found that grow at lower latitudes, yet they become smoother, and do not produce their thorny stalks.

The flat-bladed wild grasses grow at this elevation, but lose their sharp, wiry edges, which are produced on the low grounds.

At this elevation, the large forest trees grow to perfection, of which the beech, birch, and rock-maple are the most abundant of the leaf-bearing trees.

A standing rock-maple was measured with a sextant, one hundred feet high, and nine feet in circumference at its base. At an elevation of about three thousand feet, evergreen trees, or those yielding gums, are found in the greatest proportion, and continuing their upward course, diminishing in size until they find their upper limit at an elevation of about four thousand feet above the level of the sea, as indicated by the barometer.

Among the leaf-bearing trees, or those that shed their leaves in autumn, the white birch is here found to have the most extensive range, in a perpendicular direction. It is traced in this latitude 43 deg., 46 min. North, from the level of the sea to an elevation of about four thousand feet, where it finds its upper limit. Here commences the region of mosses and wild grasses, which struggle their way upward about one thousand feet further, as observed on the White Mountains, in New-Hampshire, by Mr. Andrews, in 1850. From thence upward, all vegetation ceases to grow, and the bare granite rock, in broken masses, piled in confusion six thousand five hundred feet above the level of the sea, to the line of occasional snow throughout the year.

MINERALS IN NEW-MEXICO.

We have in our possession, says the *St. Louis Intelligencer*, two specimens of ore from the *silver mine*, near Dona Ana, which is now being worked very successfully by Mr. Stephenson, though without that outlay of capital, which is necessary for the large product that is yielded by many of the mines of Mexico. We understand that, by different channels, a large number of similar specimens have been sent into the States, with a view to analysis by competent persons. Of the results of this analysis, those interested in the mines have no doubt, for the reason that they have a practical knowledge of silver mining, and are actually, by the rudest process, extracting considerable quantities of the metal from these ores. The chief object had in view by them and others in New-Mexico, who have sent in these specimens, is, that capitalists in the States, being satisfied that there are rich silver mines in the country, may have their attention turned to it. The range of mountains where this ore is found, is quite extensive; and no doubt exists among persons well qualified, from their knowledge of the silver mines of Mexico, to judge in this matter, that those mountains are stored in great abundance with this precious metal.

Besides these specimens of silver, we had shown to us, by Major Greiner, a quantity of quicksilver, weighing nearly a pound, which had been *scooped up* at Los Truches, near the Del Norte, about forty miles north of Santa Fé. This metal is found in globules, and sometimes in little pools near the surface, at the roots of shrubs, or on the earth, in damp spots underneath the rocks and stones of the neighborhood.

The mineral wealth of New-Mexico, as we have again and again contended, is greatly undervalued. The estimate put upon that territory by our countrymen does no sort of justice to its resources. A railroad through it would develop those resources to an extent, which, if predicted now, would be believed by nobody, save those who have been in the country and impartially examined it.

MINING IN NEW-ENGLAND.

The present age is marked with many revolutions. The civil governments in the old world have not experienced a more thorough overturning than have the arts, and trades, and other industrial pursuits, in our own country. Every thing is changed. Not only are new manufactures introduced, but the old ones are so differently managed that they are not really the same thing, except in their products. For example: a worker in tin and sheet-iron of twenty years ago, performed all his labor with the hand, and a hammer, or wooden mallet. This was literally true, not only with the simple joint of stove-funnel, but from this, to the most highly-ornamented household utensil. Now, a good workman in tin or iron is actually unable even to make a joint of funnel merely with the mallet. He must have his improved machinery, or he cannot work.

An almost equally thorough change has taken place in the kinds of work performed.

The first discovery of coal in this country was hailed as important; and well it might, for the mining of coal will add more to the essential wealth of the country, than all the gold that will be dug for ages. But who, then, dreamed of finding coal in New-England? Our readers may remember a description of the Rhode Island coal-mines, in one of our numbers of last year. These beds extend into Bristol county, Mass., and have been worked there even longer than in the Island State. Prof. (now President) Hitchcock says, in a recent report, "that the whole of this tract, embracing not less than five hundred square miles, is a genuine coal-field, that has experienced more than usual metamorphic action." Whether this *metamorphosis*, which is described as both mechanical and chemical, is so extensive as to materially injure the *coal* for mining purposes, is not yet fully proved. Indications of coal have been met with in the town of Mansfield, Foxboro', Wrentham, Raynham, Bridgewater, Taunton, and Seekonk, in Massachusetts; and in Cumberland, Valley Falls, Providence, Cranston, Bristol, Portsmouth, and Newport, in Rhode-Island. In some of these localities there are several veins, and they vary in thickness from four inches to 6, 9, 10, 13, 21, and 23 feet.

More recently, other mines, of considerable promise, have been discovered. The County of Hampshire, Mass., contains a mine, supposed to be valuable, and embracing an area of about 10,000 acres. It lies between the branches of a small river, emptying into the Connecticut, and is within the townships of Northampton, East Hampton, Southampton, and West Hampton. Lead, copper, and silver have been found, and in considerable quantities, but which is most abundant, and the value of the mine for working, have not yet been ascertained. These mines are said, by practical and scientific gentlemen, to give good promise.

Charles T. Jackson, M. D., geologist and chemist, says of this mine:

"Enough has already been disclosed by mining operations to encourage the construction of a regular working mine with its proper shafts and levels. The certainty of a valuable metalliferous lode is now proved, but we cannot yet say whether lead or copper ore will ultimately predominate in the vein; for, although at present the lead ore is the principal mineral raised, we perceive that the proportion of copper ore increases as the vein descends into the rocks. The copper ore will probably form so important a part of the lode as to warrant its being collected separately from the lead."

The President and Directors of the Company, in their report, say:

"The engine-shaft is now sunk to the depth of fifty feet, going down in a vein which has yielded thus far a quantity of ore, considerably exceeding in value the entire amount expended on the mine, and the vein is increasing in richness as it goes down. This, the directors regard as sufficiently encouraging to warrant the erection of an engine of sufficient power to drain the mine and crush the ore, with a view to extensive mining operations, when the mine shall have been fully opened, and a mining-ground obtained for a large force. The engineer is now driving a level to cut the vein at the depth of ninety feet, which opens near the stream at the base of the hill, and through this level the ore may be brought out for a long time on the tram-road; he is also building a stone dam on the stream, for the purpose of providing a head of water for washing the ore. The whole work is prosecuted with great vigor."

We learn that a scientific corps is making very extensive and careful examination of that entire section of country, exploring further North, through the valley of Lake Champlain, and also at the White Mountains. It is supposed that tin mines exist in the latter district.

It has long been the popular belief that in the mountainous regions on the New-York side of Lake Champlain, both silver and tin are to be found. Some six or eight years ago, we were shown some specimens that were thought to resemble the latter metal. We were not at all impressed by the specimens shown us, and still, from the descriptions given us of other rocks dug from the mountains, we were almost inclined to think the mineralogists of that region had ridiculed the *notion* rather too hastily. On the Vermont side of the lake, in the county of Windsor, at Bethel we believe, we have seen indications of tin, though no attempt has been made to open a mine. In several sections of the State, copperas is abundant. The suphuret of copper and of iron are among the most abundant minerals, leaving out their slates and marbles. The cost of transportation prevented the successful working of several mines, some years ago, on both sides the Green Mountains.

The most profitable *mines* in New-England, thus far operated, are the marble quarries of Vermont and Western Massachusetts. The entire range of mountains—the Green Mountains in Vermont, and the Housatonic in Massachusetts—abound with marble. Most of it is white; some of it is fawn-colored; while in other localities it is mixed with serpentine, which is also abundant, and thus receives a green hue, and in a variety of shades and mixtures.

At Plymouth there is a very elegant variegated marble, favorably to be compared with that from any foreign mine; but it is very hard, and, therefore, is difficult to work. In Middlebury, the white marble is of remarkable fineness. A specimen, now lying before us, will compare favorably with any statuary marble in the Crystal Palace. At Rutland, the grain is coarser, but the marble is very superior. Thousands of tons are sent to market, every year, from that one town. At Darby, further south, there is a variety of white marble, which is elastic when first separated from the quarry. If a large slab is sustained near its extremities, it bends very perceptibly. By exposure to the air, it soon loses this property. In Brandon, Rutland County, Vermont, in addition to the white and "blue" marble, they dig immense quanties of iron ore, and the "tall chimneys" are quite numerous. They also find large quantities of a yellow ochre, which possesses considerable value. In one locality, on the banks of Otter Creek, which are there quite precipitous, this ochre gives its own yellow hue to the entire mass of earth, for a long distance.

Further north, in Orleans County, at Troy, and its neighborhood, is a furnace, where large quantities of pig-iron are manufactured. This ore is, also, in connection with huge masses of serpentine, of which much of the mass of the mountain consists. In this serpentine we have found very splendid specimens of asbestos and amaranthus, the fibres of which were to be measured by *feet*. Probably no locality in the world contains more real value in its rocks than the State of Vermont. Though much has been done in the work of mining them, the beginning is scarcely made.

Our readers are aware, to some extent, of the importance we have attached to this subject. In previous volumes, we have given it a share of attention; but the interest of this department is wonderfully increased, and we purpose to devote more time and space to its consideration. In subsequent numbers we shall attempt to describe its condition in different sections of the country, and invite those, more immediately interested, to send us papers on this subject, and, if possible, to forward to us illustrations, diagrams, &c.; and last, but not least, samples of the various ores or metals, from the mines, or from sections not yet even examined. We have many specimens from Vermont, chiefly collected by ourself, but we should be glad of many more. We would like to exhibit, in our office, a cabinet of these American ores and American minerals.

A WONDERFUL PRINTING PRESS.

The New-York *Tribune* describes a printing press of wonderful capacities, just perfected by Victor Beaumont, a citizen of New-York. It says:

"The press, at a moderate rate of speed, will deliver *thirty thousand* sheets printed on both sides in a single hour! Its movement combines the original principles of Napier, which are applied by Hoe in his great press, with some new and beautifully simple arrangements and devices of the inventor. It has a large central cylinder like the Hoe press, on which are fastened the forms for both sides of the sheet to be printed. The type are held fast by Hoe's patent column-rules. The paper used is a continuous strip or band, dispensing with men to feed the separate sheets as in other power-presses. This strip or band, Mr. Beaumont arranges very ingeniously; he avoids the inconveniences inseparable from having it in the form of a roll, by laying it in a pile, folded backward and forward like a piece of broadcloth; one end of this pile is put into the press, which then draws its own supply without tearing or straining the paper till the whole sheet has passed through. As there are no feeders, room is obtained for additional printing cylinders; a moderate sized press will have twelve of these, and will require three hands to run it, two of them being employed in carrying and looking after the paper. Each twelve-cylinder press will work four of these continuous sheets at a time, or one to each three of its cylinders. Each sheet will pass twice through; at its first passage, one of its sides will be entirely printed, the forms of the newspaper being impressed on it alternately. As it comes out, the machine lays it back again in the same sort of a pile, so that when it is done, the attendant supplies its place with a fresh pile, and then carries it to the proper spot for it to be taken up and passed through the second time, which prints the side left blank before. Then the mechanism passes it along to the knives which cut the sheets apart, while another contrivance puts them in neat piles ready for the carriers. These knives are very ingenious. A serious difficulty has been experienced in other machines designed to print a continuous sheet, from the fact that an ordinary knife cannot be relied on to cut paper which is wet enough for printing. This inconvenience Mr. Beaumont obviates by making his serrated, or saw-shaped knives with long and acute teeth. The points of the teeth easily pierce the paper, and once having obtained an entrance, the cutting is completed in an instant."

IMPROVEMENTS IN FARMING.

Farmers are an "injured race" in more than one respect. They are sometimes called the mum profession, or those that have to get lawyers to make all their speeches, and sometimes the stand-still profession, or those who make little or no progress in their art. These both are calumnies. We have elsewhere defended them against the first, and now have a word to say in reference to the second.

We deny that they are of that dull and stupid class, which have eyes but see not, and ears but hear not. They see and hear too much to believe all that is addressed to them by their volunteer overseers and self-created supervisors, and are very unwilling to risk what they have earned by hard labor, on the mere recommendation of those who claim a per centage for their instructions. And this is right. We love the staid character of many of our rural districts, who know of many of the modern *isms* only by report. They guard safely what they get, and they get what they can by those means which they consider reliable.

But have they not made great progress in their art? Unquestionably they have. And for our first witness on this point, we will call that old plough that we all remember in our grandfather's out-house, if not in our father's, and which is, to-day, on exhibition in the north-east gallery of the Crystal Palace. Yet it stands "mum" by the side of the modern plough, as it does in that gallery, and though it was the property of no less a man than Roger Sherman, of Connecticut, the defendant stands acquitted of the charge of "no progress." Then call up the cultivators, and hoes, and forks, the carts and wagons, the shellers and reapers, the threshers and cleaners, of recent times; those of times gone by are among the things, most of them, not only that *are not*, but *never were.* It cannot be said of them even as was said of Troy, Troja fuit,—and again the defendant stands acquitted.

Nor is this all. In the saving of and in the preparation of barn-yard manure, there is a great improvement, enough to affect materially the value of the crops. New manures, before unused, are often and generally turned to account. Composts are prepared. Mineral manures are purchased; the phosphates, the super-phosphates, and the improved super-phosphates; the guanos of Peru and other countries, all are modern and even recent. It is not long since our farmers first heard the name of gypsum as a manure.

Eighty years ago bones were not used as manure, and the super-phosphates were unknown till 1790.

We are inclined to believe that more progress has been made in these matters than we find in almost any other trade. For we have just begun to enumerate the improvements of the greatest value. Improved implements, as means, are important. But *improved crops* and improved stock are of still greater importance. And look at the varieties of pears and apples, and other fruits, on the tables at the shows of every county in the States. Berkshire rivals even Norfolk, and Western New-York stands up unabashed before either, while Iowa, and other States far west, are already gaining ground upon the older sections of country. In a southern tour, within a few weeks, we were shown some apples that were raised in and brought from Iowa, as specimens, that could not be beaten by those on the tables of the Massachusetts Horticultural Society.

The sales of imported animals for the last few years in every section of country, are ample testimony as to the improvement of hogs, sheep, and cattle.

Notwithstanding all this, one of our *excessively* scientific journals declares that no trade or calling has made so little progress.

But still further improvements are made in the construction of their buildings, and in the increased comfort thereby secured. All such improvements, however, are but incidental. They grow out of a deep conviction that a farmer is some body, and can afford to have domestic enjoyment as well as others.

PREPARING POULTRY FOR MARKET.

"How shall I dress and pack my turkeys, geese, ducks, and chickens, to send to market?"

That question is thus answered by the *Tribune:*

Hang your turkeys up by the heads, and cut the jugular vein. Pick them dry. Remove the intestines, and wipe inside dry. If you use water at all, do it by holding the bird by the legs, and letting an assistant pour the water through them. Wipe, and hang them up in a cool place twelve hours, or till thoroughly dry. Serve geese, ducks, and chickens the same way. Do not scald them, unless you would like to have them spoiled. Take a box that will hold 250 chickens, close packed. Put only 200 in it. The remainder of the space fill with RYE straw—clean rye straw—no chaff. Do not use wheat straw, or oat straw, if you can avoid it. You may use coarse, clean, marsh hay. A wisp of straw in each bird will be advantageous. Nail up your box tight, and hoop strong, and mark plainly what is in it, and to whom it is sent. Send only in cold weather.

"To whom can I send my poultry for sale?"

We cannot tell you. Look to the advertisements, and make your own selection of a commission merchant. You had better send by express, and take a receipt of the agent, guaranteeing the delivery of the box in three days in this city; and thus any body and every body, who raises or buys chickens, along any of the great western railroads, may send them to this high-priced market during all the cool months of the year.

THE GREAT EXHIBITION.

Since our last issue, some changes have been made in reference to the management of this vast collection of mechanical and artistic products. The exhibition, as we now understand it, will remain open so long as its proceeds are remunerative. The various articles that may be purchased will be delivered at once, and the Crystal Palace, for the month of December, and thereafter, has been, and is, a huge and splendid bazar. We are not certain that this arrangement will materially affect the extent of the show, as new goods will replace those removed, while a change will, to some extent, heighten the interest of repeated visits. But we exceedingly regret that so little has been done by all the journals of the city and country, to show up the inventions of the machine arcade. Though less extensive than it should be, it is a very good collection of mechanical ingenuity and skill. Many of the machines exhibited have been published elsewhere, but there should be a good "picture of the machines of the Crystal Palace."

But we must proceed with our account of this rich show, and we commence by a short description of

THE GOBELIN TAPESTRY.

We have often been asked what there is in this which is so peculiar, and which renders it so very expensive. We are now able to give a more particular account than we have heretofore, by the perusal of a long and instructive paper, on this subject, in the last number of *Putnam's Illustrated Record.* This number, by the way, is very rich in its illustrations, and contains much valuable matter in its text. Limited as the largest journals are, compared with what is required to describe so large a collection, Mr. Putnam's *Record* will be very serviceable, when completed, as furnishing individual samples of large and various classes of goods. It deserves a far more liberal patronage.

The Gobelins, two brothers, Jean and Gilles, were eminent dyers. They were natives of Rheims, and in the time of Francis I. they took a small house in the Faubourg St. Marcel, and, by persevering industry and a careful application of their knowledge of chemistry, then so little understood, they surmounted all obstacles, and, by the beauty and firmness of their colors, at length secured a very extensive and profitable trade. The wealth thus acquired was invested in lands and houses, and they erected "one of those quaint, unsightly edifices," occasionally seen in the neighborhood north of Notre Dame, which was nick-named "Gobelin's Folly." This title was changed, by a royal edict, to that of the "Royal Manufactory of the Gobelins."

Their successors, the brothers Cannaye, added the manufactory of tapestries to their trade of dyers. These were succeeded by a Dutchman, named Gluck, and Jean Liansen, who first used the high-loom in the manufacture of tapestry.

The weavers of tapestry had been divided into two classes, one using the high-loom and known under the title of the weavers of the high-loom, or fine drawers; the other, under that of weavers of counterpanes. By a parliamentary decree of Nov. 11, 1621, the union of these two was effected, and their letters-patent were granted by Louis XIII., in July, 1636.

The earliest mention of tapestry occurs in an edict of the Chatelet in Paris, in 1295, which authorizes the establishment of a manufactory of the tapestry of the high-loom, &c., &c.

Having repaired and embellished the palaces of the Louvre and the Tuilleries, and other royal residences, Colbert "next bethought himself how he could furnish and decorate them in a style corresponding with the magnificence of their architecture. With this view, he called together all the eminent artists and workmen who were scattered throughout the kingdom, and, by splendid offers of pensions and privileges, induced most of them to enter into his plans. He contemplated uniting these different branches of industry into one vast establishment, and placing it under the direction of some capable officer, to be named by the king." To secure the permanent success of the enterprise, he induced Louis XIV. to purchase the old hotel of the Gobelins, in which a manufacture of tapestry was still continued. In November, 1667, by the king's edict, was created *The Manufacture Royale des Meubles de la Couronne.* Le Brun, his first painter, was made director; and, by means of immunities, privileges, &c., he secured the services of men of great and lasting reputation. One of them was Sebastian le Clerc, the author of the well-known engraving, *Mai des Gobelins*, designed for a permanent May-pole in the court-yard of the establishment. The base of the pillar forms a pedestal, 21 feet in height; above it is placed an oval medallion, surmounted with palms, on which Virtue is seen trampling on Ignorance and Envy. Beneath is a figure of History inditing its records on the back of Time.

Artists from the manufactory at Brussels, who had become famous for their copies of the cartoons of Raphael and Jules Romain, were induced, by liberal offers, to engage with Colbert. The best painters were employed to compose pictures, to serve as models for tapestry.

It is not strange, therefore, that, in those days so notable for the love of ornament, these products of art were sought after throughout Europe.

In 1694, however, the establishment began to decline. Through the want of funds, the king's orders were suspended, and the number of employées was greatly reduced. In the reign of Louis XV., the establishment was temporarily closed, but was again opened for the execution of some orders from the king, for decorations for the royal residences.

In 1791, the establishment was placed on a different footing, the workmen being paid by the year. This change has improved the quality of the tapestry. Now, the artist makes the warp himself and forms his own designs, and selects his own colors, though the whole is under a single superintendent, and the artistic details are confided to an experienced painter.

The high-looms now are exclusively employed. "Two instruments suffice to work this loom, the comb and the needle. The artist places himself before the loom, separates with his finger the threads of the warp, in order to see the design, and taking the needle, charged with the color he requires, passes it between the threads, after raising or lowering them by means of the treadle, upon which his feet rest. He then presses down the silk, or wool, he has placed, by striking it with his comb. The needle is generally made of ash and is from 18 to 20 centimetres (inches) long. Its head is round, and it terminates in a blunt point. The body is hollowed out, in order to contain the worsted or silk. The comb is made of ivory, somewhat like an iron wedge for splitting wood; is 15 or 16 centimetres in length; its width at the top, 5 or 6, and at the bottom 4 or 5. The bevelled end is composed of 17 or 18 teeth, separated by narrow intervals, through which the threads of the warp pass."

The time required for the execution of a piece of tapestry varies, of course, according to the size and the difficulties of the picture; but it is estimated, on an average, at about a square centimetre in a year. The value set upon a metre of this tapestry is about 3000 francs. The number of workmen employed is about 120, and the annual expenditure, which is charged in the civil list, is near 300,000 francs.

The dyes of the Gobelins are as renowned as its tapestry. This superiority is owing, principally, to the skill and experience of those employed in this department.

The productions of the manufactory of the Gobelins, as those of Beauvais and Sevres, are exhibited once in two years, at the Louvre.

The following is a list of these tapestries, exhibited in the Crystal Palace, with the prices (in francs) at which they are valued.

GOBELINS.

"Autumn," after Lancret, executed in 1849, by M. Maloisel -	14,000
"The Wolf and the Lamb," after Desportes, by M. Thiers, in 1842, and "The Hound and her Companion," after Desportes, by M. Prevotet, in 1842, - - - - - - - - -	8,500
"Subject from the Chase and Still Life," after Desportes, by M. Hypolite Lucas, - - - - - - - - -	20,000
Two seats and backs for chairs, from designs by M. Godefroy, executed by Messieurs Renard and Gouthier, - - - -	2,500

BEAUVAIS.

"Combat of the two Goats," after Audrey, by Chevalier, - -	4,000
"The Skaters," after Lancret, by same, - - - - - -	6,000
Landscape, after Desgoffes, by Auguste Melisse, - - -	8,000
Three leaves for a screen, after Audrey, by Chevalier, - - -	20,000
"The Reading Lesson," after Bouchet, by Chevalier. - -	2,500

SEVRES PORCELAIN.

We have repeatedly referred to the elegant show of M. Lahoche. We have done so because his is, at least, *one* of the most elegant courts in the Crystal Palace. But we refer to it again for the purpose of giving some information in respect to these wares, which we could not find space for, conveniently, at an earlier issue.

Like the tapestry, above spoken of, it is manufactured under royal patronage. The first establishment of such a manufactory was in 1738, at the Chateau de Vincennes, but afterwards, 1755, it was removed to Sevres. It comprises a museum, an experimental school, and a model school. It is, in fact, a royal establishment, the inspection of which is open to all, in which are to be seen the best models, the best artists, the entire list of *materiel*, of all kinds, used in the manufacture of such wares, with the modes and contrivances by which the labor is performed.

Like the tapestry of the Gobelins, the manufacture of this ware at once reached the highest state of perfection. This was the golden age of painting, and the best artists were employed. The materials used were of the finest quality. The ornaments, which were very abundant, were brilliant and imposing, of course; partaking, in these respects, as in others, of the styles then prevalent at the French court. But no one, accustomed to exhibitions of this kind of art, can fail to see that the extraordinary elegance of the designs, and of the painting of the ancient Sevres, is unequalled in all the rich and abundant show of wares, of this description, in the Crystal Palace, and, as we suppose, in the "wide, wide world." The Dresden wares are its most successful imitators.

The modern Sevres wares are rather more substantial, or, perhaps, we should say are less frail, and less highly ornamented. It is only in the ancient, that we see imitations of pearl, turquoise, &c., in the bottom of a plate, increasing its cost two, three, and four-fold. But we know not why ornaments are out of place, or excessive, there, any more than when displayed in a table, or bedstead, or wash-stand, or in a carpet. We love beauty any where, and wish all the world could look at it, when they work and when they rest, at home and abroad. Beauty is beautiful every where. *We* like to see a handsome shoe. Still, costly as these are, they afford no profit in the manufacture. The modern Sevres is very beautiful. Some of those for sale by M. Lahoche, which are his own manufacture, are of the highest order, and they are of much less cost than the ancient ware.

The ornaments of the modern ware, as of the ancient, consist of an indefinite variety of landscapes, flowers, living figures, &c. The painting is done by artists of the greatest skill.

We must defer our continuation of the goods displayed in the U. S. Miscellaneous Department till our next issue.

MACHINE ARCADE.

We here present engravings of Gwynne's Patent Centrifugal Pump, as seen on exhibition at the Crystal Palace.

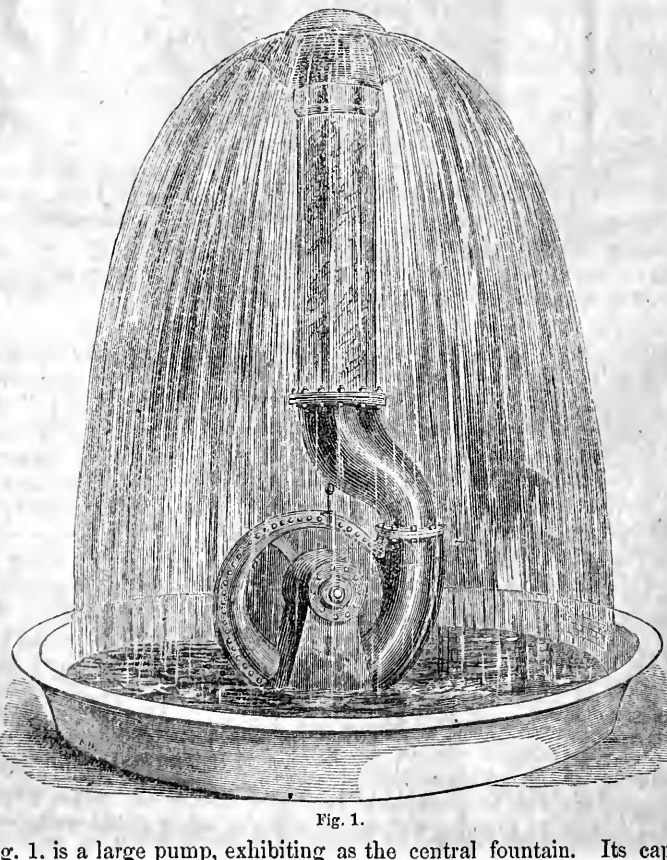


Fig. 1.

Fig. 1. is a large pump, exhibiting as the central fountain. Its capacity, with an economical application of power, is 6,000 gallons per minute.

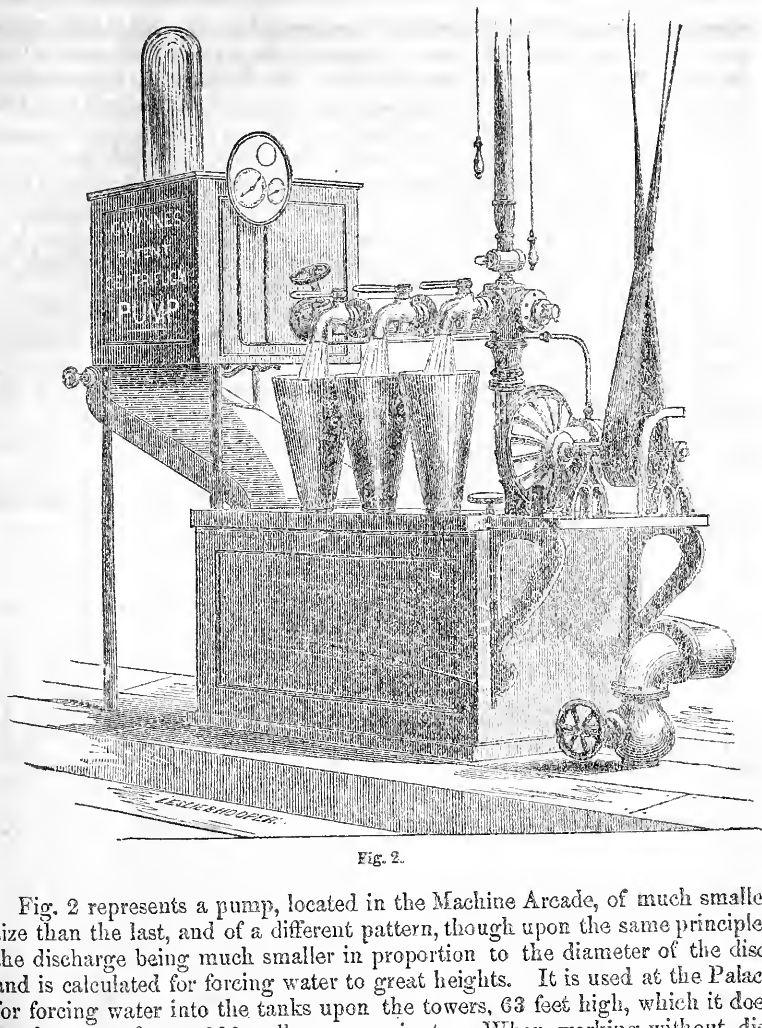


Fig. 2.

Fig. 2 represents a pump, located in the Machine Arcade, of much smaller size than the last, and of a different pattern, though upon the same principle; the discharge being much smaller in proportion to the diameter of the disc, and is calculated for forcing water to great heights. It is used at the Palace for forcing water into the tanks upon the towers, 63 feet high, which it does at the rate of over 300 gallons per minute. When working without discharge, the gauge has shown a pressure equal to a height of 180 feet. The ordinary discharge, at a few feet elevation, is over 500 gallons per minute.

Fig. 3 is a small pump, of the same pattern as the last. Capacity, 25 gallons per minute. It is used for supplying the fountain in Mr. Phalon's bower.

The principle upon which these pumps operate is centrifugal force. We have witnessed its operation upon a small scale, in the force with which water is thrown from the surface of a grind-stone when rapidly turned. If we suppose the grind-stone hollow, with orifices at the centre, into which water constantly flows, passing to the circumference from which it may as constantly escape, we shall have an approximate idea of the structure of the centrifugal pump. The revolution of the grindstone, under those circumstances, would eject with a force proportioned to its rapidity, the water nearest the issues, whose place would in turn be supplied with water from the inflow at the center, which, in

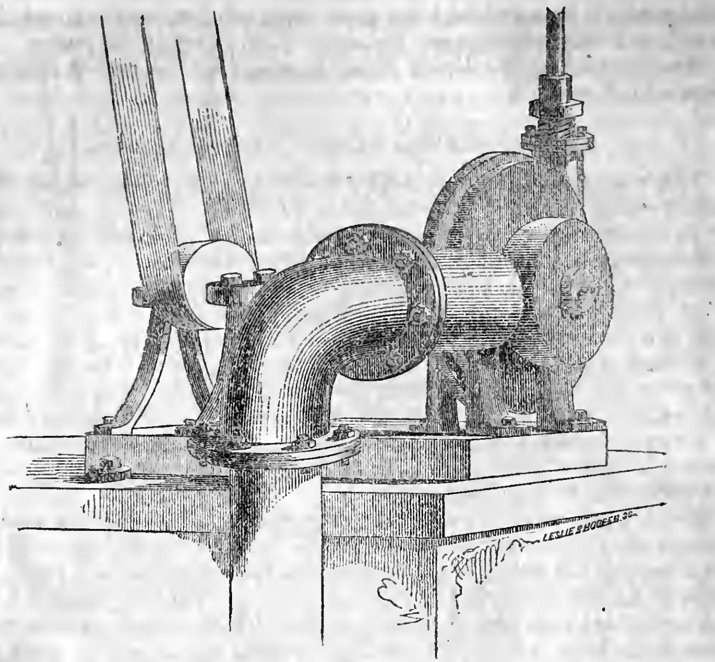


Fig. 3.

its turn, is ejected, and so on continually. In order to give to the water within the grindstone the full force of its motion, it would be necessary to have arms or veins within it, extending like radical lines from the centre to the circumference. If now, in place of a grindstone, we substitute a cast-iron disc, suspended upon a shaft with central openings, circumferential issues, and internal arms, as before supposed, we shall have the essential features of the pump. But thus far, we have only supposed the water thrown off the surface, and left to be scattered in wide profusion over the ground. To apply this profuse out-pouring of water to practical use, the disc or piston, which our hollow grindstone was made to represent, is encased in another of larger dimensions, enclosing it like a shell, and hence so termed; into this, of course, all the water is poured out, and as but one issue or discharge is provided for it here, it must, per force, seek that outlet. To this discharge a pipe is attached, and the water conveyed in any, or in as many directions as required. If the query should arise, how is the water forced into the disc at the central openings? the reply is, if the pump is placed below the head of the water, it will, of course, be kept full by the pressure of that head; if it be placed above the head, then it is first charged, that is, filled with water, which expels the air from the pump and pipe below; when set in motion, the water in the disc being thrown off, a vacuum is formed, into which the pressure of the external atmosphere forces the water from below.

The features of this pump, which entitle it to especial favor, are its simplicity, cheapness, portability, durability, and economy of power.

Destitute of valves, it is free from the liability to derangement, so objectionable in all other pumps; working with but slight contact-surface, a great amount of the friction, which, in other pumps, consumes so much of the applied power, is here avoided; the parts being all firm and compact, mud, gravel, and other matter passes through without injury to the pump.

Manufactured by the Union Power Company of the United States, 24 Broadway, New-York.

KING'S OSCILLATING RAILWAY WASHING-MACHINE.

This was invented and patented by Mr. Thomas King, West Farms, Westchester county, N. Y., and is exhibited by Mr. M. P. Coons, agent, Brooklyn. In its construction, it is both simple and substantial. It consists of a box, 24 inches square inside, and 10 inches deep, which rests upon a pair of cast-iron rockers, which also oscillate upon a cast-iron stand. The internal arrangement consists of a movable dash, perforated with holes, which, by its gravity, is made to slide back and forth, as one or the other side of the machine is elevated or depressed. The clothes are placed on both sides the dasher, the covers are closed, and the entire operation is performed simply by rocking the machine, by means of a lever attached to one side. A perforated board is attached near the ends of the machine, against which the clothes are thrown by its oscillating motion, and the weight of the slide, through which the water finds a ready discharge.

Hence, the process is twofold, consisting, first, of a repeated flow of water through the material to be washed; and second, of a sudden pressure from the weight of the slide, and of the clothes on its opposite side. Hence, the finest fabrics will not be in danger of being injured; and buttons, whalebones, &c., neither interfere with the proper action of the machine, nor are themselves liable to be broken. All sorts and kinds of fabrics may be devoted to this process at the same time, from the Marseilles-quilt to the muslin night-cap or lace-collar, and the machine "is warranted" to clean them all. It may also serve a good purpose in cleansing wool. The size above-described is competent to cleanse an amount equal to 25 yards of cotton sheeting. Twelve gentlemen's shirts, it is said, can be washed in the space of five or ten minutes. A mere child is competent to give it the motion required.

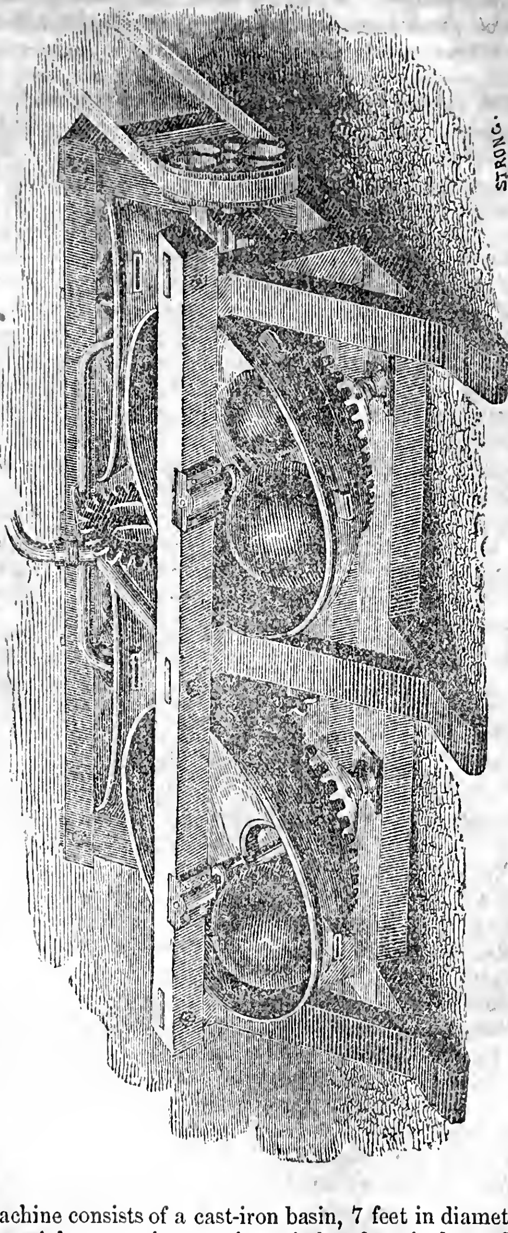
These machines have been in limited use for about two years, and those who have had experience of them highly commend them.

The proprietors claim for this patent a superiority over any other machine.

1. In cheapness and durability.
2. In the limited space it occupies.
3. In facility of working it.
4. In its facility of washing all kinds of fabrics, and without injury to their material.
5. In the space it occupies.
6. In the quality of its work, and the time required for performing it.

The machines are sold, at retail, for $12. State and county rights are to be had on application to the agent, M. P. Coons, Brooklyn. Orders may also be addressed to Thomas King, West Farms.

BERDAN'S GOLD-QUARTZ PULVERIZER AND AMALGAMATOR.



BERDAN'S GOLD-QUARTZ MACHINE MANUFACTURING CO.,

No. 6 Wall Street, New-York.

THE ABOVE ENGRAVING REPRESENTS FOUR MACHINES IN ONE FRAME.

The price of a machine will be $3,000 for every basin with two balls, including the frame and gearing.

The machine consists of a cast-iron basin, 7 feet in diameter, and 24 inches deep, the periphery turning up in a circle of 34 inches. This basin is secured to a wrought-iron shaft, which stands on an angle of 30 degrees from a perpendicular line, compelling the basin to revolve in a tilted or inclined position. The basin surmounts a conical or funnel-shaped cast-iron furnace.

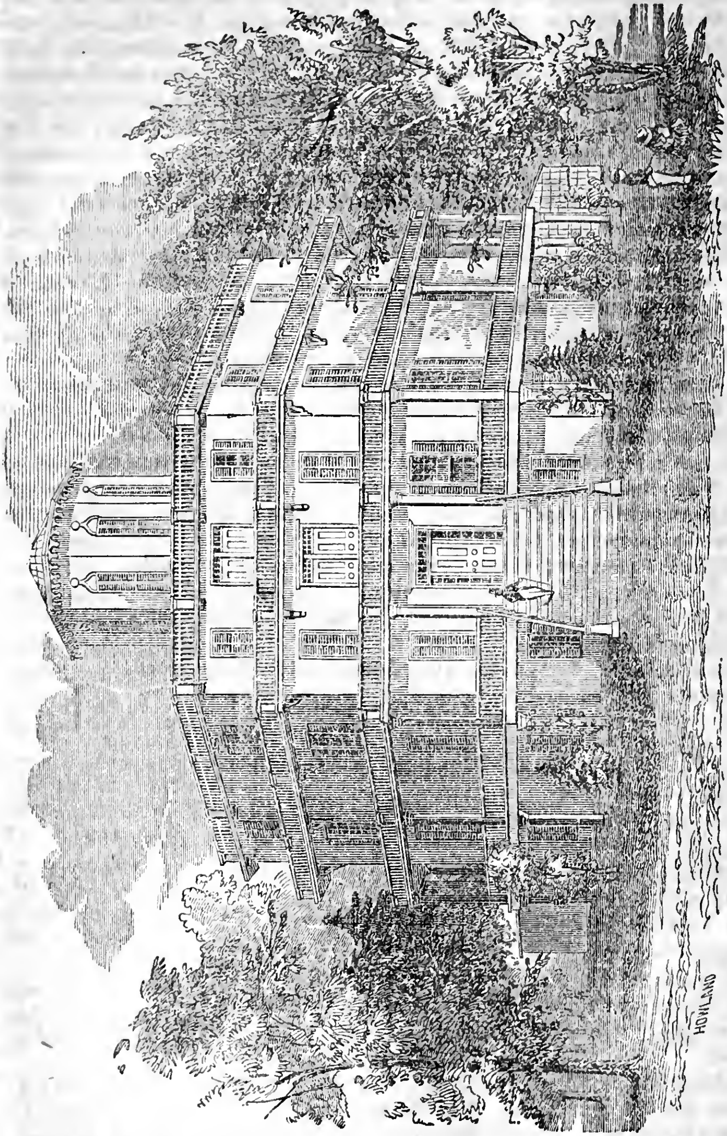
In the lower side of the basin is placed a cast-iron ball, 34 inches in diameter, and weighing 5,000 pounds. When the basin commences to rotate, the ball revolves by its own gravity, and remains at the lowest point in the basin, and has a grinding motion as well as the rolling or crushing movement. The ball fits the basin one quarter of the circumference of the ball. The small balls weigh 2,000 pounds. The frame is made of oak timber, 12 inches square, double tenoned, and bolted and braced in the best possible manner. The quicksilver is placed in the basin, and the incline of the basin compels the mercury to keep at the crushing-point of the ball. A small fire is kept in the furnace, while the machine is in operation, which keeps the bottom of the pan warm. The mercury being a conductor of heat, takes up the heat from the bottom of the pan, and is kept at a temperature of about 100 degrees. This greatly augments its affinity for the gold, and is produced at a trifling expense, and fully obviates the necessity of heating all the water, indispensably used in amalgamating and washing off the refuse matter. The balls pulverize the ore to an impalpable powder at the bottom of the mercury, thus bringing every particle of gold in contact with pure and warm mercury, and is amalgamated as soon as freed from the quartz; while the earthy matter, when sufficiently pulverized, rises in the water, by the agitation of the ball, and passes off as a sediment through screens which are placed over the openings in the side of the basin, near the top. The basin revolves in an opposite direction to the ball, so that all the ore in the basin is compelled to pass under the ball, while the water in the machine is sufficient to prevent the mercury from being broken up. The incline to the basin gives the ball its motion by its own gravity, which requires comparatively little power, and compels the mercury to keep at the crushing-point of the ball.

BALKY HORSES.

The following mode of conquering a contrary horse is so simple, it is well worth the trial:

An East-India gentleman one day took his seat in one of the omnibuses, in London, but at the time of starting, all the efforts of the driver proved unavailing, owing to a balking horse attached to the vehicle. The poor animal became more and more restive in proportion to the tortures inflicted upon him by the driver, and several other whipmen who assisted on the occasion. The street became blocked up with spectators and the interception of other carriages. Great danger was to be apprehended. The East-India gentleman above referred to, suggested to the driver and his assistants, that if they would try the East-India method of fastening a cord to the horse's fore-foot, and cause a person to pull forward, the animal would start right away. The suggestion was received with contempt. However, after all other efforts failed, a long cord was attached to the animal's fore-foot, and the moment the man gave a strong pull, the horse started off as if nothing had been the matter. The philosophy of this case seems to be that the animal, thrown off the centre of gravity by the propulsion forward, is taken by surprise, and obliged to start.

THE GRAVEL WALL, AND OCTAGON MODE OF BUILDING.



RESIDENCE OF O. S. FOWLER, ESQ., FISHKILL, N. Y.

Fowlers & Wells have recently issued a work entitled, "A Home for All, or the Gravel Wall, and Octagon Mode of Building."

Its two leading features are the gravel wall, or, concrete mode, and the octagon form of building, applied to domestic architecture. It gives specific directions for selecting, proportioning, mixing, and depositing the materials, erecting the requisite boxes or moulds, and putting on the outside finish; so that, by following them, ingenious persons can erect their own houses, and fit them for occupancy almost without aid from mechanics—doors, windows, roofing, and plastering excepted. Especially, it tells the poor man, the *very poorest*, how to proceed to make a comfortable cottage at a trifling cost, except his own labor, of from $30 to $50, including a plan for *adding* to it afterwards, as time and means may allow, without losing the part first built, besides applying these modes to barns and out-houses. It also throws out numerous observations and suggestions, applicable to all forms and kinds of buildings; shows how to make fixtures, greenhouses, flower-pits, chimneys, &c.; makes some judicious observations respecting fruit-culture, and describes the board-wall and plank-wall plans, besides introducing the hexagonal form, and other miscellaneous matters of great practical value. Progress in building is just as possible as in other departments of human industry and comfort; and our author has taken several steps in the right direction—that of *cheapening*, *bettering*, and *multiplying* human homes in general, and the laboring man's cottage in particular. All who intend to build, should give this little work a careful examination before commencing.

In building on this principle, the first object is to select the right *material*. And, fortunately, this abounds in some form on nearly every square mile of the earth's surface.

All that is wanted is stone and lime. The stone requires to be of various sizes, from tolerably fine sand, all the way along up to stones as large as you can well deposit in your wall. There must, however, be enough of the fine to connect the coarser stones together.

All that is required, is something *solid* for the lime to adhere to. The more fine sand you have, the more lime will be required; the more coarse stones, the less; and the more solidly the materials are compacted together, the thinner will that wall need to be. Probably the very best material will be found in those gravel knolls which abound throughout our country, which are composed of all sizes, from middling fine gravel, all the way along up to stones the size of the fist or head; and wherever such a bank can be had, all required is to mix the lime with it, and throw it right into the wall.

The excellent engraving, at the head of this article, gives the elevation of the author's residence, and needs no explanation. The description of the accompanying ground-plan cannot be given better than in the author's own language:

"My house is located on an oval knoll, digging off the top of which, furnished me with nearly all the stones, large and small, used in putting up its walls. All my cellar, therefore, is *above ground*, except two holes, C L and M, alongside of my ice-house.

My ice-house consists of two stories—the upper one for ice; the lower, a room, kept cool by the ice and its drippings, a preservatory for keeping fruit, butter, eggs, fresh meat, fish, bacon, pies, &c. Its structure is simple, and as follows:

Erect studs as for a wall. Lath and plaster *both sides*, and finish the outside as you do your house. This furnishes a place for *dead air*—the best non-conductor in the world—superior, says Professor Silliman, to tan-bark, or even charcoal. In the plastering, use a little cement. Then erect another set of studs, first having nailed on your lath before they are raised; then raise and fasten them, and plaster from the inside, or between the studs; this gives two confined air-chambers. Then lath on the inside of these studs, and plaster, and you have three air-chambers all around your ice-house and preservatory for both stories. Next, lay your floor to the bottom of your ice-house and top of preservatory, and make it water-tight, by caulking, or plastering with cement, or in some other way; and having this floor descend a few inches from the middle each way, so as to carry off the water, and resting this floor on rows of studs below, which serve both to support the ice and fasten shelves to, add to the outside row of studs, lath and plaster with cement, so that the ice-drippings may run off behind this inner wall of the preservatory, or between it and the two rows of studs above described. Your preservatory is now perfectly dry, and of one temperature the year round. Its bottom should also be double, so as to be dry, yet let water pass under it. In mine, the ice is gathered at the door, under which it runs through a lead pipe, bent upward like a new moon, which allows water to pass out, but prevents air from passing in. It passes into this cellar, C L, and my milk-closet, M, which also has two stories, the lower for preserves and what else we want to keep, yet do not think worth the trouble of going into the preservatory, and the top for milk, having two floors, which admits the cold air up into the milk-room, yet prevents the dirt from descending by the lower one catching it.

All required to make this floor is, having laid your floor-timbers, nail a floor to their under side, leaving a space an inch or two wide at one side, and a shelf over this crack will prevent much dirt from getting down; and then nailing another floor to the top of these timbers, having another opening on the other side of the floor.

M, for milk; the cold air passing up from the bottom story, into which the water runs from under the preservatory, both having shelves. A like arrangement at C L gives two large cellars, one above the other, on a like principle.

The entrance to my preservatory is with two stairways leading to it, one from the side toward the kitchen, for the cook; and the other larger, for the gardener to take down barrels of beef, fruits, and the larger articles. Thus, all the cold of my ice is saved, and cools five rooms, the preservatory and the other two double-storied rooms contiguous. Even the cold which escapes in opening the preservatory door, passes into these rooms, besides cooling the room marked A P, for apples, potatoes, &c.; and that marked K S, for kitchen-stores, both of which are fitted up with shelves.

In the closet, C, one angle, S, carries up a stove-pipe hole, made out of that very material described for making the wall, and drawing up, as you filled up, a round stick, the size of the flue desired—a cheap way of making chimneys, and as good as the very best. A wash-boiler is stationed in the adjoining room, W R, having a cistern, C I, 10 by 10—it can easily be made larger or smaller—which receives the surplus water from the cisterns above; and the roof having at one corner three straight walls, one of which extends from bottom to top of the cistern, made of this same wall-material, or of brick, and cemented both sides, having holes at the bottom. The other two are a foot or eighteen inches high, and say a foot on each side of the other, also cemented; and the spaces between them and the high wall filled in with charcoal and coarse gravel, so that the water, rising to this low wall, runs down through this filtering charcoal, through those holes at the bottom of the high wall, then up through charcoal and coarse gravel on the other side, and thus doubly filtered, makes the very best drinking-water in the world.

At the left of this cistern is a dark cellar, C, for sauce, or whatever you wish to keep from freezing; cool in summer, because excluded on all sides from the sun, and on the side joining the two-story cellar, C L, and the cistern on another; and free from frost in winter, besides being easily aired by its two doors. And this airing of cellars is all-important, for, otherwise, decaying vegetables infect and poison the rooms above, by finding their way up through the floor. Still, the main body of the farmer's vegetables should be stored under his barn floor, so that he can drive his cart to the hatchway, and dump right into his potato, cabbage, carrot, ruta-baga, beet, parsnip, and other cellars or bins.

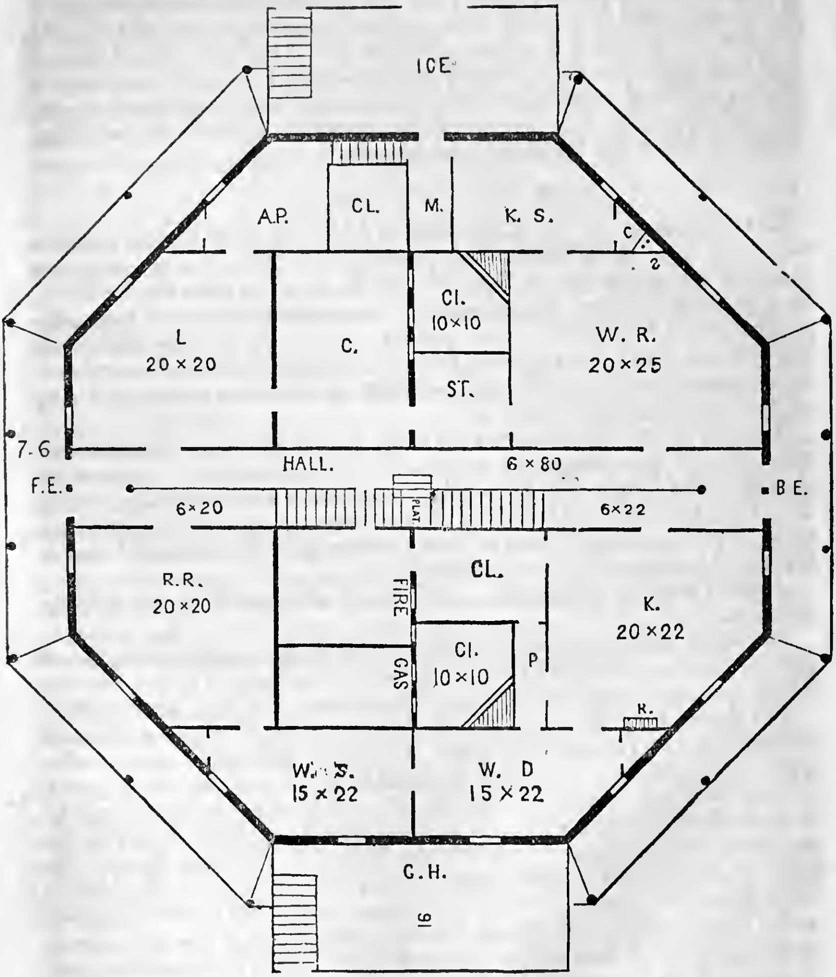
By the side of this is another room, L, which may be used for storing bedsteads, lumber, barrels, and such rubbish as garrets usually contain, tools included, with this advantage, that it is handy, and just where you want it, whereas the garret is very bad to get to and from. Or any other use can be made of it the proprietor chooses.

Between it and the wash-room, and at the end of the cistern, is a store-room, S T, some 7 by 10, just the place to put family stores, sugar, molasses, flour, pork, &c., also furnished with shelves and some drawers. A small closet off the apple-room, from which also starts another stack of chimneys, completes this, the north half of my house. How it would suit the reader, I care little, since it suits its planner and owner to a charm.

Next comes the entry. It consists of two parts. That line running nearly through it, and terminating in two octagonal pillars, is the central wall of the house, running from bottom to top; while the two walls on each side of it are for this story only, and are eight inches thick, while the middle one is a foot, and built like the outside walls. Tremendous pressure comes on parts of it, yet it stands. F E is the front entrance, where strangers will naturally apply for ingress to the house; and the room, R R, is for a common receiving-room, hat-stand, reading-room, &c.; and that pillar in the entry has an elk's head and horns, and some deer-horns masoned into it, on which to hang hats and cloaks.

The other side of the centre-wall is a through-entry; serves every purpose of one, and is just where you want it.

Passing through this entry, we enter the kitchen, K, the great stomach of the house. Two pantries, C L and P, connect with this kitchen and one anther, and one with the adjoining room, W D. At the back end of the closet, C L, is a dumb-waiter, which goes from the bottom to the top of the house, Those angular stairways, erected on the angles of the ice and green-houses. and an off-set both for receiving in—there being an outside entrance to the ice-house here—and for landing from and entering the carriage, complete the main features of this story, which is submitted not to builders and men merely, but especially to women and practical housekeepers, for such approval or criticism as they may award it. That it cannot be bettered is not asserted, but that it is far superior to any basement arrangement before invented is maintained. And mark to what extent the octagon form contributes to this end. Building-reader, is not this plan worthy general adoption?"



GROUND PLAN OF O. S. FOWLER'S OCTAGON HOUSE.

GREAT NATIONAL CATTLE-SHOW.

To say that the State of Ohio is one of the most enterprising and efficient of all the States of the Union, is but to repeat what every body, who reads the papers, has long known. This efficiency is now actively employed, among its various onward movements, in improving its system of agriculture. We find, that the project of a national show has been strongly urged in some of their meetings. It would do good, unquestionably; but that it is the most efficient means of securing the end in view, we are not yet prepared to say. We are very glad, however, to extend greater publicity to the following, which we find in the *Cincinnati Commercial :*

STATE BOARD OF AGRICULTURE.

EDS. COMMERCIAL: The Convention of Delegates from County Societie-assembled at 10 A. M., Wednesday, at Columbus. This is a meeting pros vided by law, and its special object is to fill the vacancies occurring by limita, tion, in the State Board of Agriculture. The assembly consists of the noble-sturdy sons of Ohio, tillers of her glorious soil, who have come together to consider and discuss the important interests of this great productive art, upon which so much of the wealth and prosperity of the State depends—a body of very highly intelligent men.

The call of counties was responded to by more than sixty. The first business was the appointment of a committee for nomination of persons for election to the Board. The Convention took a recess for dinner, after inviting Dr. Warder to address the meeting in the evening, upon some agricultural topic. It was anticipated that he would speak upon the culture of flax, or the use of plaster of Paris as a manure.

A warm time is anticipated, as the Board will have their acts severely scrutinized

THURSDAY MORNING, Dec. 8.—After Dr. Warder's paper on the use of plaster, which was listened to with attention last evening, the Convention discussed some resolutions and reports of interest, until the final adjournment.

The report upon the memorial of the originators of the Great National Cattle Show, to be held at Springfield, O., was not met in the most friendly spirit imaginable, by a few of the members of the Board; by others, it was warmly sustained. The latter argued, that so far from interfering in any way with the State fair of next year, it would probably contribute largely to the success of that exhibition. After a free discussion, the memorial was, by leave, withdrawn, and the enterprising citizens of Clark county determined to claim the higher prestige of the great national body of agriculturists, known as the *United States Agricultural Society*, to whom a paper was immediately directed, signed by most of the members of the Board of Agriculture, and members of the Convention, highly lauding this great enterprise, and asking the support of the national body.

The Agricultural Convention, on Thursday morning, elected the following named gentlemen members of the Board for the ensuing two years:

R. W. Musgrave, of Crawford, President.
James L. Cox, of Muskingum, Secretary.
Jos. Sullivant, of Franklin.
Buckley Steedman, of Cuyahoga.
J. K. Greene, of Hamilton.

Some very interesting discussions then ensued among them. That upon the important subject of *hedges* excited a very spirited talk, and elicited much valuable information. The practical knowledge and experience of those who knew the subject under discussion through actual acquaintance, was beautifully contrasted with the empty denunciation and cries of humbug, from those who were forced to admit the want of experience and practical knowledge.

The Convention will probably adjourn to-day, perhaps this evening, after hearing a paper upon *flax and flax-fibre*, which, it is understood, will be read by Dr. Warder, who has been investigating this subject.

It is generally supposed that the next State fair will be held in Zanesville, despite the limited accommodation for such a crowd as should attend such a meeting, and notwithstanding Cincinnati stands ready to make up a grand show, is accessible, and can accommodate all who may come.

DIGGING WELLS IN QUICKSAND.

A correspondent, in the *Genesee Farmer*, communicates the following valuable information in reference to the best mode of digging wells in quicksand. He says:

"Thinking that it may be of importance to some of your readers, I will give some of my experience in digging wells in quicksand. My father was digging a well where the quicksand ran in so bad, that he was led to contrive some way to remedy the evil resulting from it. His plan is, (when you get down where the sand runs in so as to prevent working at advantage,) to make a platform to lay the wall on, out of plank, by pinning them together; place this on the bottom, and then lay a wall of good hard brick and water-lime. When you get above where there will be any danger of the sand caving in, you can go on and dig the well as deep as you please, and the wall will settle down as fast as you take out the sand under it. We have settled a wall two feet, after it had stood for years. I was led to send this from hearing of the difficulty they had in digging wells at Geneva."

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

CURE OF ANIMALS.

Messrs. Editors:—I give you a recipe for the diseases of horses and cattle. It is used by our farriers for bruises, sprain, ringbone, spavin, and wounds, particularly on horses, and they use it on the human species. They *design* to keep it private.

℞. One pint strong alcohol, 50 per cent. or over.
One half ounce blue vitriol, pulverized fine.
One ounce camphor, pulverized.
One ounce sal-nitre, pulverized.
Two ounces tincture myrrh.
Two ounces aqua ammoniæ.

Add these to the alcohol: *mix well:* stand twelve hours, shaking frequently: keep the bottle well corked. Then add half-pint spirits turpentine. Must be shaken when used, or turned from the bottle, for the turpentine will not unite with the alcohol.

Ariel Hunton.

Hyde Park, Vt., October 22, 1853.

PIGS AND TURNIPS.

A VERY judicious paper, with the title given above, written by Mr. H. F. French, of Exeter, N. H., appeared in the *New-England Farmer*, for December. We commend it to all our readers. The culture of roots was often dwelt upon by the late "Farmer of Marshfield," and a large quantity was annually gathered for the use of his elegant herd of cattle. Mr. F. says:

If we could only discover some mode of keeping a large stock of swine on our farms, near good markets, so that we could make plenty of manure, and yet sell our hay, the question of how we can live by farming, in this part of New-Hampshire, would be answered. When hay is worth but ten dollars a ton, steers and heifers will consume more of it than the worth of their bodies, at three years old; but our farmers are too far-sighted, and have too much honesty to take from the soil without returning an equivalent; and, so many of them work all summer to collect food for their cattle in winter, and in the spring, have only their cattle left, increased in value not one-half the value of their winter's food.

Most of us have seen this to be folly, and tried keeping swine, and when potatoes could be raised for ten or twelve cents a bushel, we could raise pork to some profit, at prices lower than the present.

But potatoes are not to be named, in these days, for such base uses; and the question whether *corn* can be used with advantage for feeding swine has been very nicely tested. Perhaps with corn, at a dollar a bushel, and pork, at six cents a pound, the farmer may get the labor of the swine for his trouble, and *perhaps not.*

One thing, every farmer knows, who has tried it—that a dozen half-grown porkers will demolish his handsome cribful of a hundred bushels of corn, which it cost him so much hard work last summer to raise, in a painfully short time, and the golden ears are so beautiful, that one can hardly have the heart thus to "cast pearls before swine." I think a farmer feels rich so long as he can show his neighbor his corn-barn filled up above his head all round with this substantial treasure.

Are turnips good for pigs? Are pigs any the better for turnips? One man said turnips were good for nothing for any *critter;* for one of his neighbors, last winter, fed out a cart-load to a yoke of oxen, without doing them the least good in the world. Another said, turnips were first-rate for fatting cattle, because he tried it last winter, on a yoke of oxen and a cow, and he never saw animals gain faster. A third had tried it on pigs; and they ate the turnips well enough, and in great quantities; but he was convinced that they ate just as much meal *with* the turnips, as when kept on meal alone, and that the turnips were a total loss.

I had three shoats in September, one a full-blood Suffolk, one a half-blood, and one a native American, from a drove. I had also a crop of white flat turnips, sowed with my grass-seed in July, which cost me nothing but the trouble of picking up. For the past six weeks, I have fed these pigs with the turnips principally. We boil in a portable boiler, out of doors, two bushels of turnips at once, until they are soft, then take them out and put them into a barrel, and add a pailful, about ten quarts, of coarse shorts, and mash them together hot, adding a handful of salt. We have slops from the house, not quite enough to keep one of them; and these, with two kettlefuls of the boiled dish, last them one week. I never saw pigs thrive better. They are getting too fat to be kept over the winter, and two of them are in danger of an early death. From this single experiment, it would seem, as if a bushel of turnips is worth as much for swine, as the same quantity of potatoes; but it is not time to draw that conclusion. Many farmers have turnips on hand, and I hope the experiment will be thoroughly tried, so that if results be favorable, we may all lay down our land in July and August, with grass-seed and turnips, sell part of our hay, and keep the homestead in good heart, by raising swine at a profit. My ruta-bagas, which will keep good till spring, will many of them be turned to the same account. I have another old porker, which fed on turnips until within a month, but as he was expected to aid the festivities of Thanksgiving in the house, it was thought best to put him on a corn-meal diet.

It is said in the "Complete Body of Husbandry," published in England a hundred years ago, that sheep fattened upon turnips, should be fed on other food two weeks before they are killed, or the mutton will taste of the turnips. It probably would be prudent, for those who prefer their pork and turnips on separate dishes, to attend to this hint.

The *Genesee Farmer* has a notice of an article from the *Irish Farmer's Gazette*, in which an experiment was tried of feeding swine upon turnips, both cooked and raw, by which it was found that the pigs all gained remarkably well, but that they ate *twice as much* of the cooked as of the raw food, and gained most on the raw. The raw turnips were "pulped" or grated, and allowed to ferment.

Let us have the experiment tried, and reported in the *New-England Farmer*. I think the value of turnips is by no means appreciated in this country. It has been said that "the national power of Great Britain has its root in the turnip." It is there, *the* great crop, for fattening cattle and sheep, and so maintaining the fertility of the soil.

Exeter, N. H., November 17, 1853.

GAS-LIGHTS; RECENT ENGLISH PATENT.

Among the recent patents secured in England for the manufacture of illuminating gas, one of peculiar merit, in some respects, was by Mansfield. This was somewhat comprehensive in its claims, and was, no doubt, a very valuable discovery when viewed in connection with the prevailing modes of manufacturing gas.

We have been not a little surprised to find how extensively men have been engaged in experiments on this subject. In a visit to Baltimore, we found a very ingenious friend, who had been making experiments, though unhappily in a wrong direction. A letter of inquiry from a gentleman in Maine states that he has been experimenting in connection with benzole, while a third states substantially the same thing. Many others have made similar experiments. We have also been apprised of the fact that a Mr. A., for some months in Boston, and afterwards in this city, had induced some capitalists to invest considerable amounts in perfecting his "discovery," which terminated, like the rest, not in flame, but in smoke; and even now, perhaps, there is yet another who is, or at least, has been engaged in trying to work out the same great problem; while both these last were led on by having obtained some imperfect knowledge of what is and was already secured by patent. These both use benzole, we understand, though not in a pure form.

It is a very easy thing to make even a bright flame by the use of different hydro-carbons, but the flame is, unfortunately, too often accompanied with smoke. The common camphene-lamp consumes a liquid very like to benzole, to wit, rectified spirits of turpentine. But, arranged in the best possible manner, the soot which these lamps scatter over every foot of the apartment in which they are used, is a serious offset to their brilliant flame. The explosive nature of these fluids is also too often confirmed by actual experiment, to allow them a quiet and uninterrupted popularity.

But we propose now to give some information of a more particular character, though connected with all these modes of illumination.

In the distillation of coal-tar, products are obtained of various character, namely, ammoniacal water, heavy oils, and light oils. Among the first products are the light oils. Naphthaline is also obtained, which is an oil at ordinary temperatures. Some of these crude oils are acid in their character, and others are alkaline. Among the former are carbonic, rosalic, &c.; and among the latter, aniline, picoline, &c.

The neutral oils are hydro-carbons. Among these last is benzole. This substance boils at 80° temperature, and becomes solid at or near 0. It forms nearly or quite one-eighth of the light oil obtained from tar. In volatility, it is nearly equal to alcohol, but it is more allied to ether. At ordinary temperatures it yields so much of its vapor to a stream of air passed through it, as to cause it to burn with a white flame, till the vapor is entirely volatilized.

In the patent secured by Mansfield, the first claim set up, and allowed, was the manufacture, from "bituminous matter, of spirituous substances, so volatile, that a current of air, passed through them, may continue to burn, after once ignited, with a luminous flame, till these substances are consumed."

So far, this patent covers the same ground with the American patent, described in our November number.

The second claim related to substances of value, but not for the purpose of illumination.

The third claim secured by the English patent under consideration, had reference to the manner of avoiding the presence of smoke. On this, the English and American patents essentially differ. Mansfield says: "It is necessary for my purpose that the spirits should be as free from water as they can be obtained, consistently with cheapness, because the less water the spirits contain, the more of the hydro-carbons they will dissolve."

In the American patent, this entire absence of water is not essential, nor even desirable. If water is present in too considerable quantities, the brilliancy of the flame is diminished; and, on the other hand, if too great a proportion of benzole is used, there will be more or less smoke. But we have diluted this benzole-mixture with water, more than once, and without witnessing any unfavorable results.

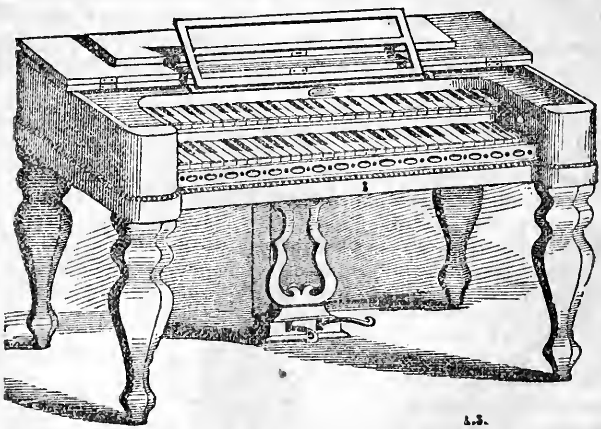
There is another point of difference in the two patents. The mixture used by Mansfield was not competent to the use for which is was designed, unless it was kept at a tolerably high temperature.

It is true of all gases obtained from these substances, that their illuminating power is essentially diminished by cold. Who has not seen and marked the dimness of street-lamps in all our cities, on a severe winter night? An eminent chemist has found, by the most carefully-conducted experiments, that the illuminating power of coal-gas is decreased three-fourths, when reduced to the temperature of 20° Fahrenheit.

The gas of which we speak is similarly affected by reduction of temperature. But the minimum temperature at which its light is quite satisfactory, is much lower than that manufactured by Mansfield's patent. It has been burned side by side with that gas; and when the latter was actually extinguished, that of the American patent continued to burn well, though with a brilliancy somewhat diminished. This gas, indeed, requires a moderate temperature, but the degree of heat most desirable may be very conveniently secured in every dwelling-house.

In burning benzole, as above implied, there are two extremes that are to be avoided; namely, on one side, so diluting the benzole that the humid air will be too slightly impregnated with illuminating power; and on the other, too concentrated a form, by which the atmospheric air will be so fully charged with carbon, as to evolve it, unconsumed, in the form of smoke. A third point also must not be overlooked. Benzole diluted with water alone, for example, mingles with it, but is not so thoroughly dissolved in it as to secure a satisfactory result. The light may be dim, and at the same time it will be accompanied with smoke. Hence, while exact proportions among the several fluids here combined are not required, it is necessary that such should be used as will thoroughly dissolve the benzole, and at the same time, dilute it to a condition in which all the carbon absorbed by the current of air, shall be completely consumed in its own flame.

MELODEONS.



GOODMAN'S PATENT.

Our readers may not all be aware of the perfection to which the melodeon, by means of various improvements, has been brought.

It has been a great point with builders of these and other reed instruments, so to combine two sets or *banks* of keys with two or more *stops* or sets of reeds, that the effect of more than one bank of keys, so prominent in organs, may be produced in these smaller instruments.

Mr. Goodman, of New-Haven, has accomplished this. He connects two banks of keys with two sets of reeds by direct application or connection, so that both sets of reeds may be played by the lower bank of keys.

The two banks of keys are arranged, as seen in the cut, one above the other, in the usual way. The improvement consists in using two sets of reeds and two sets of valves in such a manner that each set of reeds may be played by its own bank of keys, independently of the other set, or both sets of valves may be played by the lower bank of keys. Thus, as on an organ, both hands may be applied to the lower bank of keys, playing either one or both sets of reeds, or one hand to each bank of keys, each playing one set, or the lower bank playing two sets at pleasure, by which means greater force and variety are secured than this instrument has before possessed. From the simplicity of this connection of the parts by the use of the coupler, the price is comparatively but little increased.

For small churches or the parlor, the improved melodeon may well supply the place of the organ and other instruments.

EDITORS' JOTTINGS, AND MECHANICAL RECORD.

JULLIEN'S CONCERTS.—The people of New-York have had as great a treat of instrumental and orchestral music the past season, as they had in the last season, of operatic, from Madame Sontag and her troupe. Jullien's music is unrivaled in his department, as Sontag's, in hers. But Madame Sontag is entirely unlike Madame Alboni, and in some respects, the latter has no equal. So Jullien is unlike every body but himself, and, in some respects, is without a rival. But what is that which constitutes the wonderful charm of these concerts? We answer as follows:

Mons. Jullien has collected, from different parts of Europe, several of the most eminent solo-performers. They are not merely "good," or "excellent," or "very fine," but they are really *superb*, *wonderful*. On the cornet-a-piston, perhaps on the whole family of horns, Herr Koenig seems perfectly at home. He is, in this department, what Strakosch and Jaell are on the pianoforte. He does just what he chooses to do, and without apparent effort. Signor Bottesini, on the contra-basso, or double bass—who in this country ever heard the like? Very few will believe us, or give sufficient meaning to our words, when we say that he performs the different airs of the operas on that huge, awkward instrument, with all the exuberance of florid ornament that we have elsewhere heard upon the violin or the flute. His execution is in all respects absolutely wonderful. Herr Lutgen is equally at home on the violoncello, or bass-viol. His few appearances as a solo player have excited the highest enthusiasm.

Again, the flute of M. Reichert is inimitable. We have heard fine playing before, but we have heard nothing that compared with this. Indeed, M. Reichert is probably the second, if not the first flute-player in the world. The Brothers Mollenhauer are equally eminent on the violin; while Messrs. Lavigne, on the oboe, Wuille, on the clarionet and corna-musa, Hughes, on the ophicleide (a monster instrument) and Collinet, on the flageolet, are all superb. Here we have sufficient to explain the attractions of these concerts. But this is not all.

The presence of such performers inspires those of far inferior merit, in the same orchestra, and thus the seventy or eighty performers, most of whom we have perhaps often heard before, seldom or never played so well, in the chorus. But there is still another agency.

No conductor we have seen seems to inspire enthusiasm as Jullien. Others may know as much, and may be as good critics; but he has, and imparts to his choruses, an excess of animal electricity. He is but a bundle, a ganglion of musical nerve—nerves, not of sensation, but of the sensation of *sound*. So long as such a man has the confidence of those associated with him, he has immense power over them.

Again, Jullien's music is peculiar. We never had such styles brought out. We have had as good, and in our opinion, much higher styles; but this is novel and "striking," and has proved a decided *hit*. If we were to hear instrumental concerts for ninety successive evenings, we should prefer the beautifully rich strains of the Boston Germanian Musical Society. Mons. Bergman, and his little corps of twenty or thirty instruments, are unrivalled on this continent, not only for their classical elegance, but also (considering their numbers) for their efficiency. But they get up no tornadoes, no earthquakes, nor even the dialogue of the Katydids, nor target-shooting. But these are Jullien's every-day performances. True, he *can* do any thing well. He has sometimes given us true artistic musical treats, but he does not thereby secure the bursts of applause that he requires. "The public" in New-York are not sufficiently cultivated to be excited to enthusiasm by such entertainments.

The vocal performances at these concerts are and deserve to be very well received. Anna Zerr often sings very sweetly. She has wonderful compass of voice, and her lowest notes are peculiarly smooth and strong.

We do not say that these concerts deserve the attention of the public, but they have that power, that uncontrollable influence over the popular mind, that compels attention to such various and wonderful harmonies.

De Soto, Powell's great picture, now on exhibition in Broadway, receives the unqualified approbation of amateurs and of true artists.

The Chinese Museum is very highly spoken of, but we have not had the pleasure of seeing it.

Signor Blitz is still here, astonishing crowded auditories with his magical skill, and amusing them by his wonderful spirit-rappings. The stranger who visits New-York, is quite unprepared to take leave of the city and its lions, unless he has seen Signor Blitz. There is but one Blitz, as there has been but one Napoleon.

Max Maretzek has just closed a series of operas, in very superior style. The Prophet and Massaniello have been brought out for the first time, we believe, in this country, and were very successful. Mons. M. has and deserves the reputation of a very efficient manager and conductor.

Silvering all sorts of Metals and Glass.—A patent has been recently issued in Paris for the process above-described, of which the process is described as follows:

He takes 1 oz. of crystallized nitrate of silver, dissolves it in twice its weight of distilled water, and adds 9½ per cent. by weight of nitrate and liquid ammonia. He then adds six times the weight of the nitrate of silver, of spirits of wine, agitates the liquid, and adds 15 per cent. on the whole volume of resinous spirit (composed of one part of resinous matter by preference, gum galbanum, to five parts of spirits of wine.) The liquid is then left to settle, and filtered, after which it has added to it nine times its quantity of spirits of wine, with the further introduction of 8 per cent. of liquid ammonia, and a quantity of spirits of wine equal to its whole volume. The solution will then contain about five parts of nitrate of silver to 1000 parts of liquid. The liquid thus prepared and filtered may be used immediately in connection with a galvanic battery, in the manner usually practised by platers, but it is better to let it remain quiescent for some time. The anode or thin sheet of silver in connection with the positive pole, acts perfectly in this liquid, and gradually dissolves in the bath; the deposition commences immediately on the objects to be plated being introduced into the bath, in a white and brilliant form, and the thickness of coating can be regulated at pleasure. To insure its more perfect adhesion, in certain cases the metal may be first passed through a solution of nitrate of mercury. When glass is the material to be coated, a thin film of silver is previously formed on it, by adding to the liquid a few drops of spirits of cloves in a separate bath, and the quantity of ammonia used in preparing the bath is only from 2 to 8 per cent. By precipitating copper on the silvered glass, and then detaching the two metals, plates may be produced suitable for daguerreotypic or photographic purposes.

Plumbic Zinc—A New Combination of Metals.—We learn from the *London Mining Journal* that Messrs. Morewood & Rogers, of Upper Thames street, have recently patented a combination of lead and zinc, under the name of "plumbic zinc." It consists of distinct layers of each metal, perfectly united in a peculiar process of manufacture—one side thus presenting a surface of pure lead, the other pure zinc, combining the stiffness of the latter with the durability of the former. A sheet of metal is thus produced which proves as hard and durable as one of lead several times its thickness and weight; while in peculiar situations the zinc is laid undermost, and is thus protected from atmospheric actions, or the effect of acid vapors or liquors, by the preservative power of the lead. For every description of roofing, hips, and ridges, gutters, pipes, cisterns, sinks, &c., this metal will most probably be found highly advantageous. For covering terraces, balconies, stairs, and passages, it will be found similar to lead under the feet; while the stiff lining of zinc will prevent it from treading out of shape. For chimney-tops, cowls, &c., the lead is placed inside, which is indestructible from the sulphurous acids and vapors usually contained in smoke. For coal-boxes, baths, pails, and many other domestic utensils, it will also be found highly useful. Japan will adhere to it as well as to iron plate. It will solder as effectually as tin plate, and works softer and with greater facility than sheet zinc alone. It is also recommended for lining tunnels, sheathing ships, &c.; and no doubt numerous other uses will yet be found for it. The government authorities at Melbourne have contracted for a given period to secure the entire quantity which may be exported to Victoria, for flooring and roofing many of the public and private buildings erected in that city.

Travelling Hotel.—A Paris correspondent of the *Cincinnati Gazette*, in a letter, dated August 11, gives the following account of a novel mode of traveling in France. He writes:

"If we are in advance of all the world in sea yachts, the French have beaten us in the article of railroad yachts. A rich capitalist, Monsieur the Count of L——, has invented and superintended the construction of a railroad hotel, for his own private use, with which he intends to travel with his family over all the railroads of France. It is a complete house, with all its dependencies, principal and accessory. There is a parlor, bed-rooms, with beds, billiard-room, kitchen, office, a cellar which will hold a good store of wine, ice-house, &c.; in one word, all the elegance and the comfort, the useful and the agreeable, of a dwelling, the most complete and the most rich. It is very long, and like all French cars, very wide. It is made so that it can be transferred from one set of wheels to another, though that seems of no importance, since the roads of France are all, I believe, of the same wide gauge. T is travelling-hotel has cost its proprietor about 50,000 francs, and is at this moment attracting great attention at the depot of the Orleans railway.

Francis' New Printing-Press.—While in Springfield, attending the State Fair, we saw in operation the new power-press invented by Allen Francis, Esq., of the Springfield *Journal*. It is certainly a very ingenious machine, and yet in its construction it is very simple. The rollers are fastened on an endless chain, which is made to revolve to ink the forms perfectly. The impression is taken nearly in the same manner as with the Adams Press, though the bed is raised by a cam instead of a lever. There were several members of the Press present, all of whom seemed highly pleased with its performance. Though propelled only by *man*-power, it printed at the rate of two thousand an hour, and did its work well indeed. Mr. Francis told us it cost him only about six hundred dollars. This is a most important lessening of the price of a power-press, as one made in the usual manner would cost twice that amount at least. We wish Mr. Francis abundant success in his efforts to cheapen knowledge for the people. The facilities for carrying out his invention were not very good in Springfield, but in the hands of a first-rate machinist, we see not why the press may not be made a very beautiful machine, and its simplicity and cheapness certainly recommend it very strongly for general adoption.—*Chicago Dem. Press.*

Cast-Iron Interior Walls.—L. A. Gouch, architect, Harlem, N. Y., has plans for cast-iron partition walls, which he thinks far superior in every respect, and can be put up for less than those of brick. They are formed of perforated plates bolted together, each of about one sixth of an inch in thickness, and secured so as to make a partition of four inches in thickness, having an air space between, which will answer for ventilation, gas-pipes, water-pipes, and hot-air pipes. These plates can be covered with plaster, and made to resemble a hard-finish wall. These partitions will be fire-proof, and flanges are cast upon them for joists and beams of flooring and stairs. Such a partition can be taken down at any time, by merely unscrewing the bolts, and not like brick, mortar, and lath walls, it will be as good as ever, and can answer the same purpose a thousand times over, and last for a thousand years. The application of iron to architecture is an invention which should attract universal attention.

Novel Locomotive.—There has been just completed at South Boston, a locomotive c lled the "Texas," constructed on a most novel design, and intended, it is thought, to work an entire change in the manner of making locomotive engines. It weighs about thirteen tons with the tender which is connected with it, the boiler and tank being placed on the same frame. It has but four wheels, and those are hollow drivers, and are placed one pair in front of the boiler, and one pair under the tank. The cylinders are twelve and a half inches in diameter, and are outside connections. The power, instead of being applied directly to the drivers by connecting-rods, as is usual, is applied to the top of an upright beam placed just in front of the fire-box on either side of the boiler. From the top of this beam, which moves about 15 deg. on a heavy pivot, runs a rod to the back driver, and from the bottom runs a rod to the front driver. The boiler sets quite low, while the tank hangs below the wheels. The link is also of most novel construction, and is said to be a most important improvement, the link working within the block, instead of the block within the link. As no patent has been taken, or is intended to be taken, leave has already been given to other manufacturers to adopt this link, and it will probably come into general use.

The advantages derived by this novel construction of the locomotive, are the ease with which great power can be applied, and the great gain made in bringing the whole weight of the engine and tender to aid in drawing a heavy load. It is said that a thirteen-ton engine built on the new model, can do the same work as a twenty-ton engine built so that the power is applied to the drivers at the fire-box. The result will, of course, be a great diminution in the expense of procuring motive power for our railroads. The design, as we have before remarked, is wholly original, nothing of the kind ever having been attempted before.

The locomotive just completed is for a road in Texas. There are also in process of construction four others after the same model, intended for a road in Pennsylvania.

With a view of testing the capabilities of the engine, "Texas" was attached to a heavy freight-train consisting of fourteen long cars. It drew them with the greatest ease from South Braintree to Boston, making the time allotted to the train to a second. This train, which is one of the heaviest on the road, is usually drawn by a twenty-five ton locomotive. The result of the experiment is deemed conclusive that the locomotive will prove in every respect successful, and that a twelve-ton engine can, when built after the new plan, do the work of a twenty-ton engine of the old model.

Grain Harvesters.—J. Faber, of Farmer's Hill, N. Y., has contrived an improvement in the mode of hanging the cutter-bar to a swing or balance frame hung loosely upon the axles of the two wheels, whereby the cutters may be elevated above the ground sufficiently to pass any obstruction which may interfere, or to pass inequalities of surface; two sets or series of cutters are employed upon two cutter-bars, and the teeth being triangular or saw-shaped operate like shears upon each other. The cutter-bars are thrown in and out of gear with the driving-wheel by a very simple arrangement placed upon the top of the balance-frame, which is under the control of the driver.

Minerals in New-Mexico.—We have in our possession two specimens of ore from the *silver mine* near Dona Ana, which is now being worked very successfully by Mr. Stephenson, though without that outlay of capital which is necessary for the large product that is yielded by many of the mines of Mexico. We understand that, by different channels, a large number of similar specimens have been sent into the States, with a view to analysis by competent persons. Of the results of this analysis, those interested in the mines have no doubt, for the reason that they have a practical knowledge of silver-mining, and are actually by the rudest process extracting considerable quantities of the metal from these ores. The chief object had in view by them and others in New-Mexico, who have sent in these specimens is, that capitalists in the States, being satisfied that there are rich silver mines in the country, may have their attention turned to it. The range of mountains where this ore is found, is quite extensive, and no doubt exists among persons well qualified from their knowledge of the silver mines of Mexico to judge in this matter, that these mountains are stored in great abundance with this precious metal.

Besides these specimens of silver, we had shown us by Maj. Greiner, a quantity of quick-silver, weighing nearly a pound, which had been *scooped up* at Los Truches, near the Del Norte, about forty miles north of Santa Fe. This metal is found in globules and sometimes in little pools near the surface, at the roots of shrubs, or on the earth in damp spots, underneath the rocks and stones of the neighborhood.

The mineral wealth of New-Mexico, as we have again and again contended, is greatly undervalued. The estimate put upon that territory by our countrymen does no sort of justice to its resources. A railroad through it would develop those resources to an extent which, if predicted now, would be believed by nobody, save those who have been in the country and impartially examined it.—*St. Louis Intelligencer.*

Rain Statistics.—The following statements are derived from the tables of a careful and accurate observer, in this city:—The quantity of rain which fell in August was greater than that of any other month for the past twelve years. Since 1841, the average quantity of August has been 4 inches 54 hundredths. The least quantity was in August, 1848, being then 2 inches 50 hundredths; the greatest quantity, in August, 1853, being 10½ inches; and the next greatest quantity was in November, 1845, being then 10 inches. The whole quantity of rain this year, thus far, is 33⅗ inches. The greatest quantity for any one of the past twelve years was in 1850, when it was 55 inches 3 hundredths. The smallest quantity, 1844 and 1846, when it was about 34 inches, 56 hundredths. —*Salem Gazette.*

Manure for Autumn Roses.—Mr. Rivers, a famous Rose Culturist, applies a mixture of wood-ashes and guano, in the proportion of half a peck of guano to a bushel of ashes, to his late roses, with most excellent effect. About two quarts of the mixture is applied to each shrub or tree, in a circle eighteen inches in diameter around the stem, where it is suffered to remain undisturbed until autumn. It should be applied early in June, and covered with a thin grass mulch, and the effect will be that it will retain the dew and showers, and keep the tree in constant and vigorous growth, which is very necessary to the production of a good crop of flowers in the fall.

Manufacturing Gloves.—Two inhabitants of Grenoble, in France, about the same time invented a machine for sewing gloves, but instead of competing with each other, they agreed to unite the advantages of each invention. One found means to sew mechanically the fingers of gloves, while the other, after sewing the remainder of the gloves, was compelled to employ operatives to sew the fingers. The inventors by combining the two machines, have produced one which sews the gloves perfectly. This discovery has produced a great sensation at Grenoble, where the manufacturers were not able to supply the demand for want of a sufficient number of operatives.

THE *Zanesville Times* states that the wool clip of Licking county, Ohio, this year will reach 500,000 pounds, the average price of which will not be less than 60 cents a pound, making an aggregate of about a quarter of a million of dollars for the wool clip of a single county.

NEWELL'S AROMATIC BURNING FLUID.—"It was the remark of Baron Liebeg, that the greatest discovery which chemists could make, would be the solidification of coal gas, so that it could be formed into candles, and burned from stands. With all due respect to this illustrious chemist, we think that the American public would hardly retrace their steps, and adopt the *dips*, even if they were told that they were from pure gas. It is significant of the directness in the application of knowledge in this country, that leaving the notion of the solidification of gas to its suggester, Mr. John Newell, of this city, has been able, after a year of careful experimenting, to combine the elements of illuminating gas, so as to produce a *fluid*, adapted to the safety lamps, or spirit lamps, generally used. In this he has accomplished what has been the aim of every inventor, namely, the diminishing of the imflammability of the compound. Consequently, the danger in the use of burning fluids is thus generally diminished, and taken in connection with his admirable device of a safety lamp, we cannot but regard Mr. Newell as a public benefactor. We have good authority for the statement that the new fluid contains *one-sixth of its volume of water*, and that instead of highly rectified and volatile alcohol, the illuminating material is burned in a column of watery vapor. Referring to the advertisement in our columns, it will be seen that more light and greater security may be obtained at less than the usual cost."

The foregoing paragraph is from one of the Boston papers. We have paid some attention to that matter, and we are satisfied that Mr. Newell has here a very useful article. We are also furnished with an illustration of the fact that one discovery leads to another, and brings to light that which is useful in other connections. Thus, the manufacture of this fluid produces, from the residuum, oil, naphtha, creosotes, and varnish, and asphaltum, all of which are articles of commercial value. Its light is about equal to that of gas, its combustion is less rapid than that of camphene, and it is furnished at 48 cents per gallon, at retail.

ATLANTIC AND ST. LAWRENCE RAILROAD.—The annual meeting of the Atlantic and St. Lawrence Railroad Company was lately held at Portland. From the report of the directors, we learn that the total cost of the road up to the present time, is $5,150,277.72. The receipts of the road for the year have been $254,743.05, and the expenses, $141,222.66; net receipts, $113,520.39. The net income of the road to July 1st, 1853, is $407,218.06.

A NEW article of manufacture, made from the waste of smelting furnaces, and called "lava-ware," is exhibited at the Crystal Palace. After the iron is drawn off, the melted sand and clay, mixed with iron, which remains as waste, greatly in the workmen's way, can be cast into tiles, urns, bowls, table-tops, and various useful things, at a very small cost.

A FARMER'S WIFE IN THE OLDEN TIME.—Sir Anthony Fitcherbert, Chancellor to Henry VIII., thus describes a model farmer's wife:

"It is a wyve's occupation to winnow all manner of cornes, to make malte, to wash and ironying, to make hay, shere corn, and in time of nede to help her husband fill the muckwayne or dung-cart, drive the plow, load hay, corne, and such other.—And go or ride to the market to sell butter, cheese, egges, cheykns, capons, hens, pigs, geese, and all manner of cornes."

SOAP SUDS FOR WATERING PLANTS.—Nothing can be better for summer watering of plants and vines, than the suds of the weekly wash, and no one who desires a good garden will suffer it to be wasted. For cabbages, cucumbers, beets, and the like, it seems especially adapted, and one of the most thrifty grape vines we ever saw, was watered with soap suds almost daily in dry weather. A large supply is not needed at once, but frequent waterings promote rapid and vigorous vegetation.

Chocolate is an elementary preparation of very ancient use in Mexico, from which country it was introduced into Europe by the Spaniards in 1520. It was by them long kept a secret from the rest of the world. Linnæus was so fond of it that he gave the specific name *theobroma*, foods of the gods, to the cacao tree which produced it.

The cacao beans lie in a fruit somewhat like a cucumber, about five inches long and three and a half thick, which contains from 20 to 30 beans arranged in five regular rows with partitions between, and which are surrounded with rose-colored spongy substance like that of watermelons. There are fruits large enough to contain from 40 to 50 beans. After the maturation of the fruit, when their green color has changed to a dark yellow they are plucked, opened, the beans cleaned from the pulp and spread out to dry in the open air.

They are in some places packed immediately for market when they are dry. But in others they are sweated or cured by being packed in a box or a hole in the ground.

The beans being freed from all spoiled or mouldy portions, are to be gently roasted over a fire, in an iron cylinder with holes through which the vapor may escape. After the roasting, which is known to be finished if a strong aroma is sent off, the grains are again freed from all husks. They are then ground in a heated mortar and formed into a paste. This paste, flavored with whatever the manufacturer desires, constitutes the chocolate of commerce.

The cacao bean contains, in 100 parts, besides water:—

Oil,	53.1
Albuminous matter,	16.7
Starch,	10.91
Gum,	7.75
Lignin,	0.9
Red dye stuff,	2.01

NEW BOOKS.

Golden Dream and Leaden Realities. By Ralph Raven. With an Introductory Chapter by Francis Fogie, Sen., Esq. New-York: G. P. Putnam & Co., 10 Park Place. 1853. 344 pages.

This amusing book announces that its introduction is the work of Mr. Fogie, Sen., hence, he would have us infer, that he, the said Fogie, is an old man, and indeed, he says so, in almost plain English. But if so, he is in grievous error, a most inconceivable delusion, when he writes and even prints, on page 8, of all old men, that "they are a clog on its (the world's) machinery, dirt on its wheels, rust in its joints, a pebble in its shoe," and boldly adds, "it's never been a merry world since old men came in fashion." He says again, "I have always enjoyed the reputation of being as sober and as prudent as my neighbors." We don't know about the prudence, but if he is half as *sober* as his neighbors, there must be some *terra incognita* about here, or at least, within our friend Putnam's ken, that is a little merrier than any we have been accustomed to. The fact is, the whole book is incontestable evidence of the writer's mistake on these points, unless he misrepresents his own age; for he informs us that he, being an old man, is also a companion of like age with Mr. Raven, the author of the Dream. We are inclined to think that they are of very nearly the same age and temperament. But, however this may be, and whether old or not, they have put forth one of the most amusing of books, but by no means destitute of good sense and useful lessons. It is a pleasant story of a California gold-digger, that may very agreeably, and not unprofitably, occupy a few leisure hours of those of all ages and of either sex.

Illustrated Magazine of Art.—The December number of this journal is before us. We have highly commended former numbers, and as highly commend this, its latest issue. It contains a great amount of matter, both useful and entertaining. The illustrations are numerous. If the pressman could give better impressions of the well-engraved plates, he would much improve the appearance of the work. Still, many of these are given us in excellent style. A. Montgomery, Publisher, 17 Spruce street.

PUTNAM'S ILLUSTRATED RECORD, &c.—The last number of this beautiful illustration of the exhibition in the Crystal Palace is bi-double, and its literary and artistic merits are increased in a similar ratio. None of its previous numbers are so attractive, nor has any illustrated journal in this country approached, in its artistic skill, and in the elegance of its printing, the excellence of this series. It is, in this respect, entirely without a rival or a competitor in this country. Double numbers, 25 cents.

PUTNAM'S MAGAZINE is also as rich and racy as ever.

THE LECTURES COMPLETE, OF FATHER GAVAZZI; as delivered in New-York, revised and corrected by himself; with translations of his Italian Addresses, &c. By G. B. NICOLINI. New-York: M. W. Dodd. 1854. 12mo, pp. 393.

This volume has been laid by the publisher on our table. The author is a friend and fellow-exile of the lecturer, and a gentleman of education. Being prepared by an eminent stenographer, and revised by Father Gavazzi himself, their authenticity is unquestionable. This volume, therefore, may be appealed to by the advocates of either side of the questions here discussed, as containing the real views of the lecturer, his statements, plans, desires, and aims. It is well executed by the publisher.

MEYER'S UNIVERSUM, which we have failed to see for some time, has again made its appearance on our table, save a few missing numbers, which we should like to receive. Eight numbers of the second volume are published. Together, they form an elegant volume, worthy of any library. Each number contains four handsome engravings, of public buildings, views, &c., of historic fame, and of remarkable beauty, each well and fully described by Mr. Dana, of The Tribune. It is published semi-monthly. Hermann J. Meyer, Publisher, 164 William street.

NEW MUSIC.

WM. HALL & SON, Broadway, have published some very fine music recently, among which are—

STRADELLA, by W. V. WALLACE, Souvenir de l'Opera. 50 cents, net.

This is number two of a series, by this eminent composer, the first of which was Zauberflote, a souvenir of Mozart; and this (second) of Flotow. Twelve pieces complete the series.

LA BELLE MARIAN, Valses brillantes ecossaiees, for the pianoforte. By JOHN PRIDHAM. 38 cents, net.

Five waltzes are comprised in this, with an introduction and finale. The waltzes are, "Comin' thro' the Rye," "Boatie Rows," "Kinloch of Kinloch," and "Auld Lang Syne."

THE ETNA GALOP. By CHAS. D'ALBERT. And of course very good.

THE HAZEL DELL, song and chorus. By WURZEL. 25 cents, net.

This is one of the sweetest airs we have heard for a long time; but has a melancholy sweetness, just suited to the words,

> "In the hazel dell my Nelly's sleeping,
> Nelly loved so long,
> And my lonely watch I'm keeping," &c.

This must have, as it deserves to have, a very extensive sale.

List of Patents Issued,

FROM OCT. 7 TO NOV. 6.

Samuel S. Allen, of Salem, N. J., for improvement in the cutting gear of grain and grass-harvesters.

John Blue, of Covert, N. Y., for improvement in carriers to grain-separators.

Cornelius S. Cooper, of New-York, N. Y., for improvement in violins, &c.

Nathaniel Gear, of Zanesville, O., for machine for turning or cutting irregular forms.

James Greenhalgh, jr., of Waterford, Mass., for improvement in power-looms.

Jerome B. Greene, of Worcester, Mass., for improvement in temples for looms.

John Jones and Alexander Lyle, of Rochester, N.Y., for improvement in he cutting-gear of straw-cutters.

Samuel Karns, of Bloody Run, Pa., for improvement in fastening the teeth to clover-hulling cylinders.

Jonathan Knowles, of Cohoes, N. Y., for improvement in looms.

Abraham Lash and Miles Moore, of Belleville, O., for improvement in screens of winnowers.

Wm. H. Meriwether, of the county of Comal, Texas, for improved wire fence.

Abram B. Peterson, of Dexter, Mich., for improvement in grain-threshers and separators.

William Robertson, of New-York, N. Y., for keyed finger-board for violins.

Safford E. Sturtevant, of Hartford. Vt., for improvement in attaching the shafts of vehicles to the axles.

Thomas Spiller and Anthony Crowhurst, of Middlesex county, England, for improvements in operating vibrating propellers.

George Spencer, of Utica, N. Y., for improvement in railroad car-ventilator.

Saml. D. Tillman, of Seneca Falls, N. Y., for revolving musical scale.

W. D. Williams, of Raleigh, N. C., for improvement in wagon-brakes.

Joel Wisner, of Aurora, N. Y., for improvement in washing-machines.

Samuel Green, of Lambertville, N. J., assignor to Samuel Green & Cornelius Arnett, of same place, for improvement in window-shutter bolts.

Alexander C. Twining, of Hudson, O., for improvement in manufacturing ices.

Erastus B. Bigelow, of Boston, Mass., for improvement in looms for weaving pile fabrics.

John Gledhill, of New-York, N. Y., for improvement in power-looms.

Henry P. M. Birkinbine, of Philadelphia, Pa., for supplemental valve to the equilibrium-pipe of the Cornish engine.

James Brown, of New-York, N. Y., for improvement in daguerreotype apparatus.

Chas. S. Bulkley, of New-York, N. Y., for improvement in electro-magnetic annunciators.

Joseph D. Elliot, of Leicester, Mass., for machine for dressing staves.

Franklin Fruit, of Jefferson city, Mo., for improved chuck for cutting barrel heads.

Banford Gilbert, of Pittsburgh, Pa., for improvement in propellers.

Leonard Gilson, of Brighton, Mass., for machine for dressing circular sash, &c.

Daniel H. Hovey, of Kilborn, Ohio, for improvement in machines for creasing straps of leather.

J. Leeds, of Philadelphia, Pa., for improvement in ventilators.

Wm. and Wm. H. Lewis, of New-York, N. Y., for improved coating-box for daguerreotype plates.

Sergius P. Lyon, of Farmington, Mass., for improvement in self-acting dampers for air-tight stoves.

Wm. Henry Muntz, of Norton, Mass., for improved paddle-wheel.

George Phillips, of Philadelphia, Pa., for improvement in seed-planting cultivators.

Timothy Randlett, of Enfield, N. H., for improvement in mop-heads.

Robert Sinclair, jr., and Richard F. Maynard, of Baltimore, Md., for improvement in feed-rollers of straw-cutters.

John H., James M., and Hosea Q. Thompson, of Holderness, N. H., for improved machine for trimming soles of boots and shoes.

Wm. H. Towers, of Philadelphia., Pa., for hot-air registers.

Wm. Townshend, of Hinsdale, Mass., for improvement in looms.

Jon. E. Warner, of Boston, Mass., for machine for finishing the ends of staves.

Henry Waterman, of Hudson, N. Y., for improvement in safety-valves for locomotive engines.

Jon. White, of Antrim, N. H., for improvement in uniting-shovel-blades to handle-straps.

Hosea H. Grover, of North Cohocton, N. Y., for improvement in rotary churns.

Evan H. Branson, of Fredericksburg, Va., assignor to Franklin Slaughter, of same place, for machine for dressing crooked timber.

Wm. Beschke, of Alexandria, Va., for improvement in joining and riveting metallic plates.

Gardner S Brown, M.D., of Hartford, Conn., for improvement in body-braces.

Henry Carter & James Rees, of Pittsburgh, Pa. for improvement in nut-machines.

Thomas and Samuel Champion, of Washington, D. C., for improvement in transporting bridges.

Stillman A. Clemens, of Springfield, Mass., for improvement in ventilating railroad cars.

Oliver A. Kelly, of Woonsocket, R. I., for improvement in looms.

Frederick Smith, of Pontiac, N. Y., for improved water-wheel.

James R. Kain, of Tiffin, Ohio, for apparatus for cutting screws on bedstead rails.

Wm. and Wm. H. Lewis, of New-York, N. Y., for improvement in boxes for supplying business cards.

Samuel T. McDougall, of New-York, N. Y., for improvement in platform scales.

J. Parsons Owen, of Norwalk, O., for machine for cutting screws on bedstead rails, &c.

Wm. Pierpont, of Salem, N. J., for improvement in the cutters of grain and grass-harvesters.

Morgan L. Rood, of Marshall, Mich., for improvement in revolving fire-arms.

Wm Silver, jr., of Pittston, Pa., for improvement in blasting-powder.

Hiram Smith, of Norwalk, O., for apparatus for cutting screws on bedstead rails, &c.

Dr. Jos. Goldmark, of New-York, N. Y., for improvement in facing ends of percussion-caps.

Enoch R. Morrison, of Troy, Pa., for improved shingle-machine.

Elnathan Sampson, of Cornish, N. H., for improvement in platform scales.

James H. Crygier, of New-York, N. Y., for improvement in bank-locks.

Lawrence T. Frazee, of New-Brunswick, N. J., for improved life-boats.

Wm. K. Hall, of Philippi, Va., for improvement in grass-harvesters.

S. R. Holt, of Worthington, O., for improvement in self-acting presses.

Willard B. Cummings, of Tyngsborough, Mass., and Nathan P. Dudman, of Chelmsford, Mass., assignors to Willard B. Cummings, of Tyngsborough, Mass., N. P. Dudman, of Chelmsford, Mass., and Chas. H. Blood, of North Chelmsford, Mass., for improvement in machines for dressing millstones.

Samuel F. Allen, of New-York, N. Y., for improvement in fluid-lamps.

J. Bloom, of East Woburn, Mass., for improvement in condensing smoke and gases.

M. C. Gritzner, of Washington, D. C., for improved gold separator.

Benj. F. Miller, of New-York, N. Y., for improved iron fence.

John W. Peer, of Schenectady, N. Y., for improved trip-hammer.

David N. Ropes, of Meriden, Conn., for improvement in attaching handles to the blades of table knives.

Robert R. Taylor, of Reading, Pa., for improved arrangement of valves, ports, and passages, for operating steam-hammers.

Silas B. Terry, of Terryville, Plymouth, Conn., for mode of applying the vibratory spring of balance clocks.

R. C. Wrenn, of Mt. Gilead, O., for improvement in seed planters.

Ephraim B. Benedict, of Clinton, N. Y., for improvement in coupling shafts to axles.

Erastus T. Russell, of Shelbyville, Ind., for improvement in combined India-rubber and steel springs.

Samuel Chapman, jr., of New-York, N. Y., for improvement in stone saws.

Richard Edwards, of Eagle River, Mich., for improvement in machines for washing ores.

Jno. Crabtree and Jos. Hopkinson, of Philadelphia, Pa., for improvement in tightening packing of engine and pump-pistons.

Israel Graves and Charles A. Bogart, of West Dresden, N. Y., for shingle-machine.

Chas. Phelps, of Salem, Mass., for improvement in supporting falling table-leaves.

J. H. & W. F. Poague, of Fancy Hill, Va., for improvement in forming hydraulic cement pipes.

Frederick Seibert, of Williamsburgh, N. Y., for improvement in machines for polishing leather.

Samuel J. and Charles H. Trofatter, of Salem, Mass., for improvement in machines for skiving boot counters.

J. Heilman, administrator of Joshua Heilman, deceased, of France, for improvement in combing fibrous materials.

Wm. Baird, of Philadelphia, Pa., assignor to John J. Hepworth, of same place, for improvement in power-looms.

Frederick Nicholson, of Warsaw, N. Y., assignor to Nelson A. Hume, of Rushford, N. Y., for improvement in screw-jacks for raising buildings.

Simon F. Moore, of Batavia, N. Y., for design for cooking-stoves.

Jno. Davis, of New-Bedford, Mass., for improvement in indicating electro-magnetic telegraphs.

Simeon Goodfellow, of New-Orleans, La., for improved arrangement of screw-cutting dies in the die stock.

Ebenezer W. Hanson, of Spring Garden, Pa., for improvement in pen-holders.

David Matthew, of Philadelphia, Pa., for improved spark-burner and water-heater for locomotives.

Ira F. Payson, of New-York, N. Y., for improvement in soap ingredients.

James Watt, of South Boston, Mass., for improved valve arrangement for steam-hammers.

George Wellman, of Lowell, Mass., for improvement in cleaning machine-cards.

Jno. E. Whitmore, of Joliet, Ill., for improvement in overshot water-wheels.

Alfred Carson, of New-York, N. Y., for improved mode of ringing-fixed bells.

Lucian B. Flanders, of Dunkirk, N. Y., for improvement in replacing cars upon railroad tracks.

James Glenn, of New-York, N. Y., for improvement in illuminated clocks.

Ira Warren, of Boston, Mass., for improvement in shower-syringes.

R. M. Evans, of Gilford, N. H., assignor to himself and Asa Weeks, of South Boston, Mass., for improvement in cutters for planing mouldings.

Carl E. Werner, of New-Castle, Ill., for improvement in condensers for stills.

The Plough, the Loom, and the Anvil.

PART II.—VOL. VI. FEBRUARY, 1854. No. 2.

PROGRESS AND POSITION OF MECHANICS.

IN the early ages of the world the mechanic arts were almost unknown. Those that existed were not, however, all of that rude form which some imagine them to have been, but exhibited proofs of wonderful skill. Whenever dress and shelter are necessary, then it is indispensable that some of the arts should be understood; and if we trace back the history of *those* products, we find that progress has been made, not in the degree of perfection to which such workmanship has arrived, but in the material used, and in the conveniences for performing the work. For example: before civilization had ever begun to dawn, in a given country, if it was a latitude of frost and snow, its inhabitants were clothed in skins. Those skins were dressed and ornamented with a degree of skill that can not even now be surpassed. Besides, this skill in workmanship was achieved almost in the entire absence of mechanical tools. The most elegant of Indian quill-work is an illustration of this. So is the incomparable work of a similar kind wrought by the Chinese and some other Eastern nations. Several of the nations that inhabit the interior of Africa are said by travellers to excel wonderfully in ornamental work in ivory, and the softer metals, as well as in those kinds so often seen among the natives of our own country.

In civilized society, these arts are indispensable. They are not merely important, but without them civilization could not exist.

To live in such an era, we must have not only a shelter from the cold, which a hovel would furnish, but we must have a comparatively handsome and convenient dwelling, into which the beams of the sun have free admittance, at our pleasure. A rude skin would protect us from the cold, but civilization requires the taste and skill of an artist to give form and beauty to our clothing. The material must also be unlike that which nature and barbarism allow to the wandering savage. It is too degrading to a progressive race to be furnished with nothing higher in any and every department than the rude savage enjoys. This necessity extends to all the conveniences, and even the essentials of life. Hence it is that the word itself, "necessaries," has its thousands of shades of meaning, according to the condition of the individual to whom it is applied. What is "a necessary" to one class of people, would be a luxury to others in a less favored condition.

Taking the view thus far presented, we might perhaps infer, that the social position of the mechanic would be higher or lower, precisely in proportion to the condition of the mechanic arts. Where the many are dependent on the few for those higher forms of art which the few alone know how to create, it is natural that they should be *looked up to*, as dispensers of especial favors. They might be regarded with the same admiring gaze with which children sometimes stare at a fancy glass-blower, or some of even higher pretensions look upon one who performs some striking experiment in chemistry, or in some other of the physical sciences.

Accordingly, in ancient times, we find Vulcan was one of the gods, and Vaulundr, the smith, in the Scandinavian mythology, was the son of a giant and of a mermaid, and held an assigned position about the person of the king. Next to the military hero, perhaps, was the smith who provided him with armor and weapons.

Properly speaking, nature has not furnished us with any tools or implements. The knife, the axe, the plane, the plough, the harrow, the loom, the brush, nor even the card; none of these, nor any tolerable substitute for them, nor any other implement, is found as a natural production. What though we find the teazle growing in countries where the arts are unknown?—no use can be made of it. To apply it, *conveniently*, to any useful purpose, requires mechanical invention.

But if we look at society again, after time for progress has elapsed, we find a state of things in which the position of the elements which make it up is reversed. This is in consequence of another change in the mind of the community. These marvellous creations of art are no longer objects of curiosity, but the eye has been satisfied with admiring them as novelties, and men have begun to love and long for the comfort and conveniences which these inventions can procure. For, with inventions there is created the power of accumulation, and of enjoying the benefits which the ownership of property is capable of securing. True, men might be "rich" in the times of the patriarchs. But they could be rich only in flocks and herds, and their owner could not appropriate to his personal use more of the products of this property, though counted by thousands, than could he who owned only his tens, or even his units. It is only after the introduction of mechanical arts that one man could make his position essentially more comfortable, more luxurious, or more elegant than that of his neighbor; and when, by these means, the power of accumulation was so immensely multiplied, and scope was given for the exercise of talent in manufacturing, and its necessary consequence, in profitable trade, then came the diversities of condition, since extended more and more, and the luxury is the object of ambition, while the handicraft which was competent to produce it is regarded like any other manual labor.

There is, however, this distinction among the various kinds of labor, that is inherent in the very nature of things. Each kind of labor or manufacture will be held as honorable according as it requires the exercise of talent, of education, and of especial skill.

Why is not the profession of the boot-black considered an honorable calling? Simply because any fool can do such work. Why does any other trade stand higher, in its rank, than that? Because it requires more talent and skill. Why is the "boss" allowed, always, a higher place than his employées? Because the idea is innate, (if there are innate ideas,) that to obtain and maintain such a position, demands of a man a more than average amount of those qualifications. We do not say that other matters do not sometimes enter into these views, to modify, or in some way affect the degree of regard entertained for those in such positions, but we do say that this feeling can not easily be separated from them. Apparent exceptions actually confirm the correctness of this position. Have we not repeatedly heard some ambitious apprentice or disappointed "jour" speak contemptuously of those stationed over him, in such language as this: "Smith needn't feel so grand to think he is so and so; he doesn't know any more than I do," or, "it was his father's money that secured the place for him?" &c., &c.

We are very much inclined to believe that the "worship" which is so universally paid to wealth is, in part, to be attributed to this principle. It is not the abstract idea of large possessions, nor even the luxury they place within one's reach; but it is this conviction, that the possessor, he who amassed the wealth, had more efficient talent, more available power and influence; and this influence covers the less fortunate in its shadow, and shows them to be inferior. Accordingly, when some fool, some vain fop, or indolent dreamer inherits large property, he fails to receive the personal consideration freely granted to others in like condition.

There is another phase to this progressive period. Not only did new inventions and their products become articles of common trade, but *nothing uncommon* is now required in their manufacture. Though Vulcan was a god, when he forged nothing but thunderbolts, when he or his successors condescended to make horse-shoes, and nails, and hammers, &c., it was found that, with the invention of proper tools, a common mortal was quite competent to multiply these productions. Hence later Vulcans are mere blacksmiths. It was, perhaps, a mighty task for him of old to forge out the artillery of the gods; it might have been equally difficult, perhaps a much more difficult work, to forge a common hammer; but when hammers and anvils and well-arranged forges are to be had for a few paltry shillings, it ceases to become the gods to be Vulcans, and henceforth mere men, and common and ordinary men any where, may become blacksmiths.

But a machinist is something higher. The blacksmith can't make the tools and mechanical combinations required for this work; and if he could, it would require another and an advanced stage of apprenticeship to use them. Hence, socially viewed, the machinist, in the very necessity of the case, stands on higher ground than the blacksmith. The latter looks up to him. No successful machinist ever thought of becoming a blacksmith, while every day, blacksmiths aspire to become machinists. This is quite enough to show that our position is substantially correct.

Go through all the arts, and the test will apply and bring out the same result.

Nor is this all. The ratio of compensation demanded and freely given, apart from the expense of the work, material, &c., will also be found to be in the same ratio. The whitesmith demands more for a job of an hour than does the blacksmith; the machinist more than either; the maker of chronometers, &c., still more.

The mechanic arts and mechanics sustain very different positions, in different communities, whether of larger or smaller extent, as at the north and at the south, in city and in country, &c.

In different communities, too, while the *ratios* above described are perhaps never grossly violated, except in individual cases, the sums paid for the same service are very unequal.

It is curious and instructive to inquire into the relative social position of mechanics in various parts of the world. We can now only present a hint or two on this subject.

In England, the humbler and poorer sort, however skillful, are miserably rewarded for the exercise of that skill. Perhaps there is no country where the wages of such will procure so little comfort in return. That which pays dollars here, pays but shillings, or even pence, there.

The analysis of this state of things would require us to look at the organization of society in general in that country. Rank in England is based on fictitious and accidental circumstances, not on a substantial reality. The title which descends to a worthless heir, from some ancestor of even notorious infamy, but the descendant, perhaps, of a feudal lord, is entitled to, and receives more distinction, than the most ingenious artist, or the most thorough student of science. The "nobility" are land-owners. Titles are thus associated with immense free-hold estates, while the mere artisan, whose whole estate, it may be, is only his shop and tools, and the products of his own inventive faculty, is left to acquire his own reputation. And, with few exceptions, this, under such circumstances, is synonymous with being unknown, except in one's own neighborhood, and having a reputation only co-extensive with that of the village school-master.

In other words, the distinctions which ought to belong to merit wherever found, are there monopolized by the few, and the entire mass of artisans have to toil up the hill of distinction against tremendous odds.

Low wages are almost a necessary consequence of this state of things. Moneyed capital may command a larger income, whether in one form or another; but mere handicraft, almost equally at the command of each among the masses of society, can conquer only by the greatest effort. In fact, the vast expense attending the style of the higher orders, could not perhaps endure the increased draft upon their incomes, required by a fair compensation to the masses for their labor, without diminishing materially the profits of the heads of the establishments who gave them employment.

In this country it is not so. Here, intellect is king. Money is not king. True, it is second to nothing else; too often not even to moral worth. But give money to a fool, and how soon is it safely deposited in the pockets of those who have more wit! Arms are not strength. But cut off the arms of the strong man, and how easily, in comparison, can he be overpowered! Such is wealth to intellect. Intellect may be strong, but without arms. Often, this is the explanation of the want of success.

But intellect is king. The intelligent artist stands on the same level with his compeers in other pursuits. His individual position may be more or less favored. He may have more or less of motive to make effort. His facilities, in various ways, may be more or less; but there is no barrier that he may not break down, there is no honor he may not achieve, there is no title of distinction he may not acquire. The agriculturist is not in his way. He is not a rival. On the other hand, he glories in his success. The entire yeomanry of the whole land glory in the names of Watt and Whitney and Fulton and Perkins, and a host of others, who have lived, to say nothing of the present generation, and are as really household gods as those who by their swords achieved their independence.

Sometimes the artisan becomes peculiarly an object of interest. Look at the Crystal Palace, and see how small a space is occupied by the agriculturist. The things there exhibited, numbering thousands and tens of thousands, are almost exclusively the works of art. And how rich, how splendid! What a field is here opened! American mechanic, if the spirit of A MAN is in you, take possession of that field. It is as broad as the acres of God's earth. It is as deep as the sea. It is as rich as wealth.

We had purposed when we began to write, to give another train of thought connected with this subject, but must defer it till our next number.

FRUIT CULTURE NOW, AND FRUIT CULTURE TEN YEARS AGO.

In fruit time, most every body likes good fruit; every body is animated and made thrice glad by the appearance of fine apples, peaches, and pears. Ten years since, horticultural science and the pomological art had not made much impression upon the minds of the people, at least in this country. In New-Jersey, it is true, the fruit-growing business had developed itself to a considerable extent, and the peach was raised with success at that time; but we have now, in the United States, more than five hundred different varieties of peaches, and different kinds are constantly increasing as the horticultural art becomes more and more developed. Horticultural societies are springing up in most every quarter of the Union. In California, the people boast of raising larger fruit than we—boast of their pomological societies, and the luxuriant gardens of Los Angelos; so that the whole country seems to be awakened to the importance of growing an abundance of wholesome fruit. This is as it should be; for there is no branch of agricultural labor so lucrative to the farmer and gardener as is that branch which relates to fruit-raising.

Set out a grape-vine next spring, and in two years, with good management, you can eat, from your vine, fine bunches of Isabella grapes, and they will not injure your appetite, much less the coats of your stomach; on the contrary, you will be benefited by them. Set out a thrifty apple-tree, seven feet high, in the spring of 1854, and in the summer or fall of 1857 you can pluck from it apples that would do credit to any body's table. But you must not manage the tree as it was the people's wont to doctor apple-trees ten or fifteen years ago—set them out in grass sods, without paying any attention to them. Men formerly seemed to think that fruit-trees would stand almost any kind of treatment, and come out well. But this is not true. They must receive due care and attention, and they will pay you a large per centage for the labor you lay out in their cultivation; but if you abuse them by cutting off large limbs unnecessarily, and by ploughing up the lateral roots when the tree requires them to give it nourishment, you cannot expect that they are going to bring you in a large profit. We were taught several years since, that large limbs should be cut off from the trunks of apple-trees; but modern science now teaches that *this* is a bad practice, and results in the material injury of the tree. Old farmers, and I don't know but I may say old gardeners, made it a practice to cut off the lower lateral limbs of their apple-trees, and what they did it for I cannot for my life imagine, unless it was to plough under the trees for turnips and potatoes. But *modern* science says to them, "You have made fatal havoc among your fruit-trees; for, *first*, you have caused them to decay by cutting off their most important branches; and, *second*, you have ploughed *too much* under them, which ploughing has resulted injuriously in respect to their roots and spongioles." Modern horticulture tells us that large limbs do not want removing from fruit-trees; that the spongioles, or absorbent vessels, and the larger roots, must not be ploughed up if we would be successful in raising thrifty apple and pear-trees. It is sometimes necessary, we admit, to root-prune, but such instances, in our estimation, are quite rare, and allowable only where the roots afford too much nourishment to the tree.

The process of pruning of late, has become important to the fruit grower. Prune, but don't prune too much. You can form a tree most generally to your own liking, by judicious pruning. For instance, the apple-tree can be kept low by cutting off the top shoots when it is young, or it can be made to run up high in the air, by "nipping off" the side branches. But we should be careful, I think, in cutting off lateral branches; for if we run the apple-tree up twenty or thirty feet high, our fruit, as a consequence, will be jammed and spoiled when it comes in contact with the ground. As a general thing, we ought to think to keep our fruit-trees down low to the ground, and thus we would be enabled to gather our apples, pears, &c., without thirty or forty-feet ladders. And another thing; all trees should be pruned while they are young, for it is very difficult to nip the end of the limbs off after the tree attains to the height of twelve or fifteen feet. I have tried the process, and found it to be very hard work for the arms and neck. The grape-vine, no doubt, is greatly benefited by judicious pruning; but some people say that it ought to be pruned but very little, while others say that it should be pruned more than any other plant. It is sufficient to say that it wants thorough care to make it a profitable vine, as do all other plants.

Modern horticulture teaches some new things in relation to propagating trees. For instance, we learn that the grape-vine—the native grape-vine—may be grafted by simply this process: cut it off below the surface of the ground, then split it, and insert the desired kind of grape-scions; bandage it tightly, (use wax if thought to be necessary;) and then close the dirt over it, and it is said its success cannot well be doubted. And our present experience informs us that in reality, the "currant-bush" is wrongly named, for it ought to assume the name of a tree, since, in fact, by judicious pruning, it can be made to grow with a trunk and top like the apple-tree; and by thus pruning it, the fruit, says Barry, as well as my humble self, grows twice if not thrice as large as it does when the bush is left without culture.

These are facts for the million. Prune, cultivate, and manage your fruit-trees in accordance with the teachings of modern horticulture.

W. Tappan.

Baldwinsville, N. Y., February, 1854.

GRAFTING STONE FRUIT.

It is a mistaken idea that many entertain, that there is difficulty attending grafting stone-fruit. It may as safely and as surely be performed with the plum and cherry as with the apple and pear. A little more care may be necessary, from the fact that the wood of these fruits does not split so easily; and a greater care becomes necessary, in consequence of the different arrangement of the bark, which, with the apple and pear, is easily cleft with the wood, while on trees producing stone-fruit, it runs around the stalk, rendering it liable to be irregularly torn, unless precautions are taken in cleaving to insert the graft.

Hence, we find it necessary to make a longitudinal slit in the bark, with a very sharp knife, previous to cleaving the wood, which should also be done with a sharp instrument. Sometimes, when the bark was very firm, and a disposition was shown in the cuticle to curl, we have found it necessary to secure it in its place by a bandage, and for this purpose, we have used an India-rubber ring, cut considerably smaller than the stalks, and drawn over it when rendered pliable by warming. This will hold the bark in its place until it heals, when the bandage may be taken off.

Another cause of failure in grafting stone-fruit arises from the delay which attends the operation. To be successful, it should be done before the frost starts at all. We (in lat. 42° 20′) have performed the operation early in March—when it was so cold we were obliged to have a pan of coals with us to warm the wax, in order to keep it pliable—with entire success. It may be performed from that time forward, but more care is necessary, and more doubtful success will attend if they live at all.

Grafting large trees may sometimes succeed very well, but as a general thing, we cannot recommend it. The better way is to get the right kind of stocks, and graft near the ground, when the trees are no larger than a person's thumb. Then, if the scion is like to outgrow the stock, earth can be placed around it, to give strength, and, it may be, new roots, to the scion.

Yours truly, W. Bacon.

Elmwood, January 21, 1854.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

ON MANURE FURNISHING FOOD FOR PLANTS.

Permit me to offer you for the pages of your very instructive journal, the following extract from a work I prepared for another purpose, but which may be acceptable to your readers, and be followed with others, should you so deem it. Yours truly, Benjamin Willard.

Lancaster, Jan. 17, 1854.

We have said that plants contain four *organic* and ten *inorganic* constituents, and that the laws of nature demand that, from the soil and atmosphere, *each one of these* should be available, in order to secure perfect crops; and a *full supply* of each, to secure abundant crops. Perfect ears of corn can be raised on a soil lightly manured, from hills four feet apart, and one stalk in a hill, one ear to a stalk, even if the ground is ploughed only six inches deep, provided the soil is not too wet or too dry. But quite a *different culture and manuring* is required to grow twice the number of hills, three stalks in a hill, and twin ears on most of them. The same will apply to raising wheat.

Waiving remarks on the laws requiring a deeply and finely pulverized soil, for another article, we will, in this, consider *manures* as furnishing food for plants. From repeated experiments, it has been ascertained that the stale of animals contains a great amount of nutriment, or food for plants; that similar effects are produced by applying the droppings of poultry, (guano,) animal manure, (blood and offal of slaughter-yards,) &c., &c. Much of the value of these is liable to be lost by putrefaction and evaporation. By chemistry, we ascertain what this is, and the way to retain it. It is well known that in cleaning horse-stables, especially under the floor, there is a very pungent smell. The same is true in opening a heap of stable manure that has been thrown up and heated. This smell is produced by the escape of ammonia, which is the essence and value of the manure. The loss is greater from privies, because their contents are still richer, and more highly charged with fertilizing gases. How to retain these, and to fix them in a state in which they will remain till used by the growing plants, is a question of great importance, which a *scientific* knowledge of these elements alone can answer.

An English writer says: Before you begin to clean out your stable, dissolve some common salt in water; if a four-horse stable, say four pounds of salt, dissolved in two buckets of water, and poured through the nose of a water-pot over the stable-floor an hour or so before you begin to move the manure;

and the volatile salts of ammonia will become fixed salts, from their having united with the muriatic acid of the common salt; and the soda, thus liberated from the salt, will quickly absorb carbonic acid, forming carbonate of soda.

This powerful solvent will be a valuable agent in preparing the manure for the reception of plants, after it is applied to the soil. Night-soil is rendered inodorous by mixing it with charcoal-dust, (carbon.) Dry pulverized clay, and plaster of Paris, and ten times its weight of peat muck or turf may be added, or any other carbonaceous matter, with good effect. In heaping up manure, a portion of these mixed with it will, in a great measure, prevent the escape of ammonia, by their chemical action as above described. I have long practised sprinkling pulverized charcoal, or plaster, daily in our stables, and also in heaping up my manure with a free use of salt. The result has been most satisfactory. This gives it double value when kept under shelter. When mixed with alternate layers of meadow mud, treble the quantity may be obtained.

STARCH MANUFACTURE.

Mr. Edward Tucker, Esq., Belfast, Ireland, has invented a process of manufacturing Starch, from grain and potatoes, which appears valuable. It is substantially this: The reduced grain or potatoes is submitted to the usual process of fermentation, and is washed, so as to separate the bran, or refuse of the potato, from the rest of the materials forming the substance to be treated. The starching liquor is then run into a vat and allowed to remain for about thirty-six hours, for precipitation. The supernatant liquor is next run off, or removed, and the precipitate is broken up. A solution of sulphate of soda, or Glauber's salts in boiling water, is prepared, in the proportion of about 13 lbs. of the salt to one ton of the wheat, or other grain under treatment; and after cooling down this solution, it is poured into the precipitated starch; and the vat being filled up with water, the entire contents are thoroughly mixed, and intimately incorporated by stirring. The mass is then allowed to stand for twenty-four or thirty hours perfectly quiescent. In the subsequent process, technically known as the "fine shift," when the water and slimes are removed, another solution of the same salt is employed, but in much smaller proportions; about 3 lbs. weight only being applied to one ton of wheat. At this stage, in combination with the sulphate of soda, a portion of sulphuric acid is used, in the proportion of about one quart of the acid to the produce of four tons of wheat. The acid, in a diluted state, is poured gradually into the vat, which is then nearly filled up with fresh water; and the whole contents are thoroughly mixed by agitation. When the starch has been precipitated, it is finished, and prepared for sale, and used in the ordinary manner. The patentee remarks that he has found sulphate of magnesia, muriate of soda, and other salts and acids, available for a similar purpose. This general process renders pure all water suitable for manufacturing starch, however hard and unsuitable it may have been originally. The pure starch is also better separated from the glutinous constituent of the grain; whilst the manufactured starch is superior in purity, sweetness, strength, fineness of texture, and whiteness, as compared with all starch made in the usual way; and the yield is greatly increased.

ELECTRIC GAS.

We publish the following statements of the *London Mining Journal*, and also the comments of the *Scientific American*, with our own views of the subject at the close:

The proverb says, "There is nothing new under the sun;" we have been led to doubt the truth of this from having witnessed a private exhibition of "electric gas." That is, gas produced from water by means of electricity, and by which is developed, for the first time, the extraordinary phenomenon of burning the two gases together, without the least fear of explosion, which the most scientific and learned of men have ever hitherto deemed an impracticability.

The gases produced by electricity are free from all possibility of explosion. Its production requires no expensive materials, nor are large premises necessary, whilst all existing pipes and lamps may be used if requisite; and in the economy of production there will be a saving of at least fifty per cent. upon the present cost of coal-gas.

Mr. Gamble, a scientific gentleman, connected with gas-works and railways, has made a report on this electric gas, in which he says:

"I cannot find language sufficiently expressive to convey the astonishment I experienced at witnessing the effects of the electro-magnetic machine in the production of gas applicable for the purpose of artificial light and heat by the decomposition of water. Water is found, on a chemical analysis, to be composed of two permanently elastic fluids, or gases, called oxygen and hydrogen. When water is decomposed, an enormous increase in volume is the result; this increase is about 2,000 times. It has been long known that water is decomposable by electrical agency, but this has been generally effected by the action of a galvanic trough, at an expense so great as to be commercially prohibitory. But by the magnetic apparatus the expense is very trifling, being little more than interest on first cost of the machine, with a small addition for renewals, and the cost of the motive power. The decomposition of water for the purpose of obtaining a gas applicable for the production of artificial light and heat, has long engaged the attention of chemists: and numerous discoveries professing to attain this desideratum have been made. All these (so far as I am acquainted with them) have for their object the separation of the hydrogen gas only; no attempt, I believe, has hitherto been made to make use of the oxygen. The general mode in which the hydrogen is obtained, is by passing steam through scrap-iron, or a variety of other materials heated to a high temperature; in this manner, the vapor of water is decomposed, the oxygen unites with the heated solid body, and the hydrogen is liberated in the gaseous form, and collected in a gas-holder. But the gas resulting from the decomposition of water by the magnetic machine is altogether different. Here is collected not merely the hydrogen, but the oxygen also; this increases the volume of production one-third, and the gas is altogether different in its composition.

It is an invention, the most gigantic of the age of wonders."

[The above is a very long quotation, and we would not republish it unless we thought of accomplishing some good thereby. We will therefore point out the errors contained in it, and show the utter unscientific qualifications of its author, who is reported to be "a scientific gentleman." And we do this as a duty, because we have seen the above republished in many of our exchanges, and we certainly do not wish nonsense to go abroad uncorrected, under the panoply of science.

It is well known to almost every child in our land, that water is composed of hydrogen and oxygen, and when decomposed into these elements, they increase in bulk about 2,000 times their volume—as water. But it is not true that water has generally been decomposed heretofore, by passing steam through red-hot scraps of iron, by which process the hydrogen is set free, while the oxygen unites with the metal. Zinc and iron, submitted to the action of dilute sulphuric acid, will generate hydrogen by decomposing the water; but platinum, heated to a white heat, if plunged into water, will set both its oxygen and hydrogen free.

But water has been decomposed into its elementary gases many times by the very plan set forth above, namely, electricity. This was Paine's plan of decomposing water to obtain his light. It is more than twenty years since this was first done by the magneto-electrical machine of Mr. Saxton, a scientific American, residing in London: he accomplished the very thing said now to be "the most gigantic invention of this age of wonders," and in the very city where the above affair has been thus unblushingly announced by *a scientific gentleman.*

In 1838, Dr. Page, formerly of the Patent Office, made a great improvement on the magneto-electrical machine, by which powerful currents were generated, perfectly applicable to the decomposition of water.

The gases of water are not fit for illumination, unless burned on lime or chalk, forming the Drummond Light. This light is very expensive and troublesome. The gases of water cannot be conveyed, and used in pipes like our common carburetted hydrogen, nor can they be used with safety. A jar containing hydrogen and oxygen in the proportions for forming water, will explode with great violence if a spark of electricity be passed through it; these gases will also explode if a light of any kind be applied to them.

The statement above, that the gases of water "are free from all possibility of explosion," is an unqualified untruth, and so is all that is stated about its cheapness of production. These gases can be safely burned by well-known apparatus made for the very purpose; still they are dangerous. They produce, when burned, an intense heat; a heat so great, indeed, as to melt platinum like wax, by Dr. Hare's blow-pipe; but unless burned upon lime or some solid incandescent substance, as we have already stated, they will produce only great heat, but not good light. In the above extract which we have quoted, there is nothing new except that which is *untrue.—Scientific American.*]

The literal sense of the proverb quoted above, "There is nothing new under the sun," so far as inventions and new applications of long-known principles are concerned, American mechanicians have long since discarded. There are a thousand things that are new, and many, which, in one sense, never will be old, for they will be exploded as soon as they are brought to the light.

The endeavor to manufacture gas by the decomposition of water, has been often and perseveringly pursued by many persons, who were both practical and scientific; but, as the editor of the *Scientific American* observes, without *available* success.

Still, we have some substantial objections to make against the positions taken, both by the London editor and by our learned neighbor. Both are well versed in the principles of science applicable to the question discussed, no doubt; but is not the latter going too far in denying what is claimed by the London editor, as having now been accomplished, simply because it never before was accomplished? Even the chemists here have no knowledge of the mode of doing it; it may perhaps be done.

When the elements which compose water are transformed into gases, and are brought into contact, they are explosive. This has long been known. But suppose some fortunate experimenter should be successful in arranging machinery, with the requisite *chemical* contrivances, so to speak, as to modify essentially, by combination or otherwise, one of these elements, either hydrogen or oxygen. It is obvious that the conditions of the mixture may be so changed, that there is no longer any danger of explosion. Whether Mr. Gamble has, in fact, accomplished this, remains to be proved. This result need not be considered impossible, even if it remains yet unachieved. The compound blow-pipe, as now constructed, is considered perfectly safe, and yet two gases combine to give to it its tremendous power.

There is another point, on which the *chemistry of the past*, so to speak, must not be too positive. Reference is made above to the discovery of Mr. Paine. It is not perhaps generally known that the results which he obtained were accomplished by a very simple modification of the machinery in common use. He was always willing to exhibit every part of his apparatus, with the exception of one piece, scarcely larger than one's fist, namely, the helix. The change made in the construction of this magic coil secured to him his measure of success, whatever that may have been.

But what was this success? Perhaps the best answer may be a reference to his English patent. He succeeded in producing an excellent light. The economy of the process was also quite satisfactory. But the machinery was in constant danger of being blown to pieces, and this danger he long tried in vain to remove. When, at last, he supposed that this difficulty was also overcome, he found that there was another "more excellent" way, namely, the use of atmospheric air without decomposition. This ghostly obstacle was thus removed far away from the path of the experimenter.

But it was the "electric light" of Mr. Paine which was the subject of general discussion, and which led more than one very respectable committee to visit the beautiful town of Worcester. Among these, one committee, of which the late accomplished President of the Boston Gas-Light Company, Mr. George Darricott, was chairman. Mr. D. reported that the light exhibited by Mr. Paine was a good light, but they, the committee, did not believe that it was produced in the manner described by Mr. Paine. One reason assigned for this disbelief was because the gentleman, then in attendance, a brother of Mr. P., was very unwilling to take the machinery to pieces, and when he finally did separate its parts, and then replace them, the light was less brilliant than before. Now, the fact was, this brother had no inclination to run the risk of being blown up, and by mixing his gases with atmospheric air, this liability was greatly increased. As to the second reason, we are surprised that so sensible men should attach to this fact any importance. All illuminating gas gives a dim light when mixed with atmospheric air. We happened to be in Worcester the first evening in which coal-gas was used for lighting the town, and we and other guests of the American House (and a capital house it was, and is still) complained bitterly of the dimness of the lights, before we had an explanation of it.

Another matter of fact in respect to which these gentlemen were mistaken, and on which the comments above quoted need some modification, is in reference to the mode of giving brilliancy to the flame of hydrogen. This Committee stated that, in their opinion, the passage of the gas through "cold turpentine" would not catalyze it sufficiently to give it the brightness required. They were mistaken. With the improved machinery, there was nothing to be desired on this point. Our learned neighbor repeats the same thought, and suggests that lime or chalk, as used in the famous *Drummond* light, and which many of our city readers have seen on the top of Barnum's Museum, is necessary to impart to it the requisite brilliancy. This is true only when used in connection with the old machinery. Paine's experiments on this point were quite satisfactory. *Why* they should be so, why so slight a change in machinery, or why any change in machinery, should so change the properties of hydrogen gas, we do not know, nor so far as we have learned, does any one pretend to explain. The whole process of "catalysis" is utterly inexplicable. The greatest chemists do not pretend to be wiser on this subject than their unlearned neighbors.

We do not, however, attach so much importance to the discovery of "electric gas," as does the editor of the *London Mining Journal*, even though all that is claimed for Mr. Gamble's discoveries should appear to be true. We have something still better. There can be nothing cheaper than atmospheric air, and no carbonizing mixture has yet been offered to us, cheaper or more convenient than the Benzole mixture of the American Gas Company, now used in producing light at No. 3 Broadway. But we are open to conviction, and shall rejoice to be able to set forth a greater good, when it shall be shown to us.

SUBSTITUTE FOR GUTTA PERCHA.

Dr. Riddell, officiating superintending Surgeon of the Nizam's army, in making experiments on the Muddar plant of India, (*Asclepio Gigantea,*) had occasion to collect the milky juice, and found that as it gradually dried, it became tough and hard, like gutta percha. He was induced to treat the juice in the same manner as that of the gutta-percha tree, and the result has been the obtaining of a substance precisely analogous to gutta percha. Sulphuric acid chars it; nitric acid converts it into a yellow resinous substance. Muriatic acid has but little effect upon it; acetic acid has no effect, nor has alcohol. Spirit of turpentine dissolves it into a viscid glue, which, when taken between the finger and thumb, pressed together, and then separated, shows numberless minute and separate threads. The foregoing chemical tests correspond exactly with the established results of gutta percha. It becomes plastic in hot water, and has been moulded into cups and vessels. It will unite with the true gutta percha. The Muddar also produces an excellent fibre, useful in the place of hemp and flax. An acre of cultivation of it would produce a large quantity of both fibre and juice. The poorest land suffices for its growth, and, no doubt, if well cultivated, there would be a large yield of juice and a finer fibre. A nearly similar substance is procurable from the juice of the *Euphorbia Tirucalli*, only, when it hardens after boiling, it becomes brittle. The subject is most important; and if common hedge-plants like the foregoing can yield a product so valuable, the demand for which is so certain quickly to outrun supply, a material addition will have been made to the productive resources of the country.—*Journal of the Society of Arts.*

FEMALE ACCOMPLISHMENTS.

We take the following very pleasing paragraph from the address of C. P. Holcomb, Esq., before the Maryland State Society, of which we have before given some notice:

As showing the interest English ladies take in agriculture, I cannot but relate a casual interview I chanced to have with an English lady, in going up in the express train from London to York. Her husband had bought a book at the stand as we were about starting, and remarked to her that "it was one of her favorite American authors—Hawthorne." I casually observed, "I was pleased to see young American authors found admirers with English ladies," when the conversation turned on books and authors. But I said to myself pretty soon, "this is a literary lady; probably her husband is an editor or reviewer, and she handles the 'scissors' for him; at all events, I must retreat from this discussion about authors, modern poets, and poetry. What should a farmer know critically of such things? If I was only in those fields—if the conversation could be made to turn on crops, or cattle, then I should feel quite at home." I finally pointed out a field of wheat, and remarked it was very fine. The lady, carefully observing it, said: "Sir, I think it is too thin—a common fault this season, as the seeding was late." "Those drills," she added, turning to her husband for his confirmation, "cannot be more than ten inches apart, and you see, sir, the ground is not completely covered; twelve, and even fifteen inches is now preferred for the width of drills, and two bushels of seed to the acre will then entirely cover the ground, on good land, so you can hardly distinguish the drills."

If the Goddess of Ceres had appeared with her sheaf, or her cornucopia, I could not have been taken more by surprise. A lady descanting on the *width of wheat drills, and the quantity of seed!*

"I will try her again," said I, "this may be a chance shot," and remarked, in reference to a field of ploughed ground we were passing, that it broke up in great lumps, and could hardly be put in good tilth. "We have much clay-land like this," she replied, "and formerly it was difficult to cultivate it in a tillage crop, but since the introduction of Croskill's Patent Clod-Crusher, they will make the most beautiful tilth on these lands, and which are now regarded as among our best wheat lands."

The conversation turned on cattle. She spoke of the best breeds of cows for the pail, (the Ayrshires and Devons;) told me where the best cheese was made, (Cheshire;) the best butter, (Ireland;) where the best milk-maids were to be found, (Wales.) "Oh!" said I, "I was mistaken; this charming, intelligent woman, acting so natural and unaffected, dressed so neat, and so very plain, must be a farmer's wife, and what a help-mate he has in her! She is not an extravagant wife either, not an ornament about her; yes, a single bracelet clasps a fair rounded arm—that's all." The train stopped at York; no sooner had my travelling companions stepped upon the platform, than I noticed they were surrounded by half a dozen servants—men and maids—the men in full livery. It turned out to be Sir John and Lady H. This gentleman, I learned, was one of the largest landed proprietors in Berkshire, and his lady, the daughter of a nobleman, a peeress in her own right; but her title added nothing to her—she was a noble woman without it.

It is a part of our task to excel in horticulture, in which female taste and skill must aid us. We must embellish our homes; we must make them sweet and pleasant homes. The brave old oaks must be there; the spacious lawn with its green sward, and the fruit orchard, and the shrubbery, and the roses; the vines festooned and trained about the walls and balconies; even the birds will think *that* a sweet home, and will come and sing, and make melody, as though they would "teach the art to imitative man."

Such a home will be *entailed* to our children, and to their children, not by statute laws of entail, but by a higher law, the law of nature, through the force of sympathy, the associations of childhood,

> "The orchard, the meadow, the deep-tangled wild wood,
> And every loved spot which our infancy knew."

These will hold them to it—these early memories, which we should take care to deepen with a binding and indissoluble tie.

Talk not, then, O ye fathers and mothers! to your sons of forensic fame; of senatorial halls; of the distinction of professional life; or of the gains and emoluments of commerce. It is not for our class, surely, to furnish more recruits to this hazardous service, in which so many of the youth of the country have been lost—lost to any useful purpose of living; themselves miserable from that hope deferred that makes the heart sick; or disappointed of the objects of life, have been overwhelmed by bankruptcy and ruin. *Give to your sons the pursuit of Washington*, who gloried in being a FARMER; the field and the council-chamber he sought from duty, but his farm at Mount Vernon, where he wisely directed the plough, from choice and pleasure.

> "Wide—wide may the world feel the power of the plough,
> And yield to the sickle a fullness delighting;
> May this be our conquest, the earth to subdue,
> 'Till all join the song of the harvest inviting;
> The sword and the spear
> Are only known here,
> As we plough, or we prune—or we toil void of fear,
> And the fruit and the flower all smile in their birth,
> All greeting the Farmer, the Prince of the Earth."

FURS AND SKINS.

A GREAT trade is done in these on the Missouri river and at St. Louis, and much romantic incident as well as wealth is connected with the traffic.

The silver fox is found only on or near the mountain tops, where the color is perpetual. The trappers take them principally from the Utah, Sierra Nevada, and other portions of the dividing ridge west of California and Oregon. Even there, however, they are rare. The fur of the silvery gray is larger, thicker, and finer than that of any other fox. It derives its chief value, however, from its extraordinary and beautiful color. The skins, when pure, will readily command from $100 to $150. They are used for muffs, and for trimming female articles of dress. The *Democrat* says that the fur trade has declined in importance within the last twelve years. At that period, fur was held at $6 and $8 per lb., but it is now generally superseded by silk and plush. Twelve years ago, no hat was fashionable that was not of beaver, and the cost of a good beaver hat in St. Louis was from $14 to $25; and of caps, made of other skin, $15 and $20, and even more. Since the decline in the price of beaver, that kind of game has been visibly on the increase. Buffalo and other large game, however, do not increase. They have or are rapidly abandoning the large extent of plains over which the immigration pours. Being thus herded in a narrow compass, the supply must begin materially to fail in the course of a few years.

NEW COAL MINE.

Mr. Emmons, State Geologist, in North Carolina, in a letter dated December 27, 1853, to the *Raleigh Register*, gives some particulars of a very valuable development of a coal field :

It appears that the first seam was cut at 360 feet. When I first saw the statement, some weeks ago, in the public prints, I remarked that this five-foot seam is not the main seam. There is at least another just below it, which has more than twice the thickness of this. So that it will be found my estimates of the quantity of coal in the Deep River basin will far exceed the amount I stated in my report. I am not at all surprised at the results of the boring. I could not expect, from my own observations, that the first seam would be cut nearer the surface than 350 feet at any place. When the seams are covered with the entire mass of slates, I expected also, and sustained my expectations, that the seams would have become flatter at a distance from the out-crops.

It will appear, then, that I am justified in assuming the position that, at the point within the out-crop, where the auger penetrated the slates, there is three times as much coal to the acre as I stated in my report. This will make 24,900 tons to the acre; or, for every 1,000 acres, 29,400,000 tons. This coal, considering its quality, will be worth in market \$7 per ton, and will amount to \$203,800,000.

It may be said that I am holding out false lights; but I abide my time. Somewhere on Deep River, there remains to be built a city greater than Lowell. Deep River has the water, the coal, the iron, the copper, the corn, the wheat, and the cotton. Lowell, of my honored native State, had the water only; and there arose, by the industry of a few men, a great city. If the old State can't build one, somebody north of Mason and Dixon's line will, and call it after his own name.

IOWA COAL FIELD.

This zone of limestone has an average width of twenty-five miles; it circumscribes, with a short interval, the great coal-field which occupies the whole of south-western Iowa, extending north to latitude 42 deg. 30 min.; and separates it from the Illinois coal-field by a calcareous belt, varying in width from twenty-five to fifty miles.

Of this coal-field, (in Iowa alone, not including its extension south into Missouri,) the dimensions are as follows:

Its average width from east to west is less than *two hundred miles*; its greatest length from north to south, about *one hundred and forty miles*; its contents, about 25,000 square miles. It extends, measured in a direct line, nearly two hundred miles in a north-westerly direction, up the valley of the Des Moines.

After crossing the Iowa boundary line into Missouri, the boundary line of this coal-field bears nearly south, through Clark, Lewis, and Marion counties, to near the junction of the three forks of Salt River; thence through the western part of Ralls county, towards the head-waters of Rivière au Cuivre, in the eastern part of Audrian county, and north-western corner of Montgomery county; thence it sweeps in a south-westerly curve through Calloway county, towards the Missouri River, which it crosses near its confluence with the Osage; leaving a belt of country some ninety miles wide, between this coal region and the out-crops at Charbonnière, and the coal-pits worked on Rivière des Peres, in St. Louis county. These are, in fact, outliers of the Illinois coal-field. From the Missouri River, the boundary bears, with a westerly curve, up the valley of the Osage, north of that river, which it crosses, but for a very limited distance only at three points; in Camden county, near the mouth of Niangua; in St. Clair county, near the mouth of Sac River; and in Bates county, near the confluence with the main river of the Little Osage. Thence the line bears, with a northerly curve, towards the western confines of Fayette, recrossing the Missouri at Wellington; thence up the valley of that river, keeping from ten to twenty-five miles from the river, to the State line.

The coal measures of Iowa are shallow, much more so than those of the Illinois coal-field. They seem attenuated, as towards the margin of an ancient carboniferous sea; not averaging more than fifty fathoms in thickness. Of these the productive coal-measures are less than a hundred feet thick. The thickest vein of coal detected in Iowa does not exceed from four to five feet; while, in Missouri, some reach the thickness of twenty feet and upwards.

COAL ASHES.

For several years after the use of hard coal was introduced into this part of the country, the ashes were considered of no value. This has been found a mistake.

We long ago used them on the walks of our door-yards or other thoroughfares, and found them to be very useful, securing a hard path that was not easily broken. Sometimes, indeed, it is desirable to cover them with a thin coat of fine gravel, or some other substance equally clean.

On some soils, which are too loose and too "light," we have no doubt that coal ashes would be permanently beneficial.

Again, on a hard clay soil, we know of nothing that is more promising. It contains much silex, in which all clay soils are deficient.

But silex is not the only element which it supplies. It contains alumine, carbon, and iron, in a soluble form, nearly to the amount of twenty per cent. Hence, it is obvious that it is a valuable manure for many varieties of soils.

Cannel Coal.—It is now settled, beyond a doubt, that Western Pennsylvania possesses inexhaustible quantities of cannel coal, of excellent qualities. It is found in Beaver, Armstrong, and Indian counties, and, no doubt, exists in Butler, Jefferson, and Clearfield counties. The quantities already discovered are immense. Western Pennsylvania possesses fine water-power, inexhaustible supplies of coal and iron ore, a fertile soil, a salubrious climate, magnificent scenery, and a central position.

HINTS ON BREEDING GRAZING CATTLE.

We commend the following suggestions, which we take from the New-York *Spirit of the Times:*

Some breeds of cattle are disposed to carry fat internally, and others externally, while in others it is deposited between the layers of muscles, forming what is called "marbled meat." In the races of cattle disposed to carry fat externally, are the once-famed "Dishley breed," with large fatty rumps, and the African ox, with his immense humps of fat on his shoulders. These animals have little or no internal fat. The Herefords are distinguished for this peculiarity of carrying much external fat, making these exceeding good "handlers." The "improved Durham" are highly prized for their "marbled beef."

The animals which reach the greatest weight of muscle and fat, with the least consumption of food, are the Herefords and Durhams; the former breed will fatten, at the age of two and a half years, to one thousand pounds; while nearly all other breeds require at least one year longer to attain this weight—an important fact that should not be lost sight of by breeders of grazing cattle.

In calling attention to the "principles" of breeding, we cannot perhaps do better than examine the "rules" followed by the most successful English breeders.

The following are the means by which Bakewell established the permanent character of his cattle:

He first selected the best animals of their respective kinds, and coupling these, endeavored to develop in the highest degree those characters which he deemed good, looking mainly to those peculiarities of conformation which indicate a disposition to fatten. He arrived at producing a large cylindrical body, and a smallness of the neck, head, and extremities, or what is called fineness of bone. A saying of his, often quoted, is, that "all was useless that was not beef." Hence, the principles which guided him, were the most meat from the least food, the least offal, and the size of the best joints: smallness of the bones, aptness to fatten, and arrive at early maturity, he kept constantly in view. He always bred from the best animals, making the very best selections of both male and female. He thought the production of a large quantity of milk was inconsistent with the property of yielding much meat.

Charles and Robert Colling made many improvements in the Durhams. They, like Bakewell, seem to have regarded size in their animals as a quality secondary and subordinate to those which they wished to produce, and to have directed almost exclusive attention to beauty and utility of form, and development of the properties of early fattening. Having, by skillful selections, become possessed of animals with the properties sought for, they continued to breed in and in.

C. Colling's first great improvement was made on a young bull, which he obtained by a kind of chance of a poor man, from a cow fed by the roadside. His sagacity led him to see the value of the young animal. He likewise afterwards obtained a cow, which, however, on being removed to superior pasture, became so fat, that she did not again breed. The calf inherited the same property, and as he grew up, became so fat as to be useless as a bull. This bull was termed Hubback: he was the sire of the celebrated Bolingbroke.

Colling, by continually breeding from his own stock, seems to have pushed refinement in breeding to its limits, having produced that delicacy and impairment of constitution which never fails to accompany a continued intermixture of blood in a limited number of animals. He now attempted various crosses with cows of various other breeds; but his most fortunate cross was with a most beautiful polled Galloway cow, of a red color, and his "short-horn" Bolingbroke. The produce, being a male calf, was in due time conjoined with Johanna, a fine short-horn cow; the produce being another male calf, was put to "Lady," a true-bred short-horn. This cow, with her descendants, at his sale in 1810, forty-eight lots, brought £7,115, or about $716 each.

Michael Dobson, one of the earliest improvers of Durhams, visited Holland, for the purpose of selecting bulls of the Dutch breed. His stock were of great size, coarse, great consumers of food, did not fatten very early, produced much internal fat, and were well adapted to the uses of the dairy. This district, Holderness, was distinguished beyond any other part of England for its dairy stock, and many cows of this variety are yet to be found more or less mixed with the Durham blood. The effect has been to improve their form, but to impair their milking properties; nevertheless, the modern Holderness still stand in the first rank of dairy cows, and the great London dairies are chiefly supplied by them.

The following are the principal characters, found in animals possessing the faculty of fattening readily:

The head small, face long from the eyes to the point of the nose, frontis broad, muzzle fine, nostrils capacious, neck short, light, nearly straight, and small from the back of the head to the middle; full, clear, and prominent eye; the back straight from the top of the shoulders to the tail, which should fall perpendicularly from the line of the back; the chest wide and deep; the ribs deep and circular—this depth of "barrel" is most advantageous in proportion as it is found behind the elbow; hips wide apart; loins and back well filled up with muscle; quarters full and large; flank deep and well filled out; bones small and flat, but not so fine as to indicate too great delicacy of constitution; the hide, a very important part, rather thin, expansive, and mellow, well covered with fine and soft hair.

These are the principal characters which indicate the property of secreting the fatty tissue, and they may be said to be universal, extending to all domesticated animals, the horse, the sheep, the hog, the dog, and the rabbit.

In breeding, always observe the following rules:

1. Breed from sound and healthy animals.
2. Breed from the most perfect in form, and take a special care that a tendency to the same defect does not exist in both parents.
3. Breed animals of a distinct and positive character, to insure a certain description of offspring.
4. Select the very best males; for the produce inherit much more of the qualities of the male, whether good or bad, than they do from the female.
5. In crossing, the true system is to take one cross, and then return and adhere to the original breed.

It is a common practice, in the rearing of blood-stock intended for exhibition, to place the young animals, shortly after they are weaned, in a narrow stall, or box, and to feed them with milk and meal—sometimes sugar an molasses are added—and afterwards with grass, hay, carrots, &c.; the animals look fat and plump, and their owner is satisfied. Now, the effect of this is without doubt to lessen the size of the lungs and other organs concerned in nutrition, and produce a breed that will carry an immense mass of fat, come quickly to maturity, and also, when they breed, produce the same qualities in their offspring.

By breeding from animals having a great tendency to fatten, or from those kept constantly fat, function must reäct on organization, and at last these qualities become not only increased, but fixed, in the race. By functions reäcting on organization, is meant, when an organ—the lungs for instance—becomes diseased in consequence of not performing their natural functions, the diminished structure is likely to be reproduced in the progeny of an animal so affected; hence the reäction. The great secret of rearing animals for profit, is to obtain the fat kind, and supply them with all the food they desire, from their birth to maturity.

But, however desirable these qualities may be in animals intended for the butcher, others of an opposite character must be attended to: these are, weight of muscle, constitution, and capabilities of propagating their species; to produce all which, quite a different system must be adopted. The proper development and growth of muscles depend in a great measure upon the use that is made of them; as a set of muscles in active exercise increase in size and vigor, while those that are but little used, lose their firmness and diminish in bulk. Cattle require not such exercise as would harden the muscular fibre, but just so much as would tend to keep them in health, and prevent their getting too fat.

By merely feeding an adult animal, we have not the power of increasing its muscular substance, but we have great power over the increase of fatty matter, which, along with the fleshy fibre, forms food.

Daily experience fully proves the folly and impolicy of neglecting young stock of any kind; but especially is such neglect injurious in the case of those animals whose value depends on their size, symmetry, and constitution, which are mainly promoted by a careful provision of shelter, and a liberal supply of food during the first two years; as nearly the whole of the fleshy parts (muscle) of an animal, which afford most profit, are assimilated during the period of its growth.

WILL DRY GYPSUM ABSORB AMMONIA?

How shall we secure the ammonia of our barn-yards, is one of the great questions of the day. Among the discussions of the subject which we publish, we present the following remarks from the *N. E. Farmer*, and add only that the experiments described appear to have been very properly managed.—Eds. P. L. A.

That is, will dry ground plaster, spread on the manure heap, prevent the escape of its ammonia, so that on entering the stable where horses are kept, or the barn-cellar, where the droppings from the lean-to are collected, we shall not smell any odor from them?

As these escaping gases are very valuable, and as the amount of plaster now annually used for this purpose amounts to a heavy item of expenditure in farm husbandry, the question is an important one.

That the plaster so used upon manures will absorb the ammonia, the editor of the *Maine Farmer* says he "has always considered to be the true doctrine, he having sprinkled it on fermenting heaps of horse-manure, and thereby destroyed the odor." He adds, "we have also scattered it in and about privies, and neutralized the offensive odors thereof, for a time; and without any further examination, supposed the theory correct."

On the other hand, the editor of the *Rural New-Yorker* "denies that plaster will thus unite with ammonia, unless it be dissolved." To establish this theory, he says, a scientific farmer and writer took some plaster and guano, and rubbed them together in his hand, and upon applying it to the nose, found that "instead of fixing the ammonia, the plaster aided the decomposition of the guano, and the ammonia was driven off with considerable rapidity."

The test was a simple one, but was it a fair one? Could a sufficient quantity of plaster be held in the hand to neutralize the odors of even a single thimble-full of so concentrated and powerful a manure as guano? We think not, and do not consider such a test as settling the question.

The editor of the *Farmer*, in support of his theory, quotes the experiments of another practical man, Professor Campbell, of North Carolina, "by which it would seem that plaster, in a dry state, does actually absorb, or rather decompose, carbonate of ammonia, while flying off from fermenting manures."

Mr. Campbell made an experiment which he says was conducted as follows:

"A barrel was filled with fresh scrapings from the stalls of horses. Over the manure, as thrown in, a little ground plaster was sprinkled from time to time. After the barrel had been compactly filled, it was allowed to stand some weeks, until it had gone through the heating process, which always takes place when newly collected manure is thrown into heaps. But during this heating or *fermentation*, (as it may with propriety be called,) there was none of that 'vapor' or strong odor which ordinarily arises from fermenting manure heaps. When the mass had become cool, clean rain-water was passed through it, and collected at the bottom of the barrel. This water was found to contain one of the elements of plaster, and one of the volatile substances (carbonate of ammonia) above alluded to. On emptying the barrel, a white powder, looking very much like plaster, was found mingled with its contents. But when tested, this powder was found to contain only one of the elements of plaster, while it contained also one element of the volatile carbonate of ammonia just mentioned."

We have great confidence in the theory of the editor of the *Farmer*, and that confidence has been gained by several years' practice of that theory. When the horse-stalls have been neglected, and the odor arising from them has become exceedingly pungent, we apply the dry plaster, and, *presto!* the stalls are sweet. And so of the cattle-stalls, the cess-pools, the drains, and any other olfactory nuisance that comes in sight.

This dry plaster, however, is never applied to dry substances. When thrown upon the horse and cattle-stalls, the litter and the floor are wet; if they were dry, there would probably be no odor. But who has dry piles of manure in these days of inquiry and progress? Certainly not the man who is in the habit of using plaster. The dry heaps under the barn windows, resembling camel's dung that has bleached an age on deserts of sand, belong to men of another age, who laugh at you for expecting to find *virtue in stones*, and look upon *ammonia* as a cabalistic word, which, like Pandora's box, is filled with all manner of evil.

The theory of the editor of the *Rural New-Yorker*, in this view of the case, may be correct; we do not believe, however, that it is necessary to go to the trouble of leaching the plaster, and using the water thus impregnated with it.

The best mode of retaining the valuable properties of manures, until they are wanted for use, is to apply to them daily such portion of finely pulverized, old meadow-muck as will take up the juices, so that none of them will leach out. This muck is the cheapest, most accessible, and convenient, and at the same time one of the most capacious absorbents and best deodorizers at the command of the farmer. Try it in the filthiest pool, or on the most *fragrant* heap of offal you can find, and see what a magic power it possesses! Keep a winrow of it in the cellar, in front of the place where the droppings from the stall accumulate, and each day cover them so as to add as much again muck as there is of the droppings, and the whole mass shall be of as much value as the same number of loads of pure droppings, left

"To waste its sweetness on the desert air."

No man in this State was better qualified, we think, to pronounce an opinion upon this subject, than the late Mr. Phinney, of Lexington; no other person, probably, had used so much muck, or made so many careful experiments with it upon almost all kinds of crops. We have often heard him say that *three* loads of compost, prepared as we have described above, were fully equal to three loads of the unmixed manure.

COTTCN.—MODE OF CULTIVATION.

Messrs. Editors:—In accordance with my promise in my article on guano, I propose giving you my views on the culture of cotton.

The cotton plant is not easily suited in soil and climate, and it seldom happens that they are so combined as to perfect the plant.

The best cotton lands are of a deep, rich, soft mould, a medium between the spongy and sandy. The most important part of the cultivation consists in a judicious and proper preparation of the soil for planting. All cotton lands should be broken up deep and close, at the latest, by January; it would be better to have it done in November or December, but picking out generally prevents it. Plough deep, the deeper the better; use the subsoil as much as possible; even if your land has been in cotton the year previous, break it up deep, at least one foot.

About the 25th of March, I prepare for planting. I lay off my rows from thirty-two to thirty-six inches wide. Cotton should be so planted, that when it arrives at maturity, the branches will slightly interlock on every side. I lay off these rows as deep as I can with a shovel or scooter from two to three inches broad; the plough is one half inch broader at the point. I then drill my manure as regular as possible. I follow with a turning plough, laying on two furrows, raising the bed as high as possible; I then break out the middles. If the land is low, I draw up the bed with hoes; with a small, narrow plough, I lay open the bed, making a furrow of uniform size and depth. A careful hand follows, strewing the seeds evenly in the furrow, always using enough to secure a good stand, (about three bushels per acre.) I cover with a board of hard wood, an inch or inch and a half thick, seven or eight inches broad, and a foot in length, slightly notched in the centre. The board is screwed on the plough-foot, and when drawn over the row, covers the seed nicely. If the ground is well broken up, and the seed well planted, half the labor is done.

As soon as the cotton is up, I commence thinning out, leaving bunches from eight to twelve inches apart, passing along rapidly with hoes. I follow with a small shovel, running close to the cotton, ploughing very *deep*, and throwing up a little light soil to the roots of the cotton. This ploughing, too, should be close and deep, so that the roots may easily penetrate the soil, as they strike deep into the earth. If the ground is very rough, the ploughs shall precede the hoes.

In the second working, which should follow as soon as possible, the ploughs go before the hoes. This ploughing also should be deep and close. I now bring my cotton to a stand. This should be carefully done, and the hoes attentively watched, as a stand is often ruined by this working. Sore shin, rust, &c., are often chargeable to the way in which this working is done. I now leave one stalk in every bunch heretofore left, making my cotton stand from eight to twelve inches apart. I throw a little dirt to the stalks of cotton, and leave the crop clean, free of grass and weeds. The cotton will then grow off finely, and not suffer for work for twenty or twenty-five days. Every subsequent ploughing should be shallow and not close; sufficient, however, to cover all the small grass that may have sprung up since the last ploughing. The hoes should also pass over the crop, killing such grass and weeds as the ploughs cannot reach. It is difficult to say how often the crop should be ploughed, as that will depend a good deal upon the seasons. My rule is to keep the crop clean of grass and weeds, and to keep the earth well stirred up until the branches interlock, or the cotton commences to open. The two first ploughings should be deep and close, the subsequent one shallow. I use the sweep, bow, twister, side-plough, scraper, and the old-fashioned shovel, in my crop. The selection of seed is also a matter of great importance. But I must close, for fear I tire you. JOHN P. KINARD.

We again urge our Southern readers to multiply statements of the character of this paper, in all our journals. We shall be happy to publish several with each issue. The foregoing was taken from the *Alabama Planter*.

LINEN IN OLDEN TIMES.

THE following paragraph is taken from the *New-York State Agricultural Journal* for December last.

ANCIENT SPINNING WHEEL.—E. H. Pease, Esq., of this city, deposited in the Agricultural Rooms, a spinning-wheel, in good preservation, received from "Mrs. Elinor Fry," of East Greenwich, who gives the following interesting account of it:

"I will with pleasure give thee the history of the curious spinning-wheel, as far as I know. In 1754, the wheel came to my father's house, in East Greenwich, from Narraganset. Whether it originated in England or Ireland, I cannot say, but it had been in America near one hundred years when it was brought here. In 1777, I, Elinor Fry, spun on the said wheel one piece of lawn handkerchiefs, 12 in number, as good as those imported from England. The ladies here were emulous to excel, and were so patriotic, they chose the fabric of our country, and toiled with their own hands to spin lawn for their dresses, proclaiming independence of Great Britain; for some of us were so happy to have farms of our own to clothe us; and our fathers encouraged us to wear such as we made. The identical wheel spoken of, Samuel Fry, my father, gave to me, and I, Elinor Fry, presented it to Erastus H. Pease, to hold or sell, as he pleases.

"In regard to the Spinning Party, it was done in 1789, to celebrate the Federal Constitution, and to encourage manufacturing in the State of Rhode Island. 21st of April, 1789, forty-eight patriotic ladies assembled at the court-house, in East Greenwich, with their own wheels, their own flax, and for their own use, spun 173 skeins of linen yarn in one day, from sun-rise to setting at night; one lady spun seven skeins and one knot, it being the most spun by any of the company; there were several that spun six skeins in the same time; the usual custom was two skeins in one day for each to spin. There was a festival in Providence, 1790, where there was a splendid ox roasted, called the Federal Ox. I was there at the time, and saw the ox while roasting. This may not be interesting to thee, so I will omit saying more on this subject. I herein sign my name, this 9th day of the 4th month, 1853.

ELINOR FRY."

LUMBERING IN MINNESOTA.

It is well known that the extensive pineries along the Wisconsin, Chippewa, and St. Croix rivers, in Minnesota, are annually visited by troops of stout lumbermen, who spend the winter in chopping and hauling logs, which, in the spring, when the ice breaks up, are launched upon the turbulent waters, and floated down to a market. They ascend the river in batteaux, taking with them all their supplies for the winter. By dint of poling and pushing, they arrive at their destination about the 1st of November. Their first business is to build a cabin, say twenty by forty feet in size. The cabin is constructed of logs, daubed with mud inside and out, and covered with slabs of pine. A chimney is built in the middle of the room, a long table at one end, and bunks for the men are arranged on either side. We gather the following description of the wild and exciting, although laborious life of the lumberman, from an interesting article furnished by the correspondent of the New-York *Tribune:*

"Each man has his blankets and straw, if he can get it, and makes up his own bed, if it is made at all. A cook, usually a man, is employed. The oxen and teamsters arrive, hay is hauled in from the 'bottoms,' where it was cut the summer before, and our men are ready to commence the work in earnest. Two or three hands are set to chopping. The trees are cut down, cut off at the top and root, and thus hauled along; three or four hands go to 'swamping,' or clearing roads for the teams; one or two persons peel the bark from the trees, which enables us to pull it more easily; three or four act regularly as teamsters; a few extra hands to assist them whenever they are needed. Breakfast is prepared at an early hour. As soon as it is light in the morning, the hands are started off for work. The time to quit at night in the winter is at dark, but as the days lengthen in the spring, the men are allowed to leave off at sundown! Every man knows his place and business, and expects to keep 'up his end.' A good crew of men will put into the river from 5,000 to 8,000 logs in a winter. No where can a jollier set of men be found than these same woodsmen. During the long winter evenings, tales and songs, and jests and laughter, are heard in the rude cabin; and every man is expected to furnish his mite to make up the social repast. A good tale is considered 'none the worse for being twice told,' and songs are sung over and over again. Whatever books are owned by individuals become common property, and are looked upon as a kind of free circulating library. It is not uncommon to have debates. At almost any hour of an evening, you will find the men, some standing, some sitting, some reclining, and all talking, laughing, reading, or singing, as though work and hardship were gone to return no more. Socially, there is no happier circle to be found than that which is formed about the chimney-fire in the rude log-cabin in the woods. The very soul of good-fellowship is there. They are glad to escape its *ennui* by going to work on Monday. The hours of Sunday are killed in many different ways. Those who are religiously inclined employ themselves in reading, writing, &c.; some are to be seen washing their clothes; a few are asleep, and others are off hunting. In the evening they retire at an early hour, and are up bright and early on Monday morning to begin their week's labor.

Thus passes the time till winter and snow are gone; then the work of the logs begins. The men keep the logs in the stream by poles, and often ride them in the stream for considerable distances. It is amusing to see 'green hands' attempt to ride logs; for they often tumble 'neck and ears' into the river, and swim, panting and frightened, to the shore. When the streams are shallow, large booms are built into them to draw up the water, so that the logs can be got to the mills. About the end of June, the logs arrive at the mills, when they are rapidly sawed, and rafted down the river.

Common hands in woods at present receive from $25 to $30 per month; teamsters, $50 to $60. Men on the 'drive,' as it is called, get $2 and $2.50 per day, Sundays included."

ELECTRIC TIME-BALL.

WHILE the attention of the public is directed to the convenience of a time-ball on the State House, a similar apparatus has been put in operation in Edinburgh. The utility of the Greenwich ball to the ship-masters in the Thames led to the erection of a ball in the Strand, for the convenience of London mercantile houses. The raising and lowering of flags on public buildings, where legislative bodies assemble, marking the commencement and close of each day's session, have long been a convenience to many in the neighborhood of such edifices. The ball on the Observatory, at Washington, is relied upon by great numbers to regulate their time-pieces.

We copy from the *Illustrated London News* the following:

"An electric time-ball has recently been erected on the top of the Nelson Monument, on Calton Hill, Edinburgh, and is now in operation. The ball rises about five minutes to one o'clock, P.M., and falls at the hour. It is placed under the charge of Prof. Piozzt Smyth, the Astronomer Royal at the Observatory.

If the public look to the Monument at five minutes before one o'clock, P.M., Greenwich time, (now Edinburgh time also,) they will see the ball raised half-mast high; at two minutes before, full-mast high, or in contact with the cross-bars; and when one o'clock, exact to a tenth of a second, it will fall—the instant to be observed being the commencement of the fall, as shown by the formation of a line of light between the ball and the bars. Those, who, on the Monument, have witnessed the fall of the ball, describe the effect as extremely interesting.

The huge mass is first of all seen rushing downward with terrific velocity, as if likely to carry all before it; when suddenly, at about three-fourths down, it is brought, by some invisible agent, almost to a stand-still; and then, with two or three slight movements up and down, it rests on its bed-block as quietly as if nothing had happened."

INFERENTIAL ANALYSES.

We have often spoken of the importance of knowing the condition of soils, and have recommended, under certain circumstances, a careful chemical analysis.

We have also described modes in which the general character of the soil may be ascertained, without these expensive processes. Thus, we have referred in this connection to the character of the spontaneous growth of the soil, that is, the variety of the weeds which infest it; and we have explained a mode of ascertaining the presence of various elements by washing the soil, &c.

Reference has also been made to the character of the crops it has produced, as a fact of great importance in deciding in what elements it must now be deficient. We purpose a few additional suggestions, with some minuteness of detail, as to the use to be made of such facts.

We must, however, in this case, as in former ones, bear constantly in mind that the original condition of the soil will often, in respect to one or more of these elements, essentially modify and change the result at which we would arrive. On a "silicious soil," for example, it is impossible to exhaust the silex by any growth that can be cultivated. This element forms so large a portion of the whole body of "earth," in many cases, that to exhaust that element would be to use up entire "solid" feet of earth, leaving a void obvious to the sight, and changing the whole appearance of the field. On the other hand, clays are often, and, indeed, usually furnished so sparingly with silex, that it must be furnished from abroad, while the alumina is practically inexhaustible. A mere glance at some table like that exhibited on pages 24 and 100 of our numbers for July and August, vol. 5, will indicate what those elements are, in the soil in question, which may always be presumed to be present.

It obviously follows from these suggestions, that any specific instruction as to the probable absence of given elements, after certain oft-repeated crops are removed from it, must be taken as applicable to soils that are originally alike abundant in all required elements; and, at the same time, it is obvious that in fact, there is a small number of elements that seldom are found in excess; and repeated croppings, which make large demands on those elements, will leave the soil practically destitute of them.

One further remark, by way of limitation or explanation, is of paramount importance. Any element, silex, or almost any thing else, may exist in large quantities, but in an insoluble form. To dissolve silex to a very limited extent, it is now ascertained, water only is necessary; but to obtain it in solution to the extent often required, it is necessary to supply some other solvent. Here, of course, there is more necessity of science, than in any other department of the subject.

We are thus prepared the better to appreciate the following suggestions:

If we examine the straw of wheat, we find it composed of common vegetable matter—oxygen, hydrogen, and carbon, with a small quantity of carbonate of lime; so, if we examine the constituents of the grain, we find them distinguished into starch and gluten; the elements of the starch are the same with those of common vegetable matters; but the elements of gluten are analogous to those of animals, or in addition to oxygen, hydrogen, and carbon, there is also nitrogen. The production of this nitrogen cannot be effected by common vegetable matter, and the manure employed in the production of the straw and starch cannot produce the gluten. That the gluten of wheat-flour may always be present, it is necessary that a quantity of animal substance should exist in the manure to be applied to the wheat crop. If we pursue our investigations a step farther, we find that phosphate of lime is as constant a constituent of wheat as gluten. In barley, instead of phosphate of lime, there is a small quantity of either nitrate of soda or nitrate of potassa, (saltpetre;) whence those salts should be present in the soil where barley is to be grown. The ashes of bean-straw always yield a large quantity of a carbonate of potash. A considerable quantity of superoxalate of lime in the pea crop has been discovered. Clover contains a notable quantity of gypsum, &c., &c.

Wheat, oats, barley, and other cereals, make large drafts on the phosphoric acid and the potash, soda, and magnesia of the soil. Hence, if repeated crops of either of these grains are taken from it, these elements must be supplied in the manure, or the land will become barren.

The following table shows the actual and comparative demands which certain crops make upon lime:

20 bushels of	wheat	consume	13	lbs.
40 "	barley	"	17	"
50 "	oats	"	22	"
20 tons	turnips	"	118	"
8 "	potatoes	"	40	"
2 "	red clover	"	77	"

Hence, it is obvious that when these and like crops are grown, in successive seasons, lime must be supplied from abroad.

There is an important fact, by the way, in reference to lime, which it becomes us here to notice. It is found that in process of time, lime sinks into the earth, and must be brought to the surface by deep ploughing. This effect is occasioned by the rains and melting snows, in which it is dissolved, which are absorbed by the earth, and which carry the lime, in a state of solution, along with them into the sub-soil.

If a soil is overlimed, it will not produce good crops, though even then, turnips and barley thrive well upon it. But if guano or the superphosphates are supplied too liberally, turnips acquire a very large size at the expense of quality. They are then liable to early decay. This arises from the fact that they contain an excess of water. Turnips are cultivated more successfully in a light than in a strong soil.

THE GREAT EXHIBITION.

Instead of continuing the plan adopted in previous numbers, except the last, we shall make our sketches of this great collection, hereafter, rather by *topics*, or classes, than with reference to their position. We do this, because we suppose that few will hereafter visit the palace, under circumstances which require such a guide as we then proposed to furnish, while a better idea of the actual condition of the several departments may be obtained by the course now to be pursued. We begin by a short account of light-houses, and—

THE FRESNEL LIGHT.

The Fresnel Light is constructed upon the exact principles of optics. The reflectors are so arranged in connection with them, that few rays are lost by spreading themselves over a large surface, thereby of necessity appearing very dim, or by taking an upward or downward direction where they would be useless. So perfect is this arrangement of curved reflectors, that a single lamp is quite as effective as the many employed in the old methods. At the same time, such a direction is given to them parallel to the surface of the ocean, as the condition of things at each station may require.

These reflectors are placed about the sides of the revolving lantern, the entire section of the tower which forms the lantern being made to revolve by appropriate machinery. This revolving lantern is formed almost exclusively of glass. The original invention contemplated cut-glass prisms for their reflectors, but our own artists have already contrived a good substitute., very much cheaper, by prisms of pressed glass, of the requisite curve. These prisms being located at intervals around the lantern, a stationary observer would see the excessively brilliant beam of rays at short intervals, as one reflector after another comes into the line of his vision, while, in fact, this beam sweeps the entire horizon, or rather a succession of them constantly traverses the horizon, as if searching for some object requiring its assistance.

The light exhibited in the Crystal Palace was designed, we understand, to be set up at Cape May. One or two others had previously been in use in this country, but they were of the original early pattern—before Fresnel and his brother had perfected this invention. The difference between it and those at present used in France, is very great. In that model, Fresnel employed only prisms with straight sides ; he had no apparatus for making any other ; they were put together in small pieces ; the light was obstructed by the cement used to confine them in their places, and the stray beams of light which escaped through the space between the prisms were caught upon mirrors, and reflected in the desired direction. But, in the new Fresnel lights, the mirrors are laid aside as no longer necessary ; the prisms have taken a curved shape ; they are larger and less numerous, and the sphere of glass which they form, enclosing the lamp, is of a far simpler and more solid construction, and a more perfect transparency.

The lamp of the Fresnel Light consists of four concentric wicks, of the argand pattern, each having, of course, a current of air on both sides of it, for promoting combustion, with its separate frame or rack for regulating its height. The oil is supplied by a pump, after the manner of the mechanical lamp.

GLASS-WARE.

Glass, as most of our readers know, is composed of silex, clay, and an alkali. Its first discovery, it is said, was an accident, resulting from the melting into a transparent mass, a handful of clay and silex, mingled with the ashes of a watchman's fire on the sea-shore. Chemically considered, this process is analogous, to some extent, to the manufacture of soap. No two of the three elements, which form either of these compounds, will unite by themselves, but the three together are necessary, and the philosophy of this action no wise man has yet attempted to describe.

The various kinds of glass are produced by the use of substances differing in fineness, purity, &c., as the presence of other metallic substances modifies the appearance and the essential qualities of the glass. Hence, the selection of the materials is a matter of very great importance. We have seen, for example, in Southern Vermont, in the town of Westminster, a "ledge" of rock, which was exceedingly free from all impurities, of perfect whiteness, and easily reduced to a fine powder. This, of course, is of great value, in this manufacture.

Among the exhibitions of glass-ware are elegant specimens from France and from the German States, from Austria, and the United States. Many of the articles from abroad are colored, but of these we shall speak presently. Some of the specimens which are not colored are exceedingly beautiful. Austria and France send not only the usual forms of household utensils, but beautiful lenses, for optical instruments, of numerous sizes and various focal distances. We notice also the rough material unground, or in the form of a very short cylinder. The collection of M. La Hoche, now removed, was very beautiful. M. Maez, of Clichy, near Paris, in the gallery at the end of the western nave, (Sixth avenue), has a beautiful display of glass-ware, colored and uncolored. His assortment of paper-weights is the largest and most beautiful we have ever seen.

But our own artists, in most respects, are not far behind the European. The goods shown by the New-England Company who manufacture at Sandwich, Mass., and by the Company at Brooklyn, N.Y., are very handsome. In the quality of the glass, and in the beauty of form, we have recently made very great progress. He must be very difficult who cannot suit himself from these establishments.

Colored Glass.—But in coloring, the foreign ("Bohemian") ware still bears the palm without a rival. Our own establishments produce colored wares in great variety, but they are not so clear and so brilliant as those they imitate. The combination of several colors in one specimen may be seen in the collection of M. Maez. This is done by a simple process. The specimen is first formed in glass of natural color. It is then dipped in a melted mass of colored glass, and immediately withdrawn. The surface is thus covered by a thin coating of this colored mixture. The specimen, after cooling, is then shaped and ground, and the "cut" parts will of course display an uncolored surface.

The substances used in coloring glass are gold, copper, cobalt, manganese, iron, &c. The oxide of gold gives the rose and ruby tints, uranium that of the topaz, copper an emerald green, &c.

The New-England Company exhibits specimens of peculiar appearance. They resemble, *in tint*, surfaces of silver, as if of pure metal, with a glass lustre.

This is done as follows:

The glass is double, and the space between the double surfaces is filled with a solution of silvering preparation, which is then reduced to pure silver by the addition of a solution of grape sugar. The liquid matter is then poured off, and the vessel is sealed.

American Glasses.—The manufacture of glass in this country was undertaken about the beginning of this century, near Fredericktown, Md., by German artists. That establishment was broken up, and the workmen were scattered. Some of them were employed by Colonel James O'Hara, of Pittsburgh, in the first window-glass establishment in this country. Such was the commencement of this manufacture in the United States. At the present time, similar establishments are numerous.

Part of the workmen who had been employed in Maryland, who went to Pittsburgh, established a flint-glass manufactory upon the premises now occupied by Bakewell & Tears. But they were unsuccessful, and the whole concern was sold, and passed into other hands. The expenses of freight of the rough material were excessive, the pearlash and red-lead being brought from Philadelphia, and the clay from Burlington, N. J., and all was transported in wagons. For several years, the saltpetre was obtained from the caves of Kentucky, but afterwards was imported from Calcutta.

Still other embarrassments were encountered, as, in some other kinds of manufacture, these foreign artists refused to allow apprentices to be taught, and having the whole power in their hands, they used it without any regard to the interests of their employers. We have become acquainted with similar conduct on the part of foreign artists in more recent times. Indeed, we are not sure that at this day, there is not an establishment at Thompsonville, Ct., into which native citizens are not allowed to enter, even to examine the goods produced, while the idea of teaching American apprentices is, or very lately was, utterly discarded. Indeed, the presence of the agent of the Company himself was looked upon as rather suspicious. Perhaps a similar state of things might be found elsewhere in the States. But in the case before us, the owners ventured to resort to England, in spite of their severe laws, regulating, or rather prohibiting, the departure of their mechanics for other countries, and thus means were provided for carrying on the business successfully.

More recently, similar establishments have been set in operation, in Pittsburgh, Wheeling, Wellsville, Steubenville, Cincinnati, &c.

Since this manufacture was commenced in this country, a very great improvement has been introduced, which has quite revolutionized the whole system. Our readers are aware that the more elegant and costly specimens of glass-ware are what is called "cut glass," though we suppose the term less appropriate than are most technical terms which are used in the arts. This process, much of which might be termed "grinding," is slow, and of course costly. Our own artists have contrived to avoid this expense. When glass is melted, or reduced to the condition of a liquid, it is exceedingly ductile. The visitors at our museums and similar exhibitions have witnessed the feat of making glass birds, ships, and toys of all descriptions. Availing themselves of this ductility, moulds were contrived, so that by pressure, any desired form might be secured. By various improvements in the machinery employed in this service, the quality of the work has been so improved, that a practised eye is necessary to detect the difference between the cut and the pressed glass. The cost of these wares has, by these means, been so much reduced, that their consumption has increased some ten-fold; and more flint glass is now manufactured in this country than in England.

The materials used in these processes, are now obtained extensively in this country. We are told by Mr. Jarvis, of the New-England Glass Company, that the materials annually consumed in the manufacture, not including the manufacture of window-glass, are nearly as follows:

Coal for fuel, - - -	48,000 tons.
Silex, - - - -	6,500 "
Ash, nitre, &c., - - -	2,500 "
Lead, - - - -	3,800 "

STEAM-CARRIAGE.

AMONG the recent additions to the Exhibition, is a steam-carriage, invented by Mr. J. K. FISHER, and built under his direction, at the Vulcan Iron Works, in Utica. We have, a year ago, spoken of the plan of this carriage, and expressed our confidence in its ultimate success. An examination of it in its present state—complete as to its working parts—confirms our belief; and its actual performance is such as to dispel all doubts upon several important points, if not to settle at once the question of its general economy. It is to remain in the Exhibition until the weather and the roads become such, that it may be run to some place of recreation, for profit; and in the meantime, the inventor wishes to make arrangements to manufacture and introduce carriages of a large size for passengers, offering, as a first condition, to show, by his carriage, that they will work at less expense than horses, at all rates of speed above six miles per hour.

The length of this carriage is thirteen feet; the width, five and a half feet; the height, when covered, will be about six and a half feet. The floor of it is seven inches from the ground; but the inventor considers that this is too low, except for the best roads, and in future the height will be from twelve to fifteen inches. The size is therefore about that of a common private carriage without its horses.

The steering and turning are effected by a new apparatus, which is more simple than any hitherto used. The steering-wheels are firmly jointed to the axle, one being keyed fast to it, the other turning tightly when going round curves. The axle revolves with the wheels when going straight forward. The advantage of this is that the wheels will never become loose and rickety upon the axle, and will always stand upright and firm—a condition necessary to enable them to work well under the lateral strain to which they are exposed in slipping one of the driving-wheels when turning a corner. The joint which connects the steering-axle to the body of the carriage is very low, so that the strain is in a direction not so far from horizontal as to render the steering-wheels liable to overturn, although they are but eighteen inches apart; this small distance between them is adopted, because it makes it easier for the conductor to turn them than it would be if they were wider apart. The axle works in a slot, in an upright spindle, which is jointed to the ends of two springs, the one of which is directly over the other, at a height of about two feet above it; and to the top of the spindle is fixed a lever, which goes backward into the carriage, by which the steersman can guide the vehicle, without being exposed to the weather.

It may seem that the arrangement here described, of keying the driving-wheels firmly to the axle, and forcing them to slip when turning, is so obviously the best that no credit is due for it. But it was the general opinion of the English inventors that it was necessary to have one wheel loose when turning to the right, and the other loose when turning to the left, if a short turn was to be made; and it was their practice to run with one wheel loose, except when ascending a hill; and to attach and detach the wheels, it was necessary for a man to dismount. This opinion arose from actual failures to turn when both wheels were attached. But these failures resulted from a bad distribution of weight: the driving-wheels were wide apart, and the steering-wheels were not far enough forward; an arrangement that probably arose from an anxiety to make the carriage occupy little room in the street. There is, therefore, due to this simplification, the credit of unlearning what is false, and thus liberating the invention from an expensive and troublesome clog.

The *suspension* of the body is new. From two boxes, close to the hubs and the hind-wheels, a pair of springs descend, and are connected to the bottom of the carriage, about twenty inches below the axle. Under the fore part of the body, in the middle, is a spring, half of it projecting forward beyond the body, being jointed at the back and the middle to the body, and at the fore end to the steering spindle; and over this is another spring, projecting the same distance, which is jointed to the upper part of the spindle. These forward springs cannot be bent literally, but are flexible upward and downward; and they thus afford a connection of the wheels with the carriage, which is sufficiently firm in the lateral direction for the purpose of steering, and which allows whatever play of springs may be required for ease and security against jolting.

The *connections*, as they are termed in locomotives, are effected in a novel way. The axle, it is evident, should be so connected to the carriage, that the engines cannot move it backward and forward, nor upward and downward. This is a point of the utmost importance; as it is necessary, for the durability of the machinery, as well as for the comfort of the passengers that the springs should be of the most yielding and elastic kind; and it has been found, especially when the cranks are outside the wheels, that the carriage is rocked and shaken by the oblique direction in which the force is applied during a portion of the stroke, the sides of the carriage being lifted alternately as the cranks attain the vertical position, and allowed to fall as they attain the horizontal position. This rocking is entirely prevented by a new connection, which we will endeavor to describe.

The driving-axle is attached to the body by three radius rods; two of them, parallel to the sides, connect the ends of the axle to the body, and receive the strain of the engine; the other is parallel to the axle, jointed at one end to the box that bears the weight, and at the other, to the body of the carriage, allowing free motion up and down, but checking lateral motion. All the joints of these rods are equivalent to universal joints. A slender shaft turns in the joints by which the pair of radius rods are attached. Upon this shaft are two cranks; and upon the driving-axle are two cranks of the same length, but much stouter. The ends of these cranks are coupled by a parallel rod of the same length as the radius rod, working like the parallel rods that couple the wheels of locomotives. The connecting rod is jointed to the parallel rod. When the piston is at the middle of its stroke, there is an upward strain of one end of the connecting rod, tending to lift the guides, with a force of about a fifth of the whole pressure upon the piston; but this strain is balanced by an equal downward pressure upon the small crank, which turns in a bearing fixed to the body; hence, there is no tendency to rock the carriage. There is, however, a slight motion of the fore end of the carriage upward, and the hind end downward, but far less than that of a gig, and not enough to be injurious or unpleasant.

The engines being outside the wheels, room is allowed for the boiler to be low down, and also for the seats to be low; so that the vehicle is not top-heavy, nor liable to overturn; and the motion is less jolting, in consequence of the body *hanging* from the axle, instead of being perched above it, as would be the case if the cranks were near the middle of the axle. Besides, the machinery is more accessible; and the liability to break is much less than if the axle were cranked. These advantages, we think, will always secure a preference to the outside connections, thus improved, as to steadiness. And we think that the connection by gearing-chains, bands, and toothed wheels, which were used in some carriages, cannot be regarded as worthy to be used in competition with these rods.

The valves for the distribution of steam are so arranged, that a back pressure of any required force may be used to retard, stop, or run backward, so that no brakes are required. Most of the early English carriages used breaks, drags, and other means of regulating the speed down-hill; but they threw them aside, finding the steam much more efficient and convenient.

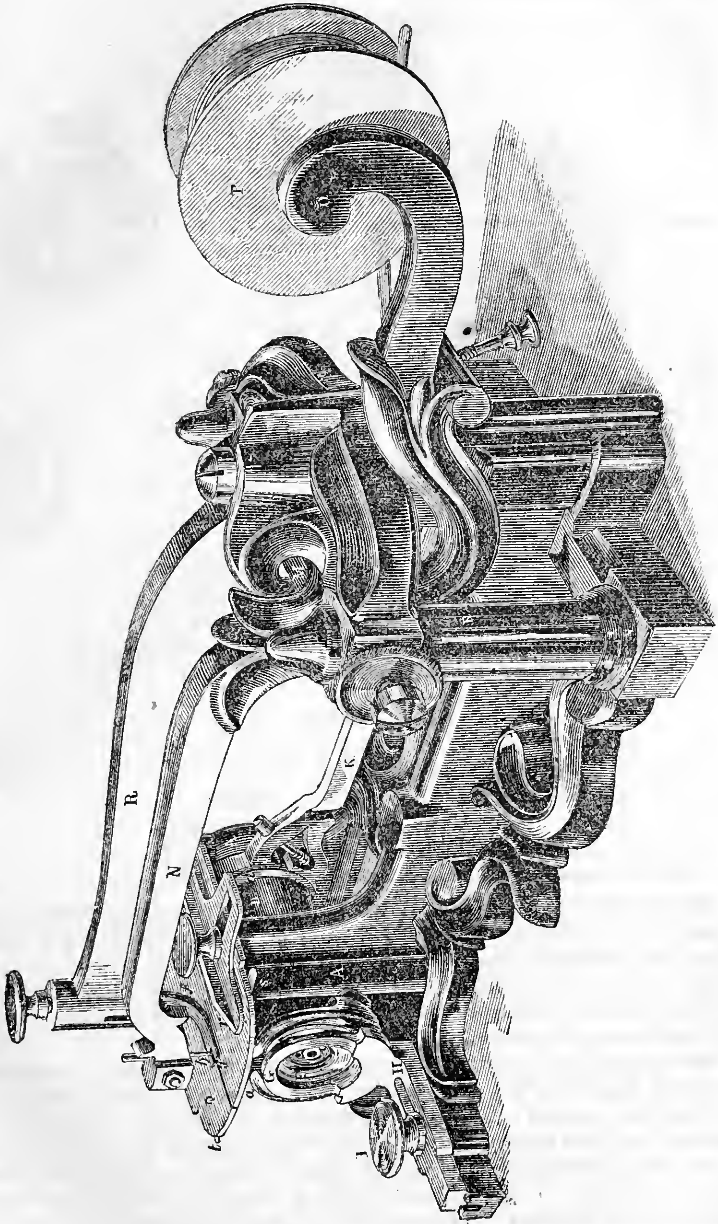
We may here remark that the history of the steam-carriage shows that some of the most important improvements in it have consisted in disencumbering it of unnecessary apparatus. Soon after its first invention, and in consequence of a carriage with a single engine slipping its wheels, it became loaded with propellers, gearing connections, breaks, and other ricketty and useless appliances, the last of which, perhaps, have now been exploded by Mr. Fisher; but we will not say that more may not be spared. However, the simplicity attained is such as to give an appearance of durability and economy; and yet all that has heretofore been attained by complex means, is attained without them. The steering, stopping, and other operations, are effected with certainty and precision.

The cost of a steam-drag, or drawing carriage, of the largest size that plank-roads will bear without injury, say two tons' weight, will probably be within twenty-five hundred dollars, and the annual repairs within a fifth of the original cost.

RAILWAY SIGNAL.

A very ingenious contrivance is exhibited by Dr. Clayton of Virginia, invented by himself, for giving signals upon railways. The approach or departure of a train may, by means of it, be made known, with scarce a possibility of mistake, while the machinery is in working order. This invention consists of a set of signals at the top of poles, say three or more, placed on the same connection, (which is of wire,) two miles in length, with a lever at each end. The one at the end first entered by the train is an upright one, so that, as the engine passes over it, it is pressed forward far enough for the train to pass, and draws the connecting wire, by which means all three of the signals are set, discernible at any distance, at the same time elevating a rule-pointed lever at the other end, for depressing the signals. The train runs the two miles with the signals up in advance, and then, in passing the lever at the other end of the connection, it is pressed down by the engine, which depresses all the signals, setting them down behind the train. Again, a signal is up behind the train always, to guard it from being run on from behind, thus preventing concussions. For safety at bridges, it is only necessary to set the levers at the draw, and every time the draw rises, the signals will go up a mile each way; and when the bridge lowers, the signals fall.

WILSON'S IMPROVED PATENT SEWING-MACHINE.



THE annexed engravings are views of the celebrated sewing-machine, invented by A. B. Wilson, of the firm of Wheeler, Wilson & Co., and for which a patent was granted on the 15th of June, 1852. Mr. Wilson had invented and received patents for previous sewing-machines, but this is a manifest improvement over all others.

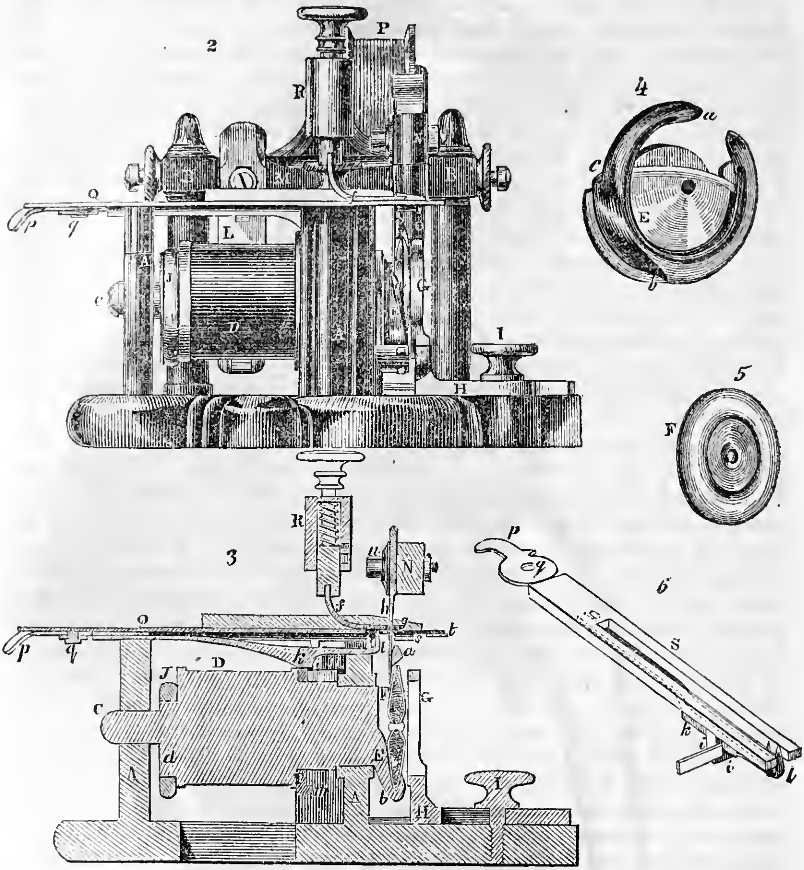


Figure 1 is a perspective view; figure 2 is an end elevation of the same; figure 3 is a transverse vertical section of the same; figure 4 is a view in perspective of the rotating hook which opens the loops; figure 5 is a view in perspective of the cymbal spool which carries the thread; figure 6 is a perspective view of the feed-bar and appendages detached from the machine. The same letters refer to like parts.

The machine is a peculiar one, and works with two threads, and forms the firm-lock stitch; but it has no shuttle, and has but one needle. The working parts are secured to a neat small frame, A B, and when in operation, is placed on a small table before the operator, and is driven by stirrup-band and pulley, like a foot-lathe, or it can be driven by steam or water-power, with band and pulley; C is a mandrel, and D a pulley on it to receive motion by a band as described. At the front end of the mandrel, C, there is a rotating cam plate-hook, E, (best seen in figure 4,) on it; this rotating cam-hook is of a peculiar form; it is concave on its face, and has portions of two threads of a screw formed on its periphery; a portion of the periphery is also cut away to form the hook, *a*, which opens the loop in the needle thread. One part of the front or outer thread of the screw is chamfered off at *b*, to the back or inner thread, and the notch, *c*, between the portions of the screw threads, is made to extend back from the hook, *a*, about one third of the circumference. Within the concavity in the face of the hook, plate E, there is a hollow quoit-formed bobbin, F, which carries a thread to be passed through the loop formed by the needle-thread when it has passed through the cloth, so as to form the lock or true binding stitch. This peculiar bobbin is held by a ring, G, attached to a rod, H, which is adjusted by a screw, I, secured in the frame; this ring keeps the bobbin in its place, but allows it to turn freely. One part, *d*, of the mandrel is turned eccentrically, and is encircled by a ring, J, to which a rod, K, is attached, which connects to an arm, L, and is secured to the arbor, M, which is fitted in bearings in the standards, B B, of the frame, and forms the fulcrum of a two-armed lever, one of whose arms, N, is the needle-arm, and to the other, O, is secured the spindle, upon which is hung the spool or bobbin, P, which carries the thread for supplying the needle and forming the loops. By the revolution of the mandrel, C, the eccentric *d*, is caused to give a vibratory movement to the lever, N O.

The cloth or material to be sewn is laid upon a plate, Q, which is secured to the top of the standards, A A, and forms a small table. It is held down by a small pressing plate, *f*, which is attached to the end of an arm, R, secured to the back of the standards, B B, and extending over the top of the needle to pass through; and an opening corresponding to the notch, *g*, is cut through the plate, Q, for the same purpose; N is the vibrating arm which carries and works the needle, *h*; the hook, *a*, rotates and passes as close as possible in front of the needle; the movements of the hook and needle are so regulated, that the hook passes the needle just as the latter is commencing its ascent. The cloth is fed forward to the needle by means of a peculiar feed-bar, S, (fig. 6.) This bar is straight and flat, with a slot nearly its whole length, and with two ears, *i i*, on its under side; under the slot, is secured a spring-bar, *k*, which has a pointed tooth, *l*, at the end. The bar, S, slides in mortices in the standards, A, below the plate, Q. The point of tooth, *l*, is below the small slot in plate, Q, and passes through it, catching the cloth, and moving it forward a short distance for a stitch, then dropping down to take another stitch. This action, it performs by a cam, T, (fig. 3,) on the mandrel, C, which has a projection on it, that presses on the spring under bar, *k*, and forces up the tooth, *l*, while at the same time its front part acts on the back of ears, *i i*, and moves the feed-bar forward towards the plane of the needle's motion. When the cam, T, ceases to act, the tooth, *l*, that catches and carries the cloth, drops down, and the feed-bar is pushed back for a new stitch, by the pressure of the spring, *n*, which is secured to one of the standards on the ears, *i i*. The length of stitch is regulated by an eccentric stop, *p*, which is pivoted on a pin, *q*, to the under side of the plate, Q; the feed-bar is forced against the stop by spring, *n*.

The material to be sewed is placed on the top of plate, Q, under the pressing-plate, *f*, and close up to the upturned part, *r*, which serves as a gauge to regulate the distance of the seam from the edge of the cloth. The thread from spool, P, is conducted through hole, *u*, near the end of the needle arm, and then through the eye of the needle near its point. The thread from the hollow plate bobbin, F, is passed through a slit between a small spring, *s*, and the edge of plate, Q, to the opening through which the needle passes; in this opening it plays freely. Its end is passed under a spring, *t*, which holds it. and the end of the thread from the needle is held by the attendant, and all is then ready to commence work.

When the mandrel is rotated, the descent of the needle-arm forces the needle through the cloth, which carries the thread with it—the thread lying close to the needle behind and in front of it. When the needle commences to return or rise, the cloth offers a slight resistance to the return thread, which forms an opening; the rotating hook, *a*, comes round and catches it, carries it forward, and forms a loop. As the rotation of the hook continues, it enlarges the loop, and that part of it which is on the front side of the hook, is drawn between the bobbin and the concave face of E, while that part of the loop behind the hook passes into the notch, *c*. The loop being extended by the rotation of the hook, the plate bobbin, F, in the concave of E, passes through it, and on the next descent of the needle, the loop is slipped over the chamfered part, *b*, of E, and drawn over the front of bobbin, F, between it and ring, G, and thus it will be understood, that as soon as one side of the loop passes on one side of the bobbin, and the other on the opposite side, the bobbin passes through it, and on its being drawn tight, it locks the thread of the needle. Every second stitch is commenced before the previous one is completed, the extension of the loop for the second stitch drawing the first tight, and thus every stitch must be alike—not one slack and one tight as in some machines. The form of the rotating hook causes it to perform three beautiful and ingenious operations, namely, forming and throwing off a loop, and drawing the preceeding one tight at the same time. While the needle is operated, the cloth is regularly fed forward by the feed-bar described. There is a brake spring applied to the spool, P, to give the needle-thread its proper tension; and a piece of leather, applied to ring, G, produces the proper tension on the threads of the loops. The needle-arm has a vibratory motion, and the length of needle stroke can be increased or diminished by a screw.

This machine is exceedingly neat and portable; it performs the finest quality of stitching, such as collars and shirt-bosoms. One girl can stitch with one machine, thirty-five dozen of shirt-collars in one day. There are 1500 of them now in operation in various parts of the country, and the work which they perform cannot be surpassed. They can sew straight and curved seams; the stitches do not rip out, and from 1000 to 1500 stitches can be made in one minute by a good operator. One machine, all complete, occupies no more room than a small work-table, and it is as ornamental as useful.

Messrs. Wheeler, Wilson & Co., have their office at No. 265 Broadway, this city, where these machines can always be seen in operation, and to see them is to admire their ingenuity of construction and excellence of action. Every machine is made under the eye of the inventor, at the Company's machine shop, Watertown, Conn., so that every one is warranted. As there has been much dispute about the originality and identity of sewing-machines, as related to Mr. Howe's original patent, no person who buys one of these machines is clogged with an impending prospective law-suit, as there is an arrangement and perfect agreement between Mr. Howe and Messrs. Wheeler, Wilson & Co.; so every customer will be perfectly protected. These machines are adapted to sew fine and coarse work, leather, canvas bags, men's clothes, or the finest collar stitching.

For further particulars, address, or call at the office of the Company.

See also their advertisements.

WADSWORTH'S MEASURING MACHINE.

An apparatus capable of determining the one-millionth part of an inch, may be viewed in the English department of the New-York Exhibition.

The use of such an instrument is chiefly for copying or regulating the standards of weights and measures, and in the construction of delicate philosophical instruments. The principle of this curious contrivance will be readily understood from a brief description. Two steel bars are placed in a cast-iron block, and are made to approach or recede from each other by means of screws moving accurately in their axes. The screw which moves one of the bars (the other being supposed stationary for the simplicity of the explanation) has twenty threads to the inch. On the head of this screw is a wheel with two hundred teeth. Hence a motion of one space on the wheel would advance the bar 1-4000 of an inch. An endless screw, which moves the wheel, has upon it a circle graduated with 250 divisions. One division of the graduated circle will therefore correspond with 1-250th of one of the wheel divisions, or to an advance of the bar of (1-250 × 1-4000) one millionth of an inch.

PORTFOLIOS, PORTMONNAIES, &c.

There are several cases in the Crystal Palace in which these goods are exhibited, but among them all we have noticed none superior, if equal, to those of Messrs. Zunn & Ranftle, whose sales-room is at 14 John street. They are well made and of good material. The elegance of these goods led us to make a visit at the rooms of these gentlemen, and we were not disappointed at the appearance of their stock. All their goods are well made, some are very handsome, while their prices are very reasonable. Go and see them.

HARRIS' PATENT PORTABLE CIRCULAR SAW MACHINE.

A large and heavy wheel, perhaps three feet in diameter, is suspended by its axis upon a strong frame. A circular saw is fastened upon another axis, so placed above the former, that its surface rests upon the flat face of the periphery of the large wheel. The motion of this, whether by hand power, applied to a crank, or by a treadle worked by the foot, or by other motive power, by the surface-adhesion referred to, gives motion to the saw. But this is not all. As different degrees of adhesion may be required for different kinds of work, the axis of the circular saw is inserted in a movable centre or box, which is regulated by a screw and spiral spring. It is a cheap and very convenient arrangement.

HARRIS' PATENT RECIPROCATING STEAM-ENGINE.

The novelty and improvement of the invention consists in the mode of communication between the cranks, shaft, and the cross-head, or lever-beam. In the ordinary mode of producing a continuous revolving motion from a reciprocal one, a single crank and one connecting rod are used: the effect of which is an unequal leverage at different positions of the machinery. To counteract the effect of this, a heavy fly-wheel is added, which diminishes the effective power of the engine. The use of two cranks placed at right angles with each other, connected by means of rods to the ends of an oscillating lever, whose fulcrum is a pin attached to, and travelling with, the cross-head, avoids this evil. "When attached to beam engines, the lever should be connected at the end of the beam. At the commencement of the stroke, the crank-pins stand at equal distances above and below the central line drawn between the cylinder and crank-shaft; consequently no motion can ensue, and the cranks are on the dead points. Now if the shaft be turned in either direction, on the admission of steam to the cylinder, the majority of the power will be communicated to the crank which has the greatest leverage, and the shaft will revolve in that direction. When the cranks have made a quarter revolution, the leverage is nearly equal on both, and the piston has travelled over one half its stroke; on continuing the revolution the crank which at the commencement had the greatest leverage now has the least, the majority of the power being transferred to the other, which continues to the end of the stroke, when the cranks assume their other dead position.

The office of the oscillating lever is to equalize or average the combined effects of the cranks of the piston.

In this engine, the cylinder is one sixth shorter (or as 24 to 29) than that of the common engine with a crank of the same length, and turns the dead points independent of the piston which in a measure, checks its momentum, and thus avoids the pressure upon the journals and boxes, and consequent wear of both."

AGRICULTURE IN VIRGINIA—ADDRESS OF HON. WILLOUGHBY NEWTON.

We have received from Mr. Corbin, 1st Vice-President of the Rappahannock River Agricultural and Mechanical Society, a copy of the address delivered by Hon. Willoughby Newton, in November last. A union was formed, at that time, with this and the Fredericksburg Society.

The following officers were chosen : President, Edward T. Tayloe. Vice-Presidents, 1st, James P. Corbin; 2d, William Pollock; 3d, Richard Baylor; 4th, O. M. Crutchfield; 5th, Colonel H. T. Garnett; 6th, W. R. Mason. Recording Secretary, Major J. H. Kelley. Corresponding Secretary, John Taylor. Treasurer, R. G. R. Catlett. Agent and Collector, John W. Kidd. Executive Committee, Dr. Edmond P. White, John Seddon, Thomas F. Knox.

The address is able. It gives a historic sketch of several counties, with their more prominent citizens. Their condition, as to agriculture, is pronounced eminently progressive. The value of slave-labor is discussed, and is pronounced more economical than any other. He may be correct in this, but he does not appear to take into his account several particulars, which would necessarily be considered in a *general* change of this sort. The importance of cotton is next considered, which, he says, is " the autocrat of the world," and certainly its actual importance is not easily exaggerated. Reference is then made to certain agricultural improvements, and on this subject we extract the following pages, which we will entitle,

PERUVIAN GUANO IN VIRGINIA.

But by far the most remarkable improvements, which indeed seem almost the work of magic, have been made in the extensive barren and exhausted region known as "The Forest," and are to be attributed, almost exclusively, to the general use of Peruvian guano. A question of great interest here presents itself, Are these improvements real or illusive ? Are we, with the improvidence of fraudulent bank directors, using up our capital in dividends, or in the spirit of a spendthrift, ruining our inheritance for the sake of large immediate profits ? My own opinion, sustained by long experience and observation, and by the judgment of many intelligent and prudent farmers, is, that no improvement is so immediate, and none so permanent, if a judicious rotation be observed, as that effected by guano. The farm of my residence, the first, I believe, in the State on which guano was used, affords in every part of it unmistakable evidence of this fact, not only by the increased product of grain, but in the clover and grasses that thickly cover it. A single detached acre affords a striking illustration in support of my opinion. During five years, it has produced three crops of wheat, one of clover, and one of corn. The wheat crops were dressed with guano; the first crop with one barrel of African, costing four dollars, the other two with less than 150 lbs. of Peruvian. The entire cost of the guano for the three crops was about eleven dollars. The corn received no manure except the droppings of the stock pastured on the lot the previous year. At the commencement of the operation, it would certainly not have produced more than five bushels of wheat. The crops of wheat were respectively 17, 22, and 21 bushels, the last crop being that of this year, after a yield of 40 bushels of corn.

I will not fatigue you with figures, but any gentleman can readily make the calculation himself, from which it is obvious that this acre has paid in cash, for a series of five years, a clear annual profit of six per cent. on a capital of not less than two hundred dollars. The lot, though cultivated one year out of turn, so far from being impoverished, exhibits every sign of great permanent improvement. It is proper to state that the surface is level, and the soil originally rather better than the average of the farm. I have been induced to examine this subject with some care, by the views expressed in the excellent address of Mr. Hallowell, before the Agricultural Society of Loudoun, sustained, as they are, by the communication in the *National Intelligencer*, signed L., published with the address, and which I attribute, without knowing the author, to the pen of Dr. Lee, a well-known agricultural editor and writer for the Patent Office Reports. I have not a word to say against the friendly and judicious counsels which they give against the improvident use of guano, accompanied by an exhausting tillage. So far from it, I highly approve and fully indorse them. But their views, though in the main correct, are liable to misconstruction, and have been very generally misunderstood by our farmers. Indeed, the views of L., adopted by Mr. H., are so strongly expressed, and without any qualification, as necessarily to lead to erroneous conclusions. I should regard our condition as hopeless, indeed, if it were true, as stated by him, that it "is in cities that both the study and the practice of good husbandry must begin, before they are possible in the country, as society is now formed." If our lands are destined to sure exhaustion, unless we can return to them, in addition to guano, all the bones, night-soil, and other offal now wasted in the cities, we had as well surrender at once in despair; for that, except in the immediate vicinity of the towns, is plainly impossible. Though very desirable, this is by no means indispensable to a very high degree of agricultural improvement. I will not repeat here views already presented to the public, as to the proper plan for renovating exhausted lands. I may say, however, that my confidence in the system is strengthened by every day's experience.

The opinions of these gentlemen are entitled to very great respect, and I would not question their correctness, if I were not satisfied that they tend to promote very erroneous impressions as to the value of the most active and extensively beneficial of all fertilizers. They state, what is not questioned, that all cultivated plants exhaust the alkalies in the soil; that potash and soda, in definite proportions, are necessary to the production of wheat, and ask, "How can the application of twelve pounds of potash and soda to an acre of wheat, producing twenty-five bushels, make good the loss of thirty-six pounds of these ingredients, removed from the land in the crop?" Now, twenty-five bushels of wheat to the acre, is much more than is usually produced, and in our easily tilled lands, is greatly beyond a remunerating crop. But even supposing that to be the product, there is not the slightest reason to apprehend the exhaustion of the land, though no foreign material be used except the guano, and the small quantity of lime that may be used as an alterative, if a proper rotation be adopted, and the usual care practised in returning to the land the straw of the crops, and the putrescent manures raised in the ordinary course of farming. According to Mr. Hallowell, such a crop of wheat consumes of potash and soda thirty-two pounds, of which twelve pounds only are restored to the land in two hundred pounds of Peruvian guano. This statement corresponds nearly with the various analyses of different agricultural chemists, and may be regarded as correct. Of the thirty-two pounds of these elements consumed by the crop, more than two-thirds are in the straw, leaving less than ten pounds in the grain of the wheat, which is all that in the course of judicious husbandry is ever removed from the land. We have, thus, two pounds more than these alkalies in the guano, than necessary to supply the grain, even if twenty-five bushels were produced to the acre. Supposing twenty bushels to be produced, which is an exceedingly profitable yield, we should have in the guano four pounds of these alkalies in excess, for the benefit of future crops. In addition to this excessive supply of the alkalies, derived from the guano, we have a considerable quantity in clover, which contains a large per centage of potash, drawn by its tap roots from below the cultivated soil, and in the ashes from our houses and quarters, and in the saline air of the sea-coast, which, according to Dr. Higgins, the State Chemist of Maryland, contains a sufficient amount of soda to enable lands in the neighborhood of the bay and salt water rivers, almost destitute of these alkalies, to produce fine crops of wheat, the soda acting vicariously and supplying the place of potash. We may, therefore, banish all apprehensions on this subject, being taught by both science and experience, that guano is not only a most active manure, but, properly managed, a most efficient agent in the permanent improvement of our lands. The progress already made by the farmers of Eastern Virginia is most encouraging, yet we should not rest satisfied until we have effected much greater and more general improvement. We have still a wide and inviting field to be explored. Our labors have of late been principally devoted to the easily tilled and improvable lands of the "Forest," and to the alluvial lands of our rivers and creeks, already open to the plough. There are extensive tracts of the very finest lands yet in their virgin state in what are called the "Necks," that have been in a great measure cleared of their heavy timber, and now only wait the employment of skill, capital, and labor, to render them most valuable and productive. Lime, draining, and persevering energy, would, in a few years, convert these now waste lands into the most beautiful and profitable farms. Lands similar to these, on the Eastern Shore of Maryland, have in a few years been reclaimed, and raised in value from $5 or $10 to $50 and $60 an acre, which they now readily command. The State Chemist in Maryland has, in his first report, given very accurate descriptions of these soils, and offered many useful suggestions for their improvement. I cannot too earnestly urge you to enter on this field of labor. The wealth acquired from the increased profits of agriculture cannot be better invested than in their cultivation. It would, by improving neighborhood roads, greatly facilitate social intercourse; health would be farther promoted, and this beautiful region rendered still more attractive, and millions added to the roductive capital of Virginia.

STATISTICS OF COTTON.

THE *Alabama Planter* publishes the following table, showing the receipts, exports, and stocks of cotton at the times and places designated :

PORTS.	Stocks on hand on 1st September.		Receipts since 1st September.		Exported from 1st of September to Dates. Great Britain.		France.		Other Foreign Ports.		T'tal to Foreign Ports.		United States Ports.		Stocks on hand and Shipboard.	
	1853	1852	1853	1852	1853	1852	1853	1852	1853	1852	1853	1852	1853	1852	1853	1852
New-Orleans, ... Dec. 27	10,522	9,758	462,796	828,772	128,507	309,693	41,237	52,212	38,972	56,010	208,716	417,915	43,393	94,406	233,929	338,899
Mobile, ... Dec. 30	7,564	2,319	127,504	219,146	15,691	59,443	10,064	6,997	2,869	3,7[illegible]0	28,624	70,130	30,966	39,927	75,478	114,243
Savannah, ... Dec. 22	5,150	2,950	105,899	138,276	6,545	20,934		1,407	509	1,158	7,[illegible]54	23,899	57,248	55,668	43,838	57,354
Charleston, ... Dec. 22	15,126	11,146	134,597	156,735	28,414	60,578	5,392	13,017	3,568	3,524	37,374	77,121	59,756	46,821	55,502	44,149
Florida, ... Dec. 19	523	451	31,650	39,366									8,580	13,015	24,127	26,773
Texas, ... Dec. 22	428	317	15,807	25,709		801	882		446	350	1,328	1,151	7,571	13,056	4,833	7,717
Virginia, ... Dec. 1	400	450	4,208	6,987									207	1,722	700	950
N. Carolina, ... Dec. 10	100	200	846	4,355									546	3,731	400	625
New-York, ... Dec. 20	67,675	45,796			62,250	46,348	3,917	9,478	8,097	4,687	74,264	60,507			23,122	20,096
Other ports, ... Dec. 17	20,100	14,200			2,996	1,842			114	121	3,090	1,983				
Total, ...	127,588	87,587	883,128	1414346	244,583	499,633	61,492	83,033	54,575	69,610	360,450	652,276	208,167	268,345	461,929	619,806
Total, 1852, ...	87,587		1414346		249,633		83,033		69,610		652,276		268,345		619,806	
Increase, ...	40,001				255,250											
Decrease, ...			531,218				21,541		15,035		291,826		60,078		157,877	

☞ We have deducted from New-Orleans the receipts from Mobile and Florida; from Charleston the receipts from Savannah; and from Mobile the receipts from Florida. The exports from Georgetown, S. C., to New-York are added to Charleston receipts, and from Darien to Liverpool and New-York to Savannah receipts.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

IMPROVEMENT IN PLANK-ROADS.

Messrs. Editors: The advantages claimed for plank-roads are, that they are easier of draft in all weathers, and that in wet weather they are not broken up, and wheels do not sink into them. These claims are just with respect to "plank-roads that are plank-roads, and nothing else;" but with respect to that great number of roads that are composed of two or three inches of dirt spread over about the same depth of planking, the claim is but partially allowable. Upon a new *and clean* plank-road, the force of draft required is one in ninety-eight; but upon the dirty roads, usually but erroneously called plank-roads, the force required is little less than what is required upon a gravel road, or one in fifteen.

The apology made for allowing plank-roads to remain dirty, and for sometimes covering them with dirt or gravel, is that they are thus protected from wear. But if, at the same time, their utility is lessened in the proportion of six to one, the protection to the property of the road-proprietors is too dearly paid for by the excessive expenditure of motive power at the expense of the toll-payer; and we do not hesitate to say, that this condition of plank-roads is an imposition upon the public, in all cases in which county roads have been turned over to companies, to be planked by them, on condition of their levying tolls. Still, the theory is, "plank-roads don't pay; we lose by them." Perhaps the following improvement, suggested by an engineer who has studied the subject, may enable the proprietors to get paid, without gross injustice to those whom the legislature compels to pay them.

If a thin plate of wrought-iron, four or five inches wide, be laid directly over each sleeper, with one spike passing through each plank into the sleeper, to secure the plate, planks, and sleepers together, a road not much inferior to a rail-road, for moderate speed, will be the result. And the wheels, especially, when heavily loaded, will be kept upon the iron, and therefore directly over the sleepers, and will not break through the planks as they now do. As to the wear by the feet of animals, it may be greater than it would be if the planks were "protected" by dirt; but if the wheel-tracks be really good, a rough horse-track will not be complained of; nay, it may be preferred for the sake of the foot-hold it gives to animals. And when a hole is made, it may be filled up with a block or a stone; and thus, by trifling repairs, the road may be kept in order until it is thoroughly worn out.

Not so with mere planks; they become broken, and deep holes are made, into which the wheels fall with great damage to both the road and the carriage. Moreover, the effect of animals' feet is to wear the planks round at the edges, and, after a while, to convert a plank-road into something like a corduroy-road. These evils will be obviated by the iron plates; and the wheel-track will always remain easy of traction, if the road be kept clean.

On a good railway, the force of draft required is one in three hundred, or seven and a half pounds per ton; on an oak plank-road, when clean, twenty-three pounds per ton; hence, upon a level, a team can draw upon an iron surface, three times as much as upon wood. It may, however, be said that a thin plate of iron will bend under the wheel; that the wood also will suffer compression, and therefore, such a road will not compare with a rail, which bends much less. We allow something for this difference; but, on the other side, much more should be allowed for the speedy wear and deterioration of planks that are not faced with iron. In this view, we may see that instead of drawing thrice as much, a team may draw six times as much as it could draw upon planks that had been crushed under heavy wheels and battered by horses' feet, even if the rounded edges and the dirt be not considered.

To iron a plank-road with plates five inches wide and a quarter of an inch thick, would require about two tons per mile, costing, say $160; add for spikes, $50; and for laying, $100; making $310 per mile, or about twenty-five per cent. additional cost, to increase the utility of the road threefold, and its durability to a very great extent.

Now, this estimate may be inexact; but we think that any intelligent proprietors, if there be any, will venture upon these reasons, if they are not at variance with their own, to iron a few rods of their road, as an experiment.

In reference to this matter, we invite attention to our article on steam-carriages, for which, see article on Great Exhibition. F.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

CORN CULTURE IN VIRGINIA.

Messrs. Editors: I promised you a short article on the culture of corn in the South.

Corn land should be well and deeply broken. Two good, strong horses will do, but three are better, hitched to strong two or three horse-ploughs. (Prouty & Mear, of Boston, make a superior plough; and there are several manufacturers of ploughs and farming implements at Richmond, Va., not often excelled.) Let the ground be broken up eight to ten inches, and if subsoiled, so much the better. If of stiff soil, it should be ploughed in the winter, particularly sod land. Let it be well harrowed in April, and laid off horizontally, so as not to disturb the sod; for good land, the rows should be four to four and a half feet wide; if land is level, it may be crossed, and four grains of corn dropped in the chuck; to be thinned out at the proper season, so as to leave two and occasionally three grains in the hill. If the land is rolling, plant in drills from nine to twelve and eighteen inches, agreeable to the strength of the land, one stalk to be left at a place.

The sod should never be disturbed, but worked on top, with three or five-tooth cultivators; twice or thrice going over will do; two strokes of the cultivator in each row at a working, followed with the hoes, to get out such weeds, &c., as the cultivator can't reach. Corn does best on sod lands, or clover-lays, as but few weeds follow those crops. As soon as the corn is sufficiently matured, which is generally from the 15th to 20th of September, with us, cut it off near the ground, and stack it snugly, two to three bushels to the shock, secured by two bands, one at the top, and the other about two feet below it. If well put up, it will stand all the winter; but it is better to crib it in November or December, and pack away the fodder for your milch cattle, &c.

In cutting up my corn, I usually, if it is heavy, put twelve rows together; first, about every eight to ten steps, bind and tie together four, six, or eight stalks; then fill up the squares, taking six rows through the field; after I have got through the field, in a day or two, finish the row of shocks, by bringing the remaining six rows, and making all snug and secure. This plan is necessary, if the corn is not well ripened. If the fodder is pretty well matured, you may finish the shocks as you go. If my corn is very tall, say nine or ten feet high, I use small hand-ladders, with four or five rounds, that the shocks may be well secured, which is very important. Oats should follow corn; and wheat, oats. The land to be ploughed immediately preceding seeding with wheat. By ploughing under the volunteer oats, your land is clear for wheat. The land should now be laid down in grass for two or three years. Clover is the best fertilizing grass crop, and if sown with orchard-grass, which ripens about the same time with the clover, you have a fine crop for hay or grazing. I am under the impression that wire-grass may be killed by this process of cropping. Winter ploughing, and the sod well turned, are essential to the destruction of this grass.

Your obedient servant, &c.,

HENRY B. JONES.

Rockbridge County, Va., January 10, 1854.

COTTON CULTURE IN ALGERIA.

IN 1851, there were only six or seven acres planted to cotton in French Algeria as an experiment, which turned out satisfactorily. Last year, (1852,) fifty acres were planted with the like result; and in 1853, 1730 acres, which, from last accounts, was promising.

Mr. E. Feray, of Essones, one of the oldest and most distinguished cotton manufacturers of France, thus writes in a letter, which has been published in the *Moniteur*, touching Algerian Cotton, and the prospect of its culture in the Colony:

"I have carefully examined the specimens of Algerian Cotton, which form part of the permanent exhibition of the products of Algeria at the Ministry of War. These Cottons are produced from

Seeds of Georgia Sea Island Cotton,
" Louisiana Cotton.
" Egyptian "
" Nankin "
" Cotton grown in Algeria itself.

These cottons are all, without exception, of good quality, and suitable for manufacture. The Georgia long-staple cottons (sea-island) whether produced from American seed or from the seed of those cottons grown in Algeria, attracted, in a special manner, my attention. It is solely the Georgia long staple cottons that are adapted to the spinning of the fine numbers above 100,000 metres, (109,400 yards.) The manufacture is tributary for these cottons to the United States exclusively; and even there they can be cultivated in a limited extent of territory in Georgia, and upon the sea-shore, whence comes the name of sea-island, by which these cottons are designated in England. The crop of sea-island cotton in America varies from 25,000 to 30,000 bags per annum, and it has been found impossible notably to increase this production. They are worth at present, (25th May, 1853,) in the Havre market, ordinary qualities, from 700 to 800 francs the 100 kilograms, (equal to 59½ to 68 cents per lb.) In February last, they were only worth in Havre 550 francs, but the insufficiency of the crop to supply the wants of manufacture caused a gradual rise, which, at the present moment, is not less than 50 per cent. over the prices of February. There are not now to be found in Havre 500 bags of sea-island cotton, and manufacturers are obliged to pay whatever the holders please to ask. The American crop of 1852 was about 4,200,000 kilograms, (9,264,000 lbs. avoirdupois.) But the manufacture actually needs, of the fine numbers at the very least, 6,000,000 kilograms; and it is obliged to supply the 2,000,000 kilograms deficiency by recourse to the better quality of Egyptian cottons, which only answer, and that very imperfectly, for the numbers from 100 to 130. Egyptian cottons have also risen considerably in price. The demand for the fine numbers increasing daily, the manufacture would in ten years from this date call for upwards of 10,000,000 of kilograms (22,057,000 lbs.,) if the culture could supply this quantity at a reasonable price, say 500 francs the 100 kilograms. This price would leave to the producer a handsome profit. Of these ten millions of kilograms, worth fifty millions of francs, ($9,350,000,) America could not produce more than four or five millions; there remain about five millions of kilograms, equivalent to twenty-five millions of francs, for the country that can produce sea-island cotton. Egypt cannot do it. All the efforts which have been made in this direction have only resulted in the production of a strong nervous cotton, very good for the numbers from 60 to 80, and of which the first qualities very rarely may go up to No. 120. But Egyptian cotton does not possess either the fineness or the length of staple of the American Georgia sea-island cotton, and cannot be used for the higher numbers.

The cottons produced in Algeria from the seeds of Georgia sea-island cotton have preserved the qualities of the good American article, the strength, fineness and length of staple. These cottons, as well as those of the Province of Oran, as those of Blidah, would sell to-day in the Havre market at from 700 to 900 francs the 100 kilograms. The better qualities of these will spin up to the No. 300,000 metres, (328,000 yards,) that is to say absolutely the finest thread, the wants of manufacture hardly ever exceeding 250,000 metres. What proves that the sea-island cotton of Algerian production has not degenerated, is the fact that this cotton has yielded seeds which, planted in Algeria, have produced cotton comparable for fineness, length, and strength of staple, with the best American specimens sent to the Exhibition of London."

This subject is receiving a good deal of attention in France, and no reasonable efforts will be spared to extend the culture of our important staple in the new colony on the South side of the Mediterranean. Whether Algeria shall do better than British India in growing cotton, time alone can determine.

D. Lee.

HORTICULTURAL.

The culture of Roses is one of the pleasantest and surest kinds of floral labor. We give below a description of the mode of procedure which will secure flowers out of season. We find it in the (Eng.) *Gardener's Chronicle:*

Culture of Roses in Pots.—No person possessing a taste for floral beauty or fragrance can be insensible to the attractions of the Rose; and its praise has been so often told that it need not be repeated here as an excuse for offering to those of your readers who stand in need of such information, directions how to grow and flower it in pots, so as to be able to enjoy roses during the winter months. It is not very many years since it was considered impossible to produce good specimens of roses in pots, and in those days gardeners who could place a few sweet rose blossoms in the Christmas bouquet, were thought more than ordinarily clever: and as to keeping up a succession of handsome, well-bloomed plants in the flower-house during the winter and spring, that was not so much as dreamed of; for the few flowers obtained were produced by leggy and all but leafless plants, which were not fit to be seen, even amongst such examples of cultivation as the plant-houses of twenty years ago afforded. Now, however, thanks to the all-prevailing spirit of improvement, it is not unusual to see, in well-managed collections, specimens of Roses in bloom at Christmas, such as would not disgrace the rose-bed in June, and these are obtained at as little trouble or expense as is required in the production of many other plants which are commonly grown for winter flowering, and which possess neither the beauty nor the fragrance of the rose. To have well-cultivated, well-bloomed specimens at Christmas, the plants must be previously managed with a view to this end, and persons commencing this kind of culture will probably have to provide a stock of plants. I will begin with directions for propagation. The varieties best adapted for winter-flowering are Bourbons, Teas, and Hybrid Perpetuals, which are better on their own roots than budded, and they root very readily, especially when good strong cuttings can be obtained early in spring from plants growing under glass. Short-jointed, stiff pieces of the firm young wood planted in sandy soil, covered with a glass, and set in a shady corner of a warm house for a week, and then placed in a bottom heat of about 75° or 80° will be rooted and ready for potting singly in small pots in little more than a month. Indeed, I find the rose to strike so freely from cuttings under glass in early spring, that, when I obtain a variety which I wish to increase as fast as possible, I place it in a growing temperature in November, and when I have got a fair amount of growth in a proper state for cuttings, the plant is cut up: and well-ripened shoots, on which the eyes may be about an inch apart, are divided just above each eye, by which means each eye is made to form a cutting. For this method, however, the wood must be rather firmer than is necessary where two or three eyes are allowed to a cutting, as it is necessary to cut in a slanting direction on the side opposite the leaf for about half the length of the cutting, removing the bark and a thin shaving of the wood; this exposes a large surface of inner bark from which roots are ultimately emitted, and cuttings prepared in this manner will be found to root very freely, and form equally good plants as those having two or more eyes. It must be observed, however, that the success of this, as of all methods of propagation by cuttings depends upon selecting wood in the proper stage of maturity, and how to do this can hardly be learnt except by practice. But to return to our rooted cuttings. These should be potted singly in four inch pots as soon as they have become sufficiently strong to bear handling (using good fresh loam and decayed leaf-soil in about equal proportions, with a liberal mixture of sharp clean sand,) and placed in a close moist atmosphere till well established in their pots. They may then be removed to a light, airy, and rather cool situation, with a view to induce close stocky growth; for, let me remark, there will be nothing gained by keeping the plants, after they are well established in four-inch pots, in higher average temperature than 55°. It will doubtless be necessary, in order to secure a bushy habit of growth, to pinch off the top of the first shoot, and this should not be done until the plants are removed to a cool situation, nor while the eyes at the base are flat and imperfectly matured, otherwise the probability is that the top bud only will start. As soon as the plants are well rooted in their first pots, shift into others one or two sizes larger, as circumstances may point out; and when moderately well-rooted, after the second shift remove them to a cold frame, and gradually inure them to full exposure to sun and air, merely protecting them from heavy rains and cold drying winds. During the summer months, a liberal supply of water must be given to the soil, using weak manure-water twice a week, and the plants should be syringed morning and evening during bright weather, and shifted into larger pots as may be necessary. Stop any gross, over-luxuriant shoots, and have a constant eye to the formation of dwarf compact specimens; also guard against the attacks of aphides, which will probably be somewhat troublesome, but they are easily destroyed by means of tobacco-smoke, and therefore should not be allowed to disfigure the plants. During summer, plants that are established after the first shift will be better removed to a warm sheltered corner out of doors, placing the pots on a bed of coal-ashes, to exclude worms, and where they will enjoy the night dews, and will not be so liable to red spider as if retained under glass. With good management, many of the plants should be nice compact specimens in seven-inch or eight-inch pots at the end of the first season's growth; and the Teas and Bourbons, if removed to a close pit or frame early in autumn, will continue growing and afford a succession of blossoms throughout the winter and spring months. But, where handsome specimens are desired, it will be better to afford the plants a second season's growth; as allowing them to flower would retard their progress the following season.

HELIOTROPE.

Many varieties of the Heliotrope have been introduced to cultivation within the last few years, but, taking all things into consideration there is perhaps none more desirable than the old well-known H. Peruvianum, a universal favorite on account of its delicious fragrance, which, combined with its free growth and profuseness of bloom, makes it a very desirable plant for furnishing bouquets during the winter months. By keeping up a succession of healthy young plants, flowers may be obtained at all seasons, with the aid of a warm greenhouse in cold weather. As a plant for the flower-beds during summer, it grows luxuriantly, provided the soil is moderately enriched. It is however very susceptible of cold, and will show the effects of a slight frost sooner than almost any other shrubby flower-garden plant. It is indeed an easily managed plant; cuttings of it will strike root at any season, and grow in any ordinary garden soil. To secure plants of sufficient strength to flower during early winter, cuttings should be inserted in June. They will form roots in two or three weeks at this season, if inserted in a shady situation; they should be immediately placed in small pots, and when these are filled with roots, shifted into flowering pots; eight-inch pots will be sufficient in size They now require to be grown in a situation fully exposed to the sun, and if the pots are plunged to their rims, less water will be required and the plants otherwise benefited. The roots of plants in pots fully exposed to the action of the sun and atmosphere are very liable to sustain injury. A few hours' neglect in watering will counteract the progress of weeks. The young, incipient points of roots are so easily destroyed that nothing short of the most vigilant attention can keep plants in a vigorous state when the pots are thus exposed. Hence the necessity of plunging the pots, that evaporation from their outer surfaces may be prevented. This is more especially necessary with pots of a soft or porous character. Hard burned-pots are condemned by many, for what reason I do not know. So far as my experience goes, I decidedly prefer pots glazed on the outside, both on account of the benefit they confer on the plant, and their freedom from becoming green and unsightly when placed in a warm, humid atmosphere. This latter circumstance alone is worthy of consideration.

When the plants are removed into the green-house, they should be placed in the warmest position, near the light, in order to flower them freely. Plants that have been growing in the flower-beds during summer, lifted and potted before frost, will commence blooming in early spring. As a permanent climbing plant, for a green-house or conservatory, it is worthy of notice. When once properly established in such a position, it will keep in flower during the year, and speedily cover a large surface if allowed sufficient root-accommodation.—*Cor. of The Florist.*

CAST-IRON RAILS FOR RAILROADS.

Why cannot cast-iron rails be used for railroads? is a qnestion which has been examined at considerable length by Mr. R. W. Hughes, the able and accomplished editor of the *Richmond* (Va.) *Examiner.* We are not able to go over the whole ground in the present number of this magazine, but will notice the important considerations in favor of cast-iron rails, with the intention of returning to the subject again. After speaking of the importance of the subject, Mr. H. proceeds:

If this be so in reference to roads now in course of construction, the difficulty will but be increased with the growing demand for other roads. These facts, together with the present high price of railroad-iron, consequently press the question upon the intelligent mind, "Why cannot cast-iron rails be used on railways?"

The fact is daily before our eyes, that cast-iron is made to bear the heaviest burdens that can be imposed. It forms a part of almost all machinery, and is subjected to enormous strains. With it we construct houses and build bridges. It is given the preference over wrought-iron for railroad car wheels which, when running at sixty miles an hour, make about nine hundred revolutions per minute, the cast-iron wheels thumping the road with the momentum due to that velocity. All these things are constantly presenting the important inquiry, whether cast-iron rails may not be safely used on roads? It is known to be vastly cheaper than rolled iron, and can be made at a profit for one third the price of rolled iron. It requires no very great expenditure to prepare the works requisite for its manufacture, but it may be run into bars directly from the ore, which abounds along many of the projected railway lines of Virginia.

Supposing its substitution practicable, no limit can be set to the industry and enterprise it at once calls into being. It invites population into our mountain lands now waste and barren, yet teeming with iron. It multiplies their value to owners, and increases the fund for taxation of the State. It projects railroads, by enabling them to be built by persons along their lines, who, by labor alone, could convert their iron lands and ore into active capital. By doing these things, it would so far cheapen railroad transportation, as to make those works far greater beneficiaries to the public than they now can be.

Indeed, no single result could be imagined which would tend so much to develop the resources of Virginia, and stimulate her enterprise, as the adoption of cast-iron rails on her projected railways. It would advance internal improvements in the State at least twenty years, and afford a cheaper, and, it is believed, more durable structure than we now have.

But the advantages which must result from the successful application of cast-iron rails to railway tracks, are far too numerous to be detailed. They suggest themselves to every reflecting and intelligent citizen. The question is, Can cast-iron be advantageously used on railways?

Whether all our ores will be suitable for the purpose, we shall not undertake to decide; but that we have large bodies of iron ore which, directly from the blast, will make more durable rails than many we now import, we have not the slighest doubt. The Lynchburg and Tennessee railroad runs through the county of Wythe, and within five or six miles of a body of iron ore, equal, if not superior, as it has often been competently pronounced, to any in the world. It is better than the Swedish; it is better than the Pennsylvania Juniata. It is unlimited in quantity, and may be gathered from the surface of the earth. Wood in abundance, and mountain streams for driving machinery are at hand; and withal, the iron is of so tough a texture, that castings, such as pots and ovens, made for the neighborhood, have frequently been tried by being pitched some ten or fifteen feet, several times, into a pile of stones, by the foundryman himself, under which severe test very few instances have been known of their being broken. Yet a railroad is to run for miles along this great iron deposit, the rails of which are ordered from England!

Descend one of those English mines, where for ages the work of excavation has been going on; go down a thousand feet or more, traverse these caverns for miles under the earth, until you are told the ocean is rolling above your head, and at the farthest extremities of these infernal caverns you will find men plying the pick-axe, and extracting iron ore. You will find railway tracks throughout one of these abodes of Pluto and Vulcan, leading to the shaft. Here a car is filled with ore. Inquire the destination of this car. The answer, calculated quite to astonish a citizen of Wythe, would be this: It is to be sent several miles to the shaft; then to be raised up a thousand feet to the surface of the earth; then hauled to the foundry to be made into pig metal; then to the rolling-mill to be converted into bars; then to the sea-coast to be shipped to the other continent. After crossing the Atlantic ocean, some three thousand miles, it is to go up James and Appomattox rivers; to be discharged at Port Walthal; to be hauled by railroad to Richmond, and thence by wagons from the depot to the canal; thence along the canal to Lynchburg, and thence by railroad and wagons to Wythe county, Virginia, to be distributed along the Lynchburg and Tennessee railroad, which runs over great iron deposits of that county, where iron lies upon the surface, of a much superior quality, and has to be removed out of its way in excavating for its track!

This case is similar to hundreds of others, and the practical remedy for this state of things is the adoption of cast-iron rails. Public opinion at first obstinately pronounced that cast-iron wheels could never be used—that they would break under the velocity required of them. Economy rendered it absolutely necessary to try them, and they have been found not only cheaper, but, in fact, to wear longer than wrought-iron wheels.

Strange as it may seem, all the early writers concur in stating, that cast-iron rails were used before the wrought, and that the latter were introduced chiefly on the ground that they were cheaper than cast-iron rails—cheaper for the reason, as then contended, that wrought-iron rails being not so likely to break, might be made much thinner and lignter than cast-iron, and would be more economical in that way. Since it has been found necessary to increase the thickness and *weight* of the rail, for the purpose of firmness and steadiness in the superstructure, it has never occurred to the engineer to return to cast-iron rails.

Experience has shown that wrought-iron rails wear out rapidly, and this although they are now made heavier than it was supposed would be requisite even for cast-iron.

From an essay on this subject, by Ellwood Morris, Chief Engineer, Philadelphia, published in the Journal of the Franklin Institute, in the year 1841, we extract the following observations on this subject:

"We are informed in Wood's treatise upon railroads, that in the early part of the seventeenth century, railroads were first used in England, and they were then formed of wood; the wooden rails were used for about one hundred years, when, in 1767, cast-iron rails were first introduced, and thereafter continued for a period of near fifty years, to be used instead of any other materials; but in the year 1815, malleable iron rails were devised, and after Mr. Birkinshaw, in 1820, had obtained his patent for an improvement in the form of such rails, and applied the rolling-mill to their manufacture, they were very extensively adopted, and subsequent to that period of time, have been almost exclusively used. The chief reasons which seem to have induced engineers, both here and abroad, so much to prefer malleable before cast-iron rails, as to exclude the latter from use, appear to have been originally a belief that—

1. Malleable iron rails were cheaper than those of cast-iron.
2. Malleable iron rails being made in longer lengths, caused fewer joints.
3. Malleable iron rails were less liable to fracture from concussion.
4. Malleable iron rails were thought to be somewhat more durable."

The writer then takes up these reasons *seriatim*, and shows how little they are worth, when tested by experience.

That the first and principal reason for the introduction of malleable iron rails—their greater cheapness—has no foundation in truth, is apparent to every body at all conversant with the iron business; and yet, all the early writers on this subject concur in stating this as the chief reason for their introduction at the time.

Secondly. That cast-iron rails may now be made from sixteen to twenty feet in length, about as long as the rolled we are accustomed to see.

Thirdly. While malleable iron rails, of equal weight, may be less liable to fracture from percussion than cast-iron rails, yet there is no such impinging direct force on the rails in working a road suitably constructed, as would be likely to produce this. He compares the relative strength of the two metals, and makes the cast-iron rails proportionably heavier. He denies that the liability to fracture, at high velocities, is greater than when going slow, but shows the greater the velocity, the less will be the vertical pressure, and says upon the same principle it is that a musket ball, shot parallel along a horizontal plane, so as barely to touch it tangentially, will not press upon the plane at all within the limits of its level or point-blank range.

Whether these views agree or not with those commonly entertained, concerning fast trains on railways, they are, nevertheless, legitimate deductions from the established doctrine of forces, and serve to account for the small effect produced by the ordinary inequalities of a railroad, as shown in the results displayed by the following direct experiments touching this matter, which were made by Professor Barlow, and recorded in his work, on the "Strength of Materials," English edition, 1837. These experiments are conclusive, and establish beyond question, the fact, that the vertical stress im posed on a railway by the transit of locomotive engines of velocities ranging from twenty-two to thirty-two miles an hour, is but little, if any, in excess of that produced by a quiescent load of the same weight!

More experiments, by Professor Barlow, were made with an ingenious and accurate instrument, to determine the deflection of rails under trains running at high speed; and as the deflection of the materials under a strain is as the insistant weight, the vertical pressure upon the rails is by this means accurately indicated.

Again, he says, after quoting largely from Professor Barlow's experiments: "These experiments having demonstrated, as they distinctly do, that the vertical stress of trains at speed, surpasses so little the effect of quiescent loads of the same weight, that it is only necessary to proportion the rails of railroads to resist quiescent and not concussive forces, to change the whole face of the question between cast and wrought-iron rails—they strike away all the objections heretofore urged against the brittleness of cast-iron; for it does not admit of doubt, that a beam of that material, of suitable proportions, is quite as competent to carry a quiescent load, as one of malleable iron." Again: "A cast-iron rail will yield sufficiently to impart a return to its proper level the moment it is relieved of the weight of a train; for it is well known that its elasticity and power of restoration after deflection, is within certain limits so perfect, that owing to its regularity in that respect, it was even proposed by Tredgold to use beams of cast-iron as weighing-machines, measuring the weights imposed by the deflections produced."

From the various experiments made, he deduces that the proportion between wrought and cast-iron rails, should be as 1: 1 3-10—and says these calculations refer to rails supported at intervals only; but if the plan of continuous bearings should be adopted on railways, the propriety of which has been strongly urged by English engineers, as a perfect remedy for acknowledged defects, all objections against cast-iron rails must wholly vanish.

EDITORS' JOTTINGS, AND MECHANICAL RECORD.

Baltimore and Ohio Railroad Works.—The machine shop of the Baltimore and Ohio Railroad Company at Mount Clare, near Baltimore, is quite a curiosity, and well worth a visit. The whole management of the road is divided into three departments, namely, Transportation, of which Mr. John H. Done is master; Machinery, of which Mr. Hayes is master; Road, of which Mr. Bollman is master. The master of transportation performs the duty of superintending all the freighting throughout the whole length of the road, and has about seven hundred men under his command. The master of machinery has the entire control of the building of locomotives, cars, &c., and has about two thousand four hundred men under his control. The master of roads attends to all constructions and repairs of roads, depots, water stations, and other buildings, and has about nine hundred men under his control. Thus it will be seen that four thousand mechanics and laborers are employed in the several departments of the road.

The most interesting department is that of machinery. The first in the department are the blacksmith and moulding shops. Of the former there are six, devoted to the manufacture of the various parts of machinery. The first is for the preparation of the heavier portions of the machinery, such as shafts and axles of the cars and locomotives. In this shop there are twenty-four forges, several of which are attended by three hands each. This number is requisite to handle with facility the heavy shafts, which are swung by a crane, and carried to a large steam-hammer in the centre of the shop. The hammer is managed by a lad, who, by simply turning a screw, regulates the force of blow to any required power. The hammer weighs fifteen hundred pounds. All the forges are blown by a pipe conducted from the blowing boxes in the main building. The other shops are for the manufacture of the smaller portions of machinery, and for repairs.

The principal machine shop is devoted exclusively to the turning and finishing of the nice and more important pieces of machinery, both of iron and brass. In this are some thirty lathes, and while one is engaged in polishing a small piece of brass-work, another is boring out the hub of a wheel, or preparing its surface for the tire. And the shop is exclusively for heavy work, such as planing down the rough surface of a heavy iron plate, or preparing the several parts of new bridges, which are in course of construction for the use of the road. Here, too, are the boilers, smoke-stacks, and furnaces of the locomotives manufactured, and also the tenders, which are constructed principally of iron.

In the moulding shops are two cupolas, blown by pipes from the main building, where all the iron is prepared, and where all the wheels and other necessary parts are cast. In this shop two tons of iron are cast daily. Twelve wheels are cast every day. On such occasions as the castings for the bridges are made, the amount of iron consumed is much larger.

The carpenter shops are for the construction and repair of cars. The company have just completed fifty-two cars, intended exclusively for the transportation of hogs and sheep. They are made with two floors, which will enable them to carry just twice the amount that can be carried by an ordinary car. Besides these, there are buildings for the trimming and painting of passenger-cars.

All the immense machinery is worked by two steam-engines, one of sixty horse power, and one of about thirty horse power.

The Company have nearly completed two powerful engines, one for passengers and the other for freight, and intended to be used on the western end of the road. There are also machine shops at Wheeling, Fetterman's, and at Martinsburg, the two former being for repairs, and the last for the construction of machinery. It is estimated that the machinery and stock on hand are alone worth one and a half millions of dollars.

Each shop has its foreman, who is responsible to the master presiding over the department to which it is attached. The road department is now engaged in the manufacture of two miles of rails, composed of three pieces. This rail is so arranged, that much of the danger of the trains running off will be avoided, by the breaks in the rail having a proper bearing upon the side rail. The whole number of buildings at Mount Clare, including car and engine houses, is thirty. The total number of cars now running, of all descriptions, is five thousand; and locomotives, with those now building, two hundred and eight.

The Baltimore and Ohio Railroad is next to the Erie road in length, the main stem, from Baltimore to Wheeling, being 380 miles, and the Washington branch, 40 miles. The road is of vast importance to those portions of Maryland and Virginia through which it passes, and opens a direct line of travel to the great West and South-west. It is under the very best of management; and the travelling public already find it one of the most safe and speedy means of reaching the great West from Baltimore and points further north. The freight of the road in agricultural products and coal, is enormous; and when its value as a means of passenger transit is fully appreciated, it will be second to none in the country in this particular. It passes through a most romantic region, and, during the warmer months, would fully compensate a lover of nature in pursuit of the beautiful and the sublime, for a ride over its entire length. Like the Erie road, it is a stupendous monument of the perseverance and enterprise of those who have overcome almost insurmountable obstacles, to effect its completion.

Camden and Amboy Railroad.—Passing on a steam-boat from Pier No. 1, North River, lately, on our way to Philadelphia, we found ourselves surrounded with new objects, and for the moment feared we had made a mistake. A little inspection, however, satisfied us that what we feared was another boat was nothing more nor less than our old friend, the "JOHN POTTER," in a new dress! It has been re-painted, re-gilded, and re-furnished, "from stem to stern," and though always a beautiful boat, is now really magnificent. The splendor and comfort of the boat were the themes of frequent remark by numerous passengers, who, knowing the advantages of this route over the other, always give it the preference. Nor were they less enthusiastic in their admiration of the excellent viands prepared for the comfort of the "inner man," over which CAPT. SIMPSON presided with his wonted ease and gracefulness. Our preference for this route increases every time we pass over it. The beautiful scenery; the change from water to land, making a pleasing variety; the handsome cars, the sumptuous dinner on board the boat, the familiar intercourse with the officers, and the desire of all to please, really relieve travel of all disagreeableness, and render a trip to Philadelphia a pleasant pastime, rather than a burthen. We do not wonder that this route is so extensively patronized, as those who pass over it once, are sure to give it the preference over the other one.

NEW-JERSEY CENTRAL RAILROAD.—This road extends from New-York to Easton, Pa., from which place to Mauch Chunk a track is already graded for a road which will bring New-York within six hours of the coal regions. The value of this road can hardly be estimated. Coal can then be brought direct from the mines to New-York at any season of the year, which will tend to keep the price of that indispensable article at moderate rates. We see no reason why a train may not leave Mauch Chunk every thirty minutes through the entire year, laden with coal, which now finds its way to New-York *via* the Lehigh canal, which is closed during the cold season.

The construction of the New-Jersey Central Railroad has paved the way for this movement, so important to the city of New-York and surrounding places. The road is constructed of the best material, and in view of the increase of business by opening the Mauch Chunk road, the Company are about to lay a double track from Easton to New-York. It passes through the beautiful towns of Elizabethtown, Plainfield, Somerville, &c., and brings Easton within four hours of New-York. The engines and cars are of the best possible make, and its affairs are conducted with that enterprise and public spirit which might be expected from having so able and energetic a gentleman as JOHN T. JOHNSON, ESQ., for its President. When the thoroughfare is completed to Mauch Chunk, many a New-Yorker will visit the coal regions, and witness scenes and sights so startling in beauty and romance, that if described to him, would be regarded by him as a "second edition" of a Gulliver or a Munchausen!

ETHER AS A LOCOMOTIVE.—The steamboat Du Trembley has an engine adapted to the use of the combined vapors of ether and water. In order to secure the heat of the steam which has done its service, the spent steam is received in an apparatus consisting of several small vertical cylinders, standing close to each other, but not in contact, and their bases plunged in a reservoir of ether, which is under the apparatus which conveys the steam. The ether rises in the tubes and partly fills them. When the steam enters this apparatus and surrounds the tubes, the water is condensed, and the ether evaporates. This condensation produces a vacuum, which adds to the expansive force of the steam in extinguishing the resistance which it had encountered; and the ether vapor, collected in a separate compartment, above the vaporizing apparatus, and in which the tubes terminate, contributes a new force which is added to the steam.

The piston of the second cylinder may or may not be connected with the same beam as that of the steam cylinder. The ether vapor is treated like that of steam, being condensed by a jet of cold water which fills the apparatus around the tubes. The ether is then carried to the vaporizer, to commence another similar circuit.

In the four experiments tried by the commission, on the quantity of coal expended, the force of the engine was constant at about 70 horses. The quantity of coal consumed during the 36 hours and 50 minutes through which the experiments lasted, was 2860.9 kil., or 77.67 kil. per hour, and 1.11 kil. per horse power. When using the steam alone, under the same pressure, acting on the two cylinders, the amount of coal consumed during the 28.18 hours, was 8519.5 kil., or 302 kil. per hour, and 4.31 to 4.51 per horse power.

The ether is not lost doing this work, and hence the cost of this combined steam is small. The greatest difficulty encountered was to secure the joints so closely as not to allow the escape of this subtle and inflammable vapor.

Ammonia in Rain-water.—M. Bousingault has been making numerous experiments on the quantity of ammonia in rain-water, both in city and country. One station was at Paris, and the other at the old monastery of Liebfrauenberg, in the department of the Lower Rhine, and on the eastern slope of the Vosges. The proportions of ammonia varied, at Paris, from 1 to 5.45 milligrams, the mean being 3.35 milligrams per liter. At Liebfrauenberg, the rain-water hardly contained one milligram. The excess at Paris was attributed to emanations. The learned chemist says that "Paris may be viewed as a vast mass of smoking chimneys,"—not the most captivating view to be taken of that elegant city.

New Publishing House.—The new publishing firm of Ivison & Phinney, who continue the well-known house established by the late Mark H. Newman, deserve, on several accounts, a cordial reception by "the trade" and the reading public. The gentlemen constituting the firm are both from old publishing houses, distinguished by many excellencies, business and personal. Mr. Ivison, commencing life in moderate circumstances, was the first to make the city of Auburn the conspicuous inland book-mart it long has been. His character and business energy had given him an honorable position in "the trade" prior to his connection with the late Mr. Newman; and during his connection with Mr. Newman, whose health was very infirm for several years, the chief labor of their extensive business devolved on Mr. Ivison. Mr. Phinney is from a veteran stock of publishers. His grandfather was one of the early friends of the celebrated Judge Cooper, the founder of Cooperstown, and before the beginning of the present century, published the *Otsego Herald*, referred to in the *Pioneers*, and one of the first newspapers printed west of Albany—a little, blue, 7 by 9 sheet, which, as now preserved, is a very mummy of a newspaper. Fenimore Cooper, the novelist, was, in his youth, regularly engaged on this paper; and not long before his death, acknowledged to a publisher in this city that much of his knowledge of printing, and the practical part of his authorly profession, were acquired in this office. This elder Phinney also commenced the publication of *Phinney's Calendar*, a famous almanac in the West, which has been continued, nearly in its original form, to the present time—a curious specimen of the infancy of book-making. His two sons, under the old firm of H. & E. Phinney, commenced business in Cooperstown in the early part of the century, and continued it under the same title, though in time embracing the son of one of them, till the death of the elder brother, in 1852, a period of over thirty years. They were an energetic pair, with strongly-marked and original characters, of whom many curious anecdotes are told among their old neighbors. Among their achievements, was the stereotyping, in the little village of Cooperstown, some thirty years ago, the Family Quarto Bible, of which they manufactured and sold untold thousands. On being burnt out in 1849, the business was removed to Buffalo, and reorganized under the firm of Phinney & Co., with two of the sons as leading partners, which still continues one of the largest and most responsible houses in the West.

With such antecedents, and with the experience, capital, and character which Ivison & Phinney bring to their business, it is fair to expect that their house will speedily take a place among the staunchest and most honorable publishing firms of this city.

Harper & Brothers.—The calamity which recently befel this well-known house, by fire, is well known to our readers. They will be glad, also, to learn that they are again at work, at 82 Beekman street. We make the following abstract of their immense business, as published in the January number of their magazine:

They employed 33 Adams power-presses, of the largest and best description, each of which averaged 6000 impressions, or 190,000 16mo pages, a day. Sixteen of the presses had been built expressly for working wood-cuts. About 40 compositors were employed in their buildings, much of the type-setting being done elsewhere by stereotypists, who supplied them with plates. Their own stereotyping rooms employed about 20 men, who made from 25 to 30 casts a day, averaging about 120 pages. A new department had just been added, for carrying on the process of electrotyping, an art but lately introduced.

The bindery employed about 250 persons, 150 being females. Besides the 130,000 copies of their monthly magazine, they had daily on hand, and in process of binding, over 12,000 volumes of books. Since the Harpers have been in business, a period of about 36 years, they have published about 1,549 works, including 2,028 volumes.

A Fanciful Gate.—A correspondent of the *Home Journal* gives a pleasant account of a gate he passed through. The gate was a common one, shut by a chain and ball. But the post to which the inner end of the chain was attached was carved and painted in the likeness of a negro, with one hand raised to his cocked hat, and the other extended to welcome you in. As you opened the gate toward you, in going in, the negro post-pointer bent toward you, by a joint in his back fairly bowing you in. Upon letting the gate go to, a spring in his back "brought him up standing" again, ready for the next comer. This faithful fellow performed the amiable for his master for many years, without reward, except now and then a new coat—of paint; and finally died of a rheumatic back, contracted in his master's service.

The Apple Man in 1853.—Mr. N. P. Morrison, of Somerville, last year received $10 for one barrel and twenty-eight apples of the Hubbardston variety. These apples were sold by the retailer at fifty to seventy-five cents a dozen. Mr. M. cultivates, says the *New-England Farmer*, eight acres of land; his fruit, this barren year, 1853, brought him $850. For twenty-six bushels of apples he received $60. For one hundred and thirty-six barrels, he received $408. For strawberries and raspberries, $100. The balance, to make up the whole sum, $850, was for cider-apples, sold at from eight to twelve cents a bushel, and for early wind-falls sold in July and August. Perhaps some of our young men will come to the conclusion that the market for *good* fruit is not yet over-stocked.

The Dauphin and Susquehanna Coal and Railroad Company have completed their connection from Harrisburg to the line of the Reading Railroad at Auburn, with the exception of two miles of heavy excavation. We understand now that the road is entirely finished, and that an engine will run over it on Monday next.

County Societies in Ohio.—Of the eighty-eight counties in the State of Ohio, seventy-five have an organized agricultural society, and held fairs last year. This far exceeds those of any other State in the Union. Of the thirty-one States, seventeen have State fairs.

The Belvidere and Trenton Railroad was opened to Easton on the 16th inst. By this road the distance from Easton to Philadelphia will be about the same distance it is from Easton to New-York by the Central Railroad of New-Jersey.

Improved Car-brake.—Mr. Marcus P. Norton, of West Poultney, Vt., has secured a patent for a Brake for Railroad Cars, which will have a tendency to diminish the number of accidents, and save the machinery of the cars. It is so constructed that all the brakes are applied to the wheels at the same time, throughout the entire train. This is done by the engineer or baggage-master. In case of collision, the engine may be separated from the train, thus removing some thirty tons of burthen from the train, which renders the passenger-cars more easy to be suddenly stopped; if any thing is to be destroyed, it *must* be the engine. The same kind of brakes are on the engine, but it cannot be stopped so quick as the passenger cars, on account of the great weight which is in such rapid motion. The cars may be stopped in two or three rods. It is, also, so constructed. that if an axletree breaks, it cannot fall or rise up; it must, therefore, keep in its place, and the train upon the track. There is no strain in the bearings, or upon the wheels; no loose chains to be gathered up before the brakes are applied, but are instantly brought to act on the wheels. If a rubber should break, it cannot fall under the wheel and throw the train from the track, as is sometimes the case by the ones now in use. The brakes are applied to the sides of the wheels, and being applied to all the wheels at the same time, remove all strain upon different parts of the machinery and throw it upon each part alike. So much friction being applied at the same time, the train *must* stop.

American Wool.—Peter A. Browne, Esq., of Philadelphia, who has given great attention to the subject, in a communication to the *Richmond* (Va.) *Whig*, asserts that he can show that "as fine fleece can be procured in the United States as in any portion of the world." He says that he has in his possession wool grown in Allegheny county, Penn., by William Hall, which measures from 1-2186 to 1-2500 part of an inch, while the finest wool in the collection sent to him by the King of Prussia, and the finest among the specimens sent to him by the King of Saxony measures 1-2186. Mr. Browne denies the correctness of the decision on this subject at the London Crystal Palace Exhibition, and produces facts to show that the jury on wool did injustice to the specimens of American wool exhibited.

Important to Milk-Dealers.—*Milk-Dealer.*—"Mr. Registrar, I come to pay my bill for water tax; but I would like to know why I am charged five dollars more than last year."

Water Registrar.—"You did not keep milk for sale last year, I believe."

M. D.—"I did not."

W. R.—"You sell milk now."

M. D.—"I do."

W. R.—"Your bill 's all right, sir. Five dollars a year for extra Cochituate to milk-dealers is a moderate tax."

Exit milk-dealer, looking as though he had been skimmed.

Artificial Silicification of Limestones.—This process consists in impregnating the limestone with silicate of potash, and has been used on a grand scale in certain parts of the cathedral of Notre Dame. The architect of the cathedral reports as follows:

1. The infiltration of silica made upon the terraces, "et contrefort du choeur," in October, 1852, have preserved the stone from the green moss that covers stones in moist places. 2. That the gutters and flagging of limestone, subjected to this process, present surfaces perfectly dry, covered with a silicious crust. 3. That upon stones so prepared, dust and spider-webs are less common than upon the stone in the ordinary state. The report also states that tender stones have become hard; have lost their porosity, and that after they are washed, they dry more rapidly than stones not silicified.

We regard this as a very important discovery, nor do we see why it may not open very widely the door for the sculptor, enabling him to work on the softer rocks, and harden their surfaces afterwards. This is precisely what was done by Mr. Samuel Perkins, in relation to the use of steel for engravings. The work is done on soft iron, and then the engraved plate is converted into steel.

We hope our own artists will make their experiments in this direction, and lead their foreign brothers into paths which, though they were the first to open, they were not the first to explore.

Vitrification of Photographic Pictures.—Here we are promised another step of progress in the most wonderful art of photography. M. Plant, the author of the process, first procured a photograph on glass covered with albumen, and subjected it gradually to a strong heat, so as to redden the glass. The albumen was destroyed, and the photograph, if negative, became positive by reflection. The picture was made of pure silver, which adheres quite strongly to the glass, so that it may be polished without alteration.

Sal-ammoniac Manufactured at Gas Works.—MM. Moerhlin & Stoll have obtained a premium from the Industrial Society of Mulhausen, for the manufacture of sal-ammoniac from the ammoniacal liquid of gas works. The process is as follows: The ammoniacal liquid is mixed with slaked lime, and is then submitted to distillation in a boiler heated by steam. The parts volatilized pass into a worm, in which the larger part of the tar is deposited. The ammonia passes on into a Wolff's apparatus, where it leaves the foreign substances present, and is finally carried into cold water, where it is condensed, in a nearly pure state. It is then neutralized with chloro-hydric acid, and evaporated in a lead boiler.

As it is deposited, it is withdrawn by means of a wooden rake, and is allowed to drain. It is then introduced into a brick mould, and subjected to a strong pressure. Blocks of sal-ammoniac are thus obtained, which are dried in an oven, heated by the evaporating furnace.

Permanent Magnets are now made of cast-iron, by means of an electric current. The only difficulty consists in tempering the metal. They must be tempered at a bright red heat.

New Use of Balloons.—Experiments have been successfully made in the use of balloons as a hydrostatic apparatus. The particular object in view was to raise heavy bodies in deep water, and it may also be applied, perhaps, in navigation, for the passage of sand-banks. A balloon of four metres in diameter raised at least 31,000 killograms, and if filled with hydrogen, the effect would be much greater. Dr. Gianetti, the experimenter, used carbonic acid, which he obtained by the decomposition of a carbonate *at the bottom of the sea*. The power of such apparatus would be proportioned to the difference between the weight of the gas filling the balloon, and that of the water in which it is immersed of the same bulk. It seems a very great improvement over hogsheads, and the like, which are sometimes used for similar purposes.

Effect of Industry.—We regret that we did not observe the following table before our January issue. We might then have made a more emphatic statement of the enormous value given to that which costs a mere trifle, by the labors of an artist. A number of the *British Quarterly Review* gives the following calculation:

Bar-iron, worth only £1 sterling, is worth, when worked into

Horse-shoes, - - - -	£2 10
Table Knives, - - -	36 00
Needles, - - - - -	71 00
Pen-knife blades, - -	657 00
Polished buttons and buckles, -	897 00
Balance springs for watches, -	50,000 00

Now and Then.—The difference between the state of things now and some seventy years ago, is strongly exhibited by the reading of the following singular proclamation. The object of Mr. Paine is evident from the document itself. It was published in the papers.

"As the subscriber is appointed by the Honorable Trustees of Dartmouth College to carry into execution the erection of an edifice for said college, for which there will be wanted a large quantity of lime,

"These are therefore to request those who know of a quantity of lime within thirty miles of said college, that will answer the purpose, and also of any person or persons who will undertake the making of it, to give the subscriber information; in doing which they will contribute towards the professed design and advantage themselves by undertaking. Elisha Paine."

"*Lebanon, Sept.* 22, 1784."

The American Journal of Science and Arts, conducted by learned gentlemen, at New-Haven, Ct., to which we are indebted for the statements of two or three new discoveries on the arts on a previous page, retains the eminent distinction it has so long possessed over all other scientific journals in this country. It ought to have a vastly increased patronage, and the fact that it takes so very high a stand in matters of science, is probably the reason why it is not more generally read. It is beyond the reach of all but a few. Still it should be patronized by all. The subscription of a five-dollar note is due the learned editors from every lover of science, whether he reads the journal or not. It is due for the honor of the country. The work is very poorly sustained. Gentlemen of wealth, send them a New Year's gift.

Clements' Live-stock Agency.—While in Philadelphia recently, we visited the extensive live-stock agency of Aaron Clements, Esq., in Cedar street. Mr. C. has the choicest breeds of cattle, horses, hogs, sheep, turkeys, ducks, hens, &c., &c., constantly on hand, which he is selling at a fair price, and thus affording the agricultural community easy and cheap facilities for improving their stock. He ships to any part of the Union, and orders may be given by mail with every assurance that they will be promptly and satisfactorily answered. Mr. C. has been engaged in raising stock for more than a quarter of a century, and possesses unusual qualifications for conducting such an agency.

Milk for Manufacturers.—Milk now possesses other offices besides the production of butter and cheese, and the flavoring of tea. It has made its way into the textile factories, and has become a valuable adjunct in the hands of the calico-printer, and the woolen manufacturer. In the class of pigment-printing work, which, indeed, is a species of painting, the colors are laid on the face of the goods in an insoluble condition, so as to present a full, brilliant face. As a vehicle for effecting this process of decoration, the insoluble albumen obtained from eggs was always used until Mr. Pattison, of Glasgow, found a more economical substitute in milk. For this purpose buttermilk is now bought up in large quantities from the farmers, and the required insoluble matter is obtained from it at a price far below that of the egg-albumen. This matter the patentee called "Iacbrine." A second application of the same article—milk—has just been developed, by causes arising out of the recent high price of olive oil. The woolen manufacturers are now using the high-priced article mixed with milk. This mixture is said to answer much better than oil alone, the animal fat contained in the globules of the milk apparently furnishing an element of more powerful effect upon the woolen fibres than the pure vegetable oil alone.—*London Medical Journal.*

Self-adjusting Switch.—The *Buffalo Commercial* says: "A trial of Dick's self-adjusting switch was made Thursday afternoon, on the Buffalo and New-York City Railroad, and was entirely successful. The main object of the invention is to provide against the accidents which too frequently occur on railroads through the carelessness of switch-tenders, in leaving open the switches when a train is about to pass over the main track. This it effectually does by means of a spring, which, being touched by the wheels of the locomotive as they pass along, instantly throws back the switch into the main track. A locomotive was driven over the main track at a very high rate of speed, when the switch was open; and the instant the spring was touched, the rails sprang back into their proper place, and the locomotive passed safely along. It has the appearance of being a most hazardous experiment, but after its operation has once been witnessed, all fear of an accident is at an end. The engine was driven by Myron E. Brown, engineer, and A. D. Garlick, assistant. The experiment was witnessed by a large number of persons connected with, and interested in railroads, all of whom expressed much satisfaction at the operation of the switch. Mr. James W. Dick, the patentee, is in a fair way of realizing a good profit from his ingenious invention."

Improvement in Building.—An improvement is introduced in a fine row of stores going up in Chambers street, worthy of attention. In constructing the walls, an iron girder is used, which serves two valuable purposes. It is of the shape of an H on its side, (thus, ⌶,) and is built into the wall, longitudinally, at the point intersected by the floor-beams, the ends of which are made to rest on the same; and by this means fire is prevented from communicating between the extremities of the floor-beams, they being separated by about two inches of solid iron. A primary object, however, is to facilitate the conversion of two or more stores into one, or their restoration to the original number; for, the girders being supported throughout their length by perpendicular iron posts, the masonry of the walls may be at any time removed, leaving the iron work unimpaired.

Safes.—Upon the subject of fire-proof and burglar-proof safes, there has been, and still is, a great difference of opinion among men of all classes.

In the general outside appearance of safes of our principal makers, there is great similarity; but in the locks used, and in the mode of putting together, and in what may be considered of more importance, safety from fire, which depends much upon the packing, as it is termed, there is great odds, as we have proofs from almost every great fire that occurs in our city.

Our friends need not to be directed; yet if before purchasing, they will call at No. 33 Maiden Lane, and examine there what saved thousands in the great fire in Pearl street, and then take a look at the stock ready for similar or any fiery trial, and burglar-proof, we feel sure that they will do as one of us did, mark one, and order it sent home, feeling that he had as good, if not the best, safe his money would buy.

This house is not as old as some others in our city; yet that is no reason why they should not make a better safe. Progress is the order of the age; and while some plod on in the beaten track, others strike boldly forth, and do works that astonish the world. So if McFarland's new improved fire and burglar-proof safe saves valuable property from destruction, it were better than to be burned up in a safe of ancient fame.

American Madder.—The experiments which have of late been made with home-grown madder, have proved that, when properly heated, American is equal to the best French madder. Like Turkey, Dutch, or Alsace madders, the American requires the addition of a little chalk to produce the best effects.

During the past winter, the Merrimack Company, Lowell, have used, with great success, some madder grown in Montague, Franklin county, Mass., and are now about to dye some calico with this Massachusetts madder, to be exhibited at the New-York Crystal Palace. The same Company has also received a small sample of madder grown in Georgia, which proves to be an excellent article—quite equal to that of Massachusetts.

We have been informed that there grows wild in Florida, a plant, whose root, when eaten by hogs, colors their bones red. Such is the effect of madder. Doubtless this is an indigenous species, whose cultivation would richly reward the planter. It is hoped that samples of this "Pink-root," as it is termed in Florida, may be forwarded to Lowell for trial in dyeing. It is very desirable to determine whether it is madder requiring the peculiar treatment of all other madders, (except the Avignon,) to produce the fullest, fastest, and most brilliant colors.

Oysters.—According to the *Baltimore American*, the product of the oyster trade of the city is equal to or greater than the product of all the wheat and corn raised in the State of Maryland. The whole shores of the Chesapeake Bay and its tributaries are adapted to the growth of the oyster, and as but one year is required for their full growth, an immense profit accrues to those engaged in the business—a profit which is estimated at some three hundred to six hundred per cent. There are 250 vessels engaged in the business, which average about 900 bushels to the cargo, and require nine or ten days for the trip. These vessels, making in the aggregate 6000 trips during the eight months in the year in which they are engaged, give a total of 4,800,000 bushels per year sold in the Baltimore market. The oysters bring an average price of fifty cents per bushel, which gives a grand total of $2,400,000 per year paid for oysters by the dealers in the city. Some of the houses send by the Baltimore and Ohio, and Baltimore and Susquehanna Railroad, to say nothing of the other modes of transportation from eight to ten tons of "canned" oysters per day. The shells are carried t manure to all parts of Virginia and North Carolina. In the "shocking" of oysters, the shells will increase about one fourth, which would give a total of about 6,000,000 bushels of shells, which sell for two cents per bushel, making a return of $120,000 per year for the shells alone.

NEW BOOKS.

THE LOST PRINCE; Facts Going to Prove the Identity of Louis XVII. of France and the Rev. Eleazar Williams, &c. By JOHN H. HANSON. New-York: G. P. Putnam. 1854. pp. 479.

WE commenced the examination of this volume free from prejudice; and while we know that it is easy to pronounce a course of reasoning as illogical and unsatisfactory, even without the trouble of weighing it, we are also aware that those who enter upon new fields of inquiry, or who depart from the beaten track of established opinions, must encounter no little reproach.

But we do not hesitate to say that the testimony and circumstantial evidence here set forth, if not forged, are stronger and more satisfactory than that which is presented in a majority of verdicts in our courts, in all sorts of disputed cases.

It may be interesting to our readers to know something of the kind of evidence relied upon by our author. We depart from our usual course, and give a very meagre abstract of more prominent points.

It is not denied by any person that a plan was laid for the escape of the young Prince from his confinement. It is also admitted by all, (that is by Duchesne, who denies in his book that the Prince is now living) that one of his keepers was privy to this plan. It was desired by all parties of the revolutionists to be rid of him, and a motion was actually made in the Assembly that he be exiled.

At the time of his pretended death, he was visited by a Committee of the Assembly, who took no measures to establish the identity of the corpse before them, but were satisfied with the general statements of his attendants.

Surgeons were appointed to examine the question of identity, but they made no such examination, nor do they testify to this point.

The young Prince was diseased in all his joints, especially in his knees. The surgeons describe two tumors only, namely, in the right knee and the left wrist.

M. Desault, his family physician, who well knew his condition, described his disease as the *germ* of a scrofulous affection. This physician *suddenly died*, it is said, by poison, just before the "death" of the Prince. The surgeons say that in the subject they examined, were the marks of scrofulous disease, "which had existed a long time." Tumors were in *both knees, both wrists, and both elbows.*

All his keepers describe the Prince as mentally imbecile and silent, while the boy who died was "talkative, forward, animative, imaginative."

Persons familiar with the Prince, publicly pronounce it as their opinion, that the child that died, whom they also saw, was not the Prince.

In 1795, and afterwards, arrests were made *by the French Government*, of persons *charged with being the Dauphin.* In the same year, Charette issued a proclamation to the army of Vendee, in which he declares that the Dauphin was then in his possession; and again, it is asserted that Cambaceres and others acknowledged that the public "were deceived on this subject," but would never reveal what he knew. The sister and other relatives of the Prince have apparently believed and known the Prince to be still alive. Thus far, as to the fact of the death of the Dauphin.

Turn now to this country. Soon after these events had transpired, two French children were brought here, and resided for a time in Albany, where the peculiar appearance of the boy was a subject of common observation among families of the highest respectability; and the contrast noted between him and those who acted as his parents, or guardians, and these were so dissimilar in their appearance, that they were not then supposed to be husband and wife. These people had many articles of very great value, which had "belonged to the deceased King and Queen of France." They suddenly disappeared, none knew whither.

About the same time, two Frenchmen, one, apparently, a Catholic priest, brought a weak, sickly boy to Ticonderoga, and left him there among the Indians. These two men informed a Mr. O'Brien that the boy was born in France, and he, having often seen him, both in youth and manhood, testifies that this "boy" is the same person with Mr. Williams. The Indian reputed to be his mother, has frequently called him her "adopted son;" and while the names of all her *other* children are duly registered, no entry is made of his.

The recollections of Mr. Williams, who is an Episcopalian clergyman, and who has been a missionary of unsullied reputation for many years among those Indians, do not extend beyond his twelfth year, or thereabout. All beyond is mist and confusion. But when Prof. Day, of New-Haven, in an interview with Mr. Williams, was showing to him, among many others, a certain portrait, *the name of which was concealed*, "Good God," cried Mr. W., "I know that face; it has haunted me through life!" It proved to be the portrait of Simon, the jailor of the young Prince!

Many French gentlemen, some of them artists, familiar with the faces of the royal family, pronounce that of Mr. Williams to be a Bourbon, and specify the peculiarities about it. The scars which they, some of them, remember on the face of the young Prince, are now visible on his. Again, Count de Balbi, an illegitimate son of Louis XVIII., was for a time in this country, and formed numerous acquaintances. Some of them, on meeting Mr. Williams, have mistaken him for the Count, and have addressed him as such.

The Prince de Joinville, when in this country, it is shown by several witnesses well known to the public, spoke of Mr. Williams with great interest, and asked for an introduction to him, going, apparently, out of his way to see him. Mr. Williams declares that in a private interview, he, the Prince, told him that he was the Dauphin. And though, on the publication of this statement in *Putnam's Magazine*, the *Prince came out with a flat denial of the whole story*, he denies too much, and entirely destroys all the weight of his statement; for he denies what is sworn to by half a dozen witnesses, the captain and passengers of the steamer; and no jury in the world but would pronounce his positive declarations as *thoroughly impeached.* This tells very strongly for Mr. Williams's correctness; and why should De Joinville think them worthy of any notice? We have thus given a very meagre account of this singular affair. But it is enough to show its nature; and those who wish for more light must order the book. They will then see, that *not half has been told* in this abstract, though it is all for which we have space.

And though one of our Puritan editors, and one or more of our city press, seem to consider this mass of testimony, some of which is from the most respectable citizens of this country, as quite unworthy of attention, we are willing to place ourselves in company with such learned, accomplished, and judicious men as Rev. Dr. Hawks and the Hon. John C. Spencer, and others, in the list of those who attach to it no small degree of consideration.

THE MISSIONARY OF KILMANY; being a Memoir of Alexander Paterson, with notices of Robert Edie. By the Rev. JOHN BAILLIE. New-York: Robert Carter & Bros. 1853. 12mo. pp. 253.

MR. PATERSON was a convert to the preaching of Dr Chalmers, who befriended him to the day of his death. He was a faithful missionary, and has preserved the journal of his humble but very successful labors among the poor, in these unpretending but well-written pages.

CLINTON; a Book for Boys. By WM. SIMONDS, author of "Boys Own Guide," "Friendly Words," &c. Boston: Gould & Lincoln. 1854.

THIS is a well-told story, designed merely to illustrate the importance of early habits of industry and obedience, the danger of vicious companions, and the ability to say No. Kindred and collateral topics are of course brought out, and all is done in good taste, and interests the reader.

THE AMERICAN STATESMAN; or, Illustrations of the Life and Character of Daniel Webster, designed for American Youth. By Rev. JOSEPH BANVARD. Boston: Gould & Lincoln. 1853. 12mo. pp. 334.

THE name of Daniel Webster is a host in itself, and is intensely suggestive of great thoughts. Every incident of his life, as one after another is brought to our attention, is but a new phase of mountain scenery. Hence this volume cannot fail to be attractive. But we think that Mr. Banvard has tried to accomplish two things that are inconsistent, though we scarcely know how to define the term "youth." If he uses it in its popular sense, the plan of the work is quite deficient. If by "youth," he means all not belonging to old age, he should have omitted sundry paragraphs of advice, unsuited to all but the very young and useless to them, and some really childish allusions. The few points selected for prominent relief, however, in this little volume, if for understanding readers, are generally very judiciously selected. All such will read the volume with pleasure.

HAPS AND MISHAPS, of a Tour in Europe. By GRACE GEEENWOOD. Boston: Ticknor, Reed & Fields. 1854. 12mo. pp. 437.

GRACE GREENWOOD is one of our most sprightly writers. She is never sleepy, and is very successful in keeping her readers awake. As a traveller, she is remarkable. Her words are apt, and her opinions quite worthy of respect. She knows what is worthy of notice, and how to convey the best idea of what she desci ibes to the mind of others. Hence her journal is peculiarly attractive. We have read it with great interest.

THE PRIEST AND THE HUGUENOT; or, Persecution in the age of Louis XV. From the French of L. BUNGENER. Boston: Gould & Lincoln. 2 vols. 12mo. 1854.

M. BUNGENER was a minister of the Reformed Church of Geneva. He is an able man and a powerful writer. His object is to give a history of the persecutions of those times. A former work, kindred to this, entitled "The Priest and the King," we have not seen. But this work we have read with intense interest, and commend it, unqualifiedly, to all our readers.

GLAD TIDINGS; or, the Gospel of Peace; a series of Daily Meditations for Christian Disciples. By Rev. R. W. TWEEDIE, D.D., of Edinburgh. Boston: Gould & Lincoln. 1 vol. 12mo. pp. 276. 1854.

THIS little volume is composed of some 120 or 130 short articles, on some important religious topic, accompanied by some passage of Scripture, and a selection of poetry. All evangelical denominations will give to it their hearty approval.

THE CHRISTIAN WORLD UNMASKED. By JOHN BERRIDGE, A.M.; with a Life of the Author, by Rev. Thomas Guthrie, D.D., Edinburgh. Boston: Gould & Lincoln. 1853. 12mo. pp. 183.

JOHN BERRIDGE is a quaint and racy writer. The book represents a spiritual physician, prescribing for a sinner ignorant of his own malady. His introductory sentences are a fair sample of the whole. "Lend me a chair, and I will sit down and talk with you. If my company proves unseasonable, or my discourse unsavory, you may be relieved from both by a single cast of your eye." Few will fail to listen, till he has finished his discourse.

THE RELIGIONS OF THE WORLD AND THEIR RELATIONS TO CHRISTIANITY. By FREDERICK DENISON MAURICE, M.A., from third revised London edition. Boston: Gould & Lincoln. 1854.

THE substance of these lectures was delivered, according to the directions of Boyle's will, in one of the London churches, at stated times, in 1845 and 1846. They embrace a view of the origin, principles, and character of Mohammedanism, Hindooism, Buddhism, and the old Persian faith, with the relations of each to Christianity. They are ably written by one who was well informed in his subject, and are replete with interest.

HOT CORN; Life-Scenes in New-York Illustrated. By SOLON ROBINSON. New-York: Dewitt & Davenport. 12mo. pp. 408. Price, $1.25. Elegantly bound.

THIS work is written in good style, and is brim-full of intensely interesting scenes. While we were reading some of the stories, as they originally appeared in the *Tribune*, we thought them capital, but the work of a vivid imagination. We have, however, been assured by the author, that if the volume has any merit, it consists in its truthfulness. This adds wonderfully to its interest. If any one would know what poverty is, and what is the severity of suffering, too common, alas, in all large cities, and *the mode of cure*, let him read these pathetic tales.

Carl Krincken; or, The Christmas Stocking. New-York: G. P. Putnam. 1854.

This is a capital juvenile. The book consists of stories that are told, and well told, to little Carl, by the different articles which he found in his stocking on Christmas morning. Every boy would like it in his library.

List of Patents Issued,

FROM DEC. 6 TO JAN. 3.

[Our list of new patents is unbroken thus far, though in our last number the dates were misprinted.]

James Cochrane, of New-York, N. Y., for improvement in hydrant valve.

John Comstock, of New-London, Ct., for improvement in bit-stocks of braces.

Norman Cook, of New-York, N. Y., for improvement in mode of fixing the colors of cotton umbrellas.

Carmi Hart, of Bridgeport, Conn., for improvement in car wheels.

Jos. Nock, of Philadelphia, Pa., for improvement in inkstand covers.

F. S. Hotchkiss and C. W. Blakeslee, of Northfield, Conn., for improvement in spring clamps for clothes-lines.

Melvin Jinks, of Wayland, N. Y., for improvement in turnkeys.

W. E. Merril and Freeman Tupper, of Nashua, N. H., for improvement in bedstead-fastenings.

J. E. Nesen, of Buffalo, N. Y., for improvement in harvesters and binders.

Chas. Page, of North Danvers, Mass., for improvement in sectional bedsteads.

Joseph Sawyer and Lyman Clark, of South Royalston, Mass., for improvement in peg rasps.

Jno. Wilmington, of South Bend, Ind., for improvement in machines for cutting sheet-metal.

J. R. Bassett, assignor to James B. Williams, of Cincinnati, O., for improvement in pump-valves.

John Butter, assignor to James Sully and John Butter, of Buffalo, N. Y., for improvement for machines for moulding brick.

J. E. Brown and S. L. Bartlett, of Woonsocket, R.I., for improvement in grain and grass-harvesters.

William C. Creamer, of New-Haven Co., Conn., for improvement in operating brakes by signal cards.

B. H. Franklin, of Worcester, Mass., for improvement in manure and other forks.

Uriah H. Goble, of Springfield, O., for improvement in grain and grass-harvesters.

Joseph and James Montgomery, of Lancaster, Pa., for improvement in shoes to winnowers.

T. F. Nelson, of Clarke Co., Va., for improvement in manure-crushers and sowers.

Wm. and Thomas Schnebly, of New-York city, for improvement in grain and grass-harvesters.

H. N. Tripp, of Alfred, Me., for improvement in power-rakes.

R. P. Walker, of New-York city, for improvement in hulling and scouring coffee.

J. B. Armstrong, of Barnwell, S. C., for improvement in cotton-presses.

Charles Atwood, of Birmingham, (Derby,) Conn., for improvement in attaching hooks and eyes to cards.

D. E. and M. Battershall, of Troy, N. Y., for improvement in candle-mould machines.

James Baxendale, of Providence, R. I., for improvement in stamping patterns on rollers.

James Bolton, M.D., of Richmond, Va., for improvement in hot-air furnaces.

Lazare Cantel, of New-York, N. Y., for improved metallic trunk-frames.

David Carroll, of Baltimore, Md., for improvement in shuttles.

John D'Homergue, of New-York, N. Y., for improvement in car-brakes.

Alexander Frankenberg, of Columbus, O., for improvement in soda-water fountains

W. J. Hatfield, of Dayton, O., for improvement in jointing table-tops.

L. O. P. Meyer, of Newtown, Conn., for vulcanizing caoutchouc compounds.

J. A. Mitchell, of Ringgold, Ga., for improvement in hand-looms.

Ephraim Parker, of Rock Island, Ill., for improvement in sawing and planing clapboards.

Godfrey Simon, of Reading, Pa., for improvement in carriages with shifting seats.

Solon Staples, of Topsham, Me., for screw for planking ships.

H. L. Sweet, of Foxborough, Mass., for guides for sewing on bindings.

Wm. H. Towers, of Philadelphia, Pa., for improvement in horse-shoe.

Elias Unger, of Dayton, Ohio, for polygonal surfaces in timber.

E. H. Bard, and H. H. Wilson, of Philadelphia, Pa., for improvement in gold pens.

Wm. Wisdom, of Cleveland, O., for cleansing hair and feathers from insects, &c.

B. F. Greenough, of Cincinnati, O., for separating alcohol from water and other heavier fluids.

B. F. Stevens and Walter Kidder, of Lowell, Mass., for shingle-machine.

A. E. Botter, of New-York, N. Y., for folding-bureau or wardrobe-bedsteads.

I. D. Garlick, of Lyons, N. Y., for self-acting machines for weighing grain.

C. F. Sibbald, of Philadelphia, Pa., for improvement in steam-boilers.

S. C. Blodgett, of Georgetown, Mass., assignor to Chas. Morey, of Boston, Mass., and Morey, assignor to Nehemiah Hunt, of Boston, Mass, for improvement in sewing-machines.

Wm. H. Atkins, assignor to W. T. Huntington, of Ithaca, N. Y., for improved time-registers, for showing the day of the week and month.

J. C. Conklin, of Peekskill, N. Y., assignor to D. Tompkins, of North Haverstraw, N. Y., and D. F. Tompkins, of New-York, N. Y., for improved pick-axes.

Wm. A. Martin, of Brooklyn, N. Y., assignor to W. Watson and Peter Van Zandt, of New-York, N. Y., for improved method of folding Seidlitz powders.

Alfred C. Cook, of Russelville, Ky., for machine for sawing bevel surfaces.

Samuel Champion and Thomas Champion, of Washington, D. C., for improvement in feathering paddle-wheels.

Isaac Crandal, of Cherry Valley, N. Y., for improvement in running-gear of wagons.

John Collman, of Silver Creek, Ill., for ruling-machine.

Wm. S. Dillehay, of the county of Shelby, Ky., for improvement in straw-cutters.

John Donlevy, of New-York, N. Y., for the method of forming plates for poly-chromatic printing.

F. P. Dimpfel, of Philadelphia, Pa., for improvement in steam-boiler furnaces.

J. Hamilton, of New-York, N. Y., for improvement in quartz crushing-machine.

M. W. Helton, of Bloomington, Ind., for improved method of hanging and operating saw gates.

G. D. Miller, of New-Berlin, Pa., for improved tyeres.

Lucius Page, of Cavendish, Vt, for improvement in screw bolts and nuts.

Jonathan Russell, of Philadelphia, Pa., for cutting irregular forms.

D. H. Chamberlain, of Boston, Mass., assignor to himself and Nehemiah Hunt, for improvement in banding pullies for saws.

J. H. Longbotham, of Brooklyn, N. Y., for improvement in bookbinder's boards.

G. A. Xander, of Hamburg, Pa., for improvement in corn-shellers.

C. Muller, of New-York, for improvement in machines in casting type.

Matthew Stewart, of Philadelphia, Pa., for floor-plates of malt-kilns.

E. A. Tuttle, of Williamsburgh, N. Y., for hot-air registers.

J. B. Terry, of Hartford, Conn., for machine for sticking pins.

Z. C. Ogden, of Glenn's Falls, N. Y., assignor to L. C. Ogden, for lowering, raising, and fastening carriage-tops.

W. H. Price, of Philadelphia, Pa., for improved bedstead-fastenings.

P. P. Tapley, of Lynn, Mass., for improved machines for polishing leather.

W. B. Tilton, of New-York, N. Y., for improvement in guitars.

C. Desbeau, of Paris, France, for improved method of turning the leaves of books.

John Shuttleworth, of Frankfort, Pa., for improvement in power-looms.

Joseph Nason, of New-York, N. Y., for improved method of cutting screws in lathes.

Reuben M. Hines, of Mentz, N. Y., assignor to Horace C. Silsby, of Seneca Falls, and Reuben M. Hines, of Mentz, N. Y., for improved hay and manure forks.

Thomas W. Harvey, of New-York, N. Y., assignor to John B. Terry, of Hartford, Conn., for improvement in machines for sticking pins.

Sherburn C. Blodgel, of Philadelphia, Pa., for trimming and cording umbrella-covers.

Patrick Clark, of Rahway, N. J., for regulating the damper of steam-boilers.

R. H. Collyer, of San Francisco, Cal., for improvement in quartz-pulverizer.

T. F. Englebrecht, of New-York, N. Y., for improvement in double-acting spring-hinges.

Banford Gilbert, of Pittsburgh, Pa., for improvement in corn-shellers.

J. D. Greene, of Cambridge, Mass., for improvement in breech-loading fire-arms.

J. B. Holmes, of Cincinnati, O., for improvement in machine for nailing washboards.

Samuel Malone, of Tremont, Ill., for improvement in corn-planters.

G. F. Page, of Baltimore, Md., for improvement in ratchet catch for head-blocks in saw-mills.

Thos. Rogers, of Philadelphia, Pa., for improvement in cutting hand-rails.

H. C. Nicholson and James Spratt, of Cincinnati, for improvement in sealing preserve-cans.

Oren Stoddard, of Busti, N. Y., for machinery for sawing logs.

Wm. Wright, of Hartford, Conn., for operative cut-off valves of steam-engines.

E. L. Freeman, of Belville, N. Y., for bog-cutting cultivators.

WEEK ENDING JAN. 10.

David Clark, of Philadelphia, Pa., for oil-cup and steam-engines.

Lucian A. and J. W. Brown, of Hartford, Conn., for press for veneering.

Leonard Campbell, of Columbus, Miss., for cotton-gins.

D. S. Darling, of Brooklyn, N. Y., for improvement in preventing dust from entering railroad-cars.

D. M. Cummings, of North Enfield, N. H., for improvement in machinery for mortising frames for window-blinds.

C. W. Fillmore, of Coral, Ill., for improvement in clamps for holding steel plates, while being hardened and tempered.

B. C. Goffin, of New-York, N. Y., for improvement in attaching cross-bar fastenings to vault and safe-doors.

B. D. Gullet, of Aberdeen, Miss., for improvement in cotton-gins.

Halver Halvorson, of Hartford, Conn., for improvement in machine for pegging boots and shoes.

The Plough, the Loom, and the Anvil.

PART II.—VOL. VI. MARCH, 1854. No. 3.

GEOLOGY.—COAL FORMATIONS.

WE purpose to give a concise view of this great subject in its several phases. It must be admitted to be a topic replete with interest, whether viewed in a scientific or economic connection. To understand the latter, however, we must know something of the former, and we shall venture therefore to presume upon the approval of our readers, while we attempt a simple statement, intelligible to the unlearned, of the more important facts belonging to such an essay. And we invite you, reader, whose eyes are now glancing along these lines, by way of testing their quality, not to be deterred from following us from page to page, in successive numbers even, until we are convicted of tediousness upon a fair trial.

The opinion was advanced by Liebnitz, and is still entertained somewhat extensively, that in some distant period the entire earth was a liquid mass, under the action of heat of great intensity. As the outer surface began to solidify, and form a crust, granite was one of the oldest "formations." It does not occur in regular *strata*, or layers. It has not the appearance of having been poured out upon a hard surface, and suffered thus to become solid, but always consists of compost masses, granulated, that is, in grains or concretions, not in crystallized forms. Nor does it contain any fragments or other remains of previously-formed rocks.

If the world was ever in such a condition, what other consequences could rationally be anticipated than the following? As the melted mass, now confined by a solid crust, boiled and heaved, being wrought upon by forces mighty beyond conception, but ever-varying in their intensity, frequent eruptions ensue. Some portions of this crust are elevated; others, perhaps, are depressed. By-and-by, huge quantities of the melted matter burst through the walls which have confined them, and pour themselves out on the uneven surface, and are there left to cool and solidify, in their turn to be covered by similar eruptions. The elevated portions would still be left bare, while those which were depressed would gradually approach to the condition of a uniform plane. So far, the results supposed completely answer to phenomena everywhere witnessed on the crust of the earth.

It is not, however, a point upon which all are agreed that the entire earth was ever, at one time, in the form of a liquid. Various theories have had and still have their defenders, although so far as belief in the fact that all has been in that condition at some time or at different times, there is but little disagreement. Numerous fractures on beds of granite, which are filled with more recent granite or other crystalline rocks, strongly indicate successive operations of this kind. There are some very notable examples of this.

Go another step. Let these repeated eruptions cover the solid crust with the liquid matter still occupying the central regions of the earth, and let chemical or other existing forces, operating through a long period of time, cause these substances, after they have become solidified, to waste and crumble—a process which is now constantly going on—and then let the waters and the winds exert their natural influence in collecting or scattering these granulated or fragmentary portions, and chemical agencies exert their legitimate influence, as they do at the present day, and we shall have all that is necessary to explain the *general condition* and arrangement of the outer crust of the earth. And if we can thus account for admitted facts, it may be wiser to receive than to reject this theory of the earth's formation. . If this is not the rational explanation of these phenomena, the scientific world would gladly hear something more in accordance with known facts.

This process would require a vast period of time. The progress of the new creation, or the change from utter chaos to a condition suited to the support of animal life, must have been very gradual, requiring the lapse of ages, and this long period may have been previous to "the first day," as is generally believed, or during the progress of the "days," each day being an epoch.

But if granite is the oldest among the rocks, what other forms of solid matter were coëxistent with it? Gneiss is one of the oldest, and bears marks of having been formed under water. Often, it is stratified, or in layers, showing that a solid mass was beneath it at its formation. Sometimes it is hard as granite, and other specimens we have often made to crumble into powder in our fingers. Mica slate is perhaps nearly as "old." So is hornblende. No remains of animals are ever found in these rocks, and who can tell us why we should believe that, during the process of these formations, any animals existed? If they did exist, they must have possessed peculiar organisms, to endure such extreme changes as those to which they must have been exposed in the midst of such revulsions of nature. This is the epoch of the primary formations, although it is not now supposed that all "primary" rocks were formed at the earliest period.

It may be in place here to state that the phrase, "the crust of the earth," has not a very definite meaning. That is, we know but little of its thickness or its substance. Perhaps a depth of ten miles may have been examined, but even this is only about 1-400 the distance from the centre of the earth to the surface.

Another remark is necessary, that we may not mislead. All granites are not supposed to belong to the rocks first formed, or solidified, but certain forms known by this general term, are believed to be of more recent origin. Still, all granites *underlie*, that is, they occupy the lowest place in the order of super-position. Hence, Sir Charles Lyell proposes to call them *hypogene* rocks, a term formed of two Greek words, signifying *to be* and *under*.

For the same reason, other rocks, as volcanic, have been termed *overlying*. These terms define their position, but not their absolute condition; for since they first occupied the spot where they are now found, they may have essentially changed their external and also their essential characteristics.

Other names are applied, of obvious import. Thus, rocks formed more recently by the action of subterranean fires, are called VOLCANIC. These contain no vegetable or animal remains.

Those rocks which spread out in strata, or beds, like the sediment at the mouths of rivers, are called AQUEOUS, as they are generally supposed to have been thus disposed by the action of water.

Fossils are the bodies, or the traces of bodies, animal or vegetable, which, by the action of natural causes, have been long buried in the earth. Of these, shells are most abundant. These are sometimes found forming a large portion of the solid mass of rocks. They occur at very different degrees of elevation above the ocean. In the Himmalayas, fossils of sea-shells occur at an elevation of 16,000 feet. In this northern section of country, the vicinity of Lake Champlain is most abundant in these interesting remains. We have seen localities so full of them that one could scarcely step without treading upon them. These are imbedded in limestone. They are also found, as we ourselves have witnessed, more than a hundred feet above the present surface of that lake.

Rocks of igneous origin, yet differing in their characteristics from the volcanic, are called PLUTONIC. They are supposed to have been formed under great pressure, perhaps at great depths, and to have been melted, and afterward cooled with extreme slowness.

One other class remains to be described. There are certain rocks that contain no fossils, no sand, pebbles, nor any such indications of aqueous origin, which do still form strata, corresponding in form and arrangement to aqueous formations. These may have been originally deposited by water, and afterward been exposed to the action of subterranean fires, and thus made to assume another texture. These rocks are highly crystalline. Statuary marble is an illustration of this class; so are mica and hornblende slates. These are termed METAMORPHIC rocks, the name denoting the change or metamorphosis which they have undergone.

These four classes, the aqueous, the volcanic, the plutonic, and metamorphic, have reference, it appears, to their origin, and not to the time of their formation.

The various degrees of elevation at which any given rock is visible, do not necessarily affect its general relative position. If at a certain point, you forcibly thrust the lining of your coat through the broadcloth, it does not follow that it ceases to belong to the lining. Granite "crops out" in a thousand places, just as the ends of one's fingers do through his gloves, though by a different process. Instead of wearing away the outer covering, the inner one is forcibly thrust out.

Next above these "primary formations," are those which Werner called TRANSITION rocks, the period of which is divided into three systems, though that name has recently been discarded. The lowest group is the *cambrian*, into which the mica slates, and gneiss, and slaty gray-wackes are found. Organic remains also occur, which consist chiefly of the lowest forms of animal life, the polypod, with the brachipods, corals, &c. Above these, is the *silurian* period, in which are organic remains of sea-weeds, zoöphytes, trilobites, shells, corals, &c. Recent discoveries, however, have brought to light, from these rocks, the track of a fresh-water turtle, a species of animal (reptile) not found in earlier investigations. This occurred on what is known as the "Potsdam sandstone," which lies at the base of the silurian system. It is not a single specimen, but such remains are very numerous. In 1851, specimens were laid before the Geological Society of London, containing the fossil of a quadruped, which gives strong evidence of having been a fresh-water tortoise. Previous to these discoveries, the trias (which lies above the coal, and to which we have not yet referred) was the lowest formation in which any trace of a chelonian had been discovered, though others have since been found, and are described in the last work of Sir Charles Lyell. These fossils of the higher species, in the older and lower formations, occur both in England and in this country. We allude to this, not as specially important as to the specific object before us, but because it belongs to the subject, and is full of interest to those especially who hold to the doctrine of "progressive development" from the lowest forms of animal life to the highest of all, man. And so far as that theory is concerned, one such example, if well established, is as ruinous as a million. Nor are such examples solitary. A molar tooth of an animal belonging to the order "mammalia" has been found in the stratum of the lias, which is just above the coal formation. Mammalia fossils occur also in the trias of Germany. Birds have been discovered in the lower eocine of England and of Switzerland, and North America. Four species of reptiles have been brought to light from the old red sand-stone of Europe, while remains of fish have been found, "plentifully in the devonian, and sparingly in the silurian strata."

Next occurs the devonian period, in which occurs the old red sand-stone, a conglomerate of various pebbles and fragmentary rocks, and abounding in marine fossils. Various metallic ores also occur. This underlies

THE COAL FORMATION, which consists of carboniferous deposits, and which abounds with vegetable remains, among which those of numerous varieties of the fern are most abundant; and nearly all these vegetable fossils belong to tropical climates; and this fact adds to the probability that the theory above suggested as to the formation of the solid earth is correct. Those regions are now very far from being of tropical temperature. Marine fossils are rarely found in this formation.

The COAL OR CARBONIFEROUS group contains a variety of minerals in connection with the coal, while often and usually even the coal constitutes but a small portion of the whole mass. According to Sir Charles Lyell, the coal strata in the north of England are, by estimation, 3000 feet in thickness, while the veins of coal do not in the aggregate exceed 60 feet. In South Wales, the coal measures are found by actual measurement to be 12,000 feet in thickness. In breadth or horizontal extent, there is nothing like uniformity.

Among the minerals found in connection with coal, are limestone of different varieties, with various marine fossils, and the old red sand-stone, which often underlies it, sand-stones, and shales. Arenacious shale, which is sometimes called fire-clay, or that suited to the manufacture of fire-bricks, is often found underlying the coal. In South Wales, this uniformly lies beneath the coal. As there are certain minerals found in this connection, so there are certain kinds of vegetable fossils, which are usually found among the veins of coal. Among these, as already suggested, ferns are the most numerous, about five hundred different species of them having been described. Some of these species are still living, but most of them are extinct. All these vegetable fossils belong to the grand divisions, acrogens and endogens, though the number of the latter is but small, not a single fossil specimen of an exogenous plant having yet been discovered.

Among the coal-beds, growths of the vegetable kingdom have been discovered in all conceivable states and conditions. Sometimes trees are found in a vertical position, that is, vertical (perpendicular) to the plain of the bed. Sometimes the stump and roots only have been found, while, in other instances, the trunks of trees, &c., are inclined, or in a horizontal position. Indications often leave no doubt that these are found on the spot where they grew, while it is equally obvious, elsewhere, that they were drifted from their native forests and swamps by some mighty force. In South Staffordshire, according to the authority above cited, in about a quarter of an acre, 78 stumps with their roots attached were found, while their trunks were lying prostrate in all directions. Portions of these trunks were converted into coal. The roots of these trees formed a stratum of coal ten inches thick, beneath which was a layer of clay two inches thick, and below this another forest, resting on a seam of coal two feet in thickness. Five feet below this, was a third forest, with large stumps.

Here, then, are evidences of forests submerged, which, by various chemical agencies, and during the lapse of an immense period of time, have changed the composition of their elements, and broken up their regular organisms, so as to become coal.

What agencies overwhelmed these forests, and covered them with drift, may never be demonstrated. But in the Bay of Fundy are witnessed processes which illustrate the possibility if not the probability of changes like those described. There, as is well known, the tides are very high, often more than sixty feet, and to this the rapidity of their currents, of course corresponds. These rapid currents constantly undermine and sweep away the whole face of the cliffs, while new growths of trees are constantly seen, succeeding those which were destroyed; to be, in their turn, overwhelmed and succeeded by others. This condition of things is seen for two or three miles in extent, from north to south, and to much greater distance from east to west, in the banks of the streams which intersect *the coal-fields*. A piece of coal has been found in Germany, near Laubach, on which the annual circles could be counted.

The nature of the change from wood to coal, according to Liebig and other chemists, is as follows: The elements of carbonic acid are disengaged from the wood, and the elements of water unite with it. All varieties of wood-coal contain more hydrogen than wood, and less oxygen than is necessary to form water by uniting with this hydrogen. It is a remarkable fact that in coal regions the springs of water are often impregnated with carbonic acid gas. So also the inflammable gases which stream out of clefts in the strata of mineral coal, always contain carbonic acid. Various analyses and experiments prove that by this continual removal of carbonic acid the wood is gradually changed into mineral coal, while hydrogen being constantly disengaged from mineral coal, in the form of a compound of carbo-hydrogen, until it entirely disappears, the mineral coal is converted into anthracite.

Coal-fields, then, are composed of decayed vegetable growths, and they were formed after that period in the history of the world's formation when it possessed a temperature fitted to sustain vegetable life, and those remains being to a great extent, apparently, of the vegetation of a tropical climate, though far removed from the torrid zone, indicate a very different condition in respect to heat and moisture, from that witnessed in the same regions in our own times.

We have thus at length reached our subject, the coal region. We purpose to give a general description of the several strata above the coal, and thus a more intelligible view of the subject of practical mining may be obtained, including the indications of its presence, &c., with the principal localities which occur in our own country, and other parts of the world.

All the rocks which we have mentioned belong to the PRIMARY FOSSILIFEROUS OR PALEOZOIC, of the most recent classification.

STOCK IMPORTATION IN OHIO.—Dr. A. Watts and Alexander Waddle have gone to Europe, to select stock for the Clark County Company. We also notice a movement in Tuscarawas county for a stock company.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

PROXIMATE ORGANIC ANALYSIS OF THE SEVERAL PARTS OF THE KERNEL OF MAIZE OR INDIAN CORN.

BY JAMES H. SALSBURY, M.D.

Although this examination may be of little practical value, yet, so far as it bears upon the physiology of the kernel, it has many points of interest. That each of the several parts should possess a composition so peculiar to itself is sufficient evidence that each is designed to perform a distinct office. It has formerly been supposed that the oil resided mainly in the corneous part. This, however, is not the case. There is a much larger per centage in the chit than in any other portion of the kernel. This part also is decidedly rich in albumen, while it contains less zein or gluten than the corneous portion.

SMALL WHITE FLINT VARIETY.

	Corneous part.		Farinaceous part.		Chits.	
	With the water.	Calculated with't the wat'r.	With the water.	Calculated with't the wat'r.	With the water.	Calculated with't the water.
Oil,	2.38	2.867	2.85	3.068	28.50	30.256
Zein or gluten,	5.02	6.043	0.55	0.592	2.45	2.601
Starch,	43.96	52.539	54.65	58.827	11.80	12.527
Sugar and extract,	16.96	20.292	21.50	23.043	17.70	18.790
Dextrine or gum,	8.56	10.242	3.80	4.090	8.00	8.493
Fibre,	4.74	5.671	4.50	4.845	7.05	7.433
Matter distilled out of fibre by potash,	0.62	0.742	3.05	3.283	1.00	1.061
Albumen,	1.26	1.508	1.60	1.722	16.40	17.409
Casein,	0.08	0.096	0.40	0.430	1.30	1.380
	83.58	100.	92.90	100.	94.20	100.
Water,	16.394		8.32		6.56	
	99.974		101.22		100.76	

CHITS OF THE SMALL WHITE FLINT AND RHODE-ISLAND CAP VARIETIES.

	Chits of the early Can'da white.	Chits of the small white flint variety.		Chits of the Rhode-Island cap variety.	
	Calculations without the water.	With the water.	Calculations without the water.	With the water.	Cal'l'tions without the water.
Oil,	29.333	25.320	26.724	27.530	29.882
Zein or gluten,	1.500	2.150	2.269		
Sugar,	6.400	14.666	15.473	14.667	15.920
Sugar and extract,	11.600				
Dextrine,	9.000	8.933	9.425	8.933	9.696
Starch,	9,733	10.578	11.161	11.100	12.049
Fibre,	10.200	11.133	11.746	11.133	12.084
Matter separated from fibre by a weak sol. of potash,		2.433	2.559		
Albumen,	19.634	17.235	18.184	16.433	17.837
Casein,	2.600	2.333	2.461	2.333	2.532
	100.	94.781	100.	92.129	100.
Water,		5.410		8.015	
		100.191		100.144	

The analysis of this and the preceding table afford some results, which, if not valuable in an economical light, are at least very interesting, so far as they bear upon the composition of the several parts of the kernel. The embryo or chit is the essential part of the seed. Indeed, it is to the forming, maturing, and protecting of this that the main efforts of the plants are directed, and the rest of the seed is subservient.

When matured, the whole plant seems to have accomplished the end in view; and if an annual, it soon decays, or if not, after a short period of partial repose, its efforts are again directed to the forming and maturing of another set of embryos.

In maize, the farinaceous and corneous portions of the kernel seem to be designed merely for the purpose of protecting the embryo, and for furnishing to it nourishment in the early stages of its vital action.

The chit or embryo is decidedly the richest part of the seed. It is literally the store-house in which are collected a large portion of the most nutritive bodies of the kernel. They seem to be stored here for immediate use in nourishing the plumule and radical during their early stages of development.

In composition, the chit differs materially from the rest of the kernel, in containing a very large per centage of oil and albumen, and a small per centage of starch. In the analysis of the chits given, the oil amounts from 26 to 30 per cent., and the albumen to from 17 to 20 per cent. of the dry matter, while the starch ranges from about 10 to 12½ per cent. In the corneous part, the oil does not exceed 3 per cent., and the albumen 1½ per cent., while the starch amounts to about 52½ per cent. A farinaceous portion affords a little over 3 per cent. of oil, and a little less than 2 per cent. of albumen, while it gives of starch nearly 59 per cent. The zein exists more largely in the corneous portions than in any other part, and the dextrine and gum more largely in the corneous part and chit than in the rest of the kernel.

It is well known that the mouse and squirrel prefer the chit to the rest of the kernel. It is generally supposed they choose it on account of its softness. These analyses show, however, that their tastes have taught them to prefer it for another reason.

The fact is, they have preceded us in a discovery of its superior richness, and up to this day have kept their own counsel, and refrained from divulging this secret to their less (in the field) discriminating neighbors.

The very large per centage of oil in the chit may have something to do in guarding this part under some circumstances from becoming hard and shrivelled, and under others, from absorbing a sufficient amount of water to favor germination. In this way, it may give to seeds their power of retaining vitality for so great a length of time. Seeds of maize have been known to germinate when thirty years old, and would probably retain their vitality much longer when placed in circumstances which would neither cause them to germinate nor decay.

Oil-Cups.—An improvement in self-acting oil-cups for steam-engines, is said to have been made by David Clark, of Philadelphia, who has taken measures to secure a patent. The oil-cup has an opening at its bottom, in which a conical double steam-valve works, which is opened by the steam to allow a certain quantity of oil to be fed in at regular intervals, by the letting on and shutting off of steam.

FLAX.—ITS CULTURE, &c.

Flax, as an economical crop, is worthy of and is receiving increased attention. It has been often cultivated for the seed alone; but recent improvements in machinery give additional facilities for the preparation of the fibre for the market. The seed is used for the manufacture of oil, and for medicinal purposes. An acre of the plant produces from 18 to 20 bushels.

The chaff of flax is also of value, and the refuse of the seed, after its oil is extracted, is sold as oil-cake. As fattening food for cattle, and for increasing the milk of cows, no kind of food, perhaps, has stronger claims to our attention.

Since the manufacture of flax-cotton has been introduced, a new impetus has been given to the growth of this crop, and when our farmers are better instructed as to its culture and manufacture, the amount grown will be greatly increased.

In Great Britain, linen manufactures are carried on to a very great extent. According to the statement of Mr. Wilson, the President of the Royal College of Agriculture, in Chichester, the annual import into England of dressed fibre, during the last ten years, was 70,000 tons, and for 1851, was 124,784 tons, worth twenty-five millions of dollars, and the import of linseed for crushing was 650,000 quarters, and of oil-cakes, 75,000 tons, worth *ten* millions more—making thirty-five millions of dollars per annum, which goes chiefly to Russia and the northern ports, and which could be supplied by the United States.

There were employed in spinning flax in 1851, in

	Spindles.		Spindles.
England,	265,658	Russia,	50,000
Scotland,	303,125	Austria,	30,000
Ireland,	500,000	Zollverein States,	80,000
France,	350,000	Switzerland,	10,000
Belgium,	100,000	U. S. America,	15,000
Holland,	6,000		

And the capital thus invested may be estimated at 40 millions of dollars, of which 25 millions belong to Great Britain. Spinning is carried on on the Continent, to so great an extent that the yarn thus produced is much more than is spun on all these spindles.

It further appears, from the same authority, that the manufacture of linen in England has increased from 45,000,000 yards in 1805 to 110,000,000 yards in 1850, and that her aggregate *export* of yarns, thread, small wares, and woven goods in 1852, was $26,684,355, of which near three fifths were consumed in the United States.

The culture of flax in Ireland, in 1848, was 53,868 acres, and has gradually increased, until in 1853 it was 175,469 acres. Under favorable circumstances, we may expect an average crop to produce from 30 to 40 cwt. of straw, and 16 bushels of seed per acre.

Experiments were made by Doctor Hodges, for the purpose of ascertaining the relative proportions of the produce of flax, and the distribution of the inorganic matter in them. The flax employed had been steeped in the ordinary way, and was found to contain 1.73 of ash. Of this air-dried straw 4000 lbs. weight were taken, which produced of dried fibre 500 lbs.; of fine tow, 132 lbs.; of coarse tow, 192 lbs.; of fibre in all, 824 lbs. These products contained in the dressed flax, 4.48 of ash; in the fine tow, 2.08 of ash;

in the coarse tow, 2.56 of ash; or in the whole fibre 9.12 lbs. of inorganic matter; so that of 59.08 lbs. which the crop had withdrawn from the soil, remained the useless portions, while only 9.12 lbs. were carried off in the dressed fibre. So if we compare these results with those obtained from the analysis of an acre of wheat, for instance, we shall see that while the flax fibre takes away with it 9.12 lbs. of inorganic matter, the wheat crop, grain and straw together, abstracts about 365 lbs. from the soil.

By the census of 1850, it appears that there are grown in this country, 13,391,415 lbs. of flax, and that from this is obtained 562,810 bushels of flax-seed. New-York, Kentucky, and Pennsylvania cultivate flax more extensively than any other States, while Ohio exceeds every other State in the quantity of *flax-seed.* Whether this difference is true, or only founded on truth, we are not certain, although, as already suggested, the plant is cultivated in many places exclusively for the seed.

At the rates mentioned above, the value of this crop would be as follows:

13,391,415 lbs. flax, - - -	$2,008,712.25
562,810 bushels seed, - - -	703,512.00

The various experiments that have been made, the results of which have been given to the public, ought to induce careful attention to this subject. With good and land tolerable cultivation, we cannot doubt that the crop would prove highly profitable. We select the following from those that have been published. The first is from the New-York Agricultural Transactions, and was furnished by Mr. W. Newcomb.

Weight per acre - - -	3848 lbs.	
" threshed straw, - -	2664 "	
" dew-rotted, - -	2009 "	
' dressed lint, - - -	348 " at 10 cts - -	$34.80
Clean seed, - - - -	13 bush. 1 pt. - -	16.27
Yellow, - - - - - -	1 1-4 bush. - -	78
		$51.85

In 1849 he had one acre yield 548 lbs. of flax lint. He says, the average yield of seed is eight bushels per acre, and that the average yield of flax is 250 lbs.

In the Norwich (Eng.) *Mercury*, the following results are given, as the cost of cultivation and the value of the crop, the seed not being included:

Expenses and profits of one acre of flax.	£	s.	d.
Two winter ploughings, - - - - - - - -		12	0
Spring harrowing, ploughing, sowing, and bushing, -		11	0
One thousand gallons liquid manure, - - - - -		15	0
Three bushels of seed, - - - - - - - -	1	0	0
Weeding and pulling crop, - - - - - - - -	1	2	0
Steeping, drying, re-tying, &c., - - - - -	1	0	0
Scutching 54 stone of flax, 3s. per ton, - - - - -	8	2	0
Expenses, - - - - - - - - -	£13	2	0
Value of crop			
54 tons of flax, sold at 9s per stone, - - - - -	24	6	0
Realized profit, - - - - - - - -	£11	4	0

Samuel Druce, a distinguished agriculturist of England, read before the Royal Agricultural Society, the following:

Cultivated, 1851, 5 acres, 2 roods, 35 perches.

Sales of produce.	£	s.	d.
Sale of flax-seed 116 3-4 bushels, at 8s, - - - - -	46	10	0
Sale of flax-straw, 12 tons 2 cwt 2 qrs. not prepared, which would have been far more profitable, but sold on gross at £3 per ton, - - - - - - - - -	36	7	0
Sale of chaff at 5s. per acre - - - - - - -	1	8	7
Gross return of seed and straw, - - - -	£84	6	7

Expenses of Cultivation.	£	s.	d.
One plowing, 10s. per acre, - - - - - - -	2	17	3
Sowing and harrowing 1s 6d, - - - - - - - -		8	7
Weeding at 2s. per acre, - - - - - - - -		11	5
Flax-seed 13 1-4 bushels at 9s., - - - - - -	6	1	6
Rent of land 48s. per acre, - - - - - - -	13	14	9
Taxes at 6s. per acre, - - - - - - - - -	1	14	4
Pulling flax at 14s. per acre, - - - - - - -	4	0	1
Carting and staking at 4s., - - - - - -	1	2	10
Threshing, - - - - - - - -	5	7	1
Winnowing, - - - - - - - -		12	6
	£36	10	4
Net profit, - - - - - - - -	£47	15	9

This instance is related by Mr. Deman (p. 48) in his excellent treatise on Flax Cultivation. It will perhaps only be necessary to quote one more table from Dickson's book, p. 12.

Produce.	£	s.	d.	£	s.	d.
40 stone flax at 10s, - - - - - - - - -				20	0	0
Seed for feeding cattle, - - - - - - -				4	10	0
				£24	10	0
Gross returns of one acre.	£	s.	d.			
Rent and charges, - - - - -	7	11	6			
2 1-2 bushels of seed, - - - -	1	10	3			
Tillage, - - - - - - - -	1	5	0			
Weeding, - - - - - -		12	0			
Pulling, watering and grassing, - -	1	16	0			
Expense of sowing seed, - -		10	0			
Scutching 40 stones, - - - -	2	0	0	9	4	9
Net profit per acre, - - - - - -				£15	5	3

Mr. Wilson estimates the product per acre, at from 30 to 40 cwt. of straw, and 16 bushels of seed. If we take this estimate, with the cost of production as he calculates it, the result will be as follows:

16 bush. seed at 1.25, - - - - - - - -	$20
500 lbs flax fibre at .15, - - - - - - - -	75
130 lbs. fine tow at .10, - - - - - - - -	13.
200 lbs. coarse tow at .4, - - - - - - - -	8
Produce per acre, - - - - - - - -	$116

The cost of preparing the fine fibre, by Watt's process, is estimated at $50 per ton. One laborer can cultivate 20 acres of flax.

MINNESOTA.

We give below, the substance of an interesting, letter from O. H. Kelley, Esq., Secretary of Benton County Agricultural Society, to the Secretary of the New-York State Agricultural Society. The statements made are interesting to all farmers, and especially so to the farmers of the West, presenting the very details we desire to know of that extensive region.

Northwood, Minnesota, July 19, 1853.

In giving you information regarding crops, and our mode of culture here, you must bear in mind that our farms are all new; that is, it is not more than four years since our largest and best farms were comprised in the vast prairies of our Territory. The sod, older, probably, than Methusalah, at any rate as hard and tough, generally, as if it had been trodden down by innumerable herds of buffalo, for centuries. This has to be turned over by means of large breaking plows, of a medium size; 17 inch, drawn by three yoke of cattle, I prefer, where there are not many grubs; a 24 inch, with five yoke, is better where grubs are plenty. Our "grubs" are mostly the roots of oaks, the tops of which have been burnt off by prairie fires, year after year, leaving only annual shoots above the soil, while the roots are frequently from four to ten inches in diameter, and often spreading near the surface so as to cover three feet in diameter. These require a heavy plough and team to cut them off without checking the progress: and speaking of this, there seems to be a diversity of opinion as to the best season for breaking, and the manner of leaving the land. Many contend that the sod will rot better where it is "cut and covered," and left uneven, so that the air may get under; others prefer that the plough turn only what it cuts, and leave the sod flat. From my own experience and observation, I must say I favor the latter method, and have the sod at least 3½ or 4 inches in thickness, or plough to that depth. As to the former, it is always advocated by those who own breaking teams, and who break by the acre; prices ranging from $3.50 to $6, therefore, the more ground they go *over* (they don't go *through* more thant wo-thirds) with the plough, the more they make. By the sod being laid flat, there is a good chance of sowing a crop of grain the first year; and if some of the under soil is turned with it, it is easily harrowed without tearing the sod up, and also furnishes a chance for the sod to sprout, and can better then push down its roots through the matted roots of the sod; otherwise, when the sod is "skinned," there is no soil to cover the seed with, and consequently no chance to plant until the sod rots; and if broken the last of May, or first of June, the grass will sprout up nearly as well as if it had not been turned at all.

The best time to "break prairie" is another question. I always break in June, as near the first as possible, and prefer to sow with oats, at the rate of three and a half bushels per acre. This crop grows rapidly, and shades the ground, answering for mulching; harrow twice before sowing, and once after; this loosens the soil, and allows the rain to soak in, and consequently to rot the sod; leave the stubble on the field, and cross-plough the following spring. This prevents the weeds from getting ahead of the crop the second year, and the sod is generally sufficiently rotted to be quite mellow the second year. The crop, the first year, if a fair season, is from 10 to 20 bushels of oats per acre, (call it 15,) at 50 cents per bushel, our lowest market price, in this country; this pays all expenses of breaking, seed, and harvesting, &c.

The second year, follow with corn or potatoes, any crop that will require the free use of the hoe, so as to cut up all clumps of sod, and pulverize the soil. This year I harrowed all my ground as soon as ploughed, twice, and a part of it four times, as some of it was not cross-ploughed until two years after it was broken. I think myself a gainer by so doing—I mean harrowing, for I certainly raised a third as much weeds last year as I did grain, on the piece not cross-ploughed, and that was of course a loss.

Some say they prefer to break in July or August; but, as a general thing, they would break in June, *if* they could, for the grass is always high enough then to allow of turning under a good sward, whereas, if left till later it is too high to cover. As to breaking later in the season, I have seen the experiment tried; about twenty acres were broken in September and October, and as much more in the spring of the next year—all sowed with oats; the spring crop did well, and sold for six bits per bushel, (75 cents,) whereas the fall-ploughing produced a crop that was so feeble they were left standing, and were eaten by the black-birds, which, by the way, are plenty here, and are *exceedingly* fond of corn.

There is no necessity of manuring the soil here until the sod is demolished, though the third year I found that compost did not do any *harm* to the crop; and this year, (my fourth,) I find that manure does good service in the corn where it is very sandy.

I have mentioned our method of getting our farms under way, that you may compare them with the old farms in the East; but I assure you I had much rather cultivate *ten* acres on this farm than *one* on any farm I ever visited in the East, for this reason; now that the soil is in good working condition, it is, in comparison, like hoeing or shovelling in clear sand; and as to rocks or stones, there is but one stone larger than a hen's egg on thirty-five acres of ground now under cultivation, and there are a hundred and fifty more acres just like it on the farm; that stone will be out of sight in a few days.

The soil is a sandy loam; on the bottoms, and also where there is a good growth of oaks and hazels, the soil is almost jet black, with much less sand than on the open prairie. In some parts of the Territory there is clay, producing excellent crops; in other parts (though, if I recollect correctly, they are found in the same vicinity,) rock in ledges of limestone and trap-rock of granite, in considerable quantity; but within a circuit of twelve miles, in my vicinity, there is no ledge of any kind yet discovered, and we have to resort to the river, at low water, where we can obtain stone or loose rock, of all shapes and variety, for cellar walls. The soil stands a drought exceedingly well; we had a fair trial in that line last year, and yet it seems almost impossible, with a subsoil of red sand lying upon gravel. Our dews are very heavy, coming on about sunset, and in such copious quantity that the grass, and every thing out of doors, appears as if drenched with rain; about ten o'clock in the forenoon the grass is dry. Our seasons are peculiar; cool nights and mornings commence the latter part of August; generally about the twenty-eighth of September we have the first frost, and often there is no second frost for ten days after. October is generally a delightful month here. In November the air gets cool; and we are ready for winter by the middle of the month. Ice runs in the river; generally a flurry or two of snow. About the tenth of December the Mississippi closes, and this is a season of interest to all on the river, for it is from the islands, and the opposite shore, we procure our fuel and timber; and there is a noble beauty and grandeur in the closing of this river, which is equalled only by its breaking up in the spring, and it must be seen to realize it; my pen is too feeble an instrument to describe the wild freaks of this mighty river. Snow falling in November frequently stays on the ground until the January thaw, which commences about the middle of the month, and we have very pleasant weather for a couple of weeks, and perhaps it will thaw at noon of each day. I have seen the snow nearly disappear, one year, in January. In February we have our coldest weather—the mercury going into ecstasies; ranging, during last February, at sunrise, from thirty-four degrees above zero, to thirty-two degrees below. In March, about the first to tenth, we finish crossing the river on the ice; and from the tenth of March to the fifteenth of April, the ice starts, and in three or four days after, a week at furthest, the river is again clear for navigation. During the winter and spring months, the farm-work here is the same as with you in the East; sugar-making in March, and cutting up firewood for summer; ploughing, and building and repairing fences and tools for spring work, in April. We begin to plant and sow in May, beginning with wheat, oats, and peas; then corn, about the 15th, and so on, finishing, if possible, with ruta bagas, the 1st day of June. We then have a week or ten days for "fancy-work," before hoeing, which we contrive to complete by the great and glorious Fourth of July, a day, by the way, which we Yankees, even here, on the outskirts of creation, think as much of as our kindred do in the Eastern States. On this day, we have the first green peas, plenty of strawberries, (wild ones are very plenty and very large, of delicious flavor.) About the middle of July, we commence haying, at present resorting to the sloughs and bottom-lands, where the wild grasses are more luxuriant; tame grass not having yet been introduced, to any extent. Of the grasses native to our latitude, I must speak hereafter. The grain harvest usually commences about the last of July, or first of August. This completed, we are reminded of the near approach of autumn, and the end of the season soon arrives, with the reward for our labors, oftentimes ten fold what we deserve, for I hardly think there is any part of the country where labor is more plentifully repaid by good crops, than Minnesota.

I have gone somewhat more into minuteness than I intended, but it is to enable you to compare the seasons with those of New-York.

In the summer season the weather is very warm, and if it were not for the fine breezes we almost daily enjoy, the heat would be too oppressive for outdoor work—commencing the latter part of May—and until the last of August, our growing season, the mercury, at 12 o'clock M., very often is at ninety degrees above zero, in the shade; and frequently, for curiosity, I have placed the thermometer in the sun, from four to ten minutes, and seen it rise rapidly to 130 degrees. And yet, with all this severe heat and cold, we are healthy and vigorous, with appetites that would astonish the servants at the "Astor House," or "St. Nicholas." I sometimes think it is fortunate that our crops are plentiful, or else we should come short before a harvest.

New Telegraph-Machine.—An attorney at Rising Sun, Indiana, by the name of Hayden, has invented a very simple machine, by which any child who knows his A B C's, can send dispatches with perfect accuracy. There is no possible chance of a mistake being made, which is so much desired in this important science. Steps have been taken to secure a patent, and the machine must necessarily come into immediate use. It will lessen the expense of telegraphing 50 per cent.—*Exch.*

BREADSTUFFS.—PRODUCTION, EXPORTS, AND PRICE.

The subject discussed in the following paragraphs is exceedingly important, and the opinions advanced are worthy of careful attention. They are taken from the *Railroad Record*, published at Cincinnati.

There has been in the last year a decided failure in the grain crops of Europe, except in Russia and Poland; so much so, that in France and Italy all custom duties have been taken off for the importation of grain, and in England the price has risen since last June from twenty-two shillings to forty shillings per quarter, or nearly double.

From the beginning, we have regarded this as the most serious difficulty in the way of relief to the money pressure. There is double the amount required to manage the transfers of grain, which makes a difference in Europe and America of *one hundred millions of dollars in the demand for money.* But this is not all. The price of all other food rises with the price of bread, and alternately it requires a vast deal more money to carry on public works. These facts will suggest to our readers the difficulty caused by the rise in the price of grain.

In this country we are undoubtedly gaining, to the extent of our bread export, in the increased price and quality. We share, however, in the financial difficulties which that deficiency in foreign crops occasions.

But how much of breadstuffs have we to export? One thing is certain, that in regard to wheat, we have not near so much as many sanguine persons believe. We *can* raise wheat almost indefinitely, but we do not, because there has been a very moderate foreign demand, and a very moderate price.

In the *Record*, (No. 36,) November 3d, we said:

"In regard to the amount of wheat *actually* raised in the United States, there is a mistaken idea. We do not (according to the English allowance per individual) raise any surplus whatever! But, by the great consumption of Indian corn, as a breadstuff, we make a surplus of wheat; and it is in that way only. The past two or three years being good wheat years, we have an old stock lying over; but we cannot after all export to any such extent as England and France need. They get their largest supplies from the Black Sea. If we export twenty millions of grain this winter, the spring price in our markets will be unusually high."

The truth of this is now seen at New-York and New-Orleans, where grain and flour have not come forward with anything like the freedom expected. In the face of this fact, the *exports are larger than they have ever been.* The consequence of this is obvious. The price is steadily rising, and in all probability will continue to rise. The crop of wheat in Ohio, in 1853, was probably equal to those of 1851–2, but by no means equal to that of 1850 when it rose to the enormous amount of *thirty-five millions of bushels.* Probably our crop in 1853 was 25,000,000, and of that, (by eating some Indian corn,) we can manage to spare *fifteen millions.* But all the United States cannot spare as much more.

Let us now look at former exports of grain from the United States. Reducing wheat to flour, we give the export of flour and grain for the last eight years, in quantity and value:

	Amount.	Value.
In 1846, bbls.,	2,612,176	$13,350,644
" 1847, "	5,482,000	32,183,166
" 1848, "	2,589,393	15,788,568
" 1849, "	2,413,873	13,036,030
" 1850, "	1,511,178	7,762,193
" 1851, "	2,437,635	11,550,067
" 1852, "	3,337,239	14,424,352

It will be seen from this statement that the highest amount of wheat exported in any one year (1846–7) was 27,410,000 bushels, and the price was not as high then as it is now. In 1846–7, we exported 612,000 barrels of flour to France, but we have now exported nearly that amount to France since the 1st of September.

In our last number, we stated that the exports of flour and grain from the United States, since the 1st of September, were greater than they were in 1846–7, but the price is also much higher. The advance of price proves clearly enough that although in consequence of the heavy European demand, the exports from New-York have been hurried with great rapidity, yet, in fact, the *domestic supply is not equal to that demand.* The result is, that the export cannot be continued largely, except under the temptation of *very high prices.* In that case, a large part of our population will resort to Indian corn, and export the wheat. But how is that to be done, when the price of Indian corn is also rising rapidly? We need not inform our readers (who well enough know it) that potatoes are *treble* in price to what they were a few years since.

There is an idea that an immense amount of wheat is brought from Michigan, Wisconsin, &c. This is all fallacious. The whole amount of flour and wheat brought into Milwaukee from the interior, in 1853, by the Mississippi railroad, was 187,000 barrels, a mere drop in the bucket. Of all the flour and wheat cleared by the canal at Buffalo, *three fourths came from Ohio.* The population of the frontier States grows faster than their grain production. New-England and the South are importers of grain from the new States. There are but four or five States that are really exporters of wheat.

If in 1846–7 we could export only 27,000,000 bushels of wheat, it may be put down, as quite certain, we shall not export more than 30,000,000 in 1853–4, unless the price is enormously high.

From the facts we have here exhibited, it appears that the *bread question* is one of momentous interest. We pretend to no knowledge, hardly an opinion, as to the continuance of scarcity, or the rate of prices; but it is quite certain that our remark of November 3d is strictly true, that "if we export 20,000,000 bushels this winter, the price will be unusually high." It is already so, and we have only reached the 20th of January.

We would in no way aid speculation in grain, but facts are things which should be known and reflected upon.

A PROFITABLE FARM.—The farm of Bryan Jackson, near Wilmington, Delaware, consists of 220 acres. On this farm he employs three hands all the year, at $132 per annum, each; two men extra for six months, at $12 per month, and day-hands, whose wages amount to about $50 a year; making in all, for labor, a cost of $590 a year. Mr. Jackson, in the *American Farmer*, says: "The sales of the farm the past year will not vary much from fifty-three hundred dollars."

USEFUL FOR FARMERS.

We find the plan of a cheap green-house in a recent number of the *Country Gentleman*, which is worthy of attention. Though we cannot illustrate with diagrams, it is quite intelligible without them.

A Cheap Green-house.—For those who are fond of flowers, there is nothing more interesting than their culture during the dreary months of winter. A few kinds will flourish well in the dry, hot, and changeable air of ordinary stove-rooms; but it is not always convenient nor practicable to occupy the limited space of living-rooms in this way, and most plants will not succeed so well here as in a cooler and more uniform temperature. An ordinary green-house is a somewhat costly structure; and regulating the fire during a whole winter is quite a formidable task. For green-house plants, properly so called, or those which do best in an air but few degrees above freezing, we have lately adopted a plan which we find to succeed admirably with but little care, and without the cost or attention of fire-heat. Although this plan is not altogether new, we believe a description will be useful and acceptable to many of our readers.

It consists of an extension made to an ordinary cellar, on the south side, and covered with a sash like that of a common green-house.

In order to obviate the necessity of fire-heat, it is requisite that so large a surface of sash should be double-glazed. The bars are made on *both* edges in the same form that ordinary sash is made on the glass side for the reception of the panes. We have had cross-bars made between these sash-bars, like ordinary window-sash, so that the lower panes are set in as in common windows, the upper or lapping-panes merely resting on these cross-bars. This arrangement makes the windows rather more secure from the passage of air, but it is not absolutely necessary.

This structure being attached to an office where a fire above the cellar is not regularly kept up, sometimes needs a very small fire in a stove when the thermometer sinks to zero; but if connected with a dwelling constantly occupied, no artificial heat would be ever needed.

We find also in the same paper the following account of an experiment in the culture of peas, which meets our views:

Plaster for Peas.—At the request of some of my friends, I send you the result of an experiment I made last season in the use of plaster.

I have used plaster for fifteen years, on all sorts of grain, potatoes, &c., upon all the kinds of soil I possess. But thinking that I derived no benefit from its use on grains, for the last ten years I have only applied it to grass and peas.

I belong to an agricultural society, as every farmer should do, and of course intend my crops for premiums. When the committee examined them, I called their attention to the difference in the different ridges of my pea-crop, the parts where plaster was sown, exhibiting a dark-green and thrifty appearance, while those ridges without plaster were pale and unthrifty. In harvesting, I cut two ridges of equal size, one plastered, the other not—and threshed them separately. The one plastered yielded one bushel and eighteen quarts, while the unplastered one produced two quarts less than a bushel.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

GRUBS IN PEACH TREES.—SHORTENING IN.

It has become a fact pretty well established, that soil and climate adapted to the growth of the peach are to be found, in greater or less extent, in nearly every portion of the country. This is seen in the exhibitions of beautiful peaches so often witnessed in our cold New-England, hitherto celebrated mostly for its productions of ice, rocks, and men. Scarcely an agricultural or horticultural fair was held last autumn in which this fruit did not claim a conspicuous position, and attract the admiration and wonder of the spectators. Many, from what they saw at these convocations, will undoubtedly be induced to try their fortunes in the business, and we sincerely hope it will be with satisfactory results, for we would gladly see so delicious and healthful a fruit placed abundantly within the reach of every body.

We have alluded to the success attending the peach culture, (which, we admit, is now carried on in a very small, yet promising way,) in New-England, supposing that if it succeeded in these States, its success must be nearly certain in every State of the Union.

Yet, as sure indications as the peach may have given of its adaptedness to a wide range of territory, there are obstacles to be contended with in order to insure for it satisfactory results. Among these, the grub, so perpetual in its annoyance, and so fatal in its operations, furnishes one of the least formidable. So far as our observation has extended, it slyly secretes itself in the earth until age and strength have armed it to the teeth for mischief, when it insinuates its way into the tree, under the darkness and *cover* of earth, where it noiselessly works on in its mission of destruction, until its errand is complete.

Different methods have been pursued to cut off the march of this desolator of beautiful verdure and heart-gladdening fruits, each productive of different results. Among the many which have been brought to our notice, none has higher claims for simplicity and facility of application than one casually mentioned a day or two since. It was, simply to take a woollen rag, of sufficient size, and wind it around the collar of the tree, not too tight, of course, when setting out. The rag should be of sufficient size to extend quite up to the surface, and the lower it extends over the roots the better. If, in a course of years, it wastes away, as it naturally must, a new one is easily replaced by removing the earth. We have been credibly informed that, when at any time the earth is displaced, and the rag removed, the bark exhibits a soundness and freshness nowhere to be found but in vigorous and healthful trees.

Since we are upon the subject of peach trees, we may as well suggest a hint upon our favorite and successful process of shortening in. It is well known that the tree is a native of warm climates. Consequently, it pushes its growth to the full extent of our short seasons, leaving the later growth wholly immature and unable to withstand the mildest severity of winter. Of course, the extremity of the branches is almost uniformly winter-killed. We only attest to the experience of others, when we say that we have found a fully remunerating benefit in shortening in the branches, a process that may be safely performed at any time previous to the commencement of the flow of sap in spring. We thin and shorten in every twig, until we are sure it is reduced so much that none but healthy wood remains. In this way the sap goes to work in healthful and vigorous vessels, and no impediment remains to its free circulation and rapid appropriation to the nourishment of new branches and the fruit. Yours, truly,

Elmwood, Feb. 16, 1854. William Bacon.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

THE FARM-HOUSE.—No. II.

THE reader will perceive that I use the term "Farm-house" in a very comprehensive sense, as embracing most of the movables and fixtures, the internal and external conditions of the "farmer's home."

STOCK should not be permitted to roam at large during the winter season. At the far South, cattle, sheep and hogs, are expected to get their living by grazing, even in the dead of winter. Not so in the Middle, Western, and Northern States, and the Canadas. From three to six months they must have most of their living from the barn or the crib.

A good farmer will provide a comfortable shelter for his stock. He will be urged to this by feelings of humanity, as well as by a regard to economy. Exposed to the storms and the rude blasts of winter, animals require much more food to sustain life, and cannot be kept in good condition.

I am led to this suggestion by seeing in this region, (York County, Maine,) the stock of many a farmer, during this inclement season, permitted to roam at large over the whole farm. Their paths may be seen leading to a neighboring brook or spring, to the dwelling-house, and to every place where shelter or food may be obtained.

Now, who would apply the epithet "thrifty" to the keeper of such an establishment?

The secret of thrift in farming consists in husbanding one's resources, in turning to account *all* the products of the farm. Manure is the farmer's stock in trade. Without it he can do nothing, especially on partially exhausted soil. And I am far from believing that the best use the Western farmer can make of manure, is to dump it into the nearest stream or quagmire. Admit that the virgin-soil does produce in abundance without the application of manures, it by no means follows that it will *continue* to do so. The growth of vegetables is an exhausting process, and the cultivator should adopt as a rule to return to the soil as much as he takes from it.

But to return from this stroll. Farm-stock should be *yarded.* A plot of ground, surrounded with a substantial fence, should be devoted exclusively to this purpose. It should have a southern exposure, and be protected on the north and west. Without this inclosure should be a trough, or cistern, in which should be kept constantly a supply of pure, fresh water. To keep stock in good condition, water is as essential as hay or grain. If compelled to wade a long distance in the snow for water, they will suffer from thirst before undertaking it.

If a portion of the yard is sheltered by a roof, the watering-trough should not be there. If so, the strong ones, having slaked their thirst, will remain, and prevent the weak and timid from approaching.

In this arrangement, one object to be gained is the comfort and consequent thrift of the stock. Another, and not less important, estimated in dollars and cents, is the making and saving of manure.

Most farmers know something of the value of animal-excrement as a manure, yet very few know how to save and make the most of it.

The surface should be covered with loam or muck. The liquid manures are no less valuable than the solid. By spreading some absorbent over the surface, these may be saved. This should, from time to time, be covered with straw, stalks, or refuse hay; thus making a comfortable bed for the stock, and preparing a supply of valuable compost. A quantity of ashes may occasionally be spread over the yard. Indeed I know of no better mode of applying ashes and gypsum, than to spread them in the barn-yard, the pig-sty, and the horse-stable. They are thus made to pay a double debt; to fix and retain the ammoniacal and other gases, and to impart their own virtues to the soil.

In the town of Deerfield, Franklin County, Mass., celebrated for its productive farms and its fat cattle, a farmer was called upon by a citizen of a neighboring town, for the same purpose that Joseph's brethren went down into Egypt. In going to the corn-barn, they were obliged to pass through the farm-yard, which, from excess of manure, was hardly passable. Says the buyer, "Were I as well able as you, I would have a more decent barnyard than this." "Had you *such* a yard," replied the seller, "you would be saved the necessity of coming to me to buy corn."

Apple-Trees.—Every farmer should have a liberal supply of this valuable fruit. In the Middle, and Northern States, and the Canadas, the apple is of more value than all other fruits that are produced. Others are valuable as luxuries, but the apple is prominent among the *necessaries* of life. Who that has land would be without apples? Yet there are multitudes of such among those who style themselves farmers. All admit the value of the fruit, and that it is easily produced, yet very few set about its production systematically. The old man will not plant trees because he *may* not live to pick the fruit. Ask him why he lays up money, or adds acre to acre; he will tell you 'tis for his children. Why not, for the same laudable purpose, plant an orchard, which is far less liable to be misused or squandered?

The young man contents himself to walk in the steps of his sire, thinking to expend his time and money upon that which promises a speedier return.

But I know of no investment that promises the farmer a richer or surer return. Let the land be sold in one year after the trees are planted, and he is sure of receiving double or quadruple the cost of the trees; for those who would never plant a tree, will readily pay the additional cost of a farm upon which they are growing. Good apples in variety and abundance are essential to the health and comfort of every family, and if more are raised than are needed, they will always find a ready sale.

In selecting and setting the trees, many things are to be observed.

1st. *Varieties.* If designed for the market, inquire what varieties are best adapted to the climate and soil, and what will command the most ready sale. But if for family use, consult the wants of the family. No farmer should be satisfied without having green apples three hundred and sixty-five days in the year. To accomplish this, he must make a proper selection of varieties. Commencing with the Sweet-bow and June-eating, he should have apples ripening all the time, till compelled by hard frosts to pick his Rhode-Island greenings and Roxbury russets.

2d. *Selection and treatment of trees.* Select healthy trees *from the nursery.* To purchase at auction, or of travelling tree-pedlers, stunted shrubs, because a few cents may be saved thereby, is being penny wise and pound foolish.

Never take a sprout or offshoot from an old tree, thinking to make a thrifty tree of it; you will but lose your labor, and expose your folly. You might almost as well attempt to make a *man* of one of those offshoots from humanity's stock, ycleped dandies.

When properly planted, they must be cared for—pruned, dug around, and manured. You may as well expect corn to grow without cultivation as an apple-tree, that is a *civilized* apple-tree. The crab-apple will grow with the forest-tree, but cultivated fruit must be nurtured, or it will degenerate into the wildness of the primitive or medieval state, just as the refinements and virtues of civilized society, without due culture, gradually lapse into barbarism. Keep the earth loose about the roots while the tree is young; spread hay, straw, or stones, underneath; remove moss and other excrescences from the bark; once, or more, each season, wash thoroughly with weak lye or strong soap-suds; remove, not with a cross-cut-saw, or a meat-axe, but with a sharp pruning-knife, all suckers and all branches which interlace, or come in contact with others.

If but little ground, different varieties may be made to grow upon the same tree by budding or grafting. Furthermore, by taking the blossoms from a part of the tree when young, you may be sure of fruit every season. I have a full-grown Baldwin tree, the halves of which bear regularly alternate years.

The best manure for apple-trees is a compost of muck, lime, wood-ashes, and decayed leaves.

Let these simple suggestions be noted and put in practice, and kept in practice, and there will be no lack of good apples. R. B. H.

SUMMER-FALLOWING GOT RID OF.—TREATMENT OF CORN.

A WRITER in the *Michigan Farmer* thus gives his account of his treatment of his land, for corn and potatoes:

The twenty-five-acre clover-lot that I had designed to summer-fallow, I broke up for corn and potatoes, and planted twenty-two acres of it with corn, and three with potatoes; rolled the ground well; marked it one way by dragging it with an ox-chain; and dropped the corn by stakes the other way. I planted four feet each way, in rows straight as a line, cultivated twice, then ploughed each way; followed with the hoe, and killed all the weeds and grass, which was of course but a light job. In one week, the corn so shaded the ground, that when it was fit to cut, it was as clean as summer-fallows generally are from weeds and grass. The tending of the corn, I think, was about the same labor as fitting for wheat the old way. I had a cultivator made purposely for putting in my wheat, in the following mode: I took a drag-tooth iron, and welded a piece of spring-steel to one end, in the shape of a shovel-plough, three inches square; let the teeth project two or three inches further to land than an ordinary cultivator, and thus the corn-roots were prevented from choking it out. I then went through the field, cut four rows and left four, and laid them in gavels close to the standing corn. I then cultivated, then sowed, and cultivated again, and then dragged the ground well. After that, I set up the gavels, and cut the remainder, and set it on the sowed ground, and then put into wheat the remainder of the ground in the same way. The corn-stalks, in fodder for my stock, paid for harvesting the corn. I had eighteen hundred bushels of ears of corn, and five hundred bushels of potatoes, and my prospects are as good as usual at this time for a good crop of wheat. The ground is sowed to clover, and looks fine. There was but little more labor expended, and no more labor lost for pasturing the land, than to have had but one crop.

MR. GLIDDEN'S SHEEP MANAGEMENT.

Gen. Glidden, one of the most experienced and successful in this department, thus writes in a late number of the *Journal of Agriculture*. He says:

I made my selection of sheep twenty-two years ago, from the best flocks in this vicinity, for fine wool. I selected a farm for that purpose, and assigned for my sheep-pasture a swell of land that bears sweet feed, and affords them a chance to shelter themselves with the woods from the storms. I secured to them a shade upon the high lands, by sparing trees for that purpose, when I cleared the land; but if I had none, I should build them a shelter, until I could grow one. I have been careful not to *breed in*, to get the proper shape for bucks, and the right grade of wool. I turn the bucks with the ewes in the middle of December. I let them have lambs at three years old, and wean the lambs about the middle of September, giving them a cattle pasture, or a field, always allowing them a better chance of feed at the time of weaning, and putting a few old ones with them to prevent them from getting wild.

MODE OF WINTERING.

I take the old sheep that have raised lambs, and look them over carefully, to see that the age is right, and that the shape and grade of wool is what I want; then put them in a yard by themselves, where they can be sheltered from the storms; not to exceed 100 in a flock. I feed them three times a day on good hay, when they first come to the barn; after two or three weeks, I give this flock coarse fodder once a day until the weather grows warm in March; then I give them good hay again until they leave the barn.

I take the wethers for another flock; if they are to be stall-fed, or to be turned soon after shearing, put them in another yard, where I can have the means of giving them grain. I take my yearling sheep to another yard, for they are the hardest flock to winter, owing to the state of their teeth. I take the lambs for another flock; give them early-cut hay through the winter, which causes them to grow through the winter.

In all cases, I feed in racks, and shut up the sheep in bad storms of rain, as well as snow. If I over-feed the two last-named flocks, I turn the old sheep in to clean the racks; but in all cases where the hay is good, let them eat clean. I rake out the sheep-pens once a day, and give to the colts or cattle.

Having got my sheep selected, I then watch over them, and see that they have water to go to at all times when the weather is favorable, and that they all look full and plump. If any of the old sheep fail to do well, put them in with the lambs. If this apartment gets too full, throw back, or give better keeping to those flocks that fail.

When the snow leaves the ground, I turn into my mowing fields, appropriating to each flock a separate field. I then feed twice a day until they leave for good. My sheep run against a common stone wall, and I believe all sheep would if they were properly brought up and properly cared for. By this I would say, that if I should put 300 sheep into a pasture of 100 acres for the summer, I think they would be likely to leave it, even if the wall was poled.

SUMMER TREATMENT.

I wash and shear from the first of June to the first of July, as I find the season. I do not wash at this season, because I have done planting, or got the highway taxes worked out; but for the reason that the weather then is right for them to part with their fleeces.

The sheep being sheared, I sort them again, to suit the size of the pasture; the wethers to take the best feed, if I intend to turn them early; salt once a week. If the sheep have ticks, wash the lambs in tobacco-juice, or salt brine; or rub the wool full of snuff.

MODE OF REDUCING A FLOCK.

I sell all of the fat ones, (especially the old ones that have lost their lambs,) also my oldest ewes, the smallest yearlings and small lambs to go into small flocks; and whenever they have gone into good hands, they would average in appearance with the flock taken from the next year. I have known a sheep kept in a small flock fourteen years.

I sold ten of the oldest sheep I had in my flock last year, to Harry Neal, Esq., for $6.67. He told me, the other day, he had sold them and their wool and lambs for $45. If others that I could name, had taken them, they would have told me that they all died with the worm in the head, (of course.)

I am frequently told of flocks running out, and that pastures have had sheep in so long, that sheep do not do well. Let me say to you, that I have a pasture that has had sheep kept in it most of the time for 75 *years*, and others that have been pastured with sheep 40 *years*, and I do not wish to change my pastures nor my flock of sheep, which I have not changed for 22 years. I do not believe in running out flocks, or pastures, or mowing-fields. by proper treatment.

I have kept on an average, for 22 years, 300 sheep, and never have had any disease amongst them; nor have I lost on an average, (the first year excepted,) one per cent. in the winter or spring.

FOR THE PLOUGH THE LOOM, AND THE ANVIL.

SHEEP-BREEDING. BY P. A. BROWNE.

A WRITER in the January number of the above-mentioned valuable periodical, has expressed a very decided opinion against *sheep that are horned.* He even proceeds so far as to say, in regard to *all animals*, (by which I presume he means *domestic* animals,) that "*horns are good for nothing but to wound and destroy.*" We confess that we have no faith in these general denunciations of the law of nature. God has constructed all animals in the most perfect accordance with the places they are designed to fill and the parts they are to play in the great drama of creation.

When the sloth was first discovered, he was misrepresented by a writer on natural history as a very ungainly monster—a blemish in the universe! but subsequent examinations, more carefully conducted, convinced mankind that the sloth is as perfect, of its kind, as the proudest animal that struts this earth.

If horns had been "good for nothing but to wound and destroy," they would not have been planted upon the heads of so large a portion of ruminants. Ask the manufacturer of handles for cutting-instruments, the combmaker, the manufacturer of lanterns, the umbrella-maker, the manufacturer of bell-pulls and drawer-knobs, the makers of prussic acid and Prussian blue, if *horns are good for nothing.*

Five reasons are given why horns are thus denounced, one of which we will now examine. It is asserted that "the substance which goes to make horns, is the same that enters into the composition of wool."

But "hollow-horns," (to which class belong those of the ox and the sheep,) are composed of two distinct materials, one of which, namely, phosphate of lime for the construction of the plates and fibres of the osseous portion or *inner* surface, and phosphate of lime does not enter into the composition of wool. And as to the outer surface, Roget (who upon such a subject as this is of the highest authority) says that it is a "mere excretion, which appears to be destitute of vessels, and which is consequently removed from the influence of the living powers."

We would likewise ask permission to call to your notice, that Russell *altered stags*, and he informs us that in some of them their antlers grew irregularly, and in others not at all. Bichat also says that a cock with his comb cut languishes, and a lion deprived of his mane loses a part of his courage, and probably a part of his vitality; all of which shows that there exists some mysterious connection between horns and such other appendages indicative of the male sex and its virility, and they ought to admonish us to "let (nature's) well alone," lest while we are endeavoring to improve upon this great mistress, we may be the cause of a lasting degeneration, having a most deleterious effect upon our stock.

Philadelphia.

CONSTRUCTION OF PIG-PENS.

We have heard of jewels in toads, while pearls are grown in oysters, and diamonds even are dug out of the earth.

Science, in some sense, covers all the territory yet known, and though not a common topic, as it should be, nor an inviting one, in all respects, we know not why this wise dame should not preside over the pig-pen as much as in other departments of farm management. We find a capital article on this subject in "The Progressive Farmer," which we lately noticed among our new books, and here copy it for our readers:

Mythology relates that one King Augeas had stalled 30,000 cattle for many years without cleaning after them. Hercules, it is said, was appointed to the task of cleansing these "Augean stables." The wily hero, as the story has come down to us, turned a river through them, and made clean work shortly. Whether the stalls travelled with the current we are not informed, but the manure went down the stream. Agriculturally considered, this was just about as wise as the management of some modern pig-pens.

I have often seen these important structures built with their roofs facing the south; the manure thrown out the south side; the eaves washing it in rainy days and the sun scorching it in fair weather; till, between washing, fermentation, and *burning*, there was little left. Others are so located that rills, if not rivers, run into them, not enough perhaps to cleanse them, after the model of the aforesaid "Herculean labor," but enough to sweep away nearly all their soluble salts. Owing to bad management, pig manure has come into bad reputation, but it is good, nevertheless, if rightly managed.

The pig-pen should be so constructed that the neves will be turned away from the manure. The ground should be in such shape that no water, except what falls directly from the heavens, can find ingress, and none find egress but by evaporation. There should be an outside inclosure, where the animals can be as filthy as their swinish nature prompts; and an inside apartment where they can be as dry and warm as they please. If the first is not allowed them, they *may* not pay for their keeping in summer; if the last is not furnished, they certainly *will* not pay for their winter's food. *No animal can grow or fatten when suffering with the cold. It takes all his food to keep him from freezing.*

Let the outside inclosure be of considerable size, giving at least one square rod to the first tenant, and half as much more to each additional occupant. It is agreed on all hands, that American farmers have land enough. They can afford to give their pigs a sufficient range. The ground should be dishing, the same as in the barn-yard, and for the same reason, that nothing may run over in wet weather; and the material for the pigs to work over should be so abundant as never to evaporate to dryness in the dryest times.

Now, what is to be done that a lot of swine may produce, partly in the "natural way," and more by the manufacture of raw materials, ten loads each, per year, of excellent compost? If the number to be kept be ten, they would give a hundred loads. Suppose this to be the average number for the year, and let us see how the thing is to be done. In the first place, put around the outside of the pen, or outer yard, seventy-five loads of peat, swamp-muck, road-scrapings, top-soil, or whatever you can best procure, and then proceed as follows:

After the pen has been cleared of its last year's manure, throw in plentifully of this to begin with. Let it be scattered over the whole inclosure several inches deep. As it becomes thoroughly moistened with the rains and the droppings of the animals, throw in more, and so on through the summer and fall; throwing in, more or less, nearly as often as you feed the swine, taking care that it always be moist, but seldom or never thoroughly drenched. The quantity will soon become so large that it will hold the water of any ordinary rain, and withstand the evaporation of any drought if not very severe. If it is inclined to dry up, it is well to throw over it a few quarts of plaster. Plaster is very little soluble. Five hundred pounds of water dissolves but one pound of plaster. It cannot, therefore, be lost by putting it on moist manure, as some other salts might be. Indeed, it should be sprinkled over all manures frequently, but especially if they incline, either in consequence of dry weather or too rapid fermentation, to become dry.

Some have supposed that the outer pen for swine should be under cover. I think not. Remember that rain does not hurt manure, unless it run through it, carrying off its soluble salts. Every drop of rain brings down ammonia and other fertilizing matter from the air. The falling rain washes the air of its impurities. After the shower we say, "How sweet the air is." It is sweet because it is *clean*. Hence, in the neighborhood of cities and large villages, and every where to a limited extent, rain falls, impregnated with enriching materials. If it falls on a quantity of manure which has sufficient depth to hold it till evaporation takes place, it leaves these materials in the manure. Hence, the more rain the better, provided it go off by evaporation and not by filtration. The evaporation should not go on to perfect dryness; for then the ammonia, the carbonic acid, and other gases, are inclined to escape, and the manure is approaching that state in which it may said to be "burnt."

Always moist but never leached should be the farmer's rule for his manure. The more manure he makes, both in his cow-yard and his pig-pen, the more easily can he keep within this rule. A few inches of manure spread over the yard or pen, will be as dry as powder one day and thoroughly leached the next; while a depth of ten, fifteen, or twenty inches will stand a long drought, or hold the water of a long rain. Consequently, it generally happens to the farmer who makes manure on a liberal scale, that his manure is as much better in quality as it is more in quantity.

I have said *always moist but never leached.* Closely allied to this is another rule. Who has not noticed that a pig-pen, in which the occupants are in danger of drowning, and one in which the manure is so dry as to be suffering a rapid fermentation, always smell horribly? To say nothing of the keeper and his family, the pigs are less healthy in such an atmosphere, and they will thrive less on the same keeping. To keep a stinking pig-pen is to throw away part of the feed and part of the manure at the same time. By giving corn to swine, shut up in a polluted atmosphere, the farmer loses a portion of his last year's crop; and, by letting his pig-pen "waste its sweetness on the desert air," he fails of a portion of his next year's. A valuable portion, and not a small portion of what should produce crops next summer, is going beyond his reach.

Not the least offensive odor should escape from the pig-pen. This is the rule before alluded to; and it is as practical as it is important. To practice it, will save something on last year's crop; something for the next, something *certainly* in comfort, and it *may be*, something in doctor's bills. In order to practise it successfully, one needs only to throw into the pig-pen, and all like places, including the vault of the privy, plenty of peat, black mud, or top-soil even, and to see that it is always moist but not drenched. A little plaster would be a help, but it is not necessary. If it is not at hand, the other part of the prescription will suffice. Plaster, however, should always be on hand. This, and cured peat or muck, should never be wanting about the farmer's premises.

The same rule should be observed with regard to every part of the premises. If others suffer bad odors about their farms, they may lose their comfort and their health; if the farmer suffers them, he will lose his *wealth* also; for these are the very quintessence of his manure; and it is a well-known fact that growing plants absorb with avidity what is most noxious to animal life.—*Progressive Farmer*, (*by Nash.*)

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

MESSRS. EDITORS:

DEAR SIR: Please inform me through the columns of *The Plough, the Loom, and the Anvil*, which is the best churn in use. I have tried several "bests," but have found none worth a straw. Now, whose make would you recommend? I am very respectfully yours, W. C. W.

Norwalk, Conn., Jan. 19, 1854.

EDITORS' REPLY.—We know of nothing better than the CYLINDER CHURN, for common family use; it is convenient in its management, portable, and is easily cleaned. There are five sizes, holding from two to twenty gallons. Cost is from $2 to $4.

INDUSTRIAL RESOURCES OF VIRGINIA.

THE lead mines in Wythe county have never been worked up to their capacity, but merely to the extent of supplying a limited home demand; the weight of the article, and the distance to water communication, utterly excluding it from the great markets of the world. The lead region, which commences at Aspinwall, extends through a considerable portion of Smyth county, and is rich in all the most valuable ores of this metal. Besides the sulphurate of lead, (galena,) which is the ore chiefly depended on, oxide of lead, (minium,) and the carbonate, (white lead ore,) exist in large quantities, may be easily wrought, and are exceedingly rich; the latter yielding about 75 per cent. Minium is the red lead of commerce; and the carbonate, the white, so extensively used as a paint. There is also in connection with these ores, a considerable per cent. of arsenic, which sublimes in the process of smelting, and collects in large quantities around the mouths of the furnaces, in the form of arsenious acid, (white arsenic.) This substance, of which no account is made at these mines, possesses considerable value in the arts, and could easily be purified and fitted for market.

Here, too, in inexhaustible profusion, we have the noblest of the metals—iron. Whatever may be said in justification of the metallurgic idolatry which is drawing so many thousands of our people to the El Dorado of the west, here, in the bowels of our mountains, in exuberant plenty, is a metal of far more intrinsic value than gold, and needing only the union of labor and capital to make it as prolific a source of wealth to Virginia, as the celebrated mines of Elaba to France, or Dalecarlia to Sweden. The Iron Mountain, (to say nothing of the numerous other localities,) which extends through the counties of Wytbe, Smyth, and Washington, in Virginia, and Johnson, and Carter, in Tennessee, contains ore enough to supply the nation for a century. This ore, too, is of the richest quality, and precisely the same (the magnetic oxide) as that from which the best iron of Norway and Sweden is obtained. Other ores also here exist in abundance, as the brown hematite, the argillaceous carbonate, specular, &c. In this mineral alone, is wealth sufficient to enrich a nation, and the brow of enterprise may cheer up at the prospect of gaining employment for centuries to come.

Contiguous to the salt deposit, and at numerous other points in the valley, between Clinch and Walker's Mountain, we have gypsum in the greatest abundance, and of the finest quality. The value of this article to the agriculture of the country is too well known to require description, and nothing is needed but facilities for cheap transportation in order to multiply its consumption a hundred or a thousand fold. In the present condition of our roads, perfectly execrable through nearly half the year, so great is the cost of transportation that the price of ground plaster, which at present is $5 per ton at "the bank," is increased 100 per cent. at the distance of eight miles, and only a very partial supply can be procured at that. We perceive, however, by the tariff of rates, established by the Virginia and Tennessee Railroad Company, that the price of transportation will be but three dollars per ton for the distance of 200 miles. These rates, when the lines of roads are completed in both directions, will give the command of the market through a scope of country of more than 400 miles in length, and furnish the article cheaper by two dollars per ton at the point of greatest distance, than it can now be obtained within *eight miles of the works.* This vast region of country, it should be remembered, also, is wholly devoted to agriculture, and the soil is of such a nature as to receive the most healthy stimulus from the use of this fertilizer. The effects on the industry and production of the country, as a consequence of our improvements, to result from this branch of business alone, are absolutely incalculable.

Additional to the above-named industrial resources which pertain to the mineralogy of the country, we might mention also the vast deposits of metamorphic limestone which are found between the Clinch and Holston rivers. These deposits furnish the beautiful variegated red marble, now well-known as the "Rogersville Marble," in consequence of works for its manufacture having been established only at that place. The formation, however, extends through Scott county, in Virginia, and Hawkins and Grainger, in Tennessee, and the quantity is inexhaustible. Quarries might be opened in each of these counties, and its manufacture for building and ornamental purposes carried on to an extent limited only by the uses to which it may be put. This marble receives a fine polish, and is mottled and variegated by numerous shells, madrepores, and other fossils, which give it a beautiful effect. We consider it scarcely inferior to the celebrated "gold-streaked" marble from Egypt. As a new variety, it needs only a market in order to be much sought after for furniture and ornamental finishings.

Besides this, throughout East Tennessee, we have reason to believe that numerous other valuable varieties may be found. We have in our possession a beautiful specimen of white granular marble from the Unaka or Smoky Mountain, between Tennessee and North Carolina, that, for purposes of statuary, cannot be surpassed; equal, no doubt, to the best Parian or Carara. The day is not distant, we hope, when our Greenoughs and Powers will not need to seek their material on the classic shores of the old world, but when their beautiful creations shall arise from native quarries, when our mountain glens and nooks shall become artists' studios, and the clink of the chisel and the hum of busy industry give new life to these sequestered solitudes; and when the railroads, which, from different points, are now pressing towards these rich but hitherto isolated regions, shall bear away to distant cities this mineral wealth, to be reared into sumptuous edifices and stately temples.—*Southern Repertory.*

PROGRESS OF MECHANICS.

We purpose to describe certain mechanic arts, in which the lapse of centuries has brought no progress, but which remain, to this day, not only not improved, but perhaps deteriorated.

We have occupied considerable space in a recent number, (for January,) with an account of PORCELAIN WARE. We have made progress of a certain kind in this department of art, the same kind which is made in so many of the arts, and a kind too which is of immense practical value. We mean an economical improvement, an adaptation of various kinds of clay to this kind of ware, so as to bring its common use within reach of the mass of the people, just as a certain amount of education is now diffused among all the people. Science in its nature is diffusive. Thus, the knowledge of pottery, in its finest forms, which was once exceedingly limited, while the ware cost far too much to be enjoyed by any but a favored few, is now essentially common property, and the products of the art are in the humbler abodes of poverty and toil.

No wares compare in elegance of finish and brilliancy of coloring to the ancient Sevres. But we need not occupy space on this subject. We refer to it, that our list may be more complete.

Glass-ware.—There are various departments, each distinct from the rest, all of which come under this general head. We will first refer to

Staining of Glass.—Perhaps nothing can exceed the beauty of many modern works in this department of art. But in our own country such specimens are few, and of the smaller forms. Abroad, it is otherwise, and yet so far as our information extends, but very few of the larger forms of remarkable beauty are the work of recent times. In the middle ages, this art was in its perfection. Many of the churches of the old world display scenes in their painted windows, that modern art cannot surpass.

The imitations of precious stones, by the ancients, has never been surpassed, if it can be equalled. A piece of glass was found at Rome, less than an inch in length, and a third of an inch in breadth, exhibiting on a dark and variegated ground, the figure of a duck, beautifully executed, in bright and varied colors. The plumage was executed with wonderful truth and fidelity.

The most wonderful feature of this work of art consisted, however, in the fact that the two opposite sides of the glass presented precisely the same figure, the colors extending quite through the substance of the glass. A fracture having occurred, the mode by which the work was executed was revealed. This was by passing straight threads of glass, of different colors, through a hole in the tablet, and so arranging them, that a transverse section presented the figure of a bird. These filaments were doubtless united, afterwards, by fusion, as no microscope could detect the point of their junction. Other specimens exhibited flowers, architectural ornaments, &c., in a blue ground, of equally surprising execution.

Glass and Marble Mosaics.—This style of decoration was known both to the Greeks and Romans, and as much skill was exhibited in these manufactures as in modern times.

Malleable Glass.—It was known long ago how to render glass malleable as iron, but the secret was confined to a few only, while the life of him who should divulge it unwisely, would be forfeited. In the time of Tiberius, an artist, banished for some political offense, it is said, discovered this art, and hoped on that account to secure the favor of the emperor. But the glass-makers, supposing "their craft was in danger," employed all their influence against him, and secured his death, and his secret died with him.

In the time of Louis XIII., an artist who made this discovery was rewarded, for a similar reason with perpetual imprisonment.

Glass Blowing.—Egyptian paintings, 3500 years old, represent glass-blowers at work, with blow-pipes similar to those now in use, and in the tombs of Thebes, implements of glass have been found similar to those of the present day. So the arts of cutting, grinding, and polishing glass were understood in those early times. The famous Portland vase, now in England, was found in a sarcophagus at Rome, some two hundred years ago, and was long believed to be of stone. It is now found to be of glass. Its color is blue, beautifully polished, and ornamented with small figures of opaque white, in bas-relief, beautiful in design, and of exquisite finish.

Another very valuable specimen of this work was dug from the ruins of Pompeii, in 1839, and is now in the museum at Naples. It is about twelve inches high, and eight inches in width, and of a style similar to that of the Portland vase. It is covered with figures in bas-relief, raised from a delicate white opaque glass, overlaying a transparent dark-blue ground, the figures being executed in the style of cameo-engraving. To produce this effect, the artist must have been familiar with the operation described last month under the head of Bohemian ware—the only mode known for exhibiting different colors, in such connection. This specimen is presumed by some to be the work of Roman, and by others of Greek artists.

The art of cutting and polishing glass has been long known; and in the ancient ruins, specimens of such work have been found that compare well with the products of modern skill.

Refining Metals.—The few specimens of ancient coins that have come down to us seem to prove that the ancients understood the art of refining the precious metals. These coins are supposed to have been made by the hammer and the punch. Among the most remarkable *antiques* formed of the precious metals, are two golden horns, found in Denmark, and supposed to be drinking vessels. They are each about three feet in length, four inches diameter at the mouth, and seven pounds in weight, and are very richly ornamented. The gold of which they are composed, is of such fineness, that the best refiners in Copenhagen, who were instructed to repair a blemish in one of them, were unable to produce metal of equal purity.

The art of refining and tempering steel was practised in the East, at a very early period. According to Pliny, the oriental steel was the best then known, and the East Indian steel, called Wootz, is believed to be superior to any of European manufacture. A sword of the steel of Borneo has been known to sever a European sword-blade, without producing a flaw.

Working Metals.—The Chinese have long possessed this art in great perfection. An old Chinese work on vases is yet extant, which contains many hundred engravings of ancient vases, of gold and other metals, with their inscriptions, which refer their date to a period fifteen hundred years before the Christian era.

Sculpture.—This art was not unknown, even in the rudest ages. The various idolatries which have prevailed in all ages of the world must have turned attention to this department of art, and as civilization and refinement modified and even controlled the public manners and tastes, progress in it was a matter of course. Accordingly, we find not a few of the ancient specimens of sculpture still appealed to as models of perfection. Perhaps our own artists excel the ancients in one point, and that indeed the highest of all, in the development of intellectual expression, and of passionate emotion, though they do not in symmetry or beauty of feature, or of form.

Not only were these *finer arts* familiar to the ancients, but some belonging to the more necessary and economic departments were practised at a very ancient period.

Spinning and Weaving.—The origin of these arts is entirely unknown. The Egyptians, even in the time of Moses, we all know, understood both these branches of labor. The pictures upon Egyptian tombs represent all the various processes connected with them. Their mummies are rolled in linen, some of which is of remarkable fineness. Some of the ancient specimens of Greek sculpture are clad in flowing drapery.

Masonry.—With the sight of this word, the huge pyramids at once stand up in their immense proportions. But perhaps it may be said that it is as easy to erect a large as a small pile, a larger quantity of material only being necessary. But these stones are found to have been of immense size, weighing, in some ancient structures, hundreds of tons. No ordinary architect of our day is competent to the skillful management of such masses. In the ruins at Balbec, some of the stones employed are sixty feet in length, nineteen in breadth, and ten in thickness. At how many quarries on this continent can contracts now be made for the delivery of such masses? It must be remembered also that Egyptian granite was very hard. The oldest structures known, were erected without lime or other cementing substance. The use of such materials is of comparatively later origin.

But when quarried, how could these immense masses be conveyed to the spot where they were required? The obelisks, at Heliopolis, consisting of a single block, weighing more than two hundred tons, were conveyed 800 miles. A colossal statue at Thebes, weighing 900 tons, was conveyed 138 miles.

The gothic structures of the middle ages exhibit wonderful skill of construction. The tower of a cathedral, at Strasburg, is nearly 500 feet high. A stone cistern, for collecting the rain which drops from the spire, is arranged 250 feet from the ground. So strong is the masonry of this structure, that in the great earthquake of 1728, though the tower was rocked so as to spill the water from this reservoir, when standing three feet below its margin, still no stone was misplaced in the tower, nor was a crack produced in its masonry.

A stone arched-bridge, built by the Romans, at Brionde, in France, with a span of 195 feet, is still standing. The ancient Roman aqueducts are to this day astonishing feats of skill in this department of art.

The obelisks conveyed from Syene to Thebes are from 70 to 90 feet in length, and that at Karnac weighed 297 tons. A statue at the Ramessium weighs upwards of 887 tons, and must have been brought 138 miles.

Herodotus mentions a temple at Bato, in the Delta, hewn from one solid rock, which was brought from the Elphantine. Its weight was reckoned to be 5000 tons. An Egyptian obelisk, the largest in the world, stands near the church of St. John Lateran, at Rome, the shaft of which is 105 feet in height. It is adorned with the finest sculptures. Palmyra was a city of palaces. Babylon was not only "the glory of the Chaldeans," but is the admiration of the world. The artists of centuries gone by left a record of their skill, which is not even dimmed by age. What is not thus eloquently uttered in the chiselled lines of their solid rocks, their painters have given us. They have illustrated the luxuries and pleasures and amusements as well as skill in the arts, to an extent which should teach us not to boast too much of our superiority, in all respects, over the olden times.

Working in Wood, Cabinet-ware, &c.—We find in Egyptian tombs, as well as in their pictures, that workers in wood were familiar with the products of modern art in this department. From these discoveries, we find that stuffed chairs were known in those early times, and that fashion and taste were gratified by the finish of the claw-feet, and other devices of the present time. They show skill in the practice of veneering, dowelling, dovetailing, glueing, polishing, staining, painting, &c.

Architecture.—We need here but to suggest a few specimens of ancient skill and taste in this department. The most ancient structures in Europe are among the most perfect. Westminster Hall, with its arched roof, still perfect, was erected in 1380. The most marvellous, in some respects, however, is the Riding House, at Moscow, which covers an extent of 10 acres, the roof of which extends 2000 feet in length, and 235 feet in width, without cross-wall or pillars.

The most remarkable dome in existence is that of the Pantheon, at Rome. It is 167 feet in diameter. Next, is that of St. Peters, still larger than that of the Pantheon. It is constructed of double walls, with a flight of stairs between them. The dome of the cathedral of Santa Maria del Fiore, at Florence, erected in the early part of the fifteenth century, is perhaps not inferior to either in its design.

The principle of the arch was as well understood, and as variously applied centuries ago, as at the present time.

In the construction of powerful machinery, the ancients must have been well skilled. We have already referred to the moving of immense burdens, and of elevating huge masses to great heights. We would also refer to the warlike machines of Archimedes, who constructed huge engines for upsetting the war-vessels of the enemy, when they came to attack Syracuse, the city of his residence. The huge cross-bows, with which stones and other missiles were thrown against the boats of the enemy, and which sunk them, are quite worthy of mention in this connection.

Iron and Steel.—So well known are the claims of the ancients to perfection in the manufacture of wares and implements of this description, that a simple reference is sufficient for our purpose.

But when we have enumerated these, and a few kindred kinds of art, we have exhausted the list. We might, indeed, were it within the scope of our plan, have referred to the painting, the poetry, and the eloquence of olden times, but such topics scarcely come within the range of our discussions.

We purpose to follow this short sketch as our convenience will permit, with illustrations of an opposite character, showing the WONDERFUL PROGRESS that has been made in other departments of mechanic art, with sketches of the more prominent artists, both of the past and the present; and if means could be devised for giving their portraits to our readers, we should most gladly avail ourselves of the opportunity.

THE ACTION OF URINE.

Dana thus illustrates the value of human urine as manure:

"Each pint of *human urine* will produce a *pound of wheat. Each pound of ammonia is equal to a bushel of grain.* Whatever may be the food, it is evident that rivers of riches run away from farms, from want of attention to saving that which ordinarily is allowed to be wasted.

"Each man evacuates, annually, enough salts to manure an acre of land. Some form of geine only is to be added to keep the land in heart, if the farmer has but the heart to collect and use that which many allow, like the flower unseen, to waste its sweetness on the desert air."

By *geine* here is meant *mould*, and we infer, that it is immaterial whether the substance used be woods-mould, marsh-mud, river-mud, peat-mould, from head-lands, or any other kindred substance. According to the above statement, 125 gallons of human urine, mixed with as much of either of the substances named, to dry the urine, and prepare it for broadcast sowing, if applied to an acre, would produce 20 bushels of wheat, provided the season and other circumstances combined to facilitate productions. Looking at the constituent elements of urine, as compared with those of wheat, we most implicitly believe, that 200 gallons of human urine, mixed with 30 bushels of mould of either of the substances above enumerated, 5 bushels of ashes, and 1 bushel of plaster, would be sufficient, if broadcasted and ploughed in, the land being properly pulverized, to produce not only a very large crop of wheat, but carry it through a four years rotation of crops, with profit to the farmer; and that the land might be seeded to clover with the certain prospect of luxuriant crops of it, provided the land naturally had lime in it, or that mineral, in the event of their being none, were applied at the rate of 10, 12, or 20 bushels per acre. The quantity of urine named would, upon decomposition, furnish upward of 44 lbs. of ammonia, a quantity abundantly sufficient, by its *direct* and *indirect* action upon the vegetable and other substances in the soil, to fertilize an acre of land.

COMPARATIVE PRODUCTIVE ECONOMY OF THE UNITED STATES.

BY CHARLES C. COFFIN, WEST BOSCAWEN, N. H.

NATIONAL prosperity is subject to three pursuits, commercial, mechanical, and agricultural; the latter is at the basis of all. Of agriculture we propose to speak; but as some States are extensively engaged in manufactures, and others in commerce, allowances should be made in the comparative results.

It is a natural supposition that a State possessing equal advantages with another State, should be equal in its like productions. Such is not the fact, as will be apparent from the annexed tables. Taking the article of butter, a product universal the world over, and which can be produced in any clime, we see the following results. The States being arranged in progressive order.

	Lbs. per Cow, per annum.
Florida,	5
Texas,	10
Georgia,	13
South Carolina,	15
North Carolina,	18
Alabama,	18
Arkansas,	19
Mississippi,	20
Tennessee,	33
Missouri,	34
Virginia,	34
Rhode-Island,	34
Kentucky,	39
Louisiana,	41
Illinois,	42
Maryland,	43
Indiana,	45
Iowa,	47
Delaware,	50
Wisconsin,	56
Massachusetts,	62
Ohio,	63
Maine,	69
Michigan,	70
New-Hampshire,	73
Connecticut,	75
Pennsylvania,	75
New-Jersey,	79
Vermont,	83
New-York,	85

In many of the States large quantities of milk are sold; but if the above table is examined, it will be seen that most of those States which produce the largest amount of butter, sell the most milk. Vermont is an exception. But the exception will be accounted for in the quantity of cheese produced.

The purely agricultural States of the West, with broad prairies, fertile fields, and favorable climate are behind the bleak and barren States of Vermont, New-Hampshire, and Maine. New-York stands highest on the list, yet she sells millions of gallons of milk per annum.

The reasons for such discrepancy must be beyond climate or soil. They are to be found in inferior stock, and improper management.

In the article of cheese* there is a wider difference.

	Lbs. per Cow
Louisiana,	.01
South Carolina,	.02
Maryland,	.04
Missouri,	.09
Alabama,	.13
Georgia,	.14
Delaware,	.16
Florida,	.24
Arkansas,	.32
Texas,	.40
North Carolina,	.43
Tennessee,	.70
Kentucky,	.89
Missouri,	.89
Virginia,	1.37
Indiana,	2.25
Illinois,	4.00
Iowa,	4.00
Tennessee,	4.72
Wisconsin,	6.00
Mississippi,	10
Rhode-Island,	11
Maine,	18
New-Jersey,	30
New-Hampshire,	31
Ohio,	36
New-York,	53
Massachusetts,	54
Vermont,	59
Connecticut,	62

The State of Vermont produces more pounds of cheese, than all the rest of the Union, with the exception of New-York, Ohio, Maine, Connecticut, Massachusetts, and New-Hampshire; and this from 146,128 cows.

It may reasonably be asked if there is aught in the geological formation, geographical position, or climate of Vermont, to account for the successful prosecution of such a branch of agriculture; which may not be equally suc-

* It is well known that cheese is not an article of food so universal in its use as butter; yet, from such data, it would seem that many of the States were dependent upon others for this article of food, which, with judicious arrangements, can be produced in all climates.

cessful in other States? We answer no. New-York and Ohio, New-Hampshire and Connecticut show the same capability.

But if we look at the number of cows per individual, surprise at the discrepancy will be still greater. We shall see that some of the States, which produce the least butter and cheese per cow, keep the greatest number of cows per individual.

	Cows per Individual.
Maine,	.22
New-Hampshire,	.29
Vermont,	.46
Massachusetts,	.13
Rhode-Island,	.13
Connecticut,	.23
New-York,	.30
New-Jersey,	.24
Tennessee,	.22
Delaware,	.21
Maryland,	.14
Virginia,	.22
North Carolina,	.25
South Carolina,	.28
Georgia,	.36
Alabama,	.29
Florida,	.83
Mississippi,	.35
Louisiana,	.20
Texas,	1.01
Kentucky,	.25
Tennessee,	.24
Arkansas,	.44
Missouri,	.33
Ohio,	.27
Indiana,	.28
Illinois,	.34
Mississippi,	.25
Iowa,	.24
Wisconsin,	.21

Vermont is a purely agricultural State. The dairy is a branch of business natural to the State. It is made profitable by industry and energy. Each individual is possessed of one forty-six hundredths of a cow, each cow producing 59 lbs. of cheese and 83 lbs. of butter.

In the State of Florida, each individual owns eighty-three hundredths of a cow. Each cow producing 24 lbs. of cheese and 5 lbs. of butter.

Now, for what purpose do the agriculturists of the South rear such stocks? Surely not for profit.

The total pounds of cheese produced in the United States, in 1850, was 105,535,219 or about 4½ lbs. to each individual. The export for the year was 10,361,189, leaving about 4 lbs. per individual for consumption. Now, if the consumption is equal in all the States, there are but seven States that produce their own cheese—Maine, New-Hampshire, Vermont, Massachusetts, Connecticut, New-York, and Ohio.

Pennsylvania, with a population of 2,311,786, produces but 2,505,034 lbs.

of cheese. If each individual consumes 4 lbs., there is a deficit of 5,742,110 lbs., which at 10 cts., amounts to more than half a million dollars. And this, with a soil and climate equally advantageous with New-York or Ohio. Indiana, with a population of 988,416, produces from 284,554 cows but 624,564 lbs. of cheese and 12,881,535 lbs. of butter.

This is a result where soil and climate are greatly in favor of the former States. Neither of the States sell milk, and it is reasonable to suppose that the proportionable consumption of milk, as an article of food, is as great in one as the other. Hence, the discrepancy must be sought for in the stock, or in the management of the dairy, or in both. There is no reason to suppose that Indiana may not be made to equal Vermont, but, on the contrary, excel it in dairy products.

The discrepancy which exists between the States of Vermont and Indiana is illustrative of that of the whole Union, not only in cheese, but in various other articles.

The amount of wool produced per sheep, shows results which must be attributed to stock and management.

In the table appended, there is evidently an error in the computation for Massachusetts; for it can hardly be supposed that that State should range so far ahead of all others, especially of Vermont, where wool-growing is a profession.

	Lbs. of wool per Sheep.
Maine,	3.02
New-Hampshire,	2.90
Vermont,	3.35
Massachusetts,	4.53
Rhode-Island,	2.9
Connecticut,	2.9
New-York,	2.9
New-Jersey,	2.9
Tennessee,	1.3
Delaware,	2.1
Maryland,	2.6
Virginia,	2.1
North Carolina,	1.6
South Carolina,	1.7
Georgia,	1.7
Florida,	0.99
Mississippi,	1.8
Louisiana,	0.9
Texas,	1.3
Kentucky,	2.0
Tennessee,	1.6
Alabama,	2.0
Missouri,	2.1
Ohio,	2.5
Indiana,	2.3
Illinois,	2.4
Michigan,	2.7
Iowa,	2.4
Wisconsin,	2.0

Vermont, with a climate of long winters, stands first on the list, probably as to quantity per sheep, and quality. No State has given so much attention to wool-growing, and within the last ten years she has produced a stock not surpassed in the country.

If Vermont has done thus, why may not Ohio, Pennsylvania, Kentucky, and other States with climate to assist, surpass Vermont?

It has been computed that each individual requires seven pounds of wool per annum, therefore the country requires not far from 166,000,000 lbs. per annum. The pounds produced in 1850, were 52,789,174 from 21,721,814 sheep, or 2.44 lbs. per sheep. Showing a deficit of more than 100,000,000 lbs. Now, if the pounds per sheep were raised to that of Vermont, it would increase the amount to 72,000,000; and if the quality, which may now be rated at 0.40 per lb., were increased to that of Vermont, which may be called $0.50, it would give an increase of 15,000,000.

It is a well-known fact that it costs no more to keep a good animal than a poor one; here then would be actual gain of fifteen millions of dollars to the country per annum. This applies with equal force, to all the products of the country which are not in any great degree affected by climate.

The deficit of 100,000,000 lbs. of wool per annum, in value $40,000,000, is worthy of the consideration of the agriculturists of the country. But the discussion of the subject cannot be pursued. It has been theorized by economists, but it is a problem which will settle itself.

Yet to arrive at national wealth, it is absolutely necessary to understand the laws of production and distribution. It is only by comparative analysis that a State can understand its progress.

There is a legitimate business for every community. It is not a haphazard course which a community can pursue successfully for a long period. Prosperity is founded upon rational laws, laws of nature, or of circumstances. Some of the States must of necessity be manufacturing, others commercial, others agricultural, and others combining different employments.

It is impossible with the space at command, to do more than to glance at the industry of the country. But perhaps enough has been said to call attention to the comparative economy of the different States. No State can float serenely on the tide of time to a great and glorious destiny. The great moving powers are industry and energy; making use of the best means which nature or circumstances has given.—*Journal of the United States Agricultural Society.*

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

FARMING IN VIRGINIA.

Messrs. Editors: I herewith send you some thoughts on the subject of farming in Rockbridge and our valley counties, which may not be altogether uninteresting to your numerous readers.

Rockbridge county is situated in the Valley of Virginia, near the centre of the State. As you are no doubt aware, the valley, from near the Tennessee line to Harper's Ferry, boasts of as fine lands as are to be found in the State. Much of this land is in a high state of cultivation, producing heavy crops of corn, wheat, rye, oats, and buckwheat, with almost every culinary vegetable. There are also many fine grazing farms, on which are raised fine cattle, substantial, and some fine. horses, Cotswold, Southdown, Saxony, and Merino, and other sheep, with fine hogs of the different breeds. Much of our stock is driven to the Richmond, Baltimore, Philadelphia, and New-York markets.

There has also been a good deal of attention paid to fruit culture in late years, and we will soon have abundant supplies of apples, pears, peaches, nectarines, apricots, plums, prunes, damsons, strawberries, gooseberries, &c. Apples grow well every where, but some of the other varieties do not succeed so well on stiff clay soils. The county of Rockbridge and other counties lying further south, produce all the above varieties in perfection, when properly cultivated.

So far as my knowledge extends, there are not many dairy-farms in the valley. There are, however, some, which I learn pay well. Butter of fine quality, and in considerable quantities, is made, which finds a ready market in Richmond, Va.

The Central Railroad, now almost completed from Richmond to Staunton, 120 miles, will, in a month, give us ready access to market. This road is pushing west to the Ohio River, and it is said will be completed in the next three or four years. It will pass by Covington, where it will meet the James River Canal. These two improvements will open up unbounded stores of mineral wealth in our western mountains, and when once completed, will throw an immense trade into Richmond, in connection with the Tennessee and South Side Railroads; a new era will dawn on the cities of Richmond, Norfolk, and Petersburg.

There is now in progress a canal from the James River to Lexington, our county seat, a distance of about 20 miles on the water line. About one half of this canal will be in operation this spring, and it will probably be completed in the next year, 1855; and it is thought it will pay well. The North River, on the line of this canal, and above, affords very fine water-power. Indeed, our county boasts of almost unlimited water-power, being watered on the south by the James River, Buffalo, Clollier's Creek; the North River, near the centre of the county; Hay's, Walker's, and Moffett's Creeks, and the South River running along the base of the Blue Ridge, with other smaller streams, offer sites to small capitalists, for every branch of mechanical labor.

Our lands vary in quality from the finest bottoms, worth $100 per acre, to mountain lands at 10 cents. There are no arable lands worth having that can be purchased for less than $5. From this price up: $10, $15, $20, $30, and $50, for our best up-lands, well adapted to corn, wheat, and rye. As you approach the James River, some tobacco is cultivated, but it is not one of our staples. There are many good flouring mills in the county, and much of the wheat raised here is of very superior quality, weighing often 66 lbs. per bushel, rarely falling below 60 lbs. per bushel. The flour manufactured in our valley is generally of superior quality; the yield being 20 barrels per hundred for Mediterranean wheat, to 22 and 23 barrels for fine white wheats, per hundred bushels. Our best wheat-lands, under fine cultivation, yield 40 bushels per acre. Good farmers get an average of 20 to 25 bushels, and poor farmers fall as low as 5 bushels per acre. Of corn the same may be said; all depends on proper cultivation and quality of land; from 10 bushels up to 100 bushels per acre have been raised.

Before closing this communication, I will say a word about our servants, as many persons at the North labor under mistaken views on this subject. The servants of the landed proprietors in the Valley of Virginia are as well fed, housed, and clothed, as the laboring classes of any other community. If it were not our duty, it is our interest, to see that they are properly cared for.

Almost every family of servants have their house, beds, and bedding. They are regularly worked, and called to their meals, where there is always plenty, morning, noon, and night; and during the harvest months, many farmers send out an evening-piece, between 4 and 5 P.M. They very often work with their masters, and fare as well. If sick, medical aid is always afforded, and they are carefully nursed. They are rarely compelled to work in bad weather; and always have a patch to work for themselves, if they wish it. Many of them spend their nights till bed-time, in making baskets, mats, and brooms, &c., for their own benefit. All who wish it, are allowed to attend the preacher of their own choice, on every Sabbath; and in communion seasons have Saturday to attend church.

I have no hesitation in saying that they are infinitely better off than the free negroes amongst us, and as a mass are better fed, housed, and clothed than many of the poor white families in our community. They are generally much attached to the families in which they live, and good servants always take an interest in the prosperity of their owners. When servants become old, and unfit to work, the master is bound by the laws of the State, to take care of them as long as they live.

There are some exceptions to this general rule, and you will sometimes find hard masters, even when they have white servants.

Your obedient servant, Henry B. Jones.

Brownsburg, Rockbridge Co., Va., Feb. 4th, 1854.

NATIONAL POULTRY SHOW.

The largest collection of the feathered tribe ever collected in this or any other city in this country, has been on exhibition at Barnum's Museum, during the past month. The number on exhibition is said to be about 4000, and embraces the common domestic fowl, geese, turkeys, ducks, pigeons, prairie-hens, pheasants, pea-hens, quails, guinea-hens, eagles, swans, &c., each species and variety being represented by both males and females. Besides these, are deer, terrier-dogs, gazelles, rabbits, pigs, &c., &c. They occupy all the room to be spared for them in three stories of those large halls. The number of exhibitors exceeds a hundred. The most extensive of these are Mr. McCormick, of Long Island, (?) and Mr. Platt, of Rhinebeck, N. Y. The States of New-York, Massachusetts, New-Hampshire, Rhode-Island, and New-Jersey, are represented in the coops, by natives of almost all the countries of the globe.

We cannot enumerate the various birds by their names, but were very glad to hear Mr. McCormick, in his remarks on the 17th, recommend that all the fowls from Eastern Asia be called by one name, Shanghais, and the varieties be known by their color only, as white Shanghais, speckled Shanghais, &c., and to find that this plan was adopted by a resolution of the Society here and at Albany. We could never distinguish between several of the "varieties" by their appearance, and perhaps it was not from ignorance, but because they were all alike.

The addresses, on the 17th, were by several gentlemen, but we were disappointed in the amount of well-ascertained facts that were presented. We call to mind but two items of practical importance, and these were—1st, that pullets seldom commence laying eggs till they are six months old ; and 2d, that the best fowl for general use is the cross of the Shanghai and Dorking.

These statements may be reliable, or they may not. We should be sorry to eject the beautiful "black Spanish" from our yards, and still hope good reason may be assigned for retaining them. The most *beautiful* birds, of *these* varieties, in this exhibition, were the Mexican game-cock, and the handsomest of the feathered race, the "golden pheasant." Then came the "silver pheasant," peacock, some varieties of pigeons, &c., &c.

The only pigs exhibited were a *beautiful* pair of Suffolks, ticketed $150.

NEW-YORK STATE AGRICULTURAL SOCIETY.

The Annual Meeting of the New-York State Society was held in the Hall of the House of Representatives, at Albany, 8th inst. The following is the list of officers chosen for the present year:

President.—William Kelly, Rhinebeck, Duchess county.

Vice Presidents.—J. C. Jackson, New-York; A. B. Conger, Rockland; Geo. Vail, Rensselaer; Le Roy Mowry, Washington; J. C. Woodruff, Onondaga; J. Barber, Cortland; D. H. Abell, Livingston; S. M. Burroughs, Orleans.

Corresponding Secretary.—B. P. Johnson, Albany.

Recording Secretary.—E. Corning, Jr., Albany.

Treasurer.—B. B. Kirtland, Rensselaer.

Executive Committee.—Edgar C. Dibble, Genesee; Elon Comstock, Oneida; Charles Morrell, Tompkins; T. B. Arden, Putnam; Ambrose Stevens, New-York.

Not being able to be present, we take the following extract of their report from the *American Agriculturist:*

The report of the committee appointed last year to take into consideration the subject of selecting two or more places to hold the future annual fairs of the Society, was then made. The report strongly urged the propriety of selecting two places to which the Society should limit their exhibitions. The conclusions of the committee were, however, strongly controverted by General Burroughs, of Orleans, and others of the members present, and the report was not adopted. The perambulating habits of the Society are therefore to be continued hereafter, and after a full consideration of the *pros* and *cons* on this subject, we are inclined to the belief that this will be most decidedly for the interests of the Society. If it incurs something more of expense and trouble, and the shows are not in all cases so full or conveniently arranged, the general result will be more satisfactory, and for this reason, we think, more useful. This Society is eminently a democratic one, and its success, and indeed its very existence, depends on its popularity with the masses, and these will only be propitiated by an occasional show, at a point which may be the most convenient to them.

The next, and only other engrossing topic of the meeting, was the location of the show the present year. The committee appointed to determine this had, by a small majority, reported in favor of holding it in the city of New-York. This conclusion was strongly opposed by several leading members, who deemed it a desecration to bring the affairs of the Society into such close proximity with the emporium of commerce and the arts. The report was, however, ably defended by Messrs. King of Queens, Stevens of New-York, Allen of Erie, and others, and after a close vote, was carried in favor of this city. On New-York, therefore, rests the *onus*, and we hope also it may prove the *honor*, of providing for the forthcoming show, which a reasonable exertion on the part of its friends, we trust, will make the most effective and remunerating agricultural exhibition ever held in the United States. A persevering and united effort on the part of its friends is all that is necessary to secure these results.

The exhibition of fat cattle was very good. A large number were at the Bull's Head, and generally were well-bred, meritorious beasts. Yet we believe there were not more than two or three thorough-bred animals, though a majority were crosses of our best breeds. There is very great room for improvement in this department, which we are confident we shall realize within the few succeeding years. Most of our pure breeds are too valuable to be turned into beef, and it will not be till we are more fully supplied with them, that they can be appropriated to the shambles. Three remarkably fat spayed heifers, and one ox, pure red, and worthy of the Devon blood, were shown, and proved the very superior qualities of the breed for beef.

Only a few head of fat sheep were on the ground, and with the exception of some three or four, were not peculiarly creditable to the exhibition. Some fine carcasses were exhibited, though the display of good meats was rather meagre, and much inferior to that of last year.

No fat pigs were on exhibition, but there were a very few dressed swine of very superior quality. One pig, 9 months and 13 days old, raised by J. Winnie, weighed 386 pounds, live weight, and dressed 336 pounds, a loss of only one eighth in dressing. We inquired of the owner its breed and treatment. He said it was mostly China, and had been fed chiefly on boiled corn. Later in the season it had, in common with some half dozen others, the offal from a dairy of three cows, boiled pumpkins, soft corn, &c., with a free run at all times of a good grass pasture. This is the true way, and the only way in our opinion, of making pork-raising profitable in the eastern portion of the United States; and with great deference to the ideas and practice which generally prevail at the South and West, we believe it the true way of making the utmost profit from swine there and elsewhere. Col. Sherwood, of Cayuga, exhibited three remarkably fine specimens of Suffolk swine, which were not destined for the butcher till their breeding capacity shall be exhausted.

There were very fine samples of grain, though these were much less abundant than we have a right to expect from so large a State. We think the interests of the producers would be largely promoted by increasing the number of samples, and make this in some measure a *fair* or *market*, where buyer and seller can both meet to exchange the choice seeds of the former for the money of the latter.

The poultry exhibition, under the auspices of the Society, was very meagre in its extent, though it contained some choice specimens of fowls. This was owing to the large exhibition of the separate Poultry Society, held at the same time in Albany, which, from the superior interest and competition excited, drew off most of the fancy birds. The latter was truly a grand affair of its kind, and was by far the most meritorious exhibition of poultry, both in excellence and number, we have ever seen.

The show of dairy products was quite limited; and the display of fruits much less than last year. But there were many very fine specimens of apples, pears, and grapes. The two latter fruits are destined, ere long, to be raised in large quantities for winter use. We know of no foreign luxuries so desirable and wholesome, and at the same time so economical to the consumer, as our best native fruits. And we know of none, either, so remunerating to the producer. We look for the production not only of these, but of other of our more delicate fruits, such as the peach, the plum, &c., (to be preserved by some new and more perfect process than hitherto adopted, by which their peculiar flavor and aroma will be retained,) in such quantities that our tables may groan under the weight of these luscious viands, instead of the crude, half-ripe, or half-spoiled foreign fruits that now occasionally, and at high prices, grace our boards.

TRIAL OF REAPERS.

We have received the following proposal from Mr. Wright, and although its details may possibly be improved, the substance of it appears free from objection. Differences of opinion might exist in relation to the persons who ought to bear the expense, and one question might come up still more substantial, namely: whether different reapers would not be preferred on different surfaces. There might be a practical difficulty here which would lead to as many opposite results as do the trials now had at annual fairs. But we let Mr. Wright speak for himself.—[Eds. P., L., & A.]

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

Dear Sir: As a manufacturer, I desire to enter my protest against any more petty trials of reapers. They cost a great deal, and amount to nothing. The decision at one trial is reversed the next week at another, perhaps with the same machines, and often the competitors can show their defeat was owing to some extraneous circumstance, as not having a suitable team, bad driving, or unfortunate management in some way.

A reaper-trial is not like a horse-race, where the sole object is to beat, regardless of every thing except the coming out ahead; it is, or ought to be, to ascertain surely which is the best machine, and not so much to benefit the owner as the farmers, who wish to know what kind to buy.

How absurd is it for any set of men—I care not how great their experience and judgment—to take from three to a dozen reapers, perhaps all of acknowledged merit, and by the cutting of two acres each, as was done at the Wooster, Ohio, trial, where mine was defeated; or even by cutting five or six acres, as at the Richmond, Indiana, trial, where mine was victor, decide positively and absolutely that one reaper is better than all others.

Such a trial might show whether a reaper would work or not, but to judge between rival reapers, of which there are over twenty of established reputation, each having its points of excellence, a long and thorough trial must be requisite, to see how they work in different kinds of grain, and under varied circumstances, and how they wear. A trial, to be decisive, should go through an entire harvest. One, too, that was thorough and reliable, would be equally available in one State as another. They are also expensive to all concerned. I would therefore propose a general trial on something like the following plan:

Let several State Agricultural Societies unite, each appropriating $200 to $500, and appointing one or two committee-men, in whose experience, judgment, and fairness, entire confidence could be placed. Let the committee make their arrangements early as possible, adopt their rules, and appoint time and place of first meeting. They might begin South, and proceeding

North, continue the trial for weeks if necessary, leaving out one machine after another as its inferiority became manifest.

The committee should have all their expenses paid, and perhaps compensation besides; and the cost of removing reapers from place to place might also be borne by the committee, in order to enable every builder to come into the trial; and for this reason I would not require any entrance-fee, though some of the larger builders would doubtless be willing to contribute to the general fund. If five or more societies can be got to unite in such a trial, I will contribute $200 to $500, or as much as any other builder.

The surplus funds should be divided to the best machines, say half to the first, one third to the second, and one sixth to the third, to be paid in plate or money as might be desired by the winner.

To save time and expedite arrangements, I would suggest to parties interested, to correspond with Col. B. P. Johnson, *Secretary New-York State Agricultural Society, Albany, N. Y.* I have not communicated with him, but am quite sure his interest in agricultural matters will cause him to bear the labors with cheerfulness.

Yours respectfully, J. S. Wright.

Chicago, Feb. 7, 1854.

CONCRETE CELLAR BOTTOMS.

The facility and cheapness with which the bottoms of cellars may be made clean, sweet, and impervious to water, is generally but little known to house-owners; nor the ease and certainty with which water may be excluded from cellars where it is difficult to drain.

In soft and pervious soils, this process is best performed by paving with small stones, laid in sand; but in common, compact soils, the natural surface, well levelled, will answer all purposes. Make a thin mortar with water, lime, and coarse sand, of the consistency called *grout*, or so thick that it can be poured from a pail on the ground. Commence with a portion of about eight or ten feet at one end, and throw on sufficient to cover it an inch or more thick, and with a scaper, or rake-head, spread it evenly and smooth; then throw on as much clean, coarse gravel as it will absorb, and so continue until it is finished. In twelve hours, or as soon as it has *set*, sweep the overplus gravel evenly over the surface, and ramp it down with a short plank and a pounder, until it is smooth and compact, and in a few days of good weather, it will become like a solid rock. It assists its durability and firmness, to give it several good dashes of water after it is dry.

To render the sides impervious to water, where drainage is difficult or costly, requires that the wall should be laid with mortar originally; and at the time of constructing the bottom, a good, well-proportioned water-lime mortar should be plastered on, a little higher than the source of water, and well and firmly slicked down when about half dry, and followed by another coat of the same; when, if a proper time intervenes before there is any outward pressure of water, it becomes tight as a barrel or tub; is always sweet, clean, and cool, and no vermin can enter or find lodgment.

The sand used in the grout and mortar should be coarse, clean, and sharp, and the gravel from the size of walnuts down to coarse sand.—*Rural New-Yorker.*

IMPROVEMENTS IN COMMUNICATION BY HIGHWAYS.

BY ZERAH COLBURN.

The necessities of business and social intercourse have created various means of communication. Upon the land, railroads, highways, and canals for *matter*, and the telegraph for *thought*, are among the facilities in our reach. Railroads afford the most expeditious, and at their working velotial capacity, the most economical application of locomotive power. Railroads, however, require a concentration of business for their creation and support; they are the product of society, and not of the individual. They are in all cases the *trunks* of which common highways are the *branches*, and so long as railroads are used, so long will highways be occupied in both the primary and the ultimate stages of transportation. However important the movement effected upon the railroad, it can be only *intermediate*, the traffic being *supplied* and *distributed* by the common highway. Railroads may occupy the route, and supplant the business of *coincident* highways, but *lateral* roads will be built, of an extent more than sufficient to restore the relation previously existing.

The engrossing interests of our railways almost preclude a calm comparison between them and the ordinary carriage-roads of our country; but so soon as we perceive the principle by which the latter must always exceed in extent the former, we cannot fail to be impressed with the importance of any improvement, having for its object the application of the most efficient and economical power on highways.

We must look upon the railway and the highway systems of the country as mutually dependent; neither can supplant the other.

The object of the railway and of the highway is the same—to facilitate carriage. The former, requiring greater economy to develop its value, has been made operable by inanimate power. The latter is still worked in the most primitive manner. There has been no important application of industry, or process of production, in which the service of inanimate power has not been been sought. Travelling by highway remains, however, essentially the same as at the invention of carriages. Animals still furnish the locomotive power. Without regard to the purpose of its *application*, the *quality* of power sought in modern times is in all other cases inanimate; involving less first cost, less subsequent depreciation and expense of maintenance; being more efficient, more controllable, less in opposition to the impulses of humanity, and affording employment to a higher grade of labor.

We must therefore apply steam-power to common roads, not that such application of power is as economical as upon a railroad, it being but about one eighth as efficient at the best, but that common roads must exist by the very existence of railroads; and that they must also be worked *with some power*, and that steam-power is better, for every reason, than any other.

There were many reasons which prevented the adoption of the early steam-carriages. The motive for the use of steam-carriages was different then from what it would be now. The contest was then between the *railroad*, operated by *horse* or *stationary* engine-power, and the *highway*, operated by *steam-power*. The steam-carriage had been tried, well matured, and had become successful, when modern railroad locomotives existed only as a *suggestion*. The fortunate idea which afterward determined the application of steam to the railway, and the gigantic enterprise offered in its development, the latter not yet completed, arrested at once all further efforts in the introduction of steam upon highways. The results given by the use of steam on railways induced a belief that *such* was soon to be the universal means of locomotion upon the land. The necessary relation between the two systems was forgotten. The engineering energy and financial patronage of the country sought only one channel.

There were other reasons which kept steam-carriages from general use. While the locomotive was provided with its appropriate track, the one being made expressly for the other, the steam-carriage could only run upon the public thoroughfares, already occupied by the ordinary means of conveyance, and in the success of which the proprietors of turnpikes were immediately interested. Hence prohibitory tolls were imposed upon the intrusive steamers, and it soon became a question with their owners, not if they would prove practicable, but if they would become profitable. The influence opposed to them soon settled that point, and established the fact, not that they *could not*, but that they *should not pay.*

We have already said that steam-carriages proved successful as a mechanical application. While the question was debating, whether steam-locomotives or stationary engines should be adopted for the Liverpool and Manchester railroad, (the pioneer in English railroad enterprise,) there had been built a large number of steam-carriages; and by the time the "Rocket" had proved its capacity for speed at twenty-two miles per hour, on the railroad, steam had been used on common roads at speeds of *thirty miles per hour.* In 1829, Goldsworthy Gurney had gone from London to Bath with his steam-carriage, and in returning made a distance of 84 miles, including several stops, in ten hours. He afterward made from twenty to thirty miles per hour, while Summers & Ogle's carriage, built soon after, was run over portions of the distance between London and Southampton at a speed of from thirty-two to thirty-five miles per hour.

In the third volume of the Executive Documents of the 22d Congress is given a reprint of the evidence upon steam-carriages, given in to a select committee of the British House of Commons, and first published Oct. 12th, 1831. Most of the inventors and proprietors of steam-carriages were examined before this committee, in the summer of 1831, besides a number of prominent engineers, whose opinions were asked as to the ultimate value of such modes of conveyances, and especially as to their effect upon highways.

Not wishing to base any estimation of what may yet be done upon the achievements of a period so long passed, we should not have alluded to this document in any terms, but for the fact that it contains reliable information upon the point, important to succeeding experimentalists, and such as is not generally accessible.

At the time of the examination by the select committee, Gurney, Hancock, Summers, and Ogle, and James Stone, the latter now of New-York city, had operated steam-carriages upon highways. All of these men contended against the greatest of difficulties. Discriminating and burdensome tolls had been placed by the turnpike proprietors upon the passage of all steam-carriages, a disposition being evinced to obstruct their success; while a wide misapprehension existed as to their effect on roads. To these were added the great expense of such trials, undertaken by men looking solely to their own interests, and who were not theorists, attempting the perfection of ingenious models. And what was worse, the absence of those guides which experience had given to other branches of engineering, was an ever-present difficulty, requiring repeated and costly trials for the determination of each proportion and arrangement.

The results elicited were, that carriages of from 53 to 80 cwt. had been built; that each 10 cwt. was equal to one-horse power, while in some cases, with better arrangement and construction, 5 cwt. yielded the same power, that the boilers were safe from explosion, the machinery safe from fracture the engine not liable to frighten horses, being free from smoke, and having no escaping steam. That a speed of ten to twelve miles per hour was an ordinary performance, while Summers & Ogle's carriage had gone at a slow speed, up a hill of 1 in 6, and 24½ miles per hour, loaded with passengers, over the London road. The same engine had gone, with 19 passengers, up a hill of 1 in 12, at 15 miles per hour. It had gone 4½ consecutive miles on a level, in 9 minutes, or at thirty miles an hour.

These engines could be stopped when going at eight miles an hour, within 21 feet. Hancock's carriage could turn around, on the inner circle of only 4 feet diameter, or could turn from one street to another at right angles, and each of ten feet width, at six miles per hour.

It was proved that there was no slipping of the wheels at 22 miles an hour.

McNeil, McAdam, and Telford, all eminent road-engineers, agreed that the wear produced by horses' feet was much greater than that by the wheels of wagons. One estimate of the proportionate wear by wheels and horses' feet was 1 to 3 on common roads, and 1 to 7 on the London pavements.

With such results actually attained during periods of several months, and in some cases for one to two years, there could be no doubt of the practicability of steam-carriages. As to their economy, it was estimated that they could save two fifths in first cost, and in wear and tear over horses doing the same work, and five fifths of the expense of feed and attendance.

Independent of these results, which have been given merely to replace them on record, the question of the adaptation of steam to good common roads, appears of easy solution.

The power that usurps the place of animals in mills, in mines, and on *railroads*, ought to do so with the same economy on common roads. The crowded streets of our cities give the best test of such a plan. The objections to *tracks*, being very serious where these are laid through streets occupied by carriages of nearly all kinds, and the bulk, danger, noise, and expense of horse omnibuses, would be essentially reduced by the substitution of a good system of steam-carriages.

[The foregoing is taken from the *R. R. Journal*, and is followed by a commendation of Mr. Fisher's steam-carriage, which was described in our last number, and on which another article will be found in another page—Eds.]

Valve Motion.—T. Goodrun, of Providence, R. I., has applied for a patent upon an improvement in the arrangement and mode of operating the valves of steam-engines, which consists in regulating the admission of steam to the cylinder by means of rotary tubular valves placed in the cylinder-heads, and receiving a constant rotary motion, and in exhausting the steam from the cylinder through ports in the cylinder-heads, furnished with puppet-valves opening inward, these valves being so connected that when one is opened the other is closed, they being operated by the piston, which opens the one and closes the other at each end of its stroke.

AUSTRIAN SALT-MINES.

PUTNAM'S Monthly, for February, contains a description of a visit to a salt-mine in Austria. It may be taken as a sample of the mining of Central Europe. The author, having been robed in a miner's dress of white duck, and having taken the precaution to guard his right hand with a thick mitten, and his head with a well-wadded cap, commences his subterranean exploration.

The first process was to walk through a long, narrow, dark, cool passage-way, gently descending for three thousand feet, into the mountain's heart. As the workmen passed me on their way to dinner, we had to make the best of our poor candle-light to get by one another in the confined path, and each said, "laub," a hasty contraction for the German, "with your leave, sir." And now came the curiosity of this underground journey. The gently sloping path, sustained by boards and beams, and just wide and high enough for one beef-eating Englishman at a time, made a sudden dip, and the guide threw himself down, and made me do the same; slipped his right leg over a smooth, wooden rail, and grasped with his right hand a cable supported on rollers; and thus we slid down as fast or slow as we pleased, a depth of one hundred and forty feet at an angle of forty-one degrees. It was not very funny to see your only dependence in human shape sinking out of your sight into the bowels of the earth; but I found the exercise delicious, and would recommend it to all good people who have mines to exhibit or sunken caves to explore, as certain to bestow upon them an unprecedented popularity.

This was succeeded by another gallery-walk, then a second descending shaft—again a nearly horizontal footpath, followed by a third "coast" downwards—and so on, the longest walk being the first of about three thousand feet, and the greatest descent at one time falling short of two hundred feet. In no part was the air unpleasant; the greater coolness was compensated by the constant exercise and the thick miner's dress. Several times we came upon large chambers, which showed with no brilliancy, as our poor candles made their darkness visible, because the saltspar is mixed up with large masses of earth, though some fine crystals are shown at a little museum, in the centre of the mountain. After this succession of similar passages had begun to be monotonous, a number of little lights began to spring up all around me, as if in fairy land; and the guide to a flat boat, which an invisible Charon set in motion at once across this lake of salt, over three hundred feet in length. Here was the secret of secrets. A chamber is excavated, wooden pipes are led to it and from it, the first of which brings the fresh water from mountain springs which gradually impregnates itself with strong brine: then after a period of months the lower pipes are opened, and the manufactured little ocean runs off to some place where wood is plenty, where I had already seen it at a distance of thirty miles, boiling down into a beautiful, pearly-white article for commerce. I was not a little perplexed at first, and I find other travelers have come away without ascertaining how the salt was procured, by not seeing the whole process going on at once, and from supposing that this pond was made by nature, and had no special concern with the government manufacture. But, as fast as this lake is formed and the fresh water dissolving the salt and separating it from the clay, another is prepared, where the mineral is thought to be more abundant; and only the worthless earth is seen in process of removal in little carts, while the precious salt carries itself out silently and away from observation, in hollowed trunks of trees. The great care is to prevent the earth from falling in upon the workmen and crushing them, as has been the case repeatedly; but the most surprising puzzle to an uninitiated observer is, why, in the process of six months or a year, this water does not run off through some natural outlet, by dissolving the salt in its way. These ponds must sometimes lie very near together, and directly above one another; besides, as their roofs are entirely flat, frequently destitute of artificial support, and what rock there is crumbles to the touch, we might expect these wide sheets of water would break through. Accidents, however, are rare, though there are sometimes forty excavations in a single mountain.

How parties of pleasure feel in crossing over this deathlike lake at such a funereal pace, with not a sound to break the oppressive stillness, and rarely a single crystal reflecting the feeble twinkle of the illumination for which you have paid, I cannot say; but, to a lone voyager like myself, it was one of the most solemn moments of life; darkness seemed to rest like a tombstone upon me; none but fearful images filled my visions; the repose of my body added to the gloom of my mind; and it was a blessed relief when I could use my own limbs on what seemed solid earth again.

Still other slides came, one at an angle of fifty degrees, and one, the longest in all the works, of four hundred and sixty-eight feet. This brought me as far down as the four miles of winding road had carried me up; but, as there was none of its sudden changes of view, no wild forest, merry mountain-stream, knot of cherry-faced peasant-girls, laughter of happy childhood to "cheer the toil and cheer the way," I may be pardoned for wishing myself out.

But now came a new vehicle. I stood alone in the very heart of this mountain of limestone, gypsum, and marl, when two wild boys mounted me between them upon a wooden horse, on a rude enough wooden railway, and, in a moment, my steeds began to show their metal, and I was run through a passage of a mile tunnelled in the solid stone; once only the ragged colts paused to take breath, and to let me admire the light from the mouth, which seemed nothing else than a bright blue star. Very soon genuine daylight came to our relief; and but slightly wearied, I bounded from the cavern mouth to take the Eilwagen on its return to Salzburg.

I learned a little more of the salt trade in Austria. It is a government affair, and six thousand men are said to be employed, some in preparing the rock crystal for the market, some in boiling or evaporating the sea water, and more in connection with mines like the Durnberg. The men did not seem very healthy, and one part of the process must often cause the sacrifice of life. At Ebensee, I found them boiling down the water brought from Hallein in thirty miles of pipes, and I learnt that whenever the iron vat leaks, a workman is obliged to wade through the boiling liquid to the injured place upon a kind of stilts; if his feet should slip, he would certainly boil to death, and if not of strong lungs, he is likely to stifle, a horrible fate either way. For more than a week, these fires are continued day and night, eating sadly into the forest, the salt being removed as fast as it is crystallized, and fresh brine poured in. Then the fire is extinguished, the pan, which is a foot deep and sixty round, thoroughly retinkered, the calcareous crust which adheres to the bottom and sides broken off, and poor plates replaced by new.

THE GREAT EXHIBITION.

Since the matter for our last number was prepared, the various jurors and judges have made their several examinations, and have pronounced their decisions. Medals have been awarded or denied, "honorable mention" has been made or declined, and the hopes of some have become fruition, and the fears of others have proved to have been well-founded. Nor would it be strange if injustice should be, to some extent, the result. In justice to all concerned, it is not, perhaps, too much to say that it is better to have jurymen thoroughly familiar with the several matters on which they are to decide, than those who are not specially practised in the business which they are to judge, although they are very respectable, very honorable men. "Perhaps you may sometimes be placed in the same position," was the remark of one to an unsuccessful exhibitor, who found fault with his decision. And when asked for an explanation of his language, he replied, "You may be called to judge on a subject on which you are not informed." For one, we should not voluntarily place ourself, nor allow others to place us, in such a position, and we should regret to see others less cautious than we would be on that point. It would also have been wise not to have allowed a single instance in which one that could be called a rival in the market, even though he was not a competitor within the Crystal Palace, to have been upon any of the juries. We believe, however, that as much caution was used on all important points connected with this matter, as the nature of the case would admit.

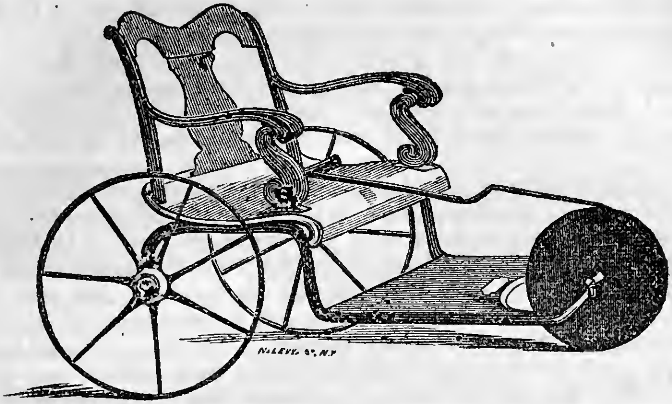
The several degrees of honor are represented by a silver medal, bronze medal with especial mention, and a bronze medal. The gold medal, so common in the more important contests for distinction, was entirely omitted. This may have been wise, but it unhappily admits of a less "honorable mention." To invite artists to cross the Atlantic, and some of them the Mediterranean besides, and at the best for a silver medal, is presenting rather a small inducement, at least for a very expensive kind of exhibition, or one liable to serious damage. Perhaps, however, the dissatisfaction, if any exists, will be only momentary. The "honorable mention," if it be of light value, is certainly bestowed with a heavy hand. According to an exchange, (for we have not counted them,) the whole number of silver medals is 116; of bronze medals, 1168; with 1210 instances of "honorable mention." American exhibitors receive most of these awards; though 35 silver medals were awarded to foreign artists. Out of 25 silver medals awarded to machinery, our own artists receive 24.

"In the departments of agricultural products and implements, naval architecture, textile fabrics, ladies' garments, shirts, &c., and India-rubber materials, our own country absorbs all the honors of the silver medal." We fear our juries, in this, have not been just to "our trans-atlantic neighbors." They surely exhibited some very beautiful goods.

INVALID'S LOCOMOTIVE CHAIR.

Among the articles designed to promote the comfort of the sick and disabled, is an invalid's chair, patented by Thos. S. Minniss, Meadville, Pa. An engraving of it is annexed.

It is so arranged, that it is set in motion and guided by the handle which is attached to a crank on the wheel. When the chair is to be drawn by others, the position and arrangement of the crank can be instantly adapted to such use, or the chair may be pushed by another person, while it is guided with the handle of the crank by the invalid. In its construction it is light, compact, and durable, and in a cheap form is offered at $20. The upholsterer can add whatever amount of expense may be desired, at the order of the purchaser.



Messrs. J. L. and D. J. Riker, 96 Suffolk street, are the agents in this city.

STEAM CARRIAGES.

THE *Scientific American* affects to be surprised that, "in these days of railways and cheap locomotion," several of its cotemporaries should advocate steam-carriages for common roads. It admits, however, that before railways were invented, there might have been a show of reason for them. And, as we find in that journal, (in 1848, we believe.) an engraving and description of Gurney's steam-carriage, and a recommendation of it for plank-roads, we presume that down to that date it will not deny that there was some plausibility in the project. But since Mr. J. K. Fisher has proposed to build a carriage, and has failed to pay this journal the necessary cost for publishing a description of it, the case seems to have changed; and it has undertaken to prove, by instancing the failure of some steam-carriages—Gordon's improvement on Gurney's—that no steam-carriages can successfully compete with horses. It is unfortunate that no such carriages were ever built at all. But had they been built, and failed as stated, it could have proved nothing; for we have proof that Gurney's, Ogle's, Hancock's, Macrone's, and Russell's carriages were brilliantly successful; that they ran at 16 to 20 miles an hour when loaded; and that they would have worked with profit had they not been subjected to prohibitory tolls, to such obstructions upon the roads as stopped horse-carriages, and to the action of magistrates, who were compelled to enforce unjust laws against them.

If this journal supposes that railways ever will supersede common roads, and go to every house, it may preserve a logical consistency; but if common roads are to be used at all, then the cheapness of locomotion, which is due partly to steam, is in favor of steam-carriages. And as the cost of light engines, since the practise in locomotive-building, is about half what it was before, while the work is much improved in quality, the advantage must be greater than it could have been before "these days of railways and cheap locomotion."

Gurney, Forey, Gordon, and other advocates of this system, estimated the cost of steam-power from a fifth to a third of that of horse-power, in 1831. And a committee of the House of Commons reported unanimously that they would "become a speedier and cheaper means of conveyance than carriages drawn by horses;" and that they would injure roads much less than horses. At the present time their economy must be greater in proportion to the improvements in machinery.

The course pursued by the *Scientific American* upon this subject has, at least, to those an interest too much the appearance of that of a paper which expects a direct pecuniary benefit as a necessary preparation to a favorable notice in their columns. This seems the most obvious explanation for their distorted statements of facts on this subject.

SECOND ANNUAL MEETING OF THE UNITED STATES AGRICULTURAL SOCIETY.

This important meeting was held at Washington, commencing on the 22d of February, and continuing several days. Able addresses and discussions were delivered, but too late for our present issue. We shall give their proceedings careful attention in our next number. The weather at its opening was very unfavorable, and the roads were blocked with snow; but the attendance was highly respectable.

THE IRON MANUFACTURE.

Iron is seldom found unalloyed in its native state, though such specimens sometimes occur. In Canaan, Ct., is a vein, two inches thick, which is sufficiently malleable to be made into nails by a blacksmith. Similar veins have been found in Europe.

Iron is, however, obtained for commerce from the ores or oxides, and the more common forms of it are the magnetic oxide, the peroxide, and brown oxide, and in the form of a carbonate.

The magnetic black oxide occurs over large parts of the Eastern continent, and in this country, and to a moderate extent in England. On the New-York side of Lake Champlain, in Peru, and in other townships, it is found in great quantities, and of very fine quality. We have seen specimens that contained 80 per cent. of iron. It also occurs at other places, as at Bridgewater, Vt.; Franconia, N. H., &c. The mines more recently opened in Missouri are of this class.

This oxide is found in connection with gneiss, hornblende, greenstone, limestone, epidote, garnet, &c. It is not found among the more recent deposits. The locality near Lake Champlain is exceedingly rich in the variety of its minerals. It is strongly attracted by the magnet, and itself possesses magnetic power. The form of its crystals is octahedron.

The peroxide is called the red oxide, and also specular iron. It has no magnetic power. By heating it highly, it is reduced to a magnetic oxide. It contains from 70 per cent. of iron to a much smaller proportion.

This oxide is often used as a paint, after undergoing the process of calcination. It forms a red-brown, a Spanish or Indian brown. The houses of the peasantry in Northern Europe are usually painted with it.

This oxide occurs extensively in Northern and Western Europe, and in this country. An inferior quality of it exists extensively in the Pittsburgh coal-fields, and it is also found in Ohio, in Massachusetts, and Western New-York. It is often found in nodular forms in beds of clay, and gives color to all our deposits of red clay. Specular iron sometimes occurs in crystals, in the craters of volcanoes.

The brown oxide of iron, familiarly known as hematite, is also the hydrated oxide, as it contains a large admixture with water. It never contains more than about 59 per cent. of iron.

Hematite is not magnetic, but becomes so by roasting. When calcined, it yields a red powder. It is found in various forms, as globular, mammillary, reniform, stalactitic. It is abundant in every part of the globe, and in almost all geological connections. The principal beds of it in this country are in Pennsylvania, where are found its richest varieties. In Kentucky, Tennessee, and Alabama also, are inexhaustible quantities. Mines of it occur in most of the New-England States. "It furnishes excellent material for the blast furnace, yields cheap pig-metal, and of all classes of ore is the most suitable for improvement in the forge, as well in the charcoal forge, as in the puddling furnace."

The carbonate of iron occurs in various localities in this country, and in Europe. Some of the best of iron and steel is manufactured from it. In Austria, most of their iron is from this ore, and the "German steel" is one of its products. In England and Scotland, the compact varieties of the carbonate is their principal ore; and it occurs extensively in Pennsylvania, Maryland, Virginia, Ohio, North Carolina, Kentucky, and Illinois. The spathic iron ore, the variety of which occurs in Austria and Germany, is also found in considerable quantities in Plymouth, Vt., and is used there in the manufacture of iron. It is sometimes called native steel. It seldom contains more than 30 per cent. of iron, often not more than 25.

The affinity of metals for oxygen is very strong, with the exception of gold, silver, platinum, and iridium. Hence, these are called Royal metals. Simple exposure to the atmosphere or to moisture will lead to a speedy oxidation. This, in fact, is the process used in the manufacture of some of the oxides. Thus, "white lead," which is the white oxide of lead, is obtained by exposing plates or sheets of the pure metal to air and moisture.

On the other hand, it is the business of the metallurgist, the manufacturer of metals, to separate the pure metal from its oxygen, and from all other substances. This is the business of the iron maker.

The manner in which this is to be done depends upon the nature of the foreign substances mingled or combined with it, and the degree of its oxidation. The strength of affinity varies with the number of different elements in combination.

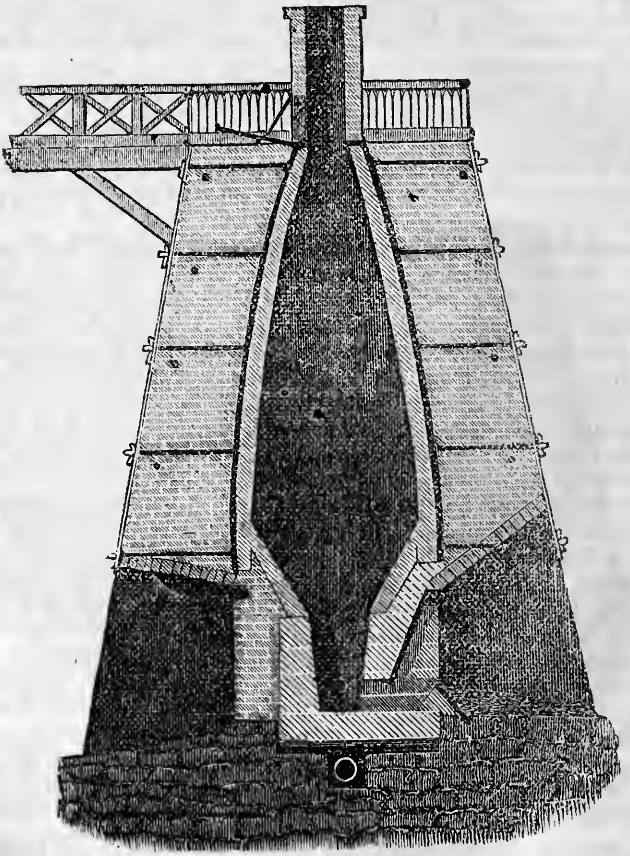
The processes for accomplishing the object thus set forth are two-fold:

If A and B are combined, and A is to be preserved by itself, they may be separated by presenting a third, which will draw away B, and combine with it, or in some instances, it may be done by applying heat.

Now, it is well known that carbon and oxygen have a very strong affinity for each other, and if carbon is presented to many oxides under favorable circumstances, the oxygen will unite with it, forming carbonic acid, while the metal will be left in a pure form. Some of the metallic oxides are thus se parated by heat alone. Gold is one of these, and so are platinum, iridium, palladium, &c. The oxides of iron are separated by a powerful heat.

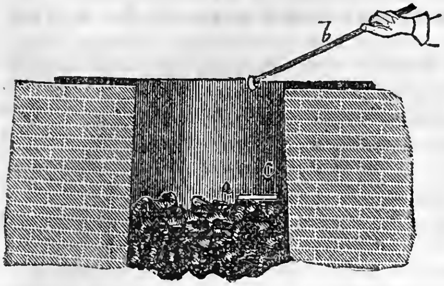
But sometimes, and usually, other foreign substances are mingled with the oxide of iron, such as phosphorus, sulphur, and other metals. Hence, different processes are required, under different circumstances, as already stated. Our next object will be to state these processes, in a very general manner.

Let us premise, however, that certain terms are used in the arts, which, however common, have a technical meaning. Thus, in this art, we have a process called *roasting*, by which is meant the application of heat. But this is done in various ways, in a furnace, under a direct and powerful heat, or in large heaps "in the open air," and not unlike a brick-kiln in principle, or a pile of wood ready for charring.



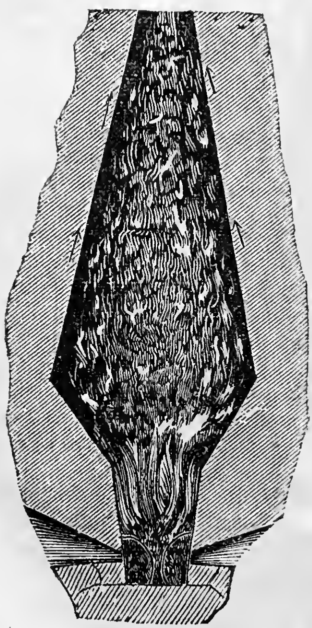
Furnaces are arranged especially for roasting, and the front section of one is given above. There are different forms of these ovens, but they may be reduced to two, the blast-furnace and the lime-kiln, and they work either perpetually or by charges. We are able to present but this single form, and for this and the other illustrations of this subject, we are indebted to our very obliging friend, Mr. W. White Smith, of Philadelphia.

The furnace is always liable to chill, that is, the iron clinkers suddenly cool near the tip or mouth-hole, impairing the draft and choking it up, in which event the whole interior work must often be taken out and relaid. To prevent this, the furnace should be filled regularly; the quantity of ore just filling the furnace. To secure this, a charge measure is often used, constructed of two half-inch round bars so connected that one bar sinks into the furnace while the other serves as a handle; *b* forming the handle, *c* the measure, and *a* the iron plate which prevents the sinking of the rod into the materials.



As already suggested, divers kinds of furnaces are employed in the reduction of ores, and various kinds of fuel are employed, of which we may treat separately hereafter. Also the various *fluxes* which are used to expedite.

The figure on the margin represents a section of a blast furnace in operation, filled with coal, ore, and fluxes. If we introduce at the tuyere holes, *a a*, a current of air, or blast, combustion in the lower part will ensue, and carbonic acid will be its product. But if there is an excess of fuel, and a limited supply of air, the result will be carbonic oxide. In its progress through the coal, the carbonic acid combines with more carbon, and is reduced to a carbonic oxide. Carbonic acid is of no use in reviving iron from the ore, for the ore is iron and oxygen, and the acid cannot combine with an additional quantity of oxygen, and cannot, therefore, abstract any amount of oxygen from the ore. But carbonic oxide will combine with oxygen, with which it comes in contact within the furnace. The principle which governs the construction and management of this furnace, therefore, is so to arrange the fuel and the draft, as to secure the greatest possible combination of the product of combustion with the oxygen of the ore. If all the oxygen is thus abstracted, the ore, as it descends, will become metallic iron and foreign matter.



As we do not write this for the practical worker in iron, but for the general reader, it is unnecessary to go further into this subject by pointing out the difference between white iron and gray iron, &c., but we merely add that the blast works both chemically and mechanically in the destruction of coal, and that a certain power of blast will produce particles of a size best calculated to penetrate the pores of the ore. If the metal is liquid, it is difficult to separate the carbon from it, and to secure a combination of carbon with it.

We shall pursue this subject in our next number.

ON THE CHOICE OF BROOD-MARES.

One of the most important elements of success is the choice of brood-mares. Never breed from a mare which is not well bred. By well bred, I do not mean having many crosses of blood; for many mares, nearly and even quite thoroughbred, are very undesirable animals to breed from. A well-bred mare, in the true sense of the word, is one of which the progenitors, for many generations back, have been carefully selected. In this respect, Yorkshire breeders possess a considerable advantage over those who reside in districts where breeding is less extensively carried on. In the former country, it is easy for a farmer, even of moderate means, to procure mares which are above the suspicion of being tainted with cart-blood. Owing to the abundance both of thoroughbred and "nag"* stallions, a roadster mare is seldom or never put to a horse of inferior stamp to herself. Thus, with little or no trouble or cost, a class of mares is in the hands of Yorkshire farmers, which elsewhere it would require much expense and research to gain. With but little of outward show to recommend them, they breed excellent hunters, when put to a suitable thoroughbred horse; whereas, mares of similar appearance in other countries would only produce stock fit for harness, if, indeed, they were good for any thing. The reason is, that in the latter case the cart or other inferior crosses would reäppear, and thus baffle the calculations of the breeders.

Perhaps mares such as the Yorkshire farmers use are, on the whole, the safest for the agriculturist to breed from. Although not so high bred as some others, they are less expensive to purchase, and require less judgment in their choice than those of a more ambitious character. They possess one recommendation which the farmer should never lose sight of—I mean power. Let his object be to produce a colt, which, if it fails as a hunter, will be useful in harness; or, if some accident should unfit him for fast work, will at any rate take his share of work on the farm. I know no better test of success than this, namely, that the colt which loses a portion of its conventional value, should yet retain its real usefulness. Always make strong, well-set-on fore-legs a primary object. They should be placed forward, so as to be an efficient support to the animal; and the shoulder ought to stand backward,

* A "nag" is a roadster. He is less in size than a coach-horse, and better bred.

in order to allow the legs liberty of action; but it must be somewhat round and full, not thin and confined, which some persons conceive to be a *fine* shoulder. Never breed from either mare or stallion with a decidedly bad shoulder. An animal may dispense with almost every other point of excellence, and yet be of some value; but if it has a bad shoulder, it bears so thoroughly the stamp of worthlessness, that nothing else can make amends for this fundamental malformation. If your mare is tolerable in her shoulders, but not very good, endeavor to find a stallion which is particularly excellent in this respect. The fore-legs and shoulders being right, action usually follows. But this being a very important point, do not take it for granted, but subject it to your strictest scrutiny. For my own part, I almost think as highly of action in a horse, as Demosthenes did of it in reference to an orator; at any rate, not even the most fabulous combination of beauty, breeding, temper, and shape would induce me to buy a horse which did not possess it.

The foot ought to be taken up straight, by a graceful bend of the knee, and set down again flat, without any deviation either outwards or inwards. The most common faults of action are a sort of shovelling movement forward, with the knees almost straight, and a sideways motion, either outward or inward, with one or both feet. But it is quite possible for the knee to be too much bent, and the foot to be apparently pushed backwards when taken up, instead of forward, thus causing it to be set down too near the place whence it was raised. Objectionable, however, as such stand-still action may be in a hack, I should prefer it in a brood-mare to the opposite defect.

The great reason why action in the mare is so essential is, that she having the roadster blood, ought to supply it; whereas, it is not always possible to find it in a stallion; it is, indeed, very rare to see a thoroughbred horse whose action is such as would be desirable in the park hack, the roadster, or the hunter. The racing man cares not, provided his horse's head is first seen at the winning-post, in what form he moves his fore-legs. The qualities which win fame for the racer are speed, endurance, and pluck. The conformation most conducive to speed depends more on the back, loins, and hind-legs, than on the fore-legs; it is therefore by no means uncommon to find horses, whose performances on the turf have been above mediocrity, with fore legs such as would not wear for three months on the road, and with action such as no man would willingly endure in his hack or his hunter. Thoroughbred horses, with every point such as the breeder would desire, combining power and beauty, equally excellent in their fore-legs, their ribs, and their hind-legs, are not to be met with in every neighborhood, and even when found, will seldom cover half-bred mares at all, and then only at exorbitant prices. These are the magnates of the stud which will not condescend to mates of descent less illustrious than their own. If, then, you cannot secure their services, you must avail yourself of the best within your reach. Supposing your mare has the fore-legs of the action which I have recommended, you may safely put her to a horse which has tolerable fore-legs, provided he is in general power, in pedigree, and in performance such as you desire. I mentioned in a former letter that I once put some mares of my own to "Tomboy;" his fore-legs were by no means first-rate, and his front action was decidedly scrambling and bad; but my mares being excellent in both these points, their stock showed no traces there of their sire's deficiency. To breed colts with bad fore-legs and insufficient bone, is to encumber your land with stock neither useful nor salable. With mares of first-rate excellence in that respect, you greatly extend the range of stallions which it is safe to put to them.

I shall not enlarge upon other points of the mare in detail, for the reason that their selection may in general be left to the discretion of the breeder; and also, because there are many of them which in practice will be more frequently supplied by the horse than the mare. I must say, however, that I should not like to breed from a mare with a bad head or a small eye. Natural soundness, especially in the feet, is very important, and so is good temper. With mares, as with cows and ewes, there is a certain character difficult to describe, but which the experienced breeder knows by instinct, as belonging to those likely to produce good stock. It is not the largest or the most showy, but those which have a certain refinement of form, and a gracefulness of outline, (which are ascharacteristic of the well-bred female as power and muscle are of the male,) which will most faithfully reflect in their offspring their own merits, and those of its sire. Many a large, showy mare, on the contrary, will be provokingly uncertain in her produce; one year bringing a foal as much undersize as next year it is overgrown. Such a mare ought to be discarded as soon as possible.

By observing the course which I have recommended, farmers who exercise ordinary judgment will make as safe an investment as they would in the breeding of any other kind of stock. Their colts will make either hunters, carriage-horses, or hacks of a useful and powerful kind.

There is a class of mares much higher than that which I have described above; I mean those which combine great power with a pedigree little short of thoroughbred—mares which have in their youthful days been foremost in the hunting-field, and contended, perhaps not unsuccessfully, in the steeplechase. Such are the dams of the cracks of the Melton field, and of the victors at Liverpool and Leamington. But they are so difficult to buy, and so rarely in the market, that the majority of breeders have little chance of trying their luck with them. Their owners naturally desire to secure a foal, when it may be a great prize, won at a small cost, and will therefore seldom be disposed to part with them. It requires, moreover, a more ripened judgment, and more mature experience, to select mares fit for the production of first-class hunters and steeple-chasers, than for the rearing of a less ambitious character of stock. The stallion to which they are put ought to be one of a superior class to the majority of the itinerant animals which secure the custom of so many farmers, simply because they save them the trouble of further inquiry. It may be laid down as a general rule that the horse ought, if possible, to be a better animal than the mare. Then there is the difficulty, even when a horse of tried excellence is found, of discovering whether his points and his blood suit the mare. The art and the science of breeding first-rate horses are not to be mastered without much thought, trouble, and research. There is no royal road to it. He who wises, in spite of every obstacle, to attain golden results, must adopt a course the very antipodes of the too common one, of putting some mare, because he happens to have her, to some horse, because it happens to come into his yard. He must never breed from a bad mare or a bad horse; nor must he grudge a few pounds spent in securing the best of either sex within his reach. A judicious outlay of capital will here assuredly not fail to reap the reward which has attended the improvement of every other description of stock.—*Mark-Lane Express.*

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

LINIMÉNT FOR HORSES.

MESSRS. EDITORS: I send you a recipe for a liniment, which is much used here by farriers for bruises, sprains, and ulcers.

One individual in our place monopolizes the sale of the article, and designs to keep it a nostrum. I learned the ingredients from his purchasing the medicines of me. He is using and applying it to the human species, as well as our domesticated animals.

℞. One pint strong alcohol.
℥ ss. Sulph cupreus or *blue vitriol.*
℥ i. Camphor gum. Pulverize.
℥ i. Nit. potash, or *saltpetre.*
℥ ii. Aqua ammonia.
℥ ii. Tincture myrrh. Let it stand twelve hours, frequently shaking it.

Add spirits terabinth, or spirits turpentine, half a pint.

When used, shake and mix well. ARIEL HUNTON.

Hyde Park, January 6, 1854.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

HOW TO RENOVATE ORCHARDS.

GENTLEMEN: I have a farm, on which there is an old orchard. This orchard, many years ago, bore very abundantly. Can there be any thing done by grafting or pruning to make the trees bear fruit, or would you advise setting out new trees? I have heard of old orchards that were made to produce as well as ever by grafting and pruning. You will oblige many interested in the cultivation of fruit, by giving the desired information.

Very respectfully yours, G. F. F.

Wilmington, Del., February 10, 1854.

REMARKS.—Our reply to these inquiries is as follows: Scrape and thoroughly cleanse the bark of your trees; carefully trim the branches, not with a hatchet, but with a fine saw or knife; remove all the sods from around their stumps, and keep the soil soft and rich, in which work a few hogs will be of material service, and it will not be long before the good results of these means will show themselves.

EDITORS' JOTTINGS.

PHILADELPHIA, WILMINGTON, AND BALTIMORE RAILROAD.—In our December number, we made mention of several valuable improvements introduced under the energetic management of Mr. Felton. The *Evening Bulletin* (Phil.) thus refers to the new cars and car-seats:

"The Philadelphia, Baltimore, and Wilmington Railroad Company is entitled to the honor of having been the first to introduce the couch-seat into the cars. Mr. Felton, the President of the road, and Mr. Spafford, the General Superintendent, have taken a commendable interest in the matter, and as a consequence, the new seats have had a fair practical trial. Two splendid cars, built for the purpose, at the company's works, at Wilmington, were placed in the hands of Mr. Hammitt, and were fitted up by that gentleman. A double row of handsome walnut spring-seat chairs, covered with enamelled cloth, run along each side of the cars, much in the same manner as the old-fashioned arrangement. Each chair is entirely independent of its neighbor; at a first glance it presents much the appearance of a mere comfortable chair for sitting purposes, but a close inspection—or what is better, a fair trial—satisfies the traveler of its important advantages. Each seat is furnished with a sliding head-rest, which can be adjusted, without trouble, to suit the stature of any passenger, whether he hails from Brobdinag or from Lilliput. The rest, which is made to conform to the shape of the head, is so padded and arranged with elastic springs, that a most delightful pillow is insured. The occupant of the incipient bed has then but to touch a brass knob at his side, and leaning back, he finds himself reclining at a comfortable angle on a couch which might be considered luxurious in a well-appointed chamber. The action of the chair when falling into its reclining position, throws up a padded leg-rest, and the occupant thus secures for his entire body the recumbent posture so essential to the enjoyment of repose. By an ingenious and simple contrivance, the seats are arranged so as to revolve to suit the direction in which the cars may be moving.

"As we have already intimated, the cars containing the patent seats were put in service on the Philadelphia, Wilmington, and Baltimore railroad during the present week, and they elicited the universal approbation of the passengers who occupied them. From the complete success of this experiment, we anticipate that the time is not far distant when every railroad company throughout the country will see the importance of adopting this new seat, especially for the night lines. Travelers who have once enjoyed the advantages resulting from its use, will not be satisfied with the old-fashioned, permanent affair, in which many a travel-worn mortal has worried through a long night, too weary to sit erect or keep awake, and deprived, by the fashion of his seat, of even a resting-place for his drowsy head. To any one who has traveled in a train, at night, over a long route, it will be needless to point out the miseries attending the old system, or debate upon the important advantages of the new improvement."

Long-Island Railroad.—Business led us a short time since, some distance on this road, and we were pleased to observe the signs of rapid settlement in the erection of numerous tasteful cottages and villas, where, but a short time since, was an open plain, or stunted scrub, oak, and pine. Long-Island is indeed waking up, and already on the line of the railroad have we the beautiful villages of Woodhaven, Brookville, Lakeland, Edenvale, and many others. That it should not have earlier attracted the notice of emigrants, and those wishing a country life or a home at small cost, may be attributed to the efforts made by the large steamboat and railroad interest pointing to the great West, as the only spot for successful emigration; but the high rents in New-York, Brooklyn, and Williamsburgh have caused attention to be given to places nearer home, and the great facilities offered by the Long-Island railroad to parties doing business in these cities, is shown in the numerous and thriving villages springing up along its line. Long-Island has always been noted for the salubrity of its climate, and the longevity of its inhabitants, its temperature being about ten degrees cooler in summer and warmer in winter than those parts of the Eastern States adjoining Long-Island Sound. The fare on this road is about two cents per mile, and the rates of commutation are, if not the *lowest, among* the *lowest* in the country; and we learn it is the intention of the Company to run trains both in and out of the city at such hours as will suit those who wish to be both early and late at their places of business.

The Ottomans.—A late traveler in Turkey thus describes some of the peculiarities in the manners and customs of the Turks:

"They abhor the hat; but uncovering the head—which, with us, is an expression of respect—is considered by them disrespectful and indecent; no offense is given by keeping on a hat in mosque, but shoes must be left at the threshold; the slipper, and not the turban, is removed in token of respect. The Turks turn in their toes; they write from right to left; they mount on the right side of the horse; they follow their guests into the room, and precede them on leaving it; the left hand is the place of honor; they do the honors of the table by serving themselves first; they are great smokers and coffee-drinkers; they take the wall and walk hastily in token of respect; they beckon by throwing back the hand, instead of throwing it toward them; they cut their hair from the head; they remove it from the body, but leave it on the chin; they sleep in their clothes; they look upon beheading as a more disgraceful punishment than strangling; they deem our short and close dresses as indecent, our shaven chins a mark of effeminacy and servitude; they resent an inquiry after their wives as an insult; they commence their wooden houses at the top, and the upper apartments are frequently finished before the lower ones are closed in; they eschew pork as an abomination; they regard dancing as a theatrical performance, only to be looked at, and not mingled in, except by slaves; lastly, their mourning habit is white; their sacred color, green; their Sabbath-day is Friday; and interment follows immediately on death."

To Obtain Skeletons of Small Animals.—Put any subject, such as a mouse or frog, (if a bird, strip it of its feathers,) into a box perforated with a number of holes. Let it be properly distended, to prevent the parts from collapsing, or being crushed together by the pressure of the earth. Then place the box with its contents in an ant-hole, and in a few days it will have become an exquisitely beautiful and perfect skeleton. The ants will have consumed every part of it except the bones and ligaments. The tadpole acts the same part with fish that ants do with birds; and through the agency of this little reptile, perfect skeletons, even of the smallest fishes, may be obtained. To produce this, it is but necessary to suspend the fish by threads attached to the head and tail, in a horizontal position, in a jar of water, such as is found in a pond, and change it often, till the tadpoles have finished their work. Two or three tadpoles will perfectly dissect a fish in twenty-four hours.

Metallic Cask-making.—The new and ingenious principle of making casks from metal, patented by Mr. Clare, of this town, is now in operation at his works in Nash-grove. The casks are made by machinery, expressly adapted to this new branch of manufacture, by skillful engineers, whose services were secured for the purpose. The staves, specimens of which have already been exhibited in public, are of peculiar construction, and the great difficulty to be overcome was to produce each stave complete by one operation. This is effected by means of a screw-press, to which a large mechanical power is applied. The iron is cut into required lengths, and after being subjected to a powerful heat in a furnace, is transferred to the press, where it receives its exact form, a mould. The machine throws out the staves at the rate of one per minute, It is necessary to cut the iron in opposition to the grain, in order that when the flange is formed it may be made without cracking. The staves, on being completed, are grouped, and formed into casks when required for use. Each stave is calculated to bear a pressure of 100 pounds on the square inch. The heads of the casks are formed by a machine adapted to cut circles of a very large diameter with the utmost precision. By a very simple plan the heads of the metallic casks can be removed without disturbing the hoops which bind them together—a matter of the utmost importance where it is necessary to transfer liquids from one cask to another. It is thought that the metallic casks will ere long come into general use, and almost, if not entirely, supersede the common wooden casks now employed for all purposes.—*English Paper.*

A Substitute for Stereotyping.—Fillmer & Co., of this city, according to the *N. Y. Evening Post,* have adopted, with success, a system of electrotyping moulds taken of type in wax, which is said to have a decided advantage over ordinary stereotyping. Their process is as follows:

Having taken a mould of the type in wax, they put it into a solution of copper, and apply it to a powerful galvanic battery, which causes the copper to be deposited with such accuracy upon the mould as to make a perfect copper-face, which will last much longer than the ordinary metal-face, without costing any more. The process occupies about twelve hours. We understand that the Messrs. Harper employ this process exclusively in their establishment.

Governor Stevens reports a practicable and favorable route across the Rocky Mountains, for the Pacific Railway, and that the success of his expedition has been unprecedented.

Lime.—There is not within the whole State of South Carolina the slightest indication of the presence of lime-stone. The consequence is, that in many of the interior towns of that State *one dollar per bushel is paid for lime.*

The California Almond.—Beautiful specimens of California Almonds have been discovered by that indefatigable naturalist, Dr. Trask, growing wild in the mountains back of San Jose. They are at least half again as large as the imported nut, and are represented to be of delicious flavor. The tree upon which they grew was about 19 feet high, and loaded with fruit. The editor of the *San Francisco Herald* has seen some specimens of a fully ripe almond, and another just bursting through its green hull, with a branch and leaves attached. The discovery that this fruit is indigenous, and grows to great perfection in California, will prove of interest to our agricultural friends, and may induce the many horticulturists who are now setting out gardens and orchards to turn their attention to its cultivation.

New Building Material.—An invention has just been patented, we are told by a London paper, for the adaptation of a preparation of coke and other substances, by which bricks, paving-slabs, door and stair steps, tiles, pipes, blocks, railway-sleepers, and other articles of general use by builders, can be produced with a perfection and a cost which, it is expected by the inventor, will effect a complete revolution in the building trade. The price at which it is proposed to offer the coke-brick to the public is scarcely one third of the clay-brick, while in point of durability it is superior to the best article supplied from the kilns. The manufacture, according to the specification, is effected by means of cast-iron moulds, the interior of which are of the exact dimensions of the common brick; in this mould a certain quantity of duff, or waste coal, powdered coke, charcoal, or cinders, is placed, and being carbonized, the amalgamated materials swell to the exact form that is requisite.

When taken from the mould, it undergoes a finishing process, in which varnish is applied to the end or side, having, while wet, a coating of powdered glass, with an admixture of a mineral coloring-matter sifted over it. The brick is then vitrified, when a beautiful glaze of any required color is produced, and the article is ready for use. During the manufacturing process the fumes are passed through water. The finishing process is only required for particular purposes, as in many instances the coke-brick is equally available without it. The material is rendered fire-proof by the application of the muriate of alumina, and is impervious to atmospheric influence by the nature of its formation.

Hollow Axles are being extensively adopted on the London and North-western Railway. It is found that they are double the strength of a solid axle, and of course are more economical.

NEW BOOKS.

Trichologia Mammalium; or, a Treatise on the Organization, Properties, and Uses of Hair and Wool; together with an essay upon the Raising and Breeding of Sheep. By Peter A. Browne, L.L.D., of Philadelphia. *Ducet amor patriæ.* Published under the patronage of the Commonwealth of Pennsylvania. 1853. 4to. pp. 179.

How many of our readers can inform us what the difference is between a hair and a fibre of wool, or between these and feathers? Our learned author has investigated this question, and others kindred to it, and has followed the subject through all its ramifications to the consideration of growth, color, length, size, softness, firmness, strength, &c., with the diseases to which each is subject, and the growth of several different animals, among which are the sheep, goats of different countries, camel, lama, alpaca, and others; and these learned and minute discussions are followed by a treatise on raising and breeding sheep. On these subjects, which were full of difficulties, and which required immense research, great learning is exhibited, and great labor has been expended. It is the only treatise of the kind which embodies so much and of so practical a sort, and at the same time it is in a popular form, so that persons of ordinary intelligence can quite understand it. We purpose, hereafter, to avail ourselves of much of the information here communicated, for the benefit of our readers.

The Pictorial Sketch-book of Pennsylvania; or, its Scenery, Internal Improvements, Resources, and Agriculture popularly described. By Eli Bowen. Illustrated with over two hundred engravings and a colored map. Eighth edition, revised and greatly enlarged. W. White Smith, 195 Chestnut street, Philadelphia. 1854. 8vo. pp. 516.

This is a "guide-book" on a large scale, containing off-hand sketches of many of the more interesting localities in the State, with accounts of their history, population, business, scenery, &c., illustrated by numerous and very good engravings, and an excellent map of the State. Many pages are devoted to an elaborate account of the coal-fields of that State, and their iron works. The volume also contains Campbell's "Gertrude of Wyoming;" "Locomotive Sketches, with pen and pencil," of the route from Philadelphia to Pittsburgh; and "Pedestrian Sketches from Sunbury to Lake Erie." The perusal of this work cannot fail to impart a very general knowledge of the condition of the State, in its agriculture, manufactures, resources, and improvements. It is well printed on good paper, and is to be had at the *very* low price of $2.

The Dove-Cote; or, the Heart of the Homestead. By the author of "Cap-Sheaf." Boston: John P. Jewett & Co. 1854. pp. 361. 12mo.

This volume is highly attractive. It is a series of connected stories, forming one tale. Willie and Adam Brown, and Miss Nancy, and other characters, are finely portrayed, and some of them excite the deepest sympathy; while every part of the story is of excellent moral, without any thing to offend, but with every thing to commend.

Similitudes from the Ocean and the Prairie. By Lucy Larcom. Boston: John P. Jewett & Co. Cleveland, Ohio: Jewett, Proctor & Worthington. 1854.

This little volume consists of sketches rather than stories, inculcating high moral principles. Its execution is admirable.

The following short extract from "Light in the Clouds," illustrates its style and structure:

"Heavy clouds, tinged with a lurid light, slowly arose and hung low along the starry arch above. * * Suddenly a sparkling belt of fire gleamed up along the horizon. Merrily onward danced the flames, prostrating, as they ran, grass, weeds, and faded flowers. The prairie was on fire, and that ominous glare was only its reflection upon the clouds.

"O ye, who look out anxiously upon the broad field of humanity, and believe that ye see horrid clouds, charged with the vengeance of heaven impending over it, watch those clouds in faith rather than in fear.

"The purifying as well as the scathing pens are at work in society," &c.

Sketches of the Irish Bar. By the Right Hon. Richard Lalor Sheil, M.P., with Memoir and Notes, by R. Shelton Mackenzie, D.C.L. In 2 vols. New-York: Redfield. 1854.

These volumes include notices of the most prominent lawyers and statesmen of Ireland for the last half century, and give an insight into the interior life of that nation not imparted by any volumes with which we are acquainted. We have read them with very great interest. The sketches are written in excellent style, and with great discrimination. No man was better qualified for this service than Mr. Sheil, and the interest of the sketches is much increased by the explanatory notes of Mr. Mackenzie. We commend them to all our readers.

LADIES' ALMANAC. 1854. Boston: J. P. Jewett & Co.

THIS is a very neat little volume, full of useful matters. Among other things, it contains notices and portraits of several female authors, fire-side games, a page for memoranda, with each calendar month, &c.

THE FARMER'S GUIDE TO SCIENTIFIC AND PRACTICAL AGRICULTURE. Detailing the Labors of the Farmer in all their Variety, and adapting them to the seasons of the year as they successively occur. By HENRY STEPHENS, F.R.S.E., author of the "Book of the Farm," etc., etc., etc. Assisted by JOHN P. NORTON, M.A., Professor of Scientific Agriculture, in Yale College, New-Haven. In two volumes, with numerous illustrations. New-York: Leonard Scott & Co., 79 Fulton and 54 Gold street.

THIS work is the last revised edition of Stephen's Book of the Farm. It is a reprint of the second edition, and almost wholly rewritten, adopting all the more recent improvements in the practice of agriculture, and suggested by scientific experiment, and making it quite a new book.

It is characterized by transcendent ability, and, beyond a doubt, the best work on the subject of agriculture now before the world.

The position of Mr. Stephens, as editor of the *Journal of Agriculture*, necessarily makes him acquainted and familiar with the literature of agriculture, and with every new light which continental and British discovery has shed upon the theory and practice of agricultural industry. And Prof. Norton, of Yale College, well known to American farmers as a practical and energetic writer, to *Americanize* it, and adapt it to the wants of the farmer in this country, has given an appendix to each part, showing wherein any essential difference exists between the rules necessary to be observed by farmers of this country and Great Britain, pointing out in a clear and concise manner when such difference should be regarded, and adds from his own experience and observations a large amount of useful information.

Altogether, it is eminently practical and agreeably enthusiastic and interesting in its style, and we recommend it not only to the practical farmer, but to the general reader, as a book of reference, and to societies for distribution; and to all libraries, as a work that should not be wanting.

N.B.—The work comprises two volumes, royal octavo, neatly bound in various styles, containing 1600 pages, fourteen steel, and about five hundred wood engravings. It is beautifully printed on thick, white paper, the British portion of it from the stereotype plates imported for that purpose. Price for the two volumes, muslin, one copy, $6; four copies, $18; leather, one copy, $6.50; four copies, $20.

The work will be sent by mail, free of postage, to any post-office not more than three thousand miles from New-York, for $1 extra; over three thousand miles, for $2 extra.

NEW MUSIC.

OLIVER DITSON, of Washington street, Boston, has recently published some most excellent pieces of music. Among these

Don Giovanni, in a quarto volume, for a piano-forte solo, in an elegant volume, with excellent type, in the same style with *Norma*, noticed in a recent number of our journal. It is a choice gem for the amateur and the professor.

Leaves from my Musical Diary. By Adolph Kulblock. Consisting of three pieces: 1. A Melody; 2. A Song without Words; 3. Remembrance of Germany.

L'Art du Chant, appliqué au piano. 4to. De l'Opera I. Puritani. By Thalberg.

Among the songs are the following:

Reply to Lilly Dale. With chorus. By C. C. Converse.

First Gift Ballad. By Thos. Baker.

Live with a Playful Heart. A Bohemian melody. By A. F. Müller.

Sweet is a Summer's Night. By S. Nelson.

She Shines before me like a Star. From the Opera of Charles II. By G. A. Macfarren.

The Mariner Boy. By A. S. Thompson.

Songs of the Flowers—The Rose, Forget-me-Not, Poppy, Lily, Snowdrop, and a Daisy. By C. W. Glover.

We have seen only the third, the song of the Poppy.

WALTZES.—Favorite Waltz. From Lucrezia Borgia. Admirably arranged by Burgomaster.

Cottager's Waltz. By Mrs. L. L. Deming.

Jullien's Library Valz d'Amour. Arranged by Thos. Baker.

POLKAS.—The Eclipse Polka and Post Sleigh Polka.

List of Patents Issued,

FROM JAN. 3 TO FEB. 7.

David Clark, of Philadelphia, Pa., for improvement in oil-cups for steam engines.

Lucian A. Brown and Jeremiah W. Brown, of Hartford, Ct., for improved press for veneering.

Leonard Campbell, of Columbus, Miss., for improvement in cotton-gins.

Daniel S. Darling, of Brooklyn, N. Y., for improvement in preventing dust from entering railroad-cars.

D. M. Cummings, of North Enfield, Me., for improvement in machinery for mortising frames of window-blinds.

Charles W. Fillmore, of Coral, Ill., for improvement in clamps for holding steel plates while being hardened and tempered.

F. C. Goffin, of New-York, N. Y., for improvement in attaching cross-bar fastenings to vault and safe-doors.

Benj. D. Gullett, of Aberdeen, Miss., for improvement in cotton-gins.

H. Halvorson, of Hartford, Ct., for improvement in machines for pegging boots and shoes.

Jas. J. Johnston, of Alleghany city, Pa., for improvement in heaters for smoothing-irons.

John Johnston, of Alleghany city, Pa., for improvement in self-heating smoothing-irons.

Ebenezer A. Lester, of Boston, Mass., for improvement in machines for squeezing and compressing metallic bodies.

Harry H. Matteson, of Buffalo, N. Y., for improvement in flexible cordage.

Wm. G. Merrell, of Auburn, N. Y., for machine for cutting ellipses.

Henry E. Pierce, of Charlemont, Mass., for machine for matting the ends of blocks, in making matches.

David Pierce, of Woodstock, Vt., for improved gold separator.

J. P. Spofford, of Brockett's Bridge, N. Y., for improvement in saw-gummers.

Caleb C. Walworth, of Boston, Mass., for improved float-valve for discharging condensed water.

S. D. Wilson, of Reading, Pa., for improvement in valves and valve-seats of steam-engines.

Jno. H. Barth, of Indianapolis, Ind., for improvement in bedsteads.

Harvey Brewer, of East Boston, Mass., for improvement in torch-lamps.

Jno. Kedzie, of Rochester, N. Y., for improvement in filters.

J. W. McGaffey, of Philadelphia, Pa., for improved mortising-chisel.

H. B. Smith, of Lowell, Mass., for improvement in mortising-machines.

Jas. Swain, of Philadelphia, Pa., for magnetic toy, called the Magnetic Cupid.

Thos. L. Jones, of Poughkeepsie, N. Y., assignor (through Horace Dresser) to James B. Jones, of New-York, for improvement in feathering paddle-wheels.

Perry G. Bates, of Waterbury, Ct., for spiral or worm-joint hinge.

F. Davison, of Liberty, Va., for improvement in saliva pumps.

Jno. Jas. Greenough, of New-York, N. Y., for improvement in machines for pegging boots and shoes.

D. T. Hitchcock, of Warren, Mass., for improvement in diaphragm pumps.

E. C. Hyatt and Christopher Meyer, of Milltown, N. J., for improvement in the manufacture of boot and shoe soles, of gutta-percha or India-rubber.

Abraham McInturff, of Liberty, Va., for improvement in machines for mincing meat.

Loriston G. Merrell, of New-Bedford, Pa., for improvement in frill-machines.

Thos. J. Sloan, of New-York, N. Y., for improvement in apparatus for indicating the action of the feed-pump to steam-boilers.

C. W. Stimpson, of Cleveland, Ohio, for improved photographic plate-vises.

Ira Warren, of Boston, Mass., for improvement in tonsil instruments.

George W. Griswold, of Carbondale, Pa., for improvement in amputating apparatus.

Charles T. P. Ware, of New-York, N. Y., assignor to D. C. Morehead, of same place, for improvement in clasps.

Lewis B. White, of Moscow, N. Y., for improvement in trusses.

Calvin Adams, of Pittsburgh, Pa., for improved copying-press.

Romeo and Albert F. Andrews, of Avon, Conn., for improvement in wood saws.

Lucien B. Batcheller, of Arlington, Vt., for improvement in railroad-car brakes.

Charles P. Bailey, of Zanesville, Ohio, for improvement in dumping cars.

Enoch Burt, of Manchester, Conn., for improvement in fancy check-looms.

Silas Constant, of Brooklyn, N. Y., for improvement in rosin oil lamps.

Wm. Cunningham, of Holliday's Cove, Va., for improvement in washing-machines.

J. H. Dennis, of Boston, Mass., for improvement in bee-hives.

Spencer D. Driggs, of Detroit, Mich., for improved attachment to piano-fortes.

Charles R. Harvey, of New-York, for improvement in air-heating furnaces.

Dennis G. Littlefield, of Lowell, Mass., for improvement in stoves.

George Nelson, of Boston, Mass., for improvement in ventilating railroad-cars.

Thomas Prosser, of New-York, N. Y., for improvement in the manufacturo of hollow slabs and flanged metallic plates.

Harvey Trumbull, of Central College, Ohio, for improvement in the feed apparatus of straw-cutters.

Peter, Wellington S., & Jerome J. Hench, of Port Royal, Pa., for improvement in mills for grinding sumac.

James H. Jennings and Thomas Brierly, of Clayville, N. Y., for improvement in machinery for fulling cloth.

Joseph Marks, of Boston, Mass., for improvement in piston-valves and steam-passages in cylindrical steam-boilers.

James Robinson, of West Hebron, N. Y., fo improvement in threshers and cleaners of grain.

Alexander Hall, of Lloydsville, Ohio, for improvement in piano-fortes.

Daniel Haight, Jr., of Clinton, N. Y., for improvement in attaching shafts to wagons.

Wm. Overend, of Cincinnati, Ohio, for machine for wetting paper.

Aaron Palmer, of Brockport, N. Y., and Stephen G. Williams, of Janesville, Wis., for improvement in grain-harvesters.

Jacob Reese, of Sharon, Pa., for improvement in rolling axles and shafts.

Charles R. Soule, of Fairfield, Vt., for improvement in threshers and separators of grain.

Moses C. Stiles and Tristram S Lewis, of Hollis, Me., for improved machine for making window-blinds.

Carl E. Werner, of Newcastle, Ill., for improvement in distilling apparatus.

Jacob E. Brown and Stephen S. Bortlett, of Woonsocket, R. I., for improved mortising-machine.

Henry F. Anthony, of New-York, N. Y., for improvement in presses for making miniature cases.

Philander H. Benedict, of Syracuse, N. Y., for improved daguerrotype plate-holder.

Enos Boughton, of East Bloomfield, N. Y., for improvement in cultivators.

William Boyd, of Garrettsville, Ohio, for improved mode of fixing likenesses in monuments.

Wm. Cleveland, of Orange, N. Y., for improvement in fountain pens.

William O. Davis, of Pittsburgh, Pa., for improvement in presses for moulding glass.

Samuel L. Denney, of Christiana, Pa., for improvement in divided railroad-axles.

Cyrus J. Fay, of North Lincoln, Me., for improvement in cotton presses.

Eleazer W. Johnson, of Perth Amboy, N. J., for improvement in saw-mills.

Harry Leach, of Boston, Mass., for improvement in propellers.

Thomas Longking, of Brooklyn, N. Y., for improved apparatus for cleaning, &c., buffing daguerreotype plates.

Harvey Lull, of South Coventry, Conn., assignor to Harvey Lull, aforesaid, and Richard Porter, of Wheeling, Va., for improvement in shutter hinges.

T. O. Cutler, of Jersey City, N. J., for improvement in quartz-crushers.

James McCarty, of Reading, Pa., for improvement in rollers for scarfing the edges of skelps for lap-welded tubes.

Charles G. Page, of Washington, D. C., for improvement in electro-magnetic engines.

William Palmer, of New-York, N. Y., for improvement in water-gauges for steam-boilers.

John L. L. Morris, of Reading, Pa., for improvements in steam hammers.

Ebenezer G. Pomeroy, of Pittsburgh, Pa., for improvement in manufacture of sheet-iron.

Benjamin Underwood, of Brooklyn, N. Y., for improvement in the construction of printing blocks.

Frederic J. Thring, of New-York, N. Y., for improvement in carpet-bags.

Edward Town, of Jersey City, N. J., for improved machines for paging books.

Peter L. Weymer, of Reading, Pa., for improvement in steam hammers.

Isaac L. Dickinson, of Richmond, Ind., for improvement in churns.

Le Roy S. White, of Chicopee, Mass, for improvement in furniture-casters.

Ebenezer Burrows, of New-York, N. Y., for improvements in rotary engines.

A. Merritt Asay, of Philadelphia, Pa., for improvement in dental chairs.

Edward Bancroft and Wm. Sellers, of Philadelphia, Pa., for improvement in turning-lathes.

John and Wm. McAdams, of Boston, Mass., for improvement in machines for ruling paper.

Jacob Reese, of Sharon, Pa., for improvement in machines for making nuts.

Michael Shimer, of Union Township, Pa., for improvement in winnowers.

Josiah Turner and W. C. Stuvoc, of Sunapee, N. H., for improvement in winnowers.

John M. Bachelder, of Cambridge, Mass., and M. C. Farmer, of Salem, Mass., for improvement in the mode of making battery connection with an electro-magnetic coil on the traveling carriage of a telegraphic register.

Thomas Blanchard, of Boston, Mass., for improved machine for polishing plough-handles and other articles.

George Edward Burt, of Westford, Mass., assignor to George Edward Burt and David C. Butterfield, both of Westford, aforesaid, for improvement in machines for cleaning and assorting bristles.

Dexter H. Chamberlain, of Boston, Mass., for improvement in bit or drill-stocks.

Dexter H. Chamberlain, of Boston, Mass., for improvement in tool-holders.

John J. Crooke, of New-York, N. Y., for improvement in the manufacture of tin-foil or sheets.

Lewis S. Davis, of New-Paris, Ohio, for improvement in blocks for horse-collars.

F. O. Deschamps, of Philadelphia, Pa., for improvement in omnibus registers.

John S. Hall, of Manchester, Pa., for improvement in ploughs.

J. B. Hayden, of Easton, N. Y., for improvement in metallic hubs.

Ansel Merrell, of New-Bedford, Pa., assignor to Ansel Merrell and John M. Irvine, of Sharon, Pa., for improved machine for dressing spokes.

Reuben Knecht, of Easton, Pa., for improved daguerreotype plate-holder.

Julius E. Merriman, of Meriden, Conn., for improvement in sewing birds.

Clark D. Page, of Rochester, N. Y., for improvement in lime kilns.

The Plough, the Loom, and the Anvil.

PART II.—VOL. VI. APRIL, 1854. No. 4.

DUTIES ON LINEN.

We have no doubt that many of our readers have already seen the letters which have recently been published over the signature of General Duff Green, addressed to the Secretary of the Treasury, in several of the leading papers of the country. But the views which he presents are so clearly expressed and so forcibly advocated, that we are very desirous of spreading the substance of them, at least, on the pages of our journal. Were they not so widely circulated already, we should be unwilling to erase a single paragraph. But under the circumstances here explained, we must be content with the following. The proposal to repeal the duties on flax and linen fabrics, was the immediate cause of this argument. The first point urged, it will be seen, is identically the same which we have ourselves urged in a recent number:

"It may be said, and I presume it will be urged, that as Great Britain has so much capital invested in the manufacture, it will be for our advantage to furnish the raw material, in exchange for her manufactures. I know there is a class of political economists, who argue that England cannot buy from us unless we buy from her, and therefore insist that British manufactures be admitted, at a low rate of duty—and that linens be admitted duty free. This may be true in theory but not in fact. If England and the United States were all the world, there would be much force in the argument. But the fact that Great Britain purchases from Russia and the North of Europe thirty-millions of dollars' worth of flax, hemp, linseed and oil cake, and that Russia and the North of Europe refuse to take her manufactures in exchange, proves that if we will sell to Great Britain hemp, flax, linseed and oil cake, at as low rates as they pay for it elsewhere, then Great Britain will purchase from us, whether we take her manufactures or not. So that this argument fails because the hypothesis on which it rests is not true.

But I meet this doctrine of free-trade and no duties boldly, and look it directly in the face, and say that that which was at one time wise and proper may be very unwise and improper at another, and that that policy which is wise and proper for Great Britain may be most unwise and improper for us.

I proceed to illustrate. It is well known that I was for many years a disciple of Adam Smith—that I advocated the policy of buying in the cheapest and selling in the dearest market. I was the advocate of free-trade. In 1836, I retired from the press. I was, nevertheless, an earnest and anxious observer of passing events. Being withdrawn from the excitement of party politics, I saw that the customs involved something more than the mere question of revenue, and that the currency had much more effect on prices than the tariff. I saw that ours was the weaker part of the British system, and that there was a power connected with the Bank of England, and the London Exchange, which transferred the effects of their overtrading and speculation, causing the explosion to take place here instead of in London; and I spent the greater part of 1842 and 1843 in London, investigating and accumulating facts on which I could make up an opinion. I found that the funding system had created a new power, by concentrating in the hands of a few leading bankers, who were the agents of the monarchies of Europe, for the sale of their securities, and of the principal fundholders, to receive and reïnvest their dividends. I found that these dividends, thus concentrated in the hands of a few individuals, and payable chiefly in London and Paris, were more than two hundred millions of dollars per annum; that the greater part of this funded debt bore an interest not exceeding three or four per cent., and that when Mr. Jaudon went to London, as the agent of the Bank of the United States, with some thirty millions of dollars' worth of American Securities, bearing an interest of six and seven per cent., these bankers, so much interested in maintaining the value of the funded debt of the European monarchies, saw that if he was permitted to establish a market for the sale of American six and seven per cents., in competition with their European three and four per cents. the holders of the European debt would exchange their three and four per cents for American six and seven per cents.; and that the inevitable consequence would be the overthrow of the existing European monarchies. They therefore combined, and by preventing a sale, and compelling Mr. Jaudon to hypothecate his securities, used up and broke down the Bank of the United States. The war upon the credit of the States and of the Federal Government was part of their system.

Until then, our merchants bought British goods on credit, and paid for them in the proceeds of our agricultural labor. Then these large bankers revolutionized the whole machinery of commerce, and since then have levied heavy contributions upon us, in the shape of interest upon *their* credit, *profits upon our capital!* and upon the exchanges.

The more I examined into this subject, the more I became satisfied that the real issue between the monarchies of the Old World, and the Repulicanism of the New, is financial; and that instead of contending with the North about the tariff, it is the interest of the South to unite with the North and West, to sever the cord which binds us financially to the Bank of England. Why is it that an Englishman's credit is worth more in New-York than an American's gold? Why is it, that while the rate of interest is less in London than in any other part of the world, exchange upon London is everywhere at a premium? Is it not because all the rest of the world is in debt to London, and that the London bankers have so organized the machinery of commerce that every body must go to England to sell as well as to buy?

I boldly assert, and challenge investigation, that the South loses much more by placing her cotton under the control of British agents than she would lose if the tariff were doubled. Let me not be misunderstood. I am not the advocate of a high tariff. My wish is to cultivate and economize our resources, so that we may have, within ourselves, the means of giving profitable employment to our people. My wish is to stimulate American industry, and economize American enterprise, by adopting that position which tends to strengthen most our financial position. I see in the new development of the hemp and flax culture, an element of great financial power, adding, as I believe it will, in a few years, an export equal in value to the cotton crop—stimulating and aiding, as it will do, our system of internal improvement—bringing into profitable culture hundreds of thousands of acres of new land, and bringing into use many acres of land in the Northern and Eastern States, which can no longer be cultivated for wheat because of the weevil, and the exhaustion of the soil. It should be borne in mind that the dividends arising from the funded debt of the monarchies of Europe is a tax levied upon the industry of her population, as the interest upon the sum expended in wars, and in the maintenance of armies, navies, and privileged persons, and that this debt may be extinguished by a revolution; while we have some seventeen thousand miles of railroad now in operation—that we have some thirteen thousand more in progress of construction, and that a few years will more than double the capital thus invested; that while the European debt is consuming the substance of an over-burdened people, every dollar properly expended on a well-located railroad may be estimated as adding ten dollars to the wealth and resources of the country, and that persons having money to invest will see that our railroad securities are a much better and safer investment than the credit of any trembling European monarchy. Under such circumstances, we may well anticipate that whether Europe be involved in a general war or not, large sums will be remitted to the United States for investment, and that the consequences must be, that if the culture of flax and hemp increases, as I believe it will, the increased value of property, the dividends on the capital invested in railroads, the product of our mines, the large amount of foreign capital seeking investment, and the export of flax, hemp, and cotton will so augment our resources as to make us financially independent; and yet it may be that the repeal of the duty on linen fabrics may so discourage the culture of flax and hemp as greatly to diminish the product and delay the consummation of this great object.

Permit me to conclude, by earnestly entreating you to consider this subject as an enlightened American statesman, discarding theories generated in party prejudice, and remembering that the funding system has organized the taxing power of the European monarchies, which is so concentrated in the hands of a few European bankers, (who are the agents of those monarchies for the sale of their credit, and of the principal fund-holders to receive and reïnvest their dividends,) that they are enabled, through those governments, to tax directly the labor and property of the people of Europe, and that they have likewise so organized the machinery of credit, of commerce, and of currency as to impose most onerous burdens indirectly upon the people of this country. That this organization is a new power, originating in the public debt of the European governments; that it has so increased in strength and consolidation, that it is stronger than the monarchies which created it; that strong as it is, its vital principle consists in the power of the monarchies of Europe to tax their subjects, and that, therefore, being monarchical in its origin and in its existence, all its sympathies are monarchical and anti-republican; that the funded debt represents the sums expended in wars, and in the maintenance of armies and navies and privileged persons, and has no value except as the pretense upon which the people of these governments are taxed to pay the interest; that in case of a conflict between the people and the monarchies of Europe, this *new power* will take part with the monarchies against the people, because, so long as the monarchies exist, it can compel the monarchies to tax the people; and it knows full well that if in a revolution the people prevail, there is great cause to apprehend that the funded debt will expire with the monarchies, and that then their organization, now so potent, must cease. Sympathizing then, as this potent organization does, with the monarchies of Europe—deeply interested as it is in maintaining the prestige of their governments and authority, its sympathies and instincts are opposed to our republican institutions, and hostile to the development of our energies and resources.

Yet, opposed and hostile as it is, it comes to us in the guise of friendship, acting through such of its numerous agencies as can best accomplish its purpose. Thus, when the purpose was to destroy the Bank of the United States, and thus extinguish its agency in sustaining American credit, it was impossible to sell the bonds of the general government in the London market. Yet, that purpose being accomplished, we find that a large amount of our public debt is held in London, and that while the bonds of many of our first railroad companies are forced upon the market, at a great depreciation, you are purchasing up, from these foreign creditors, the public debt, long before it is due, and paying them a premium of twenty-one per cent.!! Believing as I do, that the policy of these European bankers is to so regulate the machinery of credit and of commerce, that we shall be compelled to buy more from England than she purchases from us, and that so far as relates to our commerce with England, they deliberately make false the theory that commerce is a reciprocal exchange of the products of industry, by so expanding or contracting credit and currency as to depreciate the value of our credit and of the products of our labor in the British market, as at all times to create a balance against us, I am rejoiced in the hope that the rapid accumulation of capital in the United States, in the shape of dividends and profits upon current investments in railroads, agriculture, commerce, and manufactures, will create an American, *republican*, financial organization, less concentrated but stronger than this colossal *monarchical* power, because its revenues will be greater, more certain, and permanent. Its elements will be more diffused, but it will be so united in sympathy and interests, and so intimately connected with our credit and currency that its energies and resources can be easily rallied to protect us against the expansions and contractions which it is the policy of the London bankers to create, and which will be inflicted upon us so long as they are permitted to so regulate the value of our credits and agricultural produce as to leave a large balance against us.

In conclusion, permit me further to add, that it is said, upon what appears to be good authority, that the greater part of the 500,000 spindles in Ireland are owned by six individuals; that the linen manufacturers of Great Britain are among her most wealthy and influential capitalists; that they have enlisted the active coöperation of the British government, and of the British Minister, at Washington; that they have agents in Washington, who employ the press, and penetrate both Houses of Congress. They have enlisted your potent influence, and the Committee of Ways and Means, acting under your advice, have reported a bill in accordance with their wishes. I again appeal to you, as a patriot and statesman, as a citizen of a State in which hemp and flax are staples, to reconsider this subject, *for upon you rests the responsibility.* If you give the facts a careful consideration, you cannot fail to see that your recommendation was erroneous. Are you capable of seeing your error, and confessing it? If you are, many will rise up and call you blessed; for in that case the movement in the culture and manufacture of flax and hemp will be such as to give profitable employment to many thousands of our people, and will so augment our wealth and resources as greatly to aid in relieving us from those periodical contractions and expansions of credit and of value, which are the consequence of the causes that I have endeavored to elucidate."

Again he says in another letter,

"The Constitution gave to Congress the exclusive power to coin money and regulate the value thereof. And why? The purpose of government is to protect persons and *property*. As specie is the standard which regulates the value of property, the wise men who framed the Constitution well understood the necessity of giving a fixed value to the precious metals; and hence, they recognized the power to coin money and *regulate* its value, as one of the highest attributes of sovereignty. They had denied the right of the British parliament to tax the colonies, because they well knew that the power of taxation includes the power to appropriate the products of industry. So jealous were they of the rights of property, that they denied to the States the power to regulate the value of money, and gave it expressly to Congress. It thus becomes the duty of Congress not only to coin money and regulate its value, but so to regulate our intercourse with foreign nations as to prevent, as far as practicable, any foreign power from disturbing the values regulated by them. For it is preposterous to suppose that the Constitution made it the duty of Congress to regulate the value of money, and at the same time denied to Congress the power to protect the value thus regulated against the financial policy of foreign nations; that it gave to Congress alone the power to coin money, and forbade the States to regulate its value, and yet left its value subject to the caprice, the speculations, or policy of foreign nations, or of their financial agents. If, then, it is the duty of Congress to regulate the *value* of money, and the European funding system has created a power which, acting through the Bank of England, can regulate the value of money by diminishing the value of our credit, and reducing the price of the products of our labor, it must be the duty of Congress to protect us, as far as it can be done, against the periodical contractions and expansions of the currency, which is, and ever must be, the inevitable consequence of the foreign policy of the European funding system and its agents.

We have no protection but through Congress, and Congress has no power to act but through the tariff. It will thus be seen that the real question involved in the tariff is not so much the protection of American industry against competition with the cheaper labor of Europe, as the protection of the value of our money against the fluctuation which is the inevitable consequence of a control over commercial exchanges, and the manner in which the power, created by the funded debt of Europe, is used to maintain at all times a commercial balance in favor of England—and while I admit that Congress has no power to make a tariff for the purpose of fostering or protecting one class of American industry at the expense of another—or for the purpose of creating a surplus revenue, to be expended in works of internal improvements, I insist that it is the duty of Congress to so regulate our foreign commerce as to protect the value of our money, and the price of our property, and of the products of our labor, from the periodical contractions and expansions which it is the purpose and policy of the agents of the European funding system to create; and which are periodically produced, because their system is to buy at low rates when money is dear, that they may sell at high rates when money is cheap.

How can Congress do this? Will Congress regulate the value of money if they so arrange the tariff as to greatly augment the imports of linen fabrics? Will not the increased importation increase the power of the Bank of England to act upon our currency? Can Congress rightfully transfer to the Bank of England, or to the agents of the European monarchies, the power to "regulate the value of" our money? If the repeal of the duty on flax and linens will have that tendency, is not that fact an imperious reason why it should not be done? To press this argument further, would assume that you are incapable of seeing, or unwilling to admit, its truth. I therefore again recur to the question of profits.

Mr. McAdam tells us that such have been the profits on the manufacture of flax, that the single town of Belfast has, within a few years, invested in works of public improvement alone, near *nineteen millions* of dollars! Who paid those nineteen millions of dollars? The consumers. Who were the consumers? We, the people of the United States! Now, as it is well understood that every dollar properly invested in a well-located railroad adds ten dollars to the value of property, therefore, if instead of importing linens from Belfast, we had made them for ourselves, and having saved the nineteen millions of profit, we had invested that sum in American railroads, instead of sending it to Ireland to enrich the manufacturers of Belfast, the difference to us would have been one hundred and ninety millions of dollars; and instead of sending the products of our labor abroad, that it may become an element of power and influence in the hands of those who, through the exchanges, regulate the value of our money, *up* or *down*, as they wish to buy or sell, we would to that extent have added strength to our financial position. It is thus, and thus only, that we can become financially independent, and until this be accomplished, it is impossible for Congress to "*regulate* the value" of money.

Do you ask how else you are to prevent a surplus revenue? I answer that Congress has monopolized the transportation of the mail; that the department is compelled to employ railroads in that service; that the present disbursement is near two millions of dollars, and that it will soon be twice that sum per annum; that two millions is the interest at six per cent. on thirty-three millions of dollars; that instead of paying this sum to railroad companies on contracts to run for four years, I would make contracts for the permanent use of railroads, and deliver to them bonds, chargeable upon the revenues of the department, bearing *three* per cent. only, for an amount the interest on which, at six per cent., would be an equivalent, under the present system, for the service rendered. Under this change of system, the saving would be one half the sum now expended, or one million of dollars, which, compounded at six per cent., would, in less than twenty years, pay off the whole debt, and give to the government the use of such railroads for ever thereafter without charge."

GEOLOGY.—COAL FORMATIONS, &c.

In our last number, under this title, we illustrated the geological arrangement and the production of coal measures. We now come to speak of them in connection with the strata that lie above them, and which must be regarded in all mining operations. But ere we advance, let us remind the reader that, beginning from beneath, we have found, thus far, the silurian, which is divided into lower and upper; the devonian, which is also both lower and upper; and then the carboniferous, consisting of the mountain limestone, and upon which rest the coal measures.

Next above the coal is the Peruvian group, consisting (the lower Peruvian) of the new red-sandstone, which underlies marl slates and magnesia, limestones, &c., forming the upper Peruvian, and we thus reach the upper limits of the primary formations. Ascending still higher, we meet with the lower middle and upper *trias*, then the *lias*. The former of these consists of various sandstones, limestones, dolemite, gypsum, marls of various kinds, as red, gray, green, blue, and white, while the lias contains argillaceous limestone, marl, and clay.

The fossils which occur in the lower trias group are plants of peculiar species, not found in the upper trias; in the middle strata, the equisetites or order equisetaciæ, and calamites, or the rush tribe, while the upper strata contain batrachian reptiles, ferns, coniferæ, cycades, &c. In the argillaceous limestone of the lias are reptiles, mollusks, and several genera of fish, which also extend into the group next above.

Oolite. This group is above the lias, and consists of yellow sands, calcareous freestone, fuller's earth, sundry slates, Oxford and other clays, Portland sandstone, &c. Its fossils are ammonites, and belemnites, saurians, the plerosaurius, and other reptiles nearly allied to them. These slates are very rich in fossils, among which are also insects, including some of the beetle tribe, with some mammiferous fossils. The wealden group, underlying the cretaceous, lower and upper, complete the SECONDARY FORMATION.

But we begin to fear that our descriptions are becoming too extended. We dislike dry details in any department of science. We have had far too much of them, in times gone by, either for the pleasure or the profit of the learner. Let us, however, ere it passes from our thoughts, inform the reader, who may have an opportunity to avail himself of the hint, that in the Austrian department of the Crystal Palace are some of the finest ammonites we have ever seen. They are a fawn-colored marble, somewhat variegated. The largest are some twelve or fourteen inches in diameter, while other specimens do not exceed four or five inches. The latter compare very nearly, in dimensions, with those found in one or more of the islands in Lake Champlain, which are formed of a dark-colored marble, and are very abundant.

Should we continue our dry description of the remaining strata which are embraced in the eocene, miocene, and pliocene groups, of which the TERTIARY formation consists, and which rest beneath the only remaining group, the post-tertiary, which is divided into the post-pliocene, and the recent, we should reach the surface; but the view would be very imperfect without numerous details, with which we dare not, at present, challenge the attention of the reader. We must lead him through more inviting fields, else, as we pile strata upon strata, in our fast-multiplying rows of type, we destroy the little sympathy the reader may have in the subject, and deter him from any further examination of it. Thus our ill-formed devises, intended to lead to more thorough investigation, may produce effects entirely opposite. Beside, we do not hesitate to admit that we write that we may be read. Writing *not to be read* is a most stupid business. We pity the minister who writes his sermons under the conviction that his audience will not listen with interest to their delivery. Besides the interest which miners have in this subject, which we purpose to consider, there is also taken an AGRICULTURAL VIEW.

To the agriculturist, each of these formations has an interest of its own, whether it be attractive or repulsive. Thus the lower silurian, which consists of a mass of sandstones, often many thousand feet in thickness, is generally entirely naked, where it crops out to the surface, or at best, it furnishes a thin cold soil, capable of supporting only heaths and kindred vegetation. The limestones beneath these rocks are far richer. The upper silurian produces a cold, wet, unmanageable clay. The old red-sandstone soils are much more valuable. The soil of the middle oolite consists of a dark-blue, adhesive clay, rich in lime, and well suited to cultivation, though often difficult to work, being very adhesive in wet weather, and very hard when dry. The lias forms a cold, unproductive, blue clay. The wealden formation produces a hard, dry soil, but when properly drained and cultivated forms good wheat land.

Wherever the chalk formation is exhibited, we find a dry, parched soil. This is witnessed in Alabama, for example, where it is difficult to get a sufficient supply of water, and, as we have described in former numbers of our journal, the people resort to artesian wells, which are sunk five or six hundred feet, and often to a much greater depth.

We may follow along from the sea to the interior, and find, with changes of the geological formations, as many changes in the character of the soils, and the crops that can be produced. Thus, taking the region of the Southern States, we first find low and swampy land, but rich soil, (post-tertiary and alluvial,) which will produce good crops of cotton and rice. Receding from the sea, and rising above its level, we find a harder, dryer soil, but still alluvial, consisting of both loams and clay, in which the oak and hickory grow spontaneously. Here we also find good crops of tobacco, sugar, &c. On the next higher level in the tertiary formation, is the region of dry sand, stocked with pines and kindred growths. Above these are the chalk formations, nearly barren, and then the slopes of clay and loam, variously mingled, and suited to a variety of crops. This is at the termination of the plain, and the commencement of the slope of the Atlantic. The last formation only belongs to the primary formation.

It is within basins formed along the extent of the Alleghanies, that the coal beds are formed; and extending beyond the summit of the mountains, and far on to the West, "the Appalachian coal field" spreads out, with an inexhaustible supply of mineral wealth. In Ohio, in the region of Cincinnati, the silurian rocks again develop themselves, interrupting the beds of coal, but beyond this, toward the Mississippi, the surface is again depressed, and we find the immense coal field of Illinois, &c.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

INDIAN-CORN OR MAIZE.—ITS HISTORY, GROWTH, &c.

BY G. BLIGHT BROWNE, OF PENNSYLVANIA.

Among the class of farmers who devote their attention to the cultivation of corn, it has become a question, as to whether or not suckering should be encouraged, or considered as an injury to the crop. Advocates of both sides of this question have presented themselves, and have sustained their peculiar views with considerable plausibility. But thus far, I have not seen any article on the subject, in which the writer has sufficiently well based his argument on the nature and physiology of the plant itself.

Without going into the classification of this plant, by Linnæus, or by any other founder of an artificial system of botany, I will proceed to consider the construction, habits, &c., of the zea mays, maize, or Indian-corn.

This plant is a native of America, and, properly speaking, belongs to the tropics. It was, however, described as growing in the temperate zones, near the tropics, by the earliest historians on the subject. It is an annual and endogenous. Maize is physiologically constructed to endure great heat, and to resist evaporization.

In the tropics, during the hot and dry season, vegetation undergoes a species of hybernation, and awakens with the approach of the wet weather. So soon as the earth obtains sufficient moisture, the seed of this annual vegetates, but in a way well adapted to resist the heat of the climate. For instance, when a grain or seed of maize receives sufficient moisture, it commences by exhibiting signs of germination, by throwing out roots and stem; but the roots will far outstrip the stem in growth; in fact, the roots will attain great length before the cotyledons will appear above the ground. By this means, the plant is well fortified with an abundant supply of moisture or sap-bearing roots, before it ventures to show its stem to the sun. The cotyledons make their appearance enveloping one another, and the stem is fortified with a glazed surface, through which very little liquid can evaporate. The stem is composed of cellular tissue and spiral tissue, and does not become woody.

This plant is capable of projecting shoots from each joint or node, and these shoots bear the ears of corn. These shoots are by some (I think improperly) called suckers. From the summit of the stem is projected a stalk, which is crowned by a tassel, or the male organ of reproduction. Embryo ears are formed, and put forth their silk at the same period that the tassel makes its appearance. It is rare that more than the two uppermost nodes, or those situated immediately below the tassel stalk, put forth any silk, and those situated lower down usually show at this stage that they are abortions. No doubt more of the nodes would put forth true fruit, if the plant was capable of perfecting it, and such is sometimes the case in the colder climates; but, often in the warmer latitude, plants have been known to produce seven perfect ears. Some twenty years since, a Mr. Baden, in Maryland, had corn that produced from four to seven ears on a stalk.

The female organ or pistil protrudes itself at the apex end of the ear, and is called in familiar language the silk. Every grain on the ear has one of these fibres of silk communicating with it. This silk is all produced at the same time, and at a proper time to be impregnated by the pollen falling from the tassel. If any ear should mature its silk too late for the pollen, (a case which I can not conceive to happen without some disturbing case,) it will not bear any fruit. At the lower extremity of the silk is the ovule, and it is fertilized by the pollen passing down to it through the cavity in the centre of the silk. The ovules, after being fertilized, become miniature plants, consisting of root, stem, and leaf. These ovules thus matured are accompanied by a deposit of starch, and the whole enveloped in a glaze covering, constitutes the grain. The grains occupying the apex extremity of the cob have, notwithstanding they are generally somewhat smaller, been fertilized quite as early in the season as any of the lower ones. They owe their diminished size to a want of supply from the mother plant. Sometimes this want of supply will occasion not only the superior grains to be smaller, but will occasion them to dwindle away entirely. This want of supply is not occasioned by any sterility of the soil. Any soil capable of affording to the plant the means of producing the stem, tassel, and silk, will be able to continue its bounty until full development. This defect in the superior portions of the ear is occasioned by the climate, which, in such cases, has proved at the latter portion of the season unpropitious for the growth and maturing of the seed.

Suckers (properly speaking) take rise from the stalk below the ground, and are capable under some circumstances to become complete plants, producing stalk, tassel, and silk; and, no doubt, if the climate would favor the enterprise, would bear ears. In the natural climate of the maize, grown on a soil undrained of its fertility by husbandry, and in the natural state, unimproved by cultivation and art, it may be able to furnish to this sucker, or second growth, sufficient nutriment to bring it to maturity. But in our climate, and limited by one short season, no such result must be expected. Maize has been by cultivation much enlarged in the grain, and greater number of grains are found on the cob of our cultivated varieties, than originally grew on the natural plant. The great desideratum of the Northern farmer is to make his corn in the allotted time, and to have his crop well matured before our early frosts. We have usually no time to lose, and there can be no doubt that any treatment which would retard the maturing of the ear, would not be a good one.

Shoots from the nodes above ground can not do much, if any harm, to the plant, because they are soon arrested in their growth. The stripping of these shoots will occssion a very bad wound, and is calculated to do more injury than good.

The case is very different with the under-ground shoot or sucker. They derive their sap from the roots of the parent plant, and consequently divert the supply, at a moment when it is most needed to assist in procreation, then going on in the parent plant. Nothing should be allowed to interfere with this function, as the early maturing of the seed depends on the vigor with which this process is prosecuted.

Therefore, on the whole, I should conclude that the shoots or suckers which start from the nodes above ground, should not be removed; and that those which have their origin below ground should be removed.

AMERICAN WOOL.

The British Commissioners of the Great Exhibition of 1851, have determined to form, in London, a grand universal trade-museum. Mr. Solby, their agent, has applied to Mr. P. A. Browne, of Philadelphia, to ascertain how they will be able to procure for it all the leading varieties of the best American fleece; and Mr. Browne has recommended this direct appeal in their behalf to the sheep-breeders and wool-growers of the United States. Any one disposed to countenance this laudable design will be pleased, with as little delay as possible, to forward specimens to Mr. Browne, post-paid.

Each sample ought to be accompanied with the name and address of the donor, and also of the breeder, where he is not the donor; the name of the species, variety, or breed of both parents or ancestors of the animal from which the specimen is taken; the age, sex, probable weight, and amount and date of last clip, and the number of the flock to which he belongs, &c. All specimens, when practicable, should be *drawn out*, (not cut,) and be taken from the back, six inches in the rear of the neck.

Editors of agricultural periodicals and of newspapers are respectfully requested to insert this notice.

Time for Grafting the Apple.—The best time is the spring, when the buds are beginning to swell, the scions for grafting having been cut a few weeks previously, and kept in a moist, cool place, or in a box of damp moss, in a cool cellar, so as to be neither shrivelled nor water-soaked. Grafts may be cut and inserted the same day, if the buds are not swollen much. Grafts are sometimes set much later, but starting so late, they do not make so good a growth during the summer.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

A MISTAKE.—SOUTHERN PLANTER.—GYPSUM AND AMMONIA.

Messrs. Editors: If there be such a personage as a Professor Campbell, in North Carolina, who is in the habit of writing for agricultural journals, he would doubtless be surprised as well as amused, on reading the 464th page (February number) of your paper, to see the use there made of his name. The paragraph there given, detailing an experiment to show that carbonate of ammonia and gypsum mutually decompose each other, the ammonia being "fixed" as an involatile sulphate, seems to have been copied by the *New-England Farmer* from the *Maine Farmer*, but appeared originally in the *Southern Planter*, for June, 1853.

As the article from which this extract was taken has been considered of sufficient importance to be copied, in whole or in part, by several papers in this and other States, I see no reason why it should be attributed to an authorship which probably has no existence. The substance of this article formed part of a lecture on the chemical relations of different fertilizers, delivered before a class in Washington College, Virginia, in the course of scientific agriculture, as taught in that institution. By an awkward mistake, the printer, instead of W. C., (Washington College,) put N. C. In the summary of "contents," it was printed in full, "N. Carolina." But, as the editor of the *Southern Planter* lives about seventy-five miles from the office through which that paper is issued, he knew nothing of the mistake until the paper had been published. He made a very satisfactory apology for the error, in a private letter, promising at the same time a "correction" in the succeeding number; but the correction never made its appearance, and moreover, the mistake reäppeared in the index at the end of the volume. Of course the matter was forgotten by the worthy editor.

The experiment above alluded to was fairly performed, but can hardly be considered as conclusive evidence that dry gypsum will act upon ammonia, since the manure used was moist, and, therefore, soon moistened the gypsum mingled with it. But there was certainly not moisture enough present to dissolve the gypsum. Other experiments have confirmed me in the belief that ground plaster affords one of the most convenient, as well as most effectual means of "fixing" (that is, decomposing) the carbonate of ammonia, generated in fermenting vegetable and animal manures. The presence of moisture is certainly advantageous in this as in most other cases of chemical action; but there is no necessity whatever for having the gypsum in a state of solution. On the contrary, I think this would result in a disadvantage, from the large quantity of water required to dissolve it; the proportion being not less than about five hundred parts of water to one of gypsum. If, in this condition, a sufficient quantity were used to answer the purpose fully, a portion of the resulting sulphate of ammonia would undoubtedly be washed out and lost. The moisture always present in manure collected from stables and barn-yards, if sufficient to cause fermentation, will also be sufficient to promote the required chemical action between the plaster and carbonate of ammonia.

When gypsum is used for fixing the ammonia of guano, the mixture should be moistened; otherwise, the chemical interchange of elements will go on very slowly. Ashes should not be used with the plaster when mixed with guano, as the carbonate of potash in the ashes would reduce a portion of the plaster to the carbonate of lime, which does not act upon the salts of ammonia under ordinary circumstances.

Yours very respectfully, J. L. CAMPBELL.

Laboratory of Washington College,
Lexington, Va., February, 1854.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

MR. GLOVER'S MODELS OF FRUIT.

During a recent visit to the city of Washington, for the purpose of attending the meetings of the United States Agricultural Society, I was much delighted with the collection of models of fruits, &c., belonging to, and manufactured by, Townsend Glover, Esq., of Fishkill Landing, N. Y., and now at the Patent office.

This collection exhibits in the most beautiful manner, and with inconceivable accuracy, at one view, specimens of the various cultivated and natural fruits of the United States. To each specimen is attached a label, describing the taste of the flesh, habit of the tree, time of ripening, and the soil and climate best adapted to each variety.

By inspection of these models, true to life, the farmer or horticulturist has it in his power to select such fruit as he shall most fancy the appearance of, and is enabled to judge for himself whether, as to the soil and climate, any particular kind is more or less adaptable to his own locality. The same fruit grown on different soils, and in different climates, is here exhibited, and in many instances would not be recognized as being identical in stock; and, in fact, it has often, from this cause, received new names to which it is not entitled.

Accompanying these models of the fruits, are also to be found fac-similes of the new wood on which each specimen was grown, and in many cases the blossoms are also included.

Mr. Glover has also numerous reptiles and fishes, modelled with equal merit; and the whole has such a life-like appearance, that one can scarce believe it is not real.

Mr. Glover is desirous to have the aid of government to complete this arduous task, so far prosecuted at his own expense; and when completed, to deposit it at some suitable place at Washington. If the general government should refuse to aid him, I would propose that a company should be formed in New-York, who would be willing to aid him to completion, and that the work should be deposited in that city. In one season, the exhibition of such a collection would reïmburse the expended money, and New-York would have one more gem in its diadem.

Such taste as Mr. Glover has exhibited, in this his *chef-d'œuvre*, is seldom found; and if ever completed in its details, his collection would grace the shelves of any scientific museum. It is sincerely to be hoped that he will be encouraged as he deserves, and that the country may not be bereft of such a gem for want of the small sum necessary to finish a work so far advanced toward completion. G. B. B.

We have seen the models of Mr. Glover, and have always admired them. It is impossible to distinguish many of them by the eye from the true fruit. We commend them, and our correspondent's proposition, to the attention of all fruit-growers.—EDS.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

CIRCLING LAND.

If the restoration of worn land is so important and so economical as to justify heavy investments in chemical properties, brought by great labor and heavy expenses from far distant countries, how much more important, and how much more economical, to retain those chemical properties which have been placed in the soil by the hand of a kind Providence, when the expense is comparatively nothing! Even with the heaviest outlays of capital in chemical properties, the upland, in the *cotton* region, can not be kept profitably productive unless the land is so cultivated as to retain them. Ploughing commences in January, and is finished in August. During this long period, the land is ploughed five or six times, and is drenched with rains again and again. And he who undertakes to keep upland, in the cotton region, profitably productive by investing his money in chemical properties without using the precaution to retain them, almost as vainly toils as did the Danaids to fill their sieves from the waters of the Lethe. As indispensable as guano, cotton seed, pea-vines, muck, or manure of some kind may be, in keeping upland profitably productive, yet neither can be profitably used by the cotton-planter after a few years' cultivation, unless his land is so circled as to prevent the soil from washing away. Circling not only prevents the soil from washing away, but it causes the land to stand a drought much better than when the rows are straight. No planter will require that these assertions should be established by argument. He knows a heavy rain runs so rapidly down straight rows as to wash; and a moderate rain, after drought, passes off so soon as not to be taken up by absorption. The only question is as to the best instrument for circling, the manner of using it, and the best fall to give the rows.

When I tell the reader of *The Plough, the Loom, and the Anvil* that it must be done scientifically, he will acquiesce with me. The only instrument that should be used, is the engineer's level. It is perfect. Many instruments are used, and any in use will do some good, but not one will compare with it. Any one who will read this, can use it in circling as well as the most accomplished civil engineer. There is nothing about it difficult to comprehend. The level sometimes gets out of adjustment, but not very often. I will therefore first give the directions for adjusting the level.

1. To fix the intersection of the cross-hairs in the axis of the telescope, loosen the straps over the telescope; place the cross-hairs on a small object; turn the telescope half round in the half circle in which it rests, and move the cross-hairs by the four capstan-headed screws on the telescope; loosen one screw and tighten the opposite one; do so until the intersection of the hairs remains on the same spot, when the telescope is turned in the half circles in which it rests. Next, place the horizontal hair upon an object; lift the telescope out of the half circle in which it rests; reverse it; then turn it upon the tripod; see if the hair comes on the same object; if not, raise or lower one end of the telescope by the nuts on the lower part of the half circle in which it rests, until it will reverse upon the same object.

2. To adjust the spirit-level with the cross-hairs in the telescope, bring the bubble in the centre by the four leveling-screws of the tripod; turn the instrument half round on the tripod. If the bubble does not remain in the centre, raise or lower one end of the tube containing the spirits, by the nuts

at the ends of it, until the bubble will remain in the centre when the instrument is turned on the tripod.

In order to circle correctly, you should examine the land well, by riding or walking over it before commencing, observing the ridges and natural drains. The water must be made to run gently to the natural drains, the fence, if you have it on the line of your land, or to a road, if you have one through your land. To draw the water to the natural drains, commence the row at the natural drain, and let it rise one foot for every hundred yards, and if the land is broken, a little more. When one half the length of the row is run, let it fall in the same ratio until it empties into the natural drain at the other end. If the land is broken, lay these rows off twenty yards apart; if the land is moderately undulating, they may be laid off thirty yards apart. The water may be drawn to the fence if it is on the line of the tract, or to a road if there is one through it. This, however, should not be done if it can be avoided, as it will wash a ditch by the side of the fence, or wash the road, and gradually wear off the ends of the rows. I have advised to commence at the natural drains, but in a few days you will understand the use of the instrument so well that you may commence on the ridge, or on the side of the ridge, and let the rows rise or fall as you like. I have told how the rows should run; now I will tell how to run them. Get a flour-barrel of wooden pins as large as a finger, eighteen inches long, and pointed at one end. Have a small line twenty-eight feet long, with each end tied to a pin. Let your target be a black circle, six inches in diameter, with two white lines a half inch wide passing through the centre at right angles. The target-rod must be eight or ten feet long, with inches marked on it the entire length. Have two boys, and you are ready to commence. Let one boy take the target-rod and one end of the line; the other boy an armful of pins and the other end of the line. Place the boy with the target-rod where you intend to commence the row, and place the instrument on ground a little lower, judging by the eye; then level the instrument. To level the instrument, stick the feet of the tripod firmly in the ground; turn the telescope until it is over two of the leveling-screws; tighten the one and slacken the other until the bubble remains in the centre of the tube; then turn the telescope until it rests over the other two leveling-screws, and level again, and so on, until the instrument is level. The instrument may be placed from ten to three hundred yards from the target.

Adjust the focus of the telescope to the distance by moving the large glass in or out with the screw which moves it. Let the boy with the target-rod move the target up or down on the rod until the cross-hairs in the telescope rest on the white lines on the target. Let him then stick the pin, with one end of the line attached. If you intend that the row shall rise from the starting-point, let the boy move the target one inch down on the target-rod, and take the pin with the other end of the line attached, and move the length of the line, and move up or down until the cross-hairs in the telescope again rest on the white lines on the target. Let the boy with the pins stick a pin at the starting-point, bring up the other end of the line, and stick the pin attached to it at the foot of the target-rod, and another pin by it. Let the boy with the target-rod move the target down another inch, and move as before the length of the line, and up or down, until the cross-hairs in the telescope rest on the white lines on the target; and let the boy with the pins do as before. Go on in this way until you wish the row to fall the other way; then move the target up every time instead of down, and instead of rising the row will fall. You may have the level to move before the row is finished; then move it as you like from ten to three hundred yards, and place it on ground a little lower than that on which the last pin is placed, judging by the eye. It may be placed on higher ground, but you circle more rapidly when it is placed on lower ground, with the sun shining on the white lines of the target. When you have leveled the instrument, let the boy move the target up or down on the target-rod until the cross-hairs in the telescope rest on the white lines of the target, minding to keep the foot of the target-rod by the last pin that is set, and then go on as before. Divide your row so that the highest point in the row shall be equally distant from the two ends. When you have finished the row, go from one end to the other with a boy, and when you perceive a pin that would make too short a curve, move it up or down, so as to preserve the grade of the row as much as possible, and at the same time to make the curve more gradual. When you have laid off several rows, have the pins ploughed up with a light shovel with a cutter before it, by your best plough-hand, with a single mule that does not walk too fast. These rows thus laid off with the level are base rows. Fill up the space between the base rows thus: Let your plough-hand begin on the lower side of the base row, and lay off rows parallel with it, until the space between it and the base row below is filled up. Then your short rows will all fall on base rows. When you have finished laying off, run a turning-plough three or four times on the upper side of the base rows, taking a little land only. Let the hoes follow, the hands moving on the lower side of the base row, and draw the dirt out of the furrows run by the turning-plough, so as to make a ridge eighteen inches high on the lower side of the base rows. Your base rows then become hill-side ditches.

In laying off the rows between the base rows, it is best to have a small boy, with a rod, tied to the bridle of the mule, of such a length that when he holds the rod to his breast, and walks in the row that is laid off, the row that is being laid off will be at the distance wished. The length of the rod is about equal to the width of the row.

I was once much embarrassed to replace the cross-hairs in the telescope after they had disappeared; but necessity was the mother of discovery. If the cross-hairs should be destroyed, unscrew the large glass and take it out; unscrew the small straps which attach the large screw to the instrument that moves in and out the large glass; unscrew and take out the screws which adjust the cross-hairs; turn the large end of the instrument down, and a brass circle will fall out, to which the cross-hairs were attached. The circle has drawn across its face four lines equally distant. Remove the paste, and take a spider's-web and place it across the circle, letting it lie in the lines; attach it to the circle with paste, and then you will have the hairs crossing each other at right angles. Return the circle to its former place by moving it up the telescope with a round rod, and turning it until the screws will confine it. Put the instrument together, and adjust it by the directions.

A PLANTER.

Yazoo Co., Miss., February, 1854.

P.S.—The line twenty-eight feet long will give about a foot fall to the hundred yards, when some of the pins are moved a little to prevent the short curves.

ONE of the most distinguished physicians of New-England ascribes the fearful increase of cases of paralysis to the use of stoves in close rooms, particularly in sleeping apartments.

EXPERIMENTS ON COTTON,

WITH SALT, GUANO, AND SUPERPHOSPHATE OF LIME.

According to promise made you, I herewith send the result of a part of my experiments with guano, &c. Cotton seed planted soon after drilling manure, which was done under my own eye, articles weighed and measured by myself on 4th and 5th of April.

Kind of manure. No.	Order of rows and quantity of fertilizers to each.	Seed, how prepared.	Product in lbs. Per row, acre.
1. Salt.	1st 2 bushels per acre in drills.	Seed brined and rolled in plaster.	121— 968
	2d " " on row.	" "	135—1080
2. Guano.	1st 247 lbs. guano per acre.	Seed plain, brined and rolled in plaster.	135—1080
	2d 200 lbs. guano.	"	156—1248
	3d 100 "		162—1290
	4th 200 "	" brined, &c.	145—1160
3. No manure.	1st nothing added.	" plain.	130—1040
	2d " "	" brined, &c.	133—1064
	3d 4 bushels salt per acre in drill.	" plain.	117— 936
	4th " "	" brined, &c.	118— 944
4. Superphosphate of lime.	1st 200 lbs. phosphate per acre.	" plain.	134—1072
	2d " "	" brined, &c.	132—1056
	3d 100 "	" plain.	105— 880
	4th " "	" brined, &c.	131—1048
5. Bones.	1st 4 bushels bones per acre.	" plain.	112— 896
	2d " "	" brined, &c.	136—1088
	3d 2 "	" plain,	135—1112
	4th " "	" brined, &c.	149—1192
6. Guano & plaster.	1st 200 lbs. guano, one bushel plaster per acre.	" plain.	128—1024
	2d " "	" brined, &c.	138—1264
7. Guano & bones.	1st 200 lbs guano, four bushels bones per acre.	" plain.	162—1296
	2d " "	" brined, &c.	142—1153
8. Guano & phosphate.	1st 200 lbs. guano, 160 pounds phosphate per acre.	" plain,	143—1144
	2d " "	" brined, &c.	135—1080

Remarks.—I made other experiments with other quantities, but deem them too cumbersome. The field in which these experiments were made is the thinnest land on the place; the rows 440 yards long, 4 feet distant, and running due east and west. The 40-acre piece lying east of plantation road, averaged 1370 lbs. These experiments embrace not the entire yield, as I had made a light picking before I took note, and one or two after; but as there are three pickings from 13th of September to the 22d of November, I deem the showing as fair.

I made only one note during summer: June 18.—I noticed on the 16th that Nos. 6, 7, 8 were growing much faster than the others; up to this date I had not observed any difference. I see very little if any difference between 1, 2, 3, and 4, whilst 5 really appears smallest; it may be the contrast between 5, 6, 7, 8. This was made without examining book as to manures. You will observe in No. 3, 1st and 2d rows had no manure. Now, take No. 3, first two rows giving about 1050 lbs. per acre, and where 247 lbs. of guano were used. No 2–1, and the product is equal or about. Showing, so far as this experiment goes, that 247 lbs. of guano did no good, whilst 100 lbs. No. 2–3, gave 240 lbs. increase for the 100 lbs., or nearly $5 for the guano.

The greatest result was with the 100 lbs., and in No. 7–1 with 200 lbs. guano and 4 bushels of bones.

I did intend to draw no inferences, and believe I will do no more, but leave the matter to your consideration and that of our friends. Of course, I had no interest but to test what was my interest. The result has been so unsatisfactory that I am now undecided; yet, if others claim so much from one experiment, I may as well do so too.

I think I will try again, yet the trouble of having rows picked separately, for three, four, and five times, and for one to be present to prevent mistakes, is rather troublesome. I think, therefore, only of trying an acre or so, side by side.

I can not resist bringing to your notice that salt drilled, 2 and 4 bushels per acre was a detriment; see No. 1–1 and 2, and 3–3 and 4.

Again, Nos. 6, 7, and 8 were the largest and thriftiest, very green even till frost, No. 6 having rather a preference all the time, and more bolls not matured.

M. W. Philips.

—*From the American Cotton-Planter.*

BUTTER AND CHEESE.

We give below a valuable selection from the Report of the Committee of the "Rhode Island Society for the Encouragement of Domestic Industry," on this subject.

From these experiments it is shown that to obtain the best of sweet butter, that will keep for a greater length of time than any other without being rancid, we must churn sweet cream—that if the butter-milk is valuable in market, and the butter can be disposed of soon after it is made, there will be the greatest gain by churning the sour milk and cream together; that by scalding the milk, and then taking off the cream, the milk is best for market: although the yield of butter is greatest, and the flavor good, it must be put in market direct from the churn and consumed without delay, or it becomes rancid and worthless; that in proportion to the quantity of butter produced from the cream of a given measure of milk, reference being had to the length of time the cream is suffered to remain upon it, will be its liability to become soonest rancid; that the excess of weight, as exhibited above is to be attributed in a great measure to the absorption and combination of caseine (curd) with the oleaginous (oily) portions of the cream; that the prevalence of caseine, although it is not objectionable by imparting any unpleasant flavor while new, renders the butter of less value, as it soon grows rancid; and for the further reason that it is used, necessarily, more profusely than new butter, which has less curd in it. It has been fully proved that milk contains, on an average, only one per cent. more curd than butter.

Dumas says, "that the facility with which butter becomes rancid, depends on the presence of caseine, (curd) from which it is necessary it should be separated in order to its preservation."

This can be effected by fusion, (melting.) For exportation to hot climates, or for the purpose of preserving early-made butter sweet through the heat of summer, for winter's use, it should be clarified before salting or much working. For this purpose, it is put into a lipped vessel and placed in another of water, which is to be gradually heated, till the butter is melted. Care must be taken not to over-heat it; it must be kept melted until the curd and butter-milk have settled; the clear melted butter is then poured off from the sediment into small white kegs, containing from twenty to thirty pounds each, or into maple cannipails, of Shaker manufacture, for family use. When sufficiently cooled, and before it hardens, it may be salted with less than half an ounce of fine *rock-salt* to the pound, but as it is difficult to incorporate the salt well, the salt may be omitted, and the butter will keep perfectly sweet. What butter remains in the vessel will rise to the top, and harden like tallow; when taken off, the amount of curd and butter-milk will appear. You will then have the pure article, equal to the best of table butter, for all the purposes to which sweet oil (as we get it) or drawn butter is applied—it is perfect for shortening—melt it in milk instead of water. It is not suitable to spread cold on bread.

One of your committee, in the warm season, last year, took seventeen pounds of sweet, salted, lump butter, and proceeded as above directed. What settled at the bottom after melting, was composed of two ounces of limpid whey, two ounces of fine salt, and twelve ounces of curd—in all, one pound. Had this curd not been extracted, the whole, long before this (2d of Feb.) would probably have been rancid. The experiment proved perfectly satisfactory, and is recommended to the public. Store-keepers back in the country, who take in butter, would find it to their account by putting it in practice, thereby diminishing the amount of "grease-butter" sent to market.

Adulteration of Milk, from *Bowman's Medical Chemistry*, as published in the *Providence Journal*, some time since: "We have no chemical means of ascertaining whether water has been fraudulently added to milk; the only effect being to dilute it and render it of poorer quality. A knowledge of the specific gravity can not here be made available, since the abstraction of cream, which has a lower specific gravity than milk, may be made to neutralize the effect produced by the addition of water; the tendency of the removal of the cream being to raise the specific gravity, or weight of the milk, and that of the addition of water to lower it. A specimen of milk, therefore, which has been impoverished by the abstraction of cream, and still further weakened by the addition of water, may be made to possess the same specific gravity, or weight, as it had when taken from the can."

The average product of cow's milk is 15 per cent. of cream by the lactometer.

It is of quite as much importance to ascertain the average product of curd; but this can only be done by actual experiment, as no instrument will show it. Liebig says the nutriment in milk depends upon the amount of curd it contains, and not on the amount of butter. An experiment was tried by feeding a dog with butter only; he became very fat, his hair was saturated with grease, and he died at the end of thirty days. Those who were opposed to this view of the subject repeated the experiment, and the dog survived, but this result was attributed to the great amount of caseine (curd) contained in the butter.

If the object of a dairy be to make cheese, cows should be bred and selected that give milk rich with curd; if the object be butter, those that give a light milk will produce most; but if the object be the greatest profit in selling milk, such cows should be selected as will give the most milk, and from which the least butter and cheese can be made from a given quantity.

It is a remark often made, and with truth, by those who have the care of dairies, that there are individuals among their cows, whose milk yields little or no cream, but abounds in curd; while the milk of others is very deficient in curd, but is not lacking in cream. The perfection of milk is the union of these two desirable properties, and its greatest defect is the absence of both.

A cubic foot of pure water weighs 1000 ounces avoirdupois, very nearly.

The weight of all substances, except the gases, (all being brought to one temperature,) is, in relation to that of pure water, whose specific gravity (weight) is represented by unity, or one, thus:

Water - - - - - - - - - - - - - -	1.000
Butter is lighter - - - - - - - - - - - -	0.942
Cream " - - - - - - - - - - - -	0.980
New milk average is heavier - - - - - - -	1.028
Skim-milk " " - - - - - - -	1.038

In a former communication on the subject of butter-making, we disapproved of the practice of adding water to the cream, and of washing the butter, to rid it of its butter-milk. The carbonate of lime, found in water, causes the incrustation which forms on the inside of utensils in which it is boiled. Butter absorbs the lime and magnesia present in salt and in water, when it comes in contact with them; it has an injurious effect on its quality and preservation. It is therefore in all cases safest not to wash it, even if the water be pure; it will, in a measure, destroy its fine fragrance and flavor.

The use of pure salt can not be too often recommended to those who have dairies in charge. More than a million of dollars can be annually saved to our farmers in this country, by attention to this point. No one denies that good pure salt is made at our salt-springs, by solar evaporation, if taken from the first pan where all the crystals are perfectly square; but this salt comes to the consumer with various degrees of adulteration; and is therefore cheap, as to the first cost. After the square crystals of pure salt have ceased to form; then, by further evaporation, the salts of magnesia, and glaubers salts begin to show long needle-shaped crystals, very bitter to the taste; easily dissolved, and always found moist in damp weather. It will not preserve fish or meat, and when used for butter, will dissolve and run from it like water. Whereas rock-salt gives it firmness, which facilitates the extraction of butter-milk and preserves it sweet. Many bags marked rock-salt have been filled more than once; and many others never came in contact with it. Let the farmers club together, and send to a sea-port, and get the best of rock-salt—sift out the fine, wash and dry the lumps, and have it ground at any grist-mill in the neighborhood, as our fathers did, before the introduction of the very improved fine Liverpool bag or blown salt.

For the Committee, STEPHEN H. SMITH.

We also add the following selection from some unknown source:

"BUTTER.—Butter made properly is very easily preserved. The cream should be churned *while it is sweet*, the butter-milk thoroughly *worked* out—

not *washed* out with cold water—about an ounce of salt applied to a pound, packed away in the tub closely, and kept as much as possible from the air. This is the whole operation of making and keeping good butter. It is not the pure butter, which is an oil, that becomes rancid, but the butter-milk that is with it. We have seen a statement from a French paper, that the bad taste and smell of butter may be entirely removed by water mixed with chloride of lime. The discovery was made by a Brussels farmer, whose practice has been to take a sufficient quantity of water to work it in, and put in it from 25 to 30 drops of chloride of lime for every 10 pounds of butter. When it has been worked until the whole has been brought into contact with the water, it should be worked again in pure water, when it will be found sweet. This plan may easily be tested, and we should think it worth while for those dealing in butter to try it."

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

BOOK-FARMING.

Messrs. Editors: Man is so constituted by early education and association in early life, that it is not strange that we should cling to them in after years. Our early training in morals and religion is seldom forgotten; our early education in tilling the soil is apt to cling to us in after-life.

There is a common prejudice among farmers against book-farming. Most of this we have received by early training. It is very important that the farmer should form correct theories—that he should understand the nature of each crop he cultivates, the nature of the soil on his farm, the amount of manure required for each successive crop, the kind best adapted to any particular location on the farm, the best time to plough different soils, the best and most prolific seeds for cultivation, their character and habits, the most proper time to sow and plant, and so on, through a long list of operations. Now, is this science all untrue and deceptive, because it is a matter of record? Certainly not. Do any of our brethren know so much that it would be injurious to know more? Is there not room still for improvement? Do our fields do all that they are able to do by an improved system? We think we hear the answer NO to all these questions.

But how are we to be benefited by books and agricultural journals? We answer, read and practice what is adapted to our case. We must use our best judgment. We are not bound to receive what we think is unreasonable. If a correspondent advances a visionary scheme, we are not bound to follow it. But some will say, we work our farm the same as our fathers did! but do we harvest as large crops as they did? No! They cropped a virgin soil. It has now become exhausted. Books will tell us how to restore it to its original fertility.

We are not apt to think of that vast pile of pork, beef, mutton, corn, &c., carried from the farm, for two or three generations, without having the same elements restored again to it.

If there are the elements of five hundred bushels of corn in one acre of land, with what the plant absorbs from the atmosphere, when we have taken out four hundred, there is but one left, and so on, till we have taken the whole, without restoring to the earth, in the shape of manure, that which has been taken from it.

Some will say, we have seen enough of book-farming. There was such a man did this, that and the other, and "came out at the little end of the horn," as the saying is.

All very true. Do all hap-hazard farmers succeed? Do not as many systematic farmers succeed in laying up a competence for themselves and families as book-men do in any other occupation?

A good agricultural journal is a great help to a practical farmer. We might see there an experiment we had designed to make, and we may thus be informed of the folly of renewing it.

On the other hand, we might see something the idea of which never had come into our mind before, that might be of many dollars' advantage, paying the subscription, and leaving a balance in our pockets besides.

Epping, N. H. D. L. Harvey.

BLOOMSDALE—THE SEED-FARM AND RESIDENCE OF DAVID LANDRETH, ESQUIRE.

This establishment is situated on the Pennsylvania side of the Delaware river, one mile above Bristol, and embraces about two hundred acres of land.

The father of the present Mr. L., who was the first in this country to systematically cultivate seeds for sale, commenced his operations shortly after the Revolution, on a very limited scale, but at that day sufficiently large to meet the demand, with the aid of occasional importations from Europe; and within the last quarter of a century, the grounds cultivated by this concern (then as now the largest in the Union) did not exceed 30 acres. Now the shipment of seeds is to far distant points. California calls for supplies by almost every ship; Oregon and New-Mexico make occasional demands; South America and the West Indies are regular customers; and the British possessions in Asia obtain annual supplies. Within a short period Mr. L. has completed a shipment of *four tons*, ordered for distribution in British India! Thus has increased the commercial demand for one of our country's many products, and thus is answered a question which is very naturally asked on viewing the crops at Bloomsdale: where is market found for all these seeds? The amount of labor expended on the culture is evidently great, and though nearly all the crops are in drills, thus admitting of mechanical aid, still many hands are requisite to subdue the weeds, harvest and thresh the crops, and perform other operations incident to the business.

Mr. L. has found the system of providing household accommodations for his hands, to work well. Eleven families now reside on the estate, (the single men boarding with the married,) each provided with a neat cottage and garden—keep their own pigs and cultivate their own vegetables and flowers. They are encouraged to keep all neat and trim; the inconvenience and temptations of remote residence are avoided, and as Mr. L. never changes his hands but on compulsion, they feel assured good conduct will insure permanent homes.

A tank for collecting liquid manure flowing from the barn-yard, has been erected, and is capable of holding about 50 hogsheads, durably built of stone, coated with hydraulic cement, and is emptied by an ordinary chain pump, which discharges into a cask on wheels. This, though an economy almost universal among English farmers, is seldom resorted to in this country, though it could be with decided advantage by every tiller of the soil.

Among the live-stock is a pair of Norman ponies, which are made to serve a double purpose—amuse the youngsters, and cultivate drilled crops; they work within 16 inches and possess sufficient power for the harrow. These, with mules for similar labor, and oxen and heavy horses for ploughing and cartage of manure, are the force employed.

The lawn at Bloomsdale embraces eight to ten acres, and though formed but five years, promises to be highly attractive, it being laid out with unusual care and judgment. It is planted with a carefully-selected variety of indigenous trees, also many rare specimens imported from abroad for the position they now occupy.

We might here express regret, that many among us who have expended largely in the erection of their mansions, have not decorated their grounds to accord therewith. True taste consists in an harmonious whole—the grounds and buildings to be pleasing and effective must be "in keeping." Even the *habit* of trees should be studied; certain trees suit certain styles of architecture. Flat-headed ones do not accord with pointed buildings, nor do spiral trees harmonize with Italian structures, the lines of which are mainly horizontal. On these subjects we have much to learn—let us meanwhile practice what we already know, and thus impart the information to others.

It is amongst the most gratifying evidences of the true progress of agricultural and horticultural science in our country, that men are found who devote their time and attention to one particular branch, and thus develop fully what is capable of being effected by proper cultivation. Of this class are those who have demonstrated the progress that can be made by proper improvement in cattle, horses, hogs, sheep, &c. They have furnished a *seed* from which the farmer can greatly increase the quality of his products, and thus have given an impetus to this important resource of our country's prosperity. In this view of the subject, Mr. Landreth deserves to be ranked as a benefactor of his race. He has brought science, skill, and experience to bear successfully upon a department of agriculture which is developing the capabilities of the soil, and adding to the products of the earth, whether cultivated on an extensive scale by the farmer, or by him only who tills his little plot in the garden.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

WISCONSIN.

Messrs. Editors:—Thinking that a description of this country would be of interest to some of your readers, who may wish to emigrate, I have determined to set forth the advantages of this particular county (La Fayette, Wis.) for settlers.

There is but little vacant land in the county, nearly all having been entered by settlers or speculators. The settlers are generally of an unquiet disposition, and fond of change; many would sell out cheap, for the sake of moving.

The land held by speculators is mostly timbered, and can now be bought at from $5 to $10 an acre; but land is increasing in value daily.

Improved farms can be bought at from $7 to $14 an acre. One farm, near me, of 400 acres, over 100 under cultivation, 80 in timber, and 80 in meadow, with a comfortable frame-house, and fine springs, can be bought for $7 an acre. I know a lot of about 280 acres, 120 of the finest meadow, about 60 well timbered, the rest open prairie, belonging to speculators. This is one of the most beautiful sites for a farm that I have seen any where, and can be bought for between $4 and $5 an acre; two years ago, it was held at $3 an acre.

Land in this vicinity is very rich, the soil being from six inches to several feet deep. The surface is covered to the depth of about three inches with a rich vegetable mould, as black as ink, and as soft to the touch as velvet.

There is a field on the river bottom, which has been cultivated twenty years, and has never had a particle of manure applied to it, which, I am assured, produces as abundantly now as ever.

Corn is the most reliable crop, and the yield is from 60 to 100 bushels per acre. The soil is rather light for wheat, inasmuch as the wind blows it from the roots in winter, unless protected by snow; though wheat will make a good crop, if a proper spot is selected, and the wheat sown early and abundantly, so as to sod the ground before the cold weather sets in. Crops of wheat raised on sod which was turned over the preceding summer, are always sure, and yield from 25 to 40 bushels per acre. Oat crops yield from 60 to 100 bushels. Rye and barley are good crops.

As to vegetables, they are produced in perfection. I raised carrots last summer 18 inches long, and as large as a man's leg, on ground which was only broken the summer before, and was not even ploughed before the seed was sown. Under the same circumstances, I raised radishes, weighing 8 and 9 pounds; turnips, 9 inches in diameter, which would probably weigh 15 lbs.; tomatoes, weighing 1 lb. 14 oz. Potatoes of the finest quality, and 350 bushels of corn, on seven acres. Next summer, I expect to get 100 bushels per acre. I raised water-melons from seed brought from Virginia, which, though not remarkably large, were as fine flavored as those from which I got the seed. I planted a little tobacco last summer for experiment. I will simply add, that I sold some of it, *in the leaf*, for fifty cents a pound.

This is a great grazing country, and is admirably adapted to raising stock of all kinds. Cattle keep in good order all the winter, on wild hay. The tame grasses grow luxuriantly, and the wild, of which there are several varieties, grow six and eight feet high, and yield from two to four tons of hay per acre.

There is a fine water-power within a mile of me, capable of supplying several large mills, and I am surprised that it has not been taken advantage of; particularly, as a grist-mill is very much needed in this neighborhood.

Limestone, in strata, from one inch to one foot thick, and sometimes eight feet square, is abundant, and well suited for building purposes.

As to markets, we have the lead mines; Wiota, 6 miles from me; Shullsburg, 18 miles; Warren, Ill., 6 miles distant, at which place, there is a depot of the Chicago and Galena Railroad, which road has just been completed to Warren, and will probably be completed to Galena by next summer. Warren is also the point at which the Mineral Point Railroad intersects the Chicago and Galena road; so by next summer, we will have Chicago, Galena, and Mineral Point for our markets.

It is supposed that the Milwaukee and Dubuque railroad will pass through the centre of this county. Several surveys have been made within a mile of me.

I would not be surprised to see this, in less than five years, one immense village from the Lake to the Mississippi, and eight or ten miles wide.

The country is very healthy, except on the river bottoms, where intermittent fever prevails. The winters are severe, to me, a Virginian, and are six months long. The summers are delightful, and in those months the country is positively beautiful, particularly what is called the barrens, which resemble a magnificent rolling-park, with its green trees, and rich grass, and beautiful wild flowers. Respectfully yours,

G. W. VARNUM.

Wiota, Wis., January 3, 1854.

MASSACHUSETTS AGRICULTURAL FAIR.

THERE is one feature about the fairs of Massachusetts which deserves especial mention. We refer to the great number of persons who receive premiums. In some societies the number of applicants is limited, and the list of successful competitors might almost be stereotyped. In the local societies of the Bay State, no such criticism can be justly made. We have prepared the following table from the returns of the State Board of Agriculture:

Names of Societies.	Number of towns in territory represented.	Number of towns in which premiums were obtained.	Amount of prem's. obtained.
Essex, ...	30	22	882.12
Middlesex, ...	50	24	589.00
Worcester, ...	58	23	591.00
" West, . .	—	11	457.00
" North, . .	—	10	298.70
Hampshire, Franklin, & Hampden, . . .	69	18	663.90
Hampshire, ...	23	22	500.00
Hampden, ...	20	10	598.75
Franklin, ...	26	16	388.41
Berkshire, ...	32	22	813.00
Housatonic, ...	—	15	865.00
Norfolk, ...	23	18	749.00
Bristol, ...	19	14	640.75
Plymouth, ...	19	18	597.75
Barnstable, ...	14	8	182.75

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

HOP-RAISING.

DEAR SIRS: I have delayed much longer than I intended the notifying you of the amount of hops raised in this vicinity. The crop this year has been very meagre.

Not one half the quantity, in the same yard, has been produced this year that was last, many yards having been brought under cultivation. In many, the vines did not (a majority of them) ascend the pales over four feet. The growers attribute it to a worm preying on the roots in the early part of the season.

A set of *sharpers* came into the vicinity in July, and contracted with all who would bargain, from seventeen to twenty-two cents. At the time they were collected for market, the price was quick at thirty-four cents, and the few who did not sell till winter, received thirty-eight cents.

There were seventy-five tons taken in at Hyde-park, that being the universal depot. Those dealing in the article, say there must be deducted nine tons for what came from other towns. Hop-raising is a money-making business, (which appears to be the *Yankee's* god,) and is a vast benefit to our farmers.

Yours truly, ARIEL HUNTON.

Hyde-park, Vt., February 27, 1854.

MORE PROFITABLE FARMING.

THE following is the account of a farmer of Ohio. We commend it and others like it to the attention of all poor farmers. It is from the *Ohio Cultivator*. The writer says:

"All the items below have been produced, and increased on the farmsince January, 1853. We devote our attention *mainly* to raising wheat and corn; have some 15 acres in apple-orchards, &c. Our farm has 171 acres, 120 of which is in cultivation. I am assisted by three sons, 17 and 19 years of age, and therefore hire but little. I have not taken into account the labor done by the family on the farm, nor the articles consumed by them raised from the same.

Our wheat crop the past year was no more than two thirds of an average one. Mywheat and corn is mostly unsold yet; I therefore put the prices they are now selling for:

Farm account from January 1, 1853, *to January* 1, 1854.

EXPENDITURES.

Taxes for 1853,	$41	08
Hired lands,	71	10
Girl to assist in housework,	30	00
Machine for threshing grain,	22	96
Shoes and boots for the family,	41	00
Store bills,	138	80
Blacksmiths' bills,	32	00
Medical bills,	12	00
Churches, and building bridges,	20	00
School bills,	6	10
Newspapers and periodicals,	7	50
Repairing and building out-houses,	38	00
Reaping-machines, cost $130, say one quarter of this,	32	00
Wagon-maker, repairing,	6	25
Two mares to a horse,	8	00
Market-wagon, cost $40, say for this year,	8	00
Expenses attending market at Columbus,	18	00
Various other small expenses, amounting to	18	50
Total,	$551	79

RECEIPTS.

625 bushels wheat sold and on hand, at $1.10,	$687 50
1200 " corn " " 30c.,	360 00
30 stock hogs,	147 00
Lumber and timber sold from the farm,	112 10
3000 rails sold, (their places supplied by hedge,)	45 00
Rent of 2 houses belonging to farm,	48 00
Amount received for pasture from neighbors,	42 00
8 tons of hay,	64 00
Increase on 12 horses and colts—1 sold,	140 00
Seven stock cattle sold for	85 00
2 cows sold for	42 00
Increase on 28 head stock cattle and cows within the year,	110 00
160 bushels oats sold at 37½c. per bushel,	53 00
360 bushels apples sold in Columbus, averaging 60c.,	216 00
210 bushels sold at home for 25c. per bushel,	52 50
26 bbls. cider, at $2 per bbl.,	52 00
4 bushels timothy seed,	10 00
Work done for neighbors to amount of	66 00
Beef and hides sold	41 50
60 lbs. of wool of 14 sheep, at 50c. per lb.,	30 00
Increase in sheep in the year,	8 00
20 bushels sweet potatoes sold at Columbus, average $1.50 per bushel,	30 00
80 lbs. honey sold in Columbus, average 22c. lb.,	17 60
260 lbs. butter sold in Columbus, average 18c. lb.,	46 80
90 chickens, 100 dozen eggs sold in Columbus, average	20 00
Chestnuts, vegetables, and other small things sold	20 00
Shingles made and sold by us in the year,	42 00
Total amount sold and on hand to sell,	$2,608 00
Deduct expenses as above,	551 79
Amount of gain for the year,	$2,056 21

FEEDING HOGS ON COTTON SEED.

There seems to be a great diversity in the practice of Southern agriculturists in the use made of cotton seed, not required for sowing. The following account, taken from the *Soil of the South*, seems obviously a very proper application of this highly carbonized food. The writer says:

"I procured a large chaldron that holds ninety gallons, which I had put up with brick, with an arch in front, and a chimney at the opposite end, to draw the heat and let off the smoke. I put in this kettle three or four bushels of cotton seed, with a quantity of turnip-tops and old corn-cobs, the under leaves of cabbages, and a portion of salt, to make it savory; with this composition I feed twice a day, and keep my hogs inclosed in a ten-acre lot. They will keep in fine growing attitude until harvest. I then dispense with steaming their food, the gleanings of the oat fields will sustain them until I open my corn-fields in September. The cow-peas, &c., &c., put them in good pork order, and by adopting this plan, I raise my pork plentifully, and to spare, with but very little corn. I view cotton seed prepared in this way, very wholesome and nutritious food. I generally kill my hogs when they are one year old, and they will average from 175 to 200 lbs. net pork. I keep from sixty to one hundred head of different sizes in my piggery, and living contiguous to market, send all my female pigs to the shambles.

Pigs, Mr. Editor, are very susceptible of disease. When they are affected with a dry cough, and mangy, I give them poke-root soup, take two or three large bulbous roots, and put them in a large pot or kettle, and boil them until they are soft and perfectly done, and put in a quantity of meal and salt, and when co l, convey it to the piggery, and let them feast on it. I also give sulphur and pulverized antimony, copperas and strong ashes to my hogs, which destroy the kidney-worm and keep up their appetite. Now, Mr. Editor, I have given you my plan of feeding cotton-seed to hogs, as also my prescription for pigs. If you think it will contribute to inspire the farmer to try the experiment, I shall feel myself fully remunerated.

"*Montgomery City, Ala., January,* 1854."

HOW TO PROCURE GUANO FOR A WHEAT CROP.

A writer in the *Country Gentleman* gets off the following:

How to procure guano for a wheat crop? Why, send the money to Longett & Griffing, of New-York, and you will receive guano in return if you so order it, the captious joker will say. Even so. But how obtain the money for *that* purpose, without trenching upon any extraneous source? "Why," says the joker, "the extra product of wheat will pay for the guano." Possibly it may, and more gain if it do. How to procure guano for a wheat crop? I will tell thee, gentle reader.

Instead of sun-drying your land all summer in the fallow system, plough it crosswise in the first week of June, and drag it without lapping, and sow, broadcast, from three to four bushels of Indian corn, and sweet garden-corn if you can obtain the seed, and then cover it up with a gang-plough or large cultivator. Take no further care till the last week of August, when you must mow down the corn fodder, tie it up in bundles, and remove it to an adjoining field for the purpose of clearing the ground for ploughing, and set the bundles up in shocks, and as soon as cured, put it into large cocks, say a load to a cock, and let it take a *sweat.* In a dry spell of weather, open the cocks in the morning, and cart to the barn in the afternoon, and stack it in the mow the same as hay, and salt every two layers of bundles at the rate of a barrel of salt to five acres of fodder. Or if you like it better, stack it to the weather, in long, narrow stacks, in joints about ten feet long, and thatch it with straw, English fashion.

The fodder from one acre, when cured, will weigh from four to seven tons. Mr. Alpheus Morse, of Eaton, told me at our county fair, that he had weighed half an acre of dry corn fodder, and its weight was three and a half tons, or seven tons to the acre. His farm, it must be borne in mind, is in a very high state of cultivation. This corn fodder is worth $10 per ton when hay is worth $7. Four tons at $10 per ton = $40 per acre. Seed, $3; mowing and binding, $2; carting, $1.50 = $6.50. $33.20 *profit on the acre to buy guano with!* The land is left perfectly clean and mellow, and there is no loss in the consumption of the fodder, for the cattle do not leave a sign of it in the manger.

For soiling milch cows in the dry months of August and September, corn fodder is a complete stop-gap to the cows drying up, an object aimed at by all practical men. Half an acre is amply sufficient for ten milch cows. Try it, brother farmers, and see how much money you have lost in your lifetime.

If these calculations be correct, what an immense amount of fodder is lost every year in New-York State alone; for it is well known that all soils suitable for wheat will grow corn fodder to perfection.

Who will profit from the fact, that one acre of corn fodder will buy two hundred weight of guano to the acre for six acres of land? Corn fodder will revolutionize farming in the Northern States.

CULTURE OF THE CAMELIA JAPONICA.

As a green-house plant, the *camelia* stands second to none in its range of admirers. In the old and new world it is equally sought after, forming a conspicuous feature in the collections of the most costly exotics, as well as the most humble.

It has two pleasing attractions, beautiful evergreen foliage at all times, and flowers the entire part of the winter can be easily obtained, in shape and color equal to the finest rose. Under the hands of the florist, no plant has made more rapid strides to the standard aimed at; and to this country belongs the history of many of the brightest gems.

Its native country is Japan, and it is very nearly allied to the plant that produces the tea of commerce, (*Thea sinensis.*) It is a favorite with the Chinese, who have been long known to possess a yellow one, a desiderata much sought after. Mr. Fortune, during his mission to the Chinese, succeeded in procuring and sending to Europe specimens, which have since flowered. It is thus described: They are of the kind known as anemone-flowered, of a pale yellow or lemon color, the centre petals being the darkest. It flowers very freely, and both in habit and foliage is very neat. The leaves are smaller than in the ordinary kinds. It is thought to be much hardier than any other known *camelia.*

The camelia has a regular period for growth, after which it forms its flower buds; and this period is of the most consequence to the cultivator, if superior plants and flowers are desired.

As a general rule, they commence growing as soon as the flowering is nearly passed, and should then receive an abundance of water at the roots, the atmosphere at all times moist, and the plants syringed frequently over head. The temperature also should be kept from 55° to 60° as a minimum, and the plants kept carefully shaded from the mid-day sun.

As soon as the growth of the wood is complete, they commence growing at the root, and this is the time many prefer re-potting them; but provided the proper temperature is kept up, we prefer doing this just before they commence starting their buds. All young plants should receive a shift once a year, using pots about two sizes larger than those they are in. If very large specimens, once in two years is often enough. They are better under than over-potted.

After the growth is complete, they require to be kept cool and shaded during summer, occasionally syringing over head, and the pots studiously kept from becoming dry, or the buds are likely to fall off.

The best way to keep these and similar plants during summer is in the open air, under a canvas awning, so that the driving winds and heavy rains can be kept off them, plunging the pots to the rim in some non-conducting material.

No collection should be without the following sorts: alba-plena, white; Beallii rose; candidissima, white; Abbey Wilder, waxy white, sometimes faintly striped; Chandlerii, rose; Duchess of Orleans, pink; fimbriata, white; imbricata, red; Jeffersonii, red; Landrethii, pink; pictorum roseum, carmine; Sarah Frost; sacco magnifique, rose; Kermysina, red; Lowii, ochroleuca, pale yellow; and Wilderii, rose.—*Country Gentleman.*

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

THE VEGETABLE GARDEN.

Messrs. Editors: The "kitchen-garden" is much neglected. Most farmers pay but little attention to the cultivation of vegetables for the table, and what is attempted is done in the most imbecile manner. Some people seem to think a wheel-barrow of manure is thrown away by being put on the garden. All that is done in many cases, only assists to make a rank growth of weeds. The garden, like all other matters of business, to be successful, requires promptness. The work must be done in the right time, and well done, too. It must be manured and deeply cultivated, and this will generally insure a good harvest. We know of some farmers that think the cultivation of a small patch as a garden is beneath their dignity—rather small business. They have no particular dislike to the cabbage, beet, parsnip, &c., if they are well cooked, but they dislike the work necessary to raise them. Now, we believe there is no other spot on the farm of equal extent that pays so well for the labor bestowed upon it as the kitchen-garden, if the work is done well, and in the proper season; and not an equal number of rods on the farm that contributes so much to the support and health of the farmer and his family as the garden. A small piece of meat, with the cabbage, beets, carrots, &c., will constitute a good healthy meal for a large family, at a very cheap rate, much cheaper than is obtained from the broad acres.

There is an old saying, and a true one, "that a small garden, well cultivated, will half maintain a small family." We must remember it is to be well cultivated, the weeds not allowed to sap all the nourishment from the plants. If it will not be out of place, we will relate our system of gardening. Having but little help, we have to economize what labor we can in the working season. We cultivate as a garden about four square rods of land, of a moist, deep soil, situated so that the team can turn on the grass at each end. As soon as it is dry enough in the spring to work manure well, we plough as deep as the plough will work, and in two or three days, give it a good harrowing, and let it lie till about the first week in June, or when the ground is suitable to work. We then take a plough, and begin to back-furrow in the centre of the patch. After going out and back, we rake the furrow down, smooth the clods, and throw small stone into the bottom of the furrow out of the way. We then go round again, and rake down as before, till the patch is completed. We now mark off the drills by a stick with three pegs driven in seventeen inches apart, drills running north and south, so that the sun will fall in between the rows at mid-day. Then we sow the seeds by hand, and cover with the hoe. By late sowing, beets and carrots grow with great vigor, and soon cover the ground, and prevent the growth of weeds. We generally weed but twice, which is mostly done with a hoe, and suffer no weeds to go to seed.

The finest beets and carrots that ever we raised for winter and spring use, were sown the 20th of June. On this small patch of land, we raise sufficient for our family, and have a surplus for stock, being fully satisfied that there is no spot on the farm of equal size that pays so well for the labor bestowed on it. We adopt a system of rotation, sowing beets one year and carrots the next, &c., with the exception of onions, which we can not raise on this spot.

Epping, N. H. D. L. HARVEY.

UNITED STATES AGRICULTURAL SOCIETY.

THE second annual meeting of this Society was convened in Washington, at the Smithsonian Institute, on the 22d of February. But it being the anniversary of a day always regarded with especial interest, the meeting of the Society was adjourned till Thursday, the 23d.

The following abstract will give a fair view of its proceedings:

SECOND DAY, THURSDAY, FEBRUARY 23.—The Society was called to order in the morning at half-past ten o'clock, Marshall P. Wilder, Esq., of Massachusetts, President of the Society, in the chair; Recording Secretary, W. S. King, of Rhode-Island; and Nathaniel P. Causin, of District of Columbia, Assistant Secretary.

The proceedings of Wednesday being read, credentials from the representatives of various States present were received. Nineteen States were represented, and about one hundred members present. The inclemency of the weather had detained many on the road, and some had been compelled to return.

The President then made his annual address, during which the venerable G. W. P. Custis, Esq., of Arlington, entered, and was received by the Society with the usual tokens of respect.

On motion of Mr. J. C. G. Kennedy, Corresponding Secretary, the President's address was referred to the Executive Committee for publication.

The Chair read a communication from the Secretary of the Treasury, inviting the members of the Society and their families to his residence in the evening. The invitation was duly accepted.

The Chair having suggested the appointment of a committee for the better management of business, it was, on motion of Colonel C. B. Calvert, of Maryland, agreed that committees of three members each be appointed for each subject under consideration, and to be named by the Chair.

Mr. Dedrick, of Albany, N.Y., moved that a committee of three members, on the subject of agricultural machinery, be appointed, and to report to the Society. He spoke at some length in explanation of the great importance to the agricultural interest of being placed in possession of the best implements for the prosecution of their labors. The motion prevailed.

Mr. Denton Offutt, of Lexington, Ky., moved the appointment of a committee on animal physiology, and the general improvement in all respects of domestic animals. It was a subject of high interest and importance.

Mr. Calvert testified to the influence, to him wonderful, whatever it was in itself, of Mr. Offutt's power over at least one animal, the horse. He had been an eye-witness to a scene at the Maryland State Fair, which may be mesmerism, or magnetism, or what not; but Mr. Offutt reduced almost instantaneously a horse noted for vicious propensities, to gentleness and tractability. He warmly seconded the motion of Mr. Offutt.

Messrs. Browne, of Pennsylvania; Earle, of Maryland; and B. Perley Poore, of Massachusetts, also bore witness to Mr. Offutt's extraordinary powers in this respect.

The motion was carried, and a committee of three, consisting of Messrs. Browne, Earle, and French, of Massachusetts, was appointed by the Chair.

The Committee on Agricultural Machinery was then announced by the Chair. It consists of Messrs. Dedrick, Musgrave, of Ohio, and Prof. Mapes.

An invitation from Mr. Glover to the Society, to visit his collection of models of fruits at the Patent Office was then read.

General Worthington spoke in warm commendation of Mr. Glover's labors and high success.

The Recording Secretary explained it to be the wish of Mr. Glover to extend his collection, so as to include at length all the esculent fruits and vegetables, and he was desirous that Congress should purchase his collection for national purposes. If the Society, after inspection and examination, should approve of his labors and objects, Mr. Glover would be glad to get their recommendation to Congress in his favor.

The invitation of Mr. Glover was accepted, and a committee appointed on behalf of the Society to examine the collection in the Patent Office. The committee consist of General Worthington, Messrs. Berckman, of New-Jersey; Warder, of Ohio; Munn, of New-York; and Richards, of Massachusetts.

The Chairman then offered for consideration the contents of two communications confidentially committed to him. One was from Mr. Joel Hitchcock, of St. Lawrence county, N. Y., on the subject of a remedy for the potato rot; the other on the subject of a remedy for the devastation of the *curculio* on fruits, by some person, whose name did not transpire. The object of the parties seemed to be to get their remedies to be tested by the Society through committees of the same, and reports made at the meeting of next year.

The question on the reference of these proposals, gave rise to a very animated debate, in which views of very opposite character, in respect to the probable value of the alleged discoveries, were elicited.

Mr. Worthington moved that the communication just read be received, and referred to the Executive Committee, to test the mode proposed, and that they report to the next annual meeting of this Society, which was carried.

Mr. Corey moved that communications from other persons on the subject of potato disease be referred to the Executive Committee.

Mr. French thought the Executive Committee should be instructed to appoint proper persons, members of the Society, to institute experiments. He moved an amendment of Mr. Corey's motion in consonance with these views, which amendment was carried.

The Chair then presented a written communication from a gentleman in Ohio, requesting that a committee of three be appointed to investigate the subject of the remedy for curculio.

After considerable discussion, Mr. Wm. S. King moved a select committee of three on the subject, of which the President of the Society should be chairman. This was carried, and a committee appointed of Messrs. Wilder, Brinckle, of Pennsylvania, and Birckman, of New-Jersey.

Mr. Bradford, of Delaware, asked if any communication had been received by the Society on the subject of guano. The Chair having replied in the negative, Mr. Bradford then asked and obtained leave to read a memorial to Congress from citizens of Delaware, praying the interposition of Congress, either by purchase of one of the Chincha Islands, or by negotiation with Peru, to put a stop to the effects of the operation of the Anglo-Peruvian monopoly, by which the price of guano has been raised, and kept at the extravagant price of $54 per ton.

Mr. Bradford then pressed this subject on the attention of the Society as one of primary concern to the agriculturists, and in fact, the whole people of the country. On his motion, a committee of five was appointed in relation to the matter, namely, Messrs. Bradford, Calvert, Browne, Burgwin, of North Carolina, and Booth, of Virginia.

The list of the committee of nineteen on nominations was read by the Chair, Dr. J. D. Weston, of Massachusetts, being its chairman.

The report of Prof. Henry on the order of business was next read. Other committees were reported.

On motion of Mr. J. C. G. Kennedy, it was ordered that it be made the duty of the committee on nominations to nominate a permanent editor of the journal of the Society.

A communication from Mr. James Pederson, on the subject of introducing the Alpaca or Peruvian sheep into the United States, was then read by Mr. Munn, of New-York.

Papers collected by the Lighthouse Board were referred to by Prof. Henry, who made some interesting remarks on one of them, being a paper on the use and importance of Colza oil for burning.

An ear of corn was then exhibited by Mr. Henry Ives, of Ohio, and a distribution of the Japan pea was made by a member.

The meeting then adjourned till half-past five o'clock, P.M.

Evening Session.—At six o'clock, P.M., the President called the meeting to order, and introduced Professor Mapes, of New-Jersey, who exhibited and explained an improved sub-soil plough invented by himself.

On motion of Mr. Bradford, of Delaware, the subject was referred to the Committee on Agricultural Implements.

Dr. J. A. Warder presented a quantity of Japan peas, and described their nature and value. They were introduced in the neighborhood of Cincinnati three years ago, and have been widely distributed. It is not a pea, nor a vine, but has a stiff, woody stem; the leaves, however, are broad, and are greedily eaten by cattle; the fruit is very abundant, and occurs in short pods containing two or three beans; these are oblong when green, but round when dry. They will not be valuable for table use when green, but are liked by most who have tried them boiled or as soup, when ripe in winter, and must prove of great value, especially in the Southern States; succeeding well on all soils in which they have been planted. Their great value will be as food for cattle; they are easily threshed out when ripe.

In planting, give them ample room; for the greatest effect, say at squares of three feet; cultivate as corn.

The meeting then adjourned to ten o'clock this morning.

Third Day, Friday, February 24.—The Society was called to order by the Recording Secretary, W. S. King, Esq., of Massachusetts, who stated that the President of the Society was prevented from attending at the opening of the meeting by indisposition, but he hoped to be present during the morning session. On motion of the Recording Secretary, the Hon. John A. King, of New-York, was called to the chair *pro tempore.*

Prof. Fox, of Michigan, then commenced his address on the important subject of extending and improving the education of the agricultural population of the United States, so as to elevate that vast majority of our people up to their proper level, and to bring a greater amount of intelligence to bear upon that important interest, the judicious cultivation of the soil. During the lecture, the President of the Society entered, and took his seat as chairman of the meeting, held temporarily by Mr. J. A. King. Not long after, and before the conclusion of Prof. Fox's address, the President of the United States, accompanied by the Secretary of the Interior, came in, and were introduced to the Society, which received them with courteous greeting.

The sentiments of the lecturer, which were that such institutions were not feasible, at present, were fully discussed.

The President of the United States then rose, and, addressing the chair, thanked him for the intelligence that had been furnished him of the session of the Society; spoke in terms of compliment and approval of so much of Prof. Fox's address as he had heard; acknowledged the high interest and importance of the objects of the Society, and of the questions before it; and said that, whilst he should be most happy to remain during the interesting proceedings yet to be had, other duties demanded his retirement, and compelled him to bid them good morning.

Mr. Taylor moved a resolution commending the purchase of Mount Vernon by the General Government, and making a portion of it the site of a national experimental farm.

The Chair stated that the subject was already before the Society, under a recommendation in the President's annual address.

Mr. Earle proposed a substitute, which he read, for Mr. Taylor's resolution, the intent of which was, that the United States Agricultural Society should indorse the efforts of the Maryland State Society to effect the same object. Mount Vernon, he said, was on all accounts the best place for a national experimental farm, and he believed there were many members of Congress in favor of purchasing it; and after a lengthy discussion, in the course of which Mr. John Jones, of Delaware, spoke strongly in favor of a home market for our wheat, the subject was laid on the table, to be taken up to-morrow morning.

Reports of committees were received, and duly referred.

The venerable G. W. P. Custis, Esq., being then called on, addressed the Society for upward of half an hour in an eloquent and acceptable manner. He recited circumstances, which occurred in the early years of the century connected with the rise of American manufactures. The old Arlington sheep-shearing was established to improve the sheep culture, and was kept up for nine years in succession. That was an age of agricultural barbarism, and it was thought a matter of great progress at that day, when from one he-lamb, of a year old, twelve pounds of wool were clipped. Mr. Custis compared the products of his farm now with what it was in former times, when for forty years, one of his farms, with one hundred working hands on it, only served to starve him. Now, from seven thousand to nine thousand bushels of wheat per year, with a prospect of fifteen to twenty thousand, was the state of his affairs. He advocated an imitation of the good Methodist practice of giving in experiences. Why did they not every year have a meeting for that? The President from Essex county, Massachusetts, could report on his pumpkins, big enough to inclose himself and a party of friends at a rubber of whist. Prof. Mapes, of New-Jersey, could tell of his doings in superphosphate of lime. Mr. Custis enlarged in eloquent terms on the dignity of agriculture, the high respect paid to it and its devotees in England, from the prince to the peasant. In conclusion, he said it might be the last time he would address them. For the seventy-three years he had lived, he had also loved his country, and, though a Southerner, loved the true Yankee. He ended by entreating a blessing on the Society and its members, and that they might return in peace to their homes.

Mr. Robbins, of Ohio, presented a memorial from citizens of Ohio, asking the countenance and patronage of the Society to a cattle exhibition, to be held in September next, in Springfield, Clark county, Ohio, which, after considerable discussion, was referred.

Dr. Warder, of Cincinnati, then being called on, addressed the Society on the subject of the culture of the Catawba grape-vine, illustrating his remarks by reference to a series of drawings of the plant in various stages of progress. Though extemporaneous, the address was a very excellent one, and so luminous, that every body could understand it. Dr. Warder was much questioned by several members on various topics connected with the culture of this vine, all of which he answered most readily and satisfactorily.

The Society passed a vote of thanks for the address, and ordered a written paper on the subject to be printed among their transactions.

Prof. Mapes testified to the value of charcoal in vine-culture.

Dr. Warder spoke of the admirable effects of *potash*, as a manure for the grape plant. It supplied sweetness, increased the size, and improved the flavor.

Mr. Darius Clagett, of the District of Columbia, gave the history of a Catawba vine, now in his possession, more than forty years old, the parent of the greater portion of the vines now in the country.

Evening Session.—Mr. Myron Finch, of New-York, stated that a movement was now in progress for erecting a monument to the memory of the late John S. Skinner, the pioneer of American agricultural editors, and that the measure was receiving the sanction and coöperation of the most distinguished friends of agricultural science in the country. The subject had been before the National Washington Monument Committee, and that body had passed a resolution unanimously, authorising a block, with an approved inscription, to be placed in the National Monument now erecting to the memory of the Father of his Country. Mr. Finch then offered the following resolution:

Resolved, That this Convention has heard with pleasure, that measures are now in progress for erecting a monument to the memory of the late John S. Skinner, the distinguished friend and patron of agricultural science, and that we cordially commend said object to the favorable consideration of the agricultural community throughout the United States.

Geo. Blight Browne, Esq., of Pennsylvania, supported the resolution in a brief speech, in which he paid a deserved tribute to the memory of Colonel Skinner. The resolution was then unanimously adopted by the Convention.

Mr. Browne also presented a work on wool and hair, written by Peter A. Brown, LL.D., of Philadelphia.

Mr. Bradford, of Delaware, made a report on the guano trade, narrating the interview of the committee on the subject with Mr. Dudley Mann, Assistant Secretary of State. Hopes are entertained that arrangements may be made with Peru, by which the price of guano will be reduced.

The report was re-committed.

On motion of Mr. Earl, the memorial of the Maryland State Agricultural Society, petitioning Congress to purchase Mount Vernon for an agricultural school, was taken up and read.

Mr. French, a member of the committee, spoke favorably of Mr. Offutt's system, and after some discussion, it was carried, and Messrs. Blair, of Maryland; Earl, Browne, King, of New-York; and French, of Massachusetts, were appointed a committee to present it to Congress.

Mr. Browne, of Pennsylvania, made a report from the committee appointed to investigate Mr. Denton Offutt's system of animal physiology.

Mr. Causin, who was associated with E. P. Blair, Esq., to examine and audit the accounts of the treasurer, reported, (in the absence of Mr. Blair,) complimented their accuracy, and stated a balance of $3005 in favor of the Society. Of this, upward of one thousand dollars have been contributed at the present meeting.

Mr. Benson read a bill now before a committee of Congress, creating an agricultural bureau.

Mr. Calvert recommended the creation of an agricultural department, on an equal footing with the other departments, the Secretary to have a seat in the Cabinet.

George Blight Browne, of Pennsylvania, spoke at length on the various propositions for Congressional aid, and gave his own opinions.

Mr. French moved that the matter be referred to a committee, but withdrew his motion.

Mr. King, of New-York, moved that the Society adhere to the resolution of last year, asking for a full department.

Hon. Mr. Benson presented a resolution in behalf of Mr. Meacham, of Vermont, that a national exhibition of sheep be held in the course of the year in the State of Vermont, at such time and place as the Agricultural Society of Vermont shall appoint. Carried.

On a strong expression of the wish of the Society, Benjamin Perley Poore, Esq., addressed the Society, although the appointed hour had elapsed. Although prepared in haste, Mr. Poore's sketch of the rise and progress of agriculture in the old world, and more particularly in the new, was very interesting. He gave an account of Indian agriculture, and, passing through the history of colonial and revolutionary farming, came down to the present time.

On motion of Mr. Calvert, an address was ordered to be published by the Society.

On motion of Mr. Poore, it was resolved that a committee of three be appointed to collect facts and statistics illustrating the Indian and subsequent agricultural history of this Republic, embracing statistics, accounts of tools, and biographical sketches of noted farmers, and report to the Executive Committee in season for publication in the next report, if worthy. The committee are Messrs. B. P. Poore, W. S. King, and J. A. Warder.

The Society then called upon Dr. Eddy, of Massachusetts, for his lecture on *Bees and Bee Culture.* He described this branch of rural industry as the most profitable of all, as he had proved by his own experience. He pursued the history of the bee, in its family and social characteristics, and explained the process of honey-making.

Dr. Eddy having concluded his lecture on bees, and a vote of thanks awarded him, it was, on motion of Mr. W. S. King, of Massachusetts,

Resolved, That the thanks of this Society be and are hereby presented to

Professor Henry and the officers of the Smithsonian Institution, for the use of their lecture-room, and for their kind attentions; and also to Mr. H. Hardy, for his faithful attendance upon our sessions, and for his full and correct reports of our proceedings in the *National Intelligencer.*

And the Society adjourned *sine die.*

Officers for the Ensuing Year.—The officers of the United States Agricultural Society for 1854 are:

Marshall P. Wilder, of Massachusetts, President.

Nineteen Vice-Presidents, (one for each State represented.)

C. B. Calvert, John A. King, A. L. Elwyn, J. D. Weston, B. P. Poore, A. Watts, John Jones, W. S. King, Executive Committee.

U. S. King, of Boston, Corresponding and Recording Secretary.

William Selden, of Washington, Treasurer.

PROGRESS OF MECHANICS.—No. II.

In our last number, we presented a short but tolerably complete view of those mechanic arts, in which, for the last few centuries, no progress has been made.

We now purpose to give some of the more important branches in which new discoveries have been made, new inventions devised, or greatly improved skill in application acquired. The shortest possible description of all these in detail, would be of most indefinite length, if it should include each of the departments of art, but we can aim only to present a few, which, for some reason, might claim more special notice. We begin with certain branches of art, very nearly allied to those mentioned in our last number, and somewhat in the same order.

Glass-wares.—As already suggested, there are various departments belonging to this general title, and in some of them the moderns have greatly excelled the ancients.

1. In the manufacture of plates. The large plates often seen in our modern windows were formerly unknown, and the most elaborate of the stained windows of the ancient temples are of small panes; the mirrors of modern parlors were never seen in the houses of the ancients. This is the result of improvement in the implements employed.

Optical Instruments have also been chiefly the result of modern art. Nothing was known to the astronomers of olden times to compare with the telescopes now found in almost every prominent institution in the world. Even the smaller instruments, used by artists, as watchmakers, jewellers, &c., are of modern invention. The engravings of the ancients were executed by the eye, unaided by any thing but a single lens, and unremitted care and practice, and therein their skill is proved to be the more wonderful.

Weaving Glass.—This is a new application of this material. The fabric is exceedingly beautiful, and quite flexible. Progress in this department is yet anticipated.

Refining Metals.—No progress has been made in the results obtained, but there is very great improvement in the processes that are employed. The metals of various sorts are now extracted from their ores by means far more simple, more expeditious, and more economical than formerly. Some of those now employed will be considered under other titles in our journal. Suffice it here to say, that the process by which our best blistered steel is manufactured, was unknown till 1750. Case-hardening is also a modern invention. Sheet-iron and sheet-tin are now prepared with much greater facility than they formerly were. Cementation is a process invented by modern English artists.

Iron and Bronze Castings.—In this department of art, within a few years even, we have made wonderful progress, chiefly, perhaps, the result of improvements in moulding. There is, however, one style or branch of the art now on exhibition at the Crystal Palace, which is far superior to any thing we have ever seen. It is from the Royal Foundry of Berlin. Several specimens are exhibited. The lines are nearly as perfect as if made by the chisel.

Another form or branch of this art consists in casting vegetable forms, plants, &c., with their stalks, branches, twigs, leaves, buds, and flowers. Some of these also are on exhibition at the Crystal Palace, and are really wonderful. The process is described as follows:

The object to be represented is placed in an empty vessel, with small wires attached to the extremities of each bud, leaf, twig, &c. *Silt*, or fine sand, of a proper quality, mixed with water, of the consistence of cream, is then poured into the vessel till the object is covered. This mould is then left to dry, after which the wires are withdrawn, and the entire mass is exposed to a powerful heat, while streams of air are directed against the insertions of, or holes left by, the wires. The plant is thus consumed, and the incombustible ashes are expelled by blasts of wind. A perfect mould is thus obtained, ready for the melted metal.

Rolling Mills. These are now of almost numberless forms. Iron and other malleable metals are rolled into almost any desired shapes. We shall exhibit elsewhere, rollers of various shapes, and one of them of peculiar economic value—that for forming the railroad bar. Almost every new variety of form that may be desired, may be thus produced by these means, at an immense saving of human labor.

The fine surface of Russia sheets is obtained by some secret process, which our artisans or those of England can not even approach.

Electrotyping.—We only refer to this, now, as a modern discovery, by which almost any substance may be covered with a metallic plate of greater or less thickness, as may be desired. We purpose hereafter to give these processes, which are within reach of almost any one, in considerable detail. This is a discovery of the present generation.

Amalgams.—The use of mercury, in the "silvering" of glass for mirrors, or for covering other metals, and other similar operations, is a modern discovery. It is the peculiar property of mercury, that it forms an amalgam with almost every other metal. In this form, resembling a paste, it is applied to the surface, which is to be covered. It is then exposed to a heat of 600° or 700°, by which the mercury is evaporated, and the metal, gold, silver, &c., is left in a pure, unmixed state on the surface to which the amalgam had been applied.

A similar use is made of it in obtaining gold in quantities, unmixed. This process is familiar to the miners of California, Australia, &c. Even pressure will accomplish the same result as fire. The amalgam is placed in a leathern bag. When powerful pressure is applied, the mercury escapes through the pores of the leather, leaving the gold unmixed.

Spinning and Weaving.—The improvements which have been made, even within thirty years, in these departments, would occupy a large volume. We name them only to suggest that on future occasions we purpose to go extensively into the illustration of this, one of the most successful, most wonderful, and most triumphant achievements of our day, in which our own country has utterly out-distanced all other nations, so that England herself can not produce a yard of more than one kind of fabrics, so as at all to compete with our own manufactures, without buying the right to use American inventions. In more than one kind of goods, she pays a tribute for every yard she produces to one of the distinguished sons of New-England.

Labor-saving Machinery.—This may be worthy of a separate title, although its practical application may concern some of the arts specifically named. It is, however, an art of itself, to apply the force of wind, water, steam, &c., to the ten thousand forms of mechanical labor. There is scarcely a purpose or design to be achieved in the transmutation of forms, that is not essentially aided by machinery. But these inventions are nearly all recent. Even the trip-hammer is a modern notion. So are the innumerable machines or tools employed by turners in iron, in wood, of various forms, workers in sheet-iron and tin, shoemakers even, and many others.

SUSPENSION-BRIDGE FOR THE OHIO.

The following is a brief description of the proposed bridge across the Ohio river at Cincinnati, as designed by D. Griffith Smith, Civil Engineer:

This bridge will consist of one principal opening between two stupendous towers of suspension, the centres of which are 1400 feet apart.

From these towers the road-way will be suspended by three lines of wire cables, at an elevation of 112 feet above low water, leaving the whole width of the river clear and unobstructed.

The road-way will consist of two carriage-ways, separated by the centre line of cables, and four foot-ways; the width of carriage-ways at the centre of bridge, will be 10 feet each, and the foot-ways 3 feet, making the entire width of platform 32 feet in the clear.

The carriage-ways will pass through two magnificent gothic arches in each tower of suspension; the width of each arch will be 12 feet, and to the crown of arch about 30 feet.

There will be, as we have stated, three lines of cables, and in each line four cables; these cables will pass over rollers in cast-iron saddles, firmly fixed on the summits of the pyramids; the extremities of the cables will connect with strong anchor-chains, laid in the most substantial hydraulic cement masonry.

The grade of the road-way, on the Cincinnati side, will commence at Columbia street, and rise at an angle of five degrees to the tower of suspension. At Front street, an elevation of 16 feet will be obtained. In crossing Front-street, it is proposed to construct a "Malleable Iron Bridge," of the Tubular Girder pattern. On the south side of Front street the road-way will commence, and be suspended to the shore-cables. The same plan of approach on the Covington side will be adopted.

The entire structure will be so arranged, and united in such a manner, that each of the parts may be taken out and replaced separately; so that there can be no difficulty in repairing any part of the bridge whenever required.

The principal dimensions may be more conveniently examined in a tabular form.

SYNOPSIS OF THE CAPACITY OF THE PROPOSED BRIDGE.

Length of span,	1400 feet.
Total length of suspended platform,	1985 "
Elevation of platform above low water,	112 "
Total length of cables,	2000 "
Number of cables,	12
" wires in each cable,	2000
Ultimate strength of cables,	18000 tons.
Total sectional area of anchor-chains, 800 superficial inches.	
Ultimate strength of anchor-chains,	24000 tons.
Maximum permanent load,	924 "
" transitory load,	794 "
Maximum load,	1718 "
Maximum tension of cables at the points of suspension,	5326 "
Number of persons that may collect on the platform,	12704
Number of oxen that the platform will contain,	1588
Tension of cables resulting from weight of floor and 1588 oxen, (each weighing 1000 lbs.,)	5236 tons.
Approximate cost of bridge,	$450,000
Time required for its construction, about two years.	

The design exhibits a plan of structure far exceeding in strength and grandeur any similar work ever projected either in Europe or America.

When M. Telford constructed the suspension-bridge across the "Menai Straits," it was regarded by all Europe as the mightiest achievement of man.

The first stone of that magnificent structure was laid on the 10th of August, 1819. On the 20th of April, 1825, the first chain of this stupendous work was thrown over the "Straits of Menai," and on the 25th of February, 1825, it was opened to the public: "a magnificent spectacle," says Dr. Arnott, "to behold chains of tenacious iron stretched high across a channel of the ocean, and supporting an admirable bridge-road of safety, along which crowded processions may pour, regardless of the deep below, or of the storm; while, beneath, ships with sails full spread, may pursue their course unmolested."

Let us now compare this bridge, which was the wonder and admiration of all Europe, with the proposed bridge across the Ohio river at Cincinnati.

DIMENSIONS OF THE MENAI SUSPENSION-BRIDGE.

Distance between the points of suspension,	579 feet.
Height of road-way above high-tide,	100 "
Deflection of cables,	43 "
Total length of bridge,	880 "
Maximum permanent load,	489 tons.
" transitory load,	300 "
Maximum load,	789 "
Sectional area of anchor-chains,	260 inches.

Two years after the completion of the Menai Bridge, Mr. Telford added another laurel to his justly-acquired fame, by constructing a suspension-bridge across the Conway river, one tower of which stands within that ancient fortress, "Conway Castle," built by Edward III.

The span of the Conway bridge is 350 feet. Elevation above high tide, 18 feet.

The span of Freiburg bridge, in Switzerland, is 960 feet.

The span of the Hammersmith bridge across the Thames is 400 feet, 3 inches.

The span of the suspension-bridge across the Danube, at Pesth, in Hungary, is 1000 feet.

The span of the Wheeling bridge is 1010 feet.

It will appear from the history of suspension-bridges, that no span has ever been constructed that will rank in magnitude and grandeur with the proposed bridge across the Ohio, at Cincinnati.

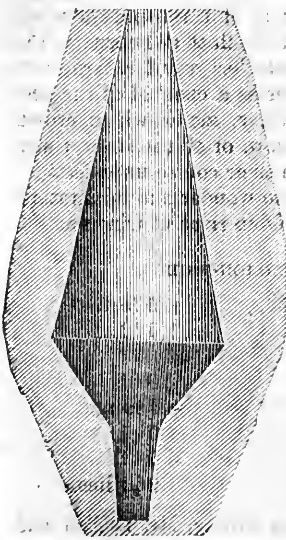
Mr. Smith's plans are at the Merchants' Exchange, where they can be examined by all who feel an interest in the enterprise.

IRON MANUFACTURE.—No. II.

We proceed with the general view of this subject, commenced in the last number, and shall endeavor that neither through our omission to examine the proofs, nor neglect so to do "elsewhere," we shall fail to say, in these pages, what we wish to communicate to our readers.

We commenced a description of certain furnaces, in common use, in this department of art. Beside those already named, we would give our readers, not familiar with the subject an idea of the form of one of the *Eastern-Pennsylvania charcoal furnaces.*

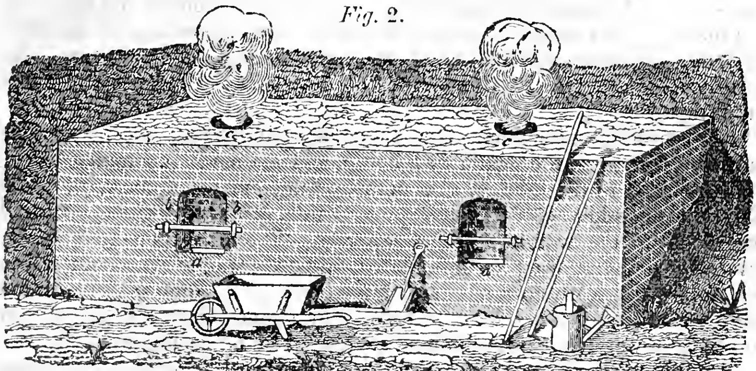
The figure in the margin represents one of these. Its height is 32 feet; width of boshes, 9 feet 6 inches; hearth, 5 feet high, 2 feet wide at the bottom, and $2\frac{1}{4}$ feet wide at the top. The ores generally used are the rich hydrates, pipe ores, fossil ores, &c., $2\frac{1}{2}$ tons of ore produce, on an average, one ton of the metal. About 180 bushels of charcoal are required in obtaining one ton of iron. Different amounts, however, are required, according to the quality of the material used.



West of the Alleghanies, instead of using charcoal, coke is used in many places, that is, coal, from which the bituminous matter and the sulphur have been extracted. This is done either by burning the coal in large heaps, covered with earth, as are piles of wood for the manufacture of charcoal, or by the use of ovens designed for the purpose.

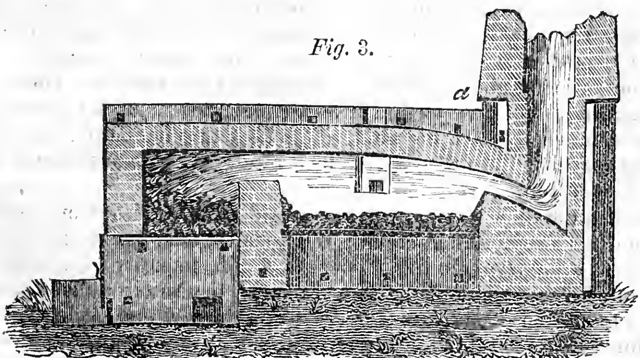
Figure 2 represents one of these ovens, sometimes called the Pittsburgh coke oven. Large quantities of bituminous coal are thrown into the oven when the fire is kindled. The doors *a* and *b b* are then closed, and the bituminous matter is separated from the coal, leaving behind a spongy mass of about the same quality as charred wood. This oven is built of stone or of common brick, against the slope of a hill, so that the coal may be readily discharged into it from the top of the oven. The English coke-ovens, long in use, were of a different construction, being an oblong square, with perhaps four ovens abreast. This form secures a greater economy in fuel, and also in masonry. The walls are two feet thick, of common brick, and the linings of fire-brick. The principles of both are the same, and the arrangement in the English form is more perfect, but more expensive. In some European countries still other forms prevail, from the fact that the coal tar is collected as a valuable article for trade. And we have no doubt that in this country it will be found profitable in many establishments to have especial regard to this product. Indeed, we have knowledge of one such in New-England, recently constructed. The products obtained by the manufacture of coke, are said to be sufficient to pay all the expense of the process. The coke is therefore clear profit.

Fig. 2.



Puddling Furnace.—The reverbatory or puddling furnace is best adapted to convert cast-iron into bar or wrought-iron. There is a great variety in the construction of these furnaces in different countries, and even in our own country. Through the West, the single furnace is used, which is the most ancient form, and which is substantially in general use in England. East of the Alleghanies, the double furnace. The single has one work door; the double has two, one opposite the other, and admits two sets of workmen.

Fig. 3.



The figure annexed shows a vertical section of a puddling furnace for anthracite coal. In this furnace, coal can be filled to the depth of from 20 to 24 inches, while in those designed for bituminous coal, a depth of 10 or 12 inches is sufficient. The letters *a a a a a* denote the cross-binders, or bars, of wrought-iron, which bind the cast-iron plates of the inclosure, and prevent the sinking of the roof, caused by the expansion and contraction of the fire-brick. The two holes below serve for the passage of the draft. The blast machines are fans. There are various points worthy of notice in the detail of the single and double furnaces, but they are of interest only to the practical artisan.

It may be well to state here that an important improvement is said to be practised at some of the English forges, where scrap-iron is worked up. Instead of carrying the piles for some distance to the rolls or hammers before being compressed, and during which the "scale" is forming, an anvil is fitted directly at the mouth of the puddling furnace, and a hammer arranged overhead, so as to drop once or more, at pleasure, upon the opening of the furnace-door. A hammering weld is thus taken at the moment the iron leaves the furnace. In rolling, the ends of the piles are not drawn, as is usually the case, and a considerable amount of "cropping" at the shears is saved. The quality of the iron is said to be improved five dollars per ton by this mode of working.

The European ovens referred to are circular, about four feet in diameter, and nine feet high; are bound with hoops, and are made of common brick or stones, bound with fire-brick, with suitable arrangements of doors, draft-holes, &c., with the addition of a tube or pipe of iron, conducting the bar from the upper part of the oven into proper receivers. The tar is condensed in warm weather, by having the pipe surrounded with cold water. Still other forms are in use, which we need not here stop to describe. The properties of good coke are as follows: It should be silvery white, compact, with a ring like that of crockery-ware, pure from sulphur, hydrogen, and all bituminous substances.

Different kinds of coal produce different quantities of coke. In England, 75 per cent. by weight, and 120 by measure, is a fair average. The extremes vary from 55 to 88 per cent. of coke. Pennsylvania coals range from 68 to 88 per cent.

After the fuel is provided, the next point is to prepare or clean the ore. This is for removing all the earthy matter from it, and may be by washing or pounding. Afterward, some ores are *roasted* in kilns, not unlike those used for burning lime.

It is a sight full of interest to those unaccustomed to such scenes, to witness the processes which follow these preparatory steps. The fires having been kindled a suitable length of time, and the iron sufficiently *smelted* or melted, the mouth of the furnace is *tapped*, and sufficient quantity of the red-hot liquid being allowed to run to waste, to clear away the cinders, &c., from the melted iron, the stream is then turned so as to run through iron troughs, or canals made in the sand, to the beds that have been prepared for it. Here it cools. It is then cut up into pieces some two feet long, and is PIG-IRON or cast-iron.

There is a question whether the hot or cold blast furnace is most desirable in its action. The hot blast secures the greatest quantity of iron, but it is more likely to be oxygenized. The effect of this intensity of the hot blast is concentrated at a single point, to wit, directly opposite the tuyeres, and the oxygen supplied so liberally at that point is consumed there, while the blast is not diffused equally through the furnace, nor are the impurities of the coal or coke driven off so effectually. On the other hand, the cold blast, becoming suddenly heated, abstracts from the temperature of the iron at that point, and thereby retards its oxydation, or rather tends to prevent it, and then becoming itself heated, is diffused at unequal temperature through the mass.

The object of the operations which succeed those just described is to give strength and convenient form. The pig-iron is next converted into

BLOOMS.—This may be done in the forge fire, resembling the forge of the blacksmith on a large scale, or in the *puddling* furnace, which we have before described. The masses of pig-iron are here heated to near melting, and are then carried to the forge hammer. Here, whatever impurities the pig-iron may contain, will disappear under the repeated blows of this powerful machine, and at the end of the operation it is formed into rounded pieces, about one foot in length, whieh are called *blooms.* These blooms are then ready for the rollers, of which we shall speak in our next number.

The *pig-iron* is the "cast-iron" of common parlance, and it is only when it has become a "bloom" that it becomes "wrought-iron." It is proper, however, to state here, that recent practice has shown that the processes which we have here described are not absolutely necessary, and that economy, in fact, demands for certain ores and for certain kinds of iron, a different mode of manufacture. Indeed, the practice of ancient times was to produce wrought-iron directly from the ores, and the process, as now witnessed, is this. The ores are reduced, at a low temperature, in furnaces of a modified form, by which the impurities are not melted. The pure iron, more easily melted, leaves these behind. Iron thus manufactured is stronger, it is said, than when smelted in the usual way, and then puddled.

AMERICAN COAL STATISTICS.

THE following statistics are from the Pottsville *Mining Journal:*

The consumption of coal does not increase as rapidly as was supposed. In 1852, the increase was less than 13 per cent., and left a surplus in the market. In 1853, the increased supply was less than 9 per cent., from all sources. To this of course is to be attributed the high price of coal during the latter part of the year; but taking the average over 12 per cent., it will reach it. We see no good reason to believe that this average per centage in the demand is likely to be exceeded the present year, which would require an increase in the supply of about 623,000 tons, in 1854, from all sources, to keep the market healthy.

This increased supply can easily be furnished by the different regions, provided dealers and customers will come forward and take coal early in the spring.

The same paper gives the following summary of operations in Schuylkill county:

Total number of collieries, - - - -	113
Red Ash do. - - -	58
White Ash, do. - - - -	55
Number of operators, - - -	82
Employed at collieries, - - - -	9,792
Miners' houses out of towns, - - -	2,756
Whole capital invested in these collieries, -	$3,462,000
By individual operators, about - -	2,600,000
Thickest vein worked at Heckscherville, feet, -	80
Smallest, - - - - - - -	2

All the coal-lands now worked in Schuykill county are owned by six corporations, and about sixty individuals. About twenty-five of the owners reside in Schuylkill county, and the balance abroad. The coal rent will average about 30 cents a ton. The product of 1853, in Schuylkill county, was 2,551,603 tons. This would give an income of $765,480 to the landholders, in the shape of rents, for the year.

GARDNER'S ROCK DRILL.

This new and powerful machine is designed to be of immense advantage in tunnelling, mining, quarrying, and all kinds of sollid excavations. By an ingenious adaptation of two forces, one to compress and vitalize the other, it accomplishes an amount and kind of work which no direct application of the prime motor could possibly do. It is operated by hand, horse, or steam power, by means of which a very powerful cylindrical India-rubber spring is compressed. The reäction of this spring, which can be graduated to a nicety, and directed at will, drives forward the drill with a rapidity and force that will accomplish more work than forty men, who should never need rest or

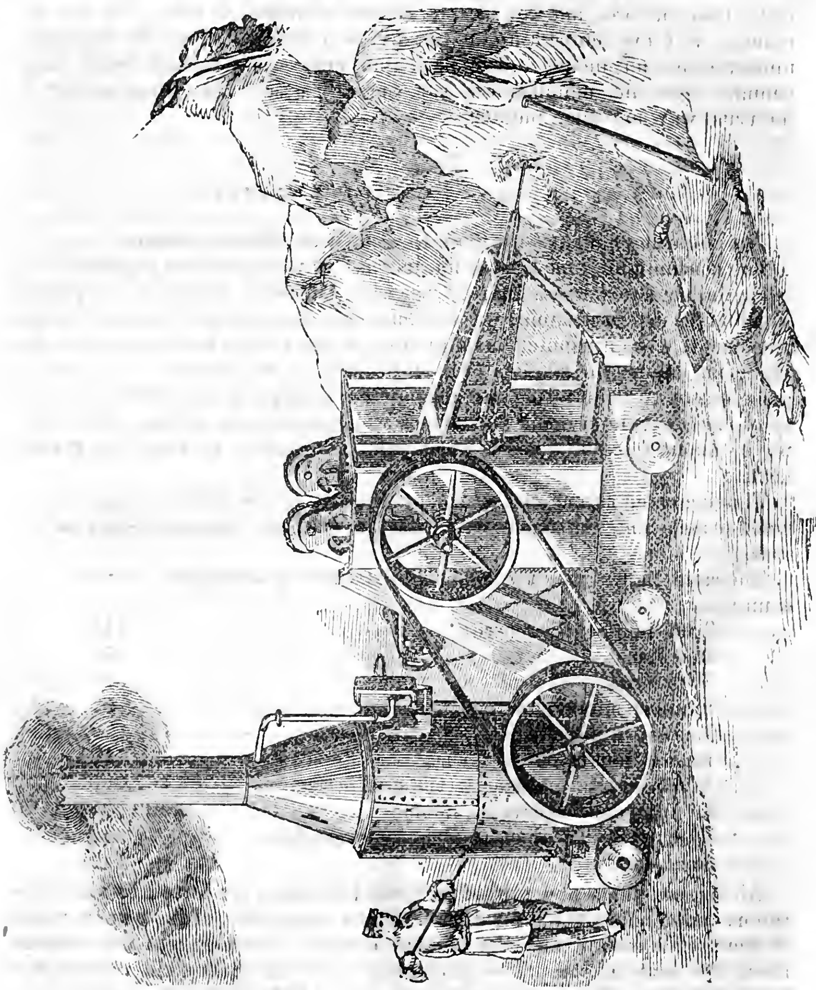


Fig. 1.

recreation could do. A saving of fifty to seventy-five per cent. in the cost of excavation can easily be effected by it. And the time saved is often of more consequence than the cost.

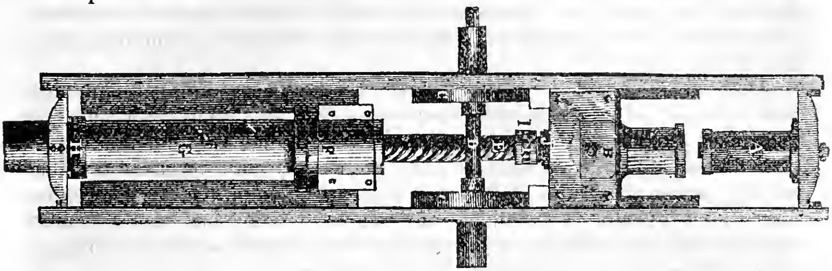


Fig. 2.

Fig. 1 is a view of the whole machine in perspective, and fig. 2 is a top view looking downward, of the swinging frame, which holds the drill, being detached from the machine, and represented upon an enlarged scale. It drills horizontally, vertically, or at any angle with the horizon. The part shown in fig. 2 it may be seen, consists of a stout cast-iron frame playing by two trunnions in two iron boxes, which are raised or lowered (and there securely fastened on each side by a large nut and bolt) between the uprights on each side of the platform; chains from each of the four corners of this frame, (called the "swinging frame," hooked to staples on the platform, hold the frame at any inclination desired.

By means of the band-wheel (fig. 1) the shaft which bears it, passing through the trunnions mentioned, is rotated, turning at the same time the cam wheels, (C C, figure 2;) these cams press against pins fastened securely to, and protruding from, the lower side of the cross-head B; thus, as they turn round, they push the cross-head B back. A is an India-rubber spring, (with 3½ horse-power; the spring is 14 inches long and 5 inches diameter,) which, as the cross-head B is pushed up, is compressed by the "plunger" on the upper part of the cross-head B. This spring is supported by a spindle passing longitudinally through it, and bolted to the upper cross-piece of the frame. When the cams have receded from the pins mentioned, the expansion of the rubber spring drives the cross-head and all it bears with it, forward with tremendous force, chipping off, with the drill, large pieces of granite or other stone. Attached to the cross-head B, and turning loosely in it, is a screw, E, passing down through a left-handed screw in the lower cross-head F. By means of a ratchet-wheel, pall, &c., seen at J, this screw is turned slowly, thus feeding forward the cross-head F, which cross-head bears at its lower side a hollow mandril, G, into the upper part of which the screw E passes. This mandril has a steel drill at its lower end, (fastened in by a set-screw,) made of such bore as may be desired.

When the cross-head F has been screwed down as far as the length of the frame will permit, by means of a straight rack, with a handle applied to the cog-wheel I, (on the screw shaft E,) the cross-head and drill are ready to commence operation again.

At H, on the mandril G, is a ring, (with ratchet-wheel and pall,) and a projection at the lower part of the pall, which slides on a bar (not seen) placed diagonally under the frame, and by this means, as the drill is withdrawn, twisting round the mandril, and consequently the drill. The same simple arrangement at T effects the turning and feeding down of the screw. By means of a sliding bar beneath the frame, the two diagonal bars are connected, and thus, by the simple and easy rotation of a hand wheel, (on the sliding-bar,) the drill is made to feed forward at the rate of half an inch, or less, or even three or four inches per minute, and the drill to turn at the rate (as desired) of ten, twelve, fifteen, or eighteen teeth upon the ratchet to a complete revolution of the wheel.

At the other end of the platform (fig. 1) is placed an upright steam-boiler with cylinder bolted to it, with force-pump, &c., and band fly-wheel. By means of the sheave wheels (seen at the top of the upright standards) a chain passing to the iron boxes, (before mentioned,) and from there to a shaft running across the braces of the standards, raise and lower the "swinging-frame" to any desirable elevation. A great desideratum has been a machine which would bore rocks at any angle with the horizon as well as vertically. This desideratum is accomplished in this machine.

The machine here represented will be in operation at the New-York Crystal Palace.

The patentee has also a mode of applying this arrangement to drilling the wedge holes for splitting rocks; the saving of time, and use of the water-vial (in consequence of the holes being uniformly straight) must recommend this to all quarry owners; it is applied also in sinking shafts in mines, and must here effect a great saving. A most important application is also made of it to tunneling for railroads, &c. A small portable arrangement, worked by hand, is used for quarries and mine galleries.

Further explanation and information will be given on application to the patentee during business hours, or by letter addressed to him.

JAPAN MANUFACTURES.

WORKS OF ART AND CURIOSITIES, FROM THE COLLECTION OF THE KING OF HOLLAND, EXHIBITED AT DUBLIN.

The following account is from the Dublin correspondence of the *London Daily News*, and will be read with interest.—[Eds.

The unique collection of manufactures, works of art, and curiosities from Japan, contributed to the Exhibition by the King of Holland, demands notice, independently of its intrinsic merits, from the circumstance that it is the first time similar productions have been seen in Europe, beyond the walls of the Museum at the Hague; and an early notice is well deserved, also, because with Dutch punctuality and business-like management, this collection was ready for inspection at the opening of the Exhibition, when all around was confusion and packing-cases.

That branch of manufacture which, from the place of its origin, has in this country obtained the name of "Japanning," is not so largely represented as might have been anticipated; but the comparatively few specimens are sufficient to show that the Birmingham manufacturers have not yet attained so high a degree of finish in this art as the Japanese. It is not that the polish of the varnish is brighter, but there is a perfect evenness of surface that reflects the light equally as from a surface of ground and polished glass, without any of the irregularities so generally observable in English goods of a similar kind. It would appear that the varnish of the Japanese must be of a superior quality to that of the English; for, judging from a set of tea-cups made of papier maché, that material is accustomed to be used in contact with hot water, without much injury to the surface, and without imparting a disagreeable taste to the beverage. There is a specimen also of a bowl for holding liquids, made of straw japanned, which feels lighter than papier maché, and equally strong. It is evident, indeed, even from the small variety of specimens of this branch of manufacture in the collection, that the Japanese apply the process of japanning to many other uses than we are accustomed to. Among the warlike accoutrements, for instance, there is a highly-finished Japan shield, entirely black, without ornament, which projects in the centre, in the approved form of ancient shields. Whether a ball would glance from the curvature may be very quesionable, but it is at all events well adapted to ward off any missile projected by hand.

The specimens of silks and velvets very clearly show that the Japanese makers of such fabrics can rival the European manufacturer in the quality of the article, however rude may be the machinery they employ for the purpose. Some silken cords, of various degrees of thickness, will also bear comparison with any that can be produced by the improved machinery of England. The wax candles, of which there are several specimens, deserve notice, from the peculiarity of their shape, and the mode of manufacture. They are made of the hardest wax, and are evidently formed by the process of successive dippings, like the wax candles in this country, the unevenness of the surface being in like manner subsequently removed by mechanical means. The peculiarity of their shape consists in their being conical instead of cylindrical, the broader end being placed uppermost. To give additional finish to the exterior, the candles are painted.

The accoutrements of war do not present a very formidable appearance, nor is a figure of a warrior armed cap-à-pié, with a visor over the lower part of his face resembling a demoniacal mask, calculated to excite much alarm in any but little children. The fire-arms are long and heavy, and are not adapted to be fired from the shoulder; the swords are short, with daggers attached, and they are inclosed in clumsy cylindrical sheaths. The armor of mail with which the model warrior is clad is composed of a woven fabric sufficiently thick to resist an arrow or the thrust of a spear. There is nothing in this display of weapons and armor to deter the Americans from making their inroad into Japan, and the only seemingly rational cause of making it a death penalty to take any arms from the island must be to prevent exposure of the defenseless condition of the people. The martial music consists of drums of various kinds, and with them are placed several lutes and guitars, curiously shaped, but there are no wind instruments.

The articles of luxury do not exhibit so much refinement and finished workmanship as those of the Chinese. There are several cabinets, but not one of them is elaborately decorated; the fans are common, and the articles of a lady's toilet, though they indicate the great variety of things requisite in the dressing of a Japanese belle, are rather coarsely manufactured. One cabinet is expressly adapted for smokers. There is a censer at the top to hold fire for lighting the pipe, with drawers underneath to contain the pipes and tobacco. The Japanese *fumeur* is very choice in his tobacco, and remarkably delicate in its use, for the specimens of pipes exhibited—one gold, the other silver—will not hold half of a small thimbleful of the plant. A parasol is, perhaps, more an article of necessity than luxury in Japan, and the specimens of them are certainly not externally ornamental, though they deserve notice from the materials of which they are constructed.

The part that is silk in our parasols is made of paper creased into many folds, the ribs of thin spliced bamboo, and they open and close with great ease. The outer covering is of a dark color, the interior white, which is the reverse of what theory would declare to be the proper colors for repelling heat; but these paper parasols must nevertheless form much better shades than semi-translucent silk.

A collection of Japanese coins, from the largest gold to the smallest silver, forms an interesting part of the collection. The gold coins are oblong, with rounded corners, and the value of the largest is about £50. The smaller of the silver coins are oblong, with sharp corners. Next to the coins are placed specimens of Japanese printing-types. They are made of wood, the body of the type being cylindrical, with the letter at one end, and they must consequently be used separately, and not set up in "form," like our printing types.

Those who are not experienced naturalists may be somewhat startled at the stuffed monsters from Japan. What the unexplored parts of that island may not contain it would be presumptuous to state; but it requires a considerable stretch of credulity to believe in the existence of flying monkeys, and of serpents with monkeys' heads; yet such objects are presented with indubitable skin, hair, and bones; and it is difficult to detect where the skin of one animal has been joined to that of another. To artists so skilled in the manufacture of monsters, the creation of a mermaid would present little difficulty; and though there is not the bodily presentment of one, there is a pictorial representation, which, instead of realizing the poetical idea of such a being, seems to be a literal copy of a mermaid, manufactured by the junction of the body of an ape to the tail of a fish. There are several other specimens which indicate a prevalent taste for monstrosities.

AMERICAN STEAMBOATS ON THE AMAZON RIVER.

A LETTER addressed to the Boston *Traveller*, dated Para, South America, December 22, 1853, gives an account of the trial trip of Dr. Whitmore's new steamers, designed to navigate the river Amazon. Some time ago he took a contract from the Peruvian government, to furnish two or more steamboats suitable for the navigation of the Amazon, a treaty having been made with Brazil with this end in view. Dr. Whitmore came to New-York, contracted for the boats and machinery, superintended their construction, had them taken to pieces and packed in a sailing vessel and shipped for the mouth of the Amazon; all at his own hazard. He then secured a sufficient number of competent mechanics to go out with him, to put the steamers together, and set up their machinery, and on the day of the date of the letter, the enterprise had been so far crowned with success, that the first of these little river boats had made its trip, and appeared off Para, some seventy miles from the mouth of the Amazon.

It was a gala day. The city was astir with joyful anticipations; and the little steamer was received with every demonstration of satisfaction. She was decked with flags, among which the stars and stripes were conspicuous, and bore a gladsome company, some two hundred persons.

THE BENZOLE GAS.

The American Gas Company, 3 Broadway, New-York, are now prepared to supply Benzole to order, in any quantity from thirty gallons upward, and to furnish machines of any size, for making their *improved Benzole Gas-light.*

They are also prepared to dispose of the right to use and vend their invention, patented July 13, 1852, for any district, county, or town in the States of New-York and Pennsylvania, and in nineteen other States south and west of New-York.

The great principle of this invention, as we have before explained, is the burning of any of the hydro-carbons, such as Benzole or its equivalent, either pure, or in combination with water and any alcoholic liquid, by passing through it a current of humid air or aqueous vapor, however obtained.

Any machine that requires humid air or aqueous vapor, can not, therefore, be used for burning Benzole or its equivalent, either pure or mixed with water, and alcoholic liquid, without the license of the American Gas Company or the other owners of this patent in States not held by the company.

No hydro-carbon can be used *economically* for illuminating purposes without the presence of water or moist air. This, Mansfield tested in England by several years' trial, under the patent which we described two months since, and he gave up the problem. It was solved, at last, by the inventor of the principle herein described.

Recent experiments have demonstrated that for twenty-five cents, the same amount of light, for the same length of time, may be obtained from a pint of benzole and a pint of alcohol mixed with a pint and a half of water, that can be obtained from two pounds of Judd's patent sperm candles of six to the pound, the price of which is fifty cents a pound; or, in other words, one hundred cents' worth of their candles.

The transportation of this gas through the ordinary gas-pipes is perfectly feasible, and machines with thirty argand burners, each equal to eight sperm candles or thereabouts, may be had at from $50 to $100, according to the finish.

There are various kinds of machinery suited to furnish this light, for which the American Gas Company will receive orders to be furnished by their mechanician and manufacturer.

Several houses in New-York and the country round will soon be furnished with this light in all its splendor.

Thus, we have proved our own assertions as to the immense importance of this patent, which assertions we made long ago, in private circles, in the face of ridicule sometimes, and always with distrust. The light in the machines of this company is even better than we had anticipated.

We add that if any of our subscribers wish for information, or for any interest in this light, as above set forth, we will act for them, and, under ordinary circumstances, *without charge to them.* If they wish any service especially laborious, we might tax a *very* small fee. But we shall be glad to be the instruments for extending the use of this light over the whole country, and thereby do our friends and the public a great service, while we rejoice in the triumph of perseverance and science in the face of much and powerful opposition. We hope our friends will make known their wishes freely, and without hesitation.

CAST-IRON RAILS FOR RAILROADS.

We recently noticed the examination by Mr. R. W. Hughes of the question, "Why can not cast-iron rails be used for railroads?" We return to the subject again, in order to present the view of it taken by the author:

"An elaborate and able report was made by a select committee of the Pennsylvania Legislature, in 1843, on the propriety of relaying the State railroads with cast-iron rails. This report, together with the facts and arguments in our former article, we deem conclusive as to the commercial and practical adoption of cast-iron rails. It is impossible to controvert them with argument, and we feel just as confident that actual experience will confirm the deductions of the report.

The rapid destructibleness of wrought-iron rails has been more and more apparent from the day the report was made, up to the present time. This results from two causes: first, from the increased weight of the locomotive; and secondly, from the great demand for railroad iron. The latter cause induces a demand for all material which can be made into railway bars; and the consequent hurry in which they are made, withdraws from them that special attention which was devoted to their manufacture in earlier days.

We therefore repeat our conviction, that cast-iron rails may be made which will prove better, in all respects, than most of the English rails we are daily importing.

Why have not cast-iron rails been generally introduced? To this there are several answers, and not one affects their fitness for this purpose. Since the introduction of railroads, the world has never stood still long enough to think. A railway mania pervades the land, and it has crushed every obstacle which has opposed it. Reflection would have required time, and none of the persons or States which have been engaged in the eager race of internal improvement, would consent to exercise it, but preferred imitation. Hence, the fact, that the railway system has undergone no positive changes since its first introduction, with the exception of the now *universal adoption of cast-iron wheels instead of wrought-iron*, a matter taken up, as it were, on the wayside, in order to supply the absolute demand for constant repairs resulting from the use of wrought-iron wheels.

Secondly. Whose duty was it to introduce cast-iron rails? That of chartered companies, in which it was every man's business who had a personal interest in the road, and what is every man's business, is generally regarded as no body's.

The construction of roads is always left to the engineer, and suggestions as to the mode of building them would be expected to come from him. But he, like the rest of the world, has had little time for study and reflection, and, deriving a comfortable living from the present plan of railways, would not be apt to originate suggestions where failure would involve him in loss of professional reputation.

Captain Moering, an engineer in the service of Austria, writing upon this subject, says, 'He eagerly sought, in this country, from engineers and others conversant with the subject, information relative to cast-iron rails, and after a deliberate examination of the questions which arose, he was impelled to the conclusion that *cast-iron rails had not been rejected from the American railways in consequence of any defect inherent in that material;*' but that 'this rejection, or omission, appears to have resulted partly from the surprising celerity with which these works were simultaneously urged forward; partly from the inexperience of many of the engineers, necessarily employed, in consequence of the great demand at the time for men of that profession having induced a number of unqualified persons to throw themselves into it; partly from a want of due deliberation consequent upon the rapid progress of the railways, which favored imitation, rather than reflection; partly from the vigor with which rolled-iron rails, *then exempt from duty by law*, were pushed into use in every quarter of the country by interested parties; and partly from a long chain of fortuitous circumstances, which conduced to the results we have witnessed, *without deciding the merits of the technical questions involved.'*

If railroads were private enterprises, we have no doubt cast-iron rails would long since have been brought into use; for the projector being the owner, upon him alone would fall the failure; but with chartered companies, each member is unwilling to take the responsibility of suggesting any thing new, for fear of failure.

Upon an examination of the report, as well as our references in a former article, it will be seen that the only suggestions heretofore made, and deemed sufficient to render cast-iron rails entirely suitable for railways, were, first, to lay them on continuous wooden sills; secondly, to increase the weight of the cast-iron over the wrought-iron rail, in the proportion of six to seven; and, to make assurance doubly sure, as it is expressed, to cast, as suggested by Mr. Morris, a small wrought-iron rod in the top table of the cast-iron rail, so as to keep the parts together in the event of fracture.

At first view, this seems a great additional safeguard, and ought to have insured the adoption of cast-iron rails; but we are assured by one who has paid a great deal of attention to the subject, that the suggestion was impracticable—the rod, upon coming in contact with the melted iron, being twisted by expansion out of line with the cast-iron at many points. Besides, it is questionable whether so small a rod would not itself become so much hardened, as to impart but little additional strength to the cast-iron. That the rod would not be kept in line, one time in ten, when merely laid in the mould, he satisfied himself by actual experiment. This may have had its effect on the recommendation contained in the report we publish.

But the other suggestions render the use of cast-iron rails entirely practicable; and we have lately seen a section of cast-iron rails, with a wrought-iron rod cast throughout their centre, a feat which has been rendered practicable by a very simple device, and which enables the road to be so constructed that it is impossible, even in the event of a fracture of one of the rails, for it to get out of place. If, therefore, the rails be laid on continuous wooden bearings, the fracture of the rail would only make another joint to it, and nothing more. There is thus provided, what we believe every practical man will pronounce, who will examine it, a far better and more economical material for our railroads than the present wrought-iron rails.

We, therefore, in this substitution of cast-iron for wrought-iron rails, propose a protective tariff, such as no one can reasonably oppose.

We say the State, in building her railroads, should use for that purpose her own iron, particularly when she has often to dig it up out of her way to locate the track, of a far better quality than she can import.

And while she may not deny to her railroad companies the privilege of using what iron they please, or buying it where they choose, she can simply say, I can not be a partner with you, unless you agree to use cast-iron, after demonstration of its fitness for rails."

NEW MODE OF APPLYING THE BRAKES.

The following statement relating to a very important matter is from the *Boston Traveller:*

"It appears that on Thursday, by special invitation, a large number of gentlemen assembled at the depot of the Boston and Worcester railroad, for the purpose of witnessing experiments with a new rail-car brake operator. The improvement consists in the application of a powerful spring to the work of turning the brakes, instead of by hand as heretofore. The spring is contained in a square box at the top of the car, from which a shaft runs down and connects with the brake beneath the car. A wire chain runs along the top of all the cars, and connects with every box, so that the engineer, by pulling the end of the wire, can remove the check from every spring at the same instant, allowing the springs to operate and stop the train. The springs have to be wound up with a few turns of a lever before every operation, but this is but the work of a moment.

The train consisted of five cars, and was accompanied by an extra engine. On the way out, the engineer applied the brakes twice, in both cases with success. At Cambridge-crossing, the company, among whom were many eminent gentlemen, left the cars, and took places at the side of the road, where the experiment could be witnessed with the greatest facility. The engine and cars then went up to the Brighton station for the purpose of getting sufficient headway, and came thundering back again at the rate of between thirty-five and forty miles an hour; owing to the fact that the engineer had neglected to make a slight reärrangement suitable to the reversed direction of the train, the brakes did not operate, and the train passed on half a mile toward the city before it could be stopped by the application of the brakes in the ordinary way.

This only served as a contrast to the second experiment, in which, after again attaining a tremendous headway by approaching from a distance, the train rushed toward the crossing; at a signal from the flag of Mr. Twitchell, the superintendent, who stood by the roadside, the engineer sounded his whistle and pulled the break-wire. Numerous gentlemen were holding their watches, and some counted but eight seconds, and others but nine seconds between the giving of the signal by Mr. Twitchell, and the complete stoppage of the train; the train, even at the speed of thirty-five miles an hour, going only eight feet more than its own length before coming to a stand-still.

A third experiment was then tried, in which the rear car was suddenly disconnected from the train by raising the coupling and inclosing the wire above. The brakeman on the last car set the spring in motion, and stopped the car so suddenly as almost to throw off several operators who were standing on its platform, while the train passed ahead. The wire-chain is coupled between every car, but if a car should accidentally break loose from the rear, the jerk upon the wire would operate the brakes without further intervention, and stop all the cars. These operators do not interfere with the ordinary mode of applying brakes, as either mode can be worked independently of the other.

Such an arrangement as this, working as well as it did to-day, would have given the means of preventing such an accident as that at Norwalk last summer, even when the train had come within its own length of the draw, and its successful application must be the means of preventing many similar accidents in the future. There is no disagreeable jerking where a whole train is thus stopped, although there might be in the case of a single car.

FAMILY MARKETING.

The following table gives the retail prices of the principal articles of farm produce in the city of New-York, on Wednesday, March 15:

BEEF.			
Hind quarters, per lb	10	a	—
Fore quarters, per lb	8½	a	—
Porter-house steaks, per lb	16	a	—
Sirloin steaks, per lb	14	a	—
Rump steaks, per lb	12½	a	—
Roast pieces, each	10	a	14
Corned, per lb	9	a	12½
Tongues, each	75	a	—
Mutton car., per lb	9	a	—
Mutton, per lb	10	a	12
PORK.			
Carcases	8 00	a	—
At retail, per lb	11	a	12½
Hams, smoked, per lb	12½	a	14
Shoulders, do., per lb	10	a	11
Sides, do., per lb	11	a	12½
Pickled, per lb	10	a	11
Sausages, per lb	12½	a	—
Head-cheese, per lb	12½	a	—
Pigs, roasting, each	1 50	a	2 50
VEAL.			
Carcases, per lb	8	a	10
Fore quarters, per lb	10	a	—
Hind quarters, per lb	12½	a	—
Cutlets, roasts, per lb	16½	a	—
VENISON.			
Saddles, per lb	15	a	18
Fore quarters, per lb	4	a	7
Retail, per lb	18¾	a	—
POULTRY.			
Turkeys, per lb	13	a	15
Rhode-Island do., per lb	15	a	18¾
Geese, per lb	11	a	13
Ducks, (tame,) per pair	1 25	a	2 25
Chickens, per lb	14	a	15
Fowls, per pair	1 00	a	1 75
Guinea, per pair	62½	a	87½
Pigeon squabs, per doz	2 25	a	3 00
Wild pigeons, per doz	1 00	a	1 50
BIRDS.			
Wild turkeys, each	1 50	a	3 00
Ducks, canvas backs, per pair	1 00	a	1 50
Ducks, gray and teal, each	25	a	37½
Widgeon ducks, per pair	62½	a	87½
Brant, each	75	a	—
Wild geese, each	1 00	a	1 25
Prairie hens, per pair	1 00	a	1 25
Mallard duck, per pair	1 00	a	—
Black duck, per pair	62½	a	87½
Red-head duck, per pair	1 00	a	1 25
Capons, per lb	16	a	18¾
Bucks county, per pair	1 00	a	2 00
Broad bills, per pair	50	a	62½
Rabbits, each	25	a	31¼
Squirrels, each	12½	a	18¾
Hares, per pair	75	a	87½
HOUSEHOLD PRODUCTS.			
Eggs by barrel, per doz	18¾	a	—
By retail, 7 for	12½	a	—
Orange county butter, per lb	28	a	30
Delaware county butter, per lb	25	a	28
Cheese, in boxes, per lb	10	a	12
By the pound, per lb	11	a	14
Pine-apple cheese, each	1 13½	a	—
Sap sago cheese, per lb	25	a	—
Lard, by tub, per lb	11½	a	12½
City made, retail do.	14	a	—
FISH.			
Halibut, per lb	12½	a	—
Pike, per lb	12½	a	—
Pickerel, per lb	12½	a	—
Muscalonge, per lb	12½	a	—
Bass, per lb	10	a	12½
Smelt, per lb	10	a	—
Codfish, per lb	6	a	—
Eels, per lb	12	a	—
Flounders, per lb	6	a	—
Savannah shad, each	75	a	1 00
Salt mackerel, per lb	8	a	18¾
Salt shad, per lb	8	a	18¾
Haddock, per lb	6	a	—
Frost fish, per lb	6	a	—
Sunfish, per lb	6	a	—
Salmon, fresh, per lb	1 00	a	—
Salmon, smoked, per lb	12½	a	15
Codfish, dry, per lb	5	a	—
Terrapin, per doz	10 00	a	12 00
Oysters, in shell, per hun	62½	a	2 00
Clams, round, per hun	37½	a	1 00
Crabs, per doz	25	a	—
VEGETABLES AND FRUIT.			
Apples, per bbl	4 50	a	5 00
Apples, per half peck	50	a	75
Apples, dried, per lb	6	a	—
Apple sauce, shakers, in pails, two gals	1 00	a	—
Pears, dried, per lb	9	a	—
Peaches, dried, per lb	12½	a	—
Plums, dried, per lb	15	a	—
Cranberries, per bbl	6 00	a	10 50
Cranberries, per half peck	50	a	62½
Potatoes, com., per bbl	3 00	a	3 75
Potatoes, per basket	1 25	a	1 50
Sweet do., per basket	2 25	a	—
Sweet do., per half peck	62½	a	—
Turnips, white, per bushel	62½	a	—
Turnips, Russia, per basket	87½	a	—
Beets, per basket	50	a	62½
Carrots and parsnips, per basket	75	a	—
Onions, white, per bushel	1 12½	a	1 25
Onions, red, per bushel	62½	a	—
Cabbage, wholesale, per 100	5 00	a	10 00
Cabbage, retail, each	12½	a	15
Lettuce, per head	6	a	8
Celery, per bunch	12½	a	15
Spinnach, per half peck	25	a	
Pumpkins, each	62½	a	1 00
Beans, Lima, shelled, dry, per bus.	7 00	a	—
Tomatoes, quart cans, per dozen	2 50	a	—
MISCELLANEOUS.			
Bologna sausage, per lb	25	a	—
Beef tongues, each	68¾	a	75
Tripe, per lb	6	a	—
Tripe, pickled, per lb	6	a	—
Maple sugar, cakes, per lb	18¾	a	—

SHOE BUSINESS.

The following statements illustrate the benefit of a variety of pursuits, and especially of mechanic trades:

A Busy and Growing Place.—The population of Milford, in Mass., at present exceeds 7000. The number of buildings erected last year was 78, valued at $173,200. The number of boot manufactories is 40, which turns out 1,450,198 pairs. Their value in 1853 was $2,594,346. Number of firms engaged in mercantile business last year, 46, the amount of whose business was $1,050,800. Amount of woollen manufactures, &c., $285,000. Total business, $4,103,346.

The Legislature has just passed a bill to establish a police court in Milford, and the judge's salary is to be $300—not a very tempting inducement; yet, it is said there are several anxious competitors for the appointment.

The Shoe Business in Haverhill.—The *Haverhill Banner* says there are more than two hundred different kinds of shoes manufactured in that town, from the brogan to the finest kind of ladies shoes, the sales some days amounting to from seventy to eighty thousand dollars. It is estimated that there are at least five million pairs manufactured annually, the shoe business of the place being only second to that of Lynn, the great shoe-mart of the country."

SOFTENING HORN.

"Can horn be so softened as to be moulded into any required shape, or pressed into moulds? And can it be made white, or is white horn to be purchased?"—Querist.

Horn may be softened by a degree of heat not exceeding melted lead, and may afterwards be moulded into any required shape. The horn handles of knives, razors, &c., are now commonly made by moulding. The softened horn is first pressed into a mould or die, which is then inclosed in a nut-cracker sort of clamp, and the die, clamp, and horn immersed in boiling water for a few minutes, after which the clamp is screwed as tight as possible, by means of a screw attached to the end opposite the joint. In about twenty minutes, the horn is taken out and finished. It is commonly dyed of various colors, and may also, we presume, be blackened, though we do not recollect to have seen any articles of white horn. Ivory is usually whitened by boiling it in pearl-ashes and water; and perhaps horn may be so also.—*Mechanics' Magazine.*

NOTICES.

American Association for the Advancement of Science.—The next meeting of this Association opens at Washington on Wednesday, the 26th of April, and not on the 30th, as stated in the May number of the *American Journal of Science.*—Eds. Am. Jour. Sci.

Oculist.—Dr. Roehrig, now employed in the foreign department of the Astor Library, announces himself as "oculist and special physician for amaurosis, even in cases of complete blindness." He is a gentleman in manners, of most extensive learning, is familiar with the theory and practice of Eastern and European physicians, among whom he has passed several years. He can not fail to receive a liberal patronage. His rooms are 387 Fourth street.

EDITORS' JOTTINGS AND MECHANICAL RECORD.

THE SUGAR MANUFACTURE.—The following interesting account of the first attempt to make sugar in Louisiana is from the report of the United States Patent Office for 1847:

Judge Rost, in his address before the Mechanical and Agricultural Association of Louisiana, gives an interesting description of the first attempt to make sugar in Louisiana, which shows from how small beginnings the great crop now raised of this article has proceeded. He says:

"How is it with the sugar-cane in Louisiana? It was introduced here at an early day from the West Indies, and cultivated to a small extent at Terre aux Bœufs, and in the neighborhood of New-Orleans. No body at first imagined that sugar could be made of it. The juice was boiled into syrup, which sold at extravagant prices. In 1796, Mr. Bore, residing a few miles above New-Orleans, a man reputed for his daring and his energy, formed the desperate resolve of making sugar. He increased his cultivation, put up the necessary buildings and machinery, and procured a sugar-maker from the West Indies. The day appointed for the experiment was come, and the operation was under way. The inhabitants of New-Orleans and the coast had assembled there in great numbers; but they remained outside of the building, at a respectable distance from the sugar-maker, whom they looked upon as a sort of magician. The first strike came, and he said nothing; this they thought fatal, but still they remained fixed to the spot. The second strike was out; the sugar-maker carefully stirred the first, and then, advancing toward the assembled crowd, told them with all the gravity of his craft, 'Gentlemen, it grains.' 'It grains!' was repeated by all. They all rushed in to see the wonder; and, when convinced of the facts, scattered in all directions, greeting every body they met with, 'It grains!' And from the Balize to the Dubuque, from the Wabash to the Yellow Stone, the great, the all-absorbing news of the colony was, that the juice of the cane had grained in Lower Louisiana. It did grain; it has continued to grain; it grained the last season at the rate of 215,000,000 pounds; and, if no untoward action of the government prevents it, in ten years it will grain to the extent of more than double the quantity."

TALBOT'S ROCK-BORER.—This machine is, in effect, a huge seventeen-feet auger, slowly turning at the rate of one revolution per hour, and advancing at the same time from four to eight inches per hour, according to the solidity of the rock perforated. The common auger, as every one knows, is fitted with two fixed cutters, vertical to its centre, each cutting its way spirally into the wood. The cutters of this auger, four in number, are likewise fitted vertically to the centre, and cut their way spirally into the rock, with the combined revolution and advance of the machine. The only difference is in the construction of the cutters, which we shall presently attempt to explain.

The principal parts of the machine are as follows: A carriage of massive iron resting on ways, and pushed forward at the rate above named, by means of a screw, turned by a simple contrivance similar to that which propels the carriage of a saw-mill, which is readily graduated to produce any desired speed, from two to twelve inches per hour. Upon this carriage rests all the machinery, engine included, and its total weight of 150,000 lbs. affords a sufficiently steady basis of operations to prevent the slightest perceptible tremor. 2. A great face-plate like that of a lathe, circular and vertical, resting and revolving on a hollow shaft large enough to admit the play of a horizontal beam, piston-like, through its cavity. 3. Four sectors, (as if a wheel were divided into quarters,) with their apexes hinged upon the face of the plate in such positions, equidistant, as to bring their segments of circumference at right angles to each other, meeting at the centre of the plate. The horizontal beam above mentioned connects by an arm with each of these segments, at their corners, which meet at the centre of the plate; and, in playing back and forth, causes each to vibrate in a segment of a circle which passes through half the diameter of the tunnel, the four meeting at the centre. 4. The circumference of each sector is armed with three small wheels having teeth, not unlike circular saws, set obliquely, so as to strike the face of the rock in the same direction as a stone-cutter's chisel, and to act upon it in substantially the same manner, as they are rolled upon it back and forth by the vibratory swinging of the sectors. Each cutter in succession thus steadily carves away its proper thickness of rock, as it swings back and forth from the centre to the circumference of the tunnel, urged against the rock by the slow advance of the carriage, and borne around by the revolution of the face-plate. The thickness of the shaving carved away by each cutter, varies from one to two inches, according to the hardness of the rock.

Four cutters, passing around once in an hour, and each cutting one and a half inches deep, make, of course, a progress of six inches per hour, which is the rate now made at Harlem. It is said that, after allowing for all necessary interruptions, the machine may be run steadily for twenty hours out of twenty-four, making a progress of ten feet per day. Sixty horse-power of steam, two engineers, and two men to shovel out the broken rock, comprehend the expense of working the machine at this rate; to which the expense of keeping up the cutting-wheels is the only additional item of importance which seems necessary to be added.

Publications delayed by Fire.—A disastrous fire broke out in No. 8 Spruce street, New-York, on the night of the 4th of March, destroying Nos. 8, 10, 12, 14, and 16. Amongst the publishing offices destroyed, were *The Independent*, by J. H. Ladd; *Ladies' Wreath*, by Burdick, Reid & Co.; *Christian Diadem*, by Z. P. Hatch; and the *Popular Educator*, the *Historical Educator*, *Cassell's Natural History*, and the *Magasin Pittoresque*, by Alexander Montgomery. These parties have all suffered more or less by the fire, and the works of some of them will be delayed in consequence. But from the business character and energy which have distinguished them heretofore, we may expect that the interruption will only be temporary. The public may soon expect to see these several works appearing with their accustomed promptness, while our readers, like ourselves, will sincerely sympathize with their unfortunate publishers in the severe calamity which has befallen them.

How to mend Broken China or Glass-ware.—Mrs. William Shelton, of Frankford, Pa., sends us the following recipe for mending broken china or glass-ware: we do not know that the discovery is original with Mrs. S., but she has long used it with invariable success. Take unslaked lime, made fine by pounding or grinding, which mix with the white of an egg to the consistence of starch or paint; thoroughly cleanse and dry the edges to be united, then apply the mixture to the parts to be cemented, place them together firmly, and let them become perfectly dry. Articles thus mended can be handled or washed without injury.

Ammonia in Rain-water.—From experiments by Mons. Boussingault, Lower Rhine, it appears that the rain of the country contains less ammonia than the rain of the city, and that it is more abundant at the beginning than at the end of a shower. He has also found that dew contains ammonia. The proportions, by several trials, were six milligrams to the litre. On the 14th and 16th of November, a thick mist prevailed, so rich in ammonia that the water had an alkaline reäction. A litre of the water contained about two decigrams of carbonate of ammonia.

Durability of Wood.—The piles under the London bridge have been driven 500 years, and on examining them in 1846, they were found to be little decayed. Old Savoy Place, in the city of London, was built 650 years ago, and the wooden piles, consisting of oak, elm, beech, and chestnut, were found upon recent examination to be perfectly sound. Of the durability of timber in a wet state, the piles of a bridge built by the Emperor Trajan, over the Danube, afford a striking example. One of these piles was taken up and found to be petrified to the depth of three fourths of an inch; but the rest of the wood was not different from its former state, though it had been driven 1600 years.

THE UMBRELLA TRADE.—A recent visit to the United States Umbrella Manufactory, 292 Pearl-street, owned by Mr. James Woods, impressed us with the vast extent of this branch of American industry, which, within a few years, has more than quadrupled. The establishment of Mr. Woods is one of the largest in the country, and his wares, from their deserved popularity for beauty and durability, find their way to every part of our country. Mr. Woods purchases his own materials himself, and gives his personal oversight to their manufacture into umbrellas. His well-known character for integrity and uprightness fully warrants us in commending his establishment to the public, as one where they will find a good article at a fair price; and where, too, any statement made by the salesman can be relied upon with the most implicit confidence.

DRESS-MAKERS' AND MILLINERS' GUIDE.—A work of the foregoing title, with several numbers of which we have been favored, is published by S. T. Taylor, 307 Broadway, at $4 per annum. It contains beautiful and accurate fashion-plates, besides patterns cut out of paper, which accompany each number. Our "gude wife" says that no family should be without it, and that it is worth triple its subscription price to ladies who have families, and who are at all tasty about their dress. The high estimation in which she holds the work, warrants us in recommending it to all our readers as indispensable to family economy.

LADIES' NATIONAL MAGAZINE.—Mr. T. B. Peterson, 102 Chestnut street, Philadelphia, publishes a magazine with the above title devoted to the interest of the ladies, which is really a meritorious work. It is only $2 per annum, and is a richly-embellished periodical, filled with choice reading matter, adapted to the taste and gratification of those for whom it is particularly intended. Mr. Peterson adds a premium of a rich collection of engravings to all new subscribers.

GODEY'S LADY'S BOOK.—Age seems to impart vigor and beauty to this pioneer in a pure and eminently useful periodical literature. Godey, for March, and for all the months of the year, is entertaining and sprightly, and embellished to a degree that defies competition, and almost challenges credulity. Published by Louis A. Godey, 107 Chestnut street, Philadelphia, at $3 per annum.

ARTHUR'S HOME MAGAZINE.—Our friend Arthur, on whose reputation the sun never sets, makes a selection from the columns of his *Gazette*, which he imposes into a monthly, with the above title. The idea is a good one, and enables him to give to the reader a very large amount of literary matter at a comparatively low rate—$2 per annum. A few handsome steel engravings, added to the numerous wood-cuts with which the work abounds, give it a place beside the most respectable periodicals of the day, and must render it a very acceptable monthly visitor. Published by T. S. Arthur & Co., 107 Walnut street, Philadelphia.

IMPROVED HARROW.—W. B. & G. M. Ramsay, of South Strabane, Pa., has taken measures to secure a patent upon an improved harrow, the nature of which consists in constructing a harrow of three separate parts or squares, so arranged that one of their diagonal lines will run parallel to the line of travel, and the other transversely thereto, securing a greater breadth of sweep than a harrow composed and jointed, as is common in these implements.

COAL FOR BURNING BRICK.—Recent experiments made with Cumberland and anthracite coal in the burning of brick, have shown that this fuel is peculiarly adapted for this purpose, and that it can be used advantageously and economically, as compared with pine wood. Three several experiments were made in Baltimore and Philadelphia by persons engaged in the manufacture of bricks, and the results were the saving of three days' time in the burning of such kiln, and one dollar and ten cents per thousand on each thousand burned.

UNITED STATES STOCK.—Taking the last census as the basis of calculation, there are at this time about six hundred millions dollars' worth of live stock in the United States. Their value exceeds that of all the manufacturing establishments in the country, and also exceeds the capital employed in commerce, both inland and foreign.

THE Patent Extension Bit, made by Mr. C. L. Barnes, of this city, is an article that will be appreciated by a large class of our mechanics. A set of three simple bits will perform all that thirty-one ordinary bits of one sixteenth of an inch sizes can be made to do, beside cutting any size between, from a quarter of an inch to two inches and one eighth diameter. See advertisement.

MENEELYS' BELLS.—The bells from the extensive establishment of Messrs. A. Meneely's Sons, West Troy, N. Y., received at the World's Fair, recently held in the city of New-York, the *highest premium* or *only silver medal* awarded for bells.

Their church, factory, steamboat, school-house, and plantation bells, as well as their chimes, were adjudged by the committee to be "the *best* in fullness and richness of tone, clearness of vibration, and workmanship" of any on exhibition.

The Messrs. Meneely attach the more importance to the decision, from the fact that the bell-founders of Europe were represented at the Crystal Palace, as well as those from the United States.

ELECTRIC WEAVING-MACHINE.—The *Commerce Sericole*, a French paper, gives an account of a remarkable invention, by which it is proposed to utilize the electric current in the process of weaving. It remarks that the Jaquard loom, although an admirable invention, is not without certain difficulties and defects. Thus, for each passage of the shuttle there must be a piece of card-board of certain breadth, pierced with holes arranged so as to correspond with the design. To direct the electricity, a series of points is arranged in a line like the teeth of a comb, each point communicating with an electro-magnet. The weaver will only have to pass underneath these points the design, traced in varnish on a cylinder or on a metallic leaf, in communication with the battery. The current will pass only where the varnish is wanting, and it will be the corresponding threads only which will remain suspended, and which by that means will reproduce the design as it came from the hands of the artist. It is estimated that this new mode will insure a saving in the most complicated designs of nearly three fourths of the expense, and in others of at least one half.

The inventor of this method is Signor Bonelli, the General-Director of the Sardinian telegraph. In the Jaquard loom, the figures are produced by a movement on a pedal operated by the weaver himself, instead of employing children, as in the old way, to draw the threads under the loom. This improved method, however, is not without defects. For instance, with the passage of every thread, a cartoon of a certain size is necessary, pierced with holes, arranged so as to correspond with the design. But these operations are expensive, and the machines are very liable to get out of order. They are also very noisy, and occupy much room.

All these difficulties are prevented by the application of electricity. It avoids the use of complicated mechanism, of cartoons, and in fact, of machinery almost altogether. The threads are raised by a pedal, as with the present arrangement, and by means of a fine copper wire, are subjected to a current of electricity, which does the work at once.

The necessary steps to procure a patent for this invention in Europe and the United States have been commenced, and as soon as they are completed, the *electrical loom* will be exhibited to the public at Turin.

HATS.—A good hat not only promotes the comfort, but also the personal appearance of its wearer. This being the case, it becomes a matter of some moment to know where a good article can be found. Beebe & Co., 156 Broadway, have an established reputation for furnishing the most beautiful, durable, and the cheapest hat manufactured in New-York. We have used their hats for a long time, and only add our testimony to that of many thousands of others, in awarding them the foregoing unqualified commendation.

NEW WHEELBARROW.—An Englishman has invented a new wheelbarrow. The wheel is placed under, and is sunk into the bottom, so that there is less oscillation. By means of this barrow, it is stated that twice the usual weight can be wheeled.

Bending Timber.—An exhibition and trial of the model machine of the Ship-timber Bending Company, took place lately, at the office of the Company, in Trinity Building, and was witnessed by a considerable number of ship-builders and other persons interested. Experiments were made with pieces of wood of various sizes, mostly of live oak, which were easily bent in any desired curve, without steaming. The leading principle in the process consists in the application of an "end pressure" to the timber, at the same time that it is compressed and turned, thereby destroying the capillary tubes by forcing them into each other. The model employed was one twelfth of the size of the working machine. It is alleged that there is no longer a necessity for searching the forests for crooked sticks suitable for ship-building, as all timber, under the new process, is equally serviceable; and it is claimed that the bent timber is stronger, and less liable to defect than the crooked and cross-grained pieces ordinarily selected. Cabinet-makers can also be furnished with materials suitable for their purposes. A thick piece of black walnut was shown at the office, which has been bent in the form of an ellipsis, the two ends meeting. Mahogany, and other woods equally brittle, are said to bend with the same ease. So far as we observed, the spectators were well satisfied with the result of the trial. Mr. Jarvis, timber inspector and measurer at the United States Navy Yard, Gosport, expresses the opinion that the whole frame of a ship, except perhaps the floor-timbers, will ultimately be bent in this way.—*New-York Journal of Commerce.*

Important Means of Lubrication.—We are informed by the *London Mining Journal* that Mr. John Flick, of Bolton, has patented a new plan of lubricating revolving-shafts, axles, &c. At or near the centre of the step of bearing, and at about right angles to the axis, a groove is formed both in the upper and lower portions of it, thus extending all round the journal. The lower part of this groove forms a receptacle for the lubricating fluid, and there is another small horizontal groove formed in the step, parallel with the axis of the shaft. A metal ring is placed loosely on the shaft, and is carried round with it by means of the friction of the surfaces; the lower part of this dips into the fluid, and is constantly passed to the upper part of the shaft, carrying supplies of the fluid, which becomes attached to its surface.

Potato-Planter.—Alexander Anderson, of Markham, C. W., has invented an improved potato-planter. His machine has an endless apron at the bottom of a hopper, which is provided with a series of apertures, which receive the potatoes and carry them to the discharge spout, through which they fall into the furrow at equal distances. These apertures also convey those potatoes which are too large for seed, to a knife at the bottom of the hopper, by which they are cut into pieces of suitable size. The inventor has applied for a patent.

State Agricultural School and Farm.—A meeting of the Maryland State Agricultural Society was held recently at the rooms of the Society, in the American Building, which was called to order by J. Howard McHenry, Esq.; C. B. Calvert, Esq., President of the Society, occupied the chair. The Committee appointed at the last quarterly meeting of the Society, to whom was referred the duty of preparing a plan for the establishment of an agricultural school and farm, submitted their report, which was read. After a few remarks from Hugh Gelston, Esq., the charter of incorporation was read, when a supplement was presented, granting greater power to the Society, and providing for the purchase and furnishing of an experimental farm, and providing for its stock to be divided into one thousand shares, at the rate of one hundred dollars per share.

The President thought the charter was a very liberal one, but some action was necessary by the Legislature. When the stock was sold to persons outside of the Society, it might be voted away by the by-laws of the Society, and it was necessary to prevent that to have it controlled by a majority of the stockholders. That course would throw a guard round it, and many gentlemen, not members of the Society, could purchase in the stock of the farm without any fear whatever. No particular form of supplement to the charter was fixed upon, but it was determined to apply to the Legislature for an extension of the powers of the incorporation.

The Largest Engine.—Messrs. Stillman & Allen, of the Novelty Works, of New-York City, are now constructing the largest engine that was ever built in this or any other country. The diameter of the cylinder is 105 inches, and the length of stroke 12 feet. It is designed for the Bay State Company's new Fall River boat, which is to run in connection with the Fall River and Boston railroad.

Spider Architect.—The nest of a tarantula (spider) has been found in California of the most singular construction. It is about three inches in length, by two in diameter, built of adobes, the walls being nearly half an inch thick. Inside is a projection, which nearly divides into apartments, about an inch in diameter. The inside is lined with a white, downy substance, not unlike velvet, and presents one of the cleanest and most tidy little households imaginable. But the most curious part of it is a door, which fits into an aperture and closes it hermetically. The door is secured by a hinge, formed of the same fibrous substance as the lining of the house, upon which it swings with freedom. The nest is occupied by a dozen little tarantulas, which seem to subsist upon a yellow secreted substance that appears upon the walls of the front apartment. The arrangement of the door for the protection of the little inmates indicates great instinctive architectural knowledge. It is the intention of the finder to forward this curiosity to the Smithsonian Institute at Washington.

The Springfield, Mount Vernon, and Pittsburgh Railway.—From Springfield to Delaware, forty-eight miles, the grading, masonry, and bridging is nearly completed, and will be entirely done by the 10th or 15th of October. The ties, iron rails, spikes, and chairs are all in readiness. The track-laying was commenced at Springfield, and has progressed fifteen miles, and will be completed to Marysville (32 miles) in 40 or 50 days. The track-laying was commenced at Delaware the present week, and will be completed west to Marysville in from 40 to 50 days.

From Delaware eastward to the intersection with the Ohio and Pennsylvania Railroads, 54 miles, the road was let last winter for all the work and materials, excepting the iron rails, and chairs, and the work was commenced in the spring, and has been prosecuted vigorously. It is in the hands of as good contractors as any known in the Western country, and it is not doubted but that the grading, masonry, and bridging, will be ready for the superstructure as early as April or May, so that this part of the road may be brought into use in the summer or fall of 1854.

The Panama Railroad.—The whole length of this road from Aspinwall on the Atlantic side, to Panama on the Pacific side, is 49 miles. It crosses an elevation of 276 feet above high tide at Aspinwall, which will be graded down to 250 feet. The general direction and course of the road from Aspinwall to Panama, is from north-west to south-east, a direction hardly anticipated by those acquainted with the topographical peculiarities of that region. The gauge of this road is five feet, and the sharpest curve one of fifteen degrees. The iron is brought from Wales, and is what is called the heavy W rail, but some T rail will be used. It strikes the Chagres river about seven and a half miles from Aspinwall, and follows the general course of the river to three miles above Gorgona, where it leaves the river, and continues in a south-east direction to the height of land between the two oceans, in the direction toward Panama. It crosses the Chagres river at Barbacoas, the present terminus of the road, where a substantial bridge, 624 feet long, with three piers, is now erecting, the timber and wood-work of which is constructed at Darien, Ga. There will be no grade on the road over the 50 feet to the mile, except for one mile, where it is 70 feet.

Port-monnaies, &c.—We notice that our friends, Messrs. Zurn and Rantfle, 14 John street, of whom we made mention lately, in our account of the Crystal Palace, have received a premium for the goods they exhibited in the Crystal Palace. This agrees with our opinion of their merits, as before stated. They are excellent workmen, and very courteous and obliging gentlemen. Some of our New-York acquaintances do not sufficiently appreciate either of these traits, judging from the exhibition which they make.

FLYING ALMOST.—A curious spectacle (says the Paris *Pays*) was witnessed in the great avenue of the Champs Elysées the day before yesterday. A well-dressed person appeared, with a great number of bladders, each nearly filled with pure hydrogen gas, covered with a net-work of silk, and attached to his body by means of a strap fastened to a belt beneath his arms. The bladders possessed a sufficient ascensional force to diminish the weight of the man by three fourths, without lifting him from the ground. Thus lightened, he was able to take leaps of five or six yards at a time with extraordinary rapidity. After descending the great avenue from the quartier Beaujon to near the Palace de l'Industrie, he returned in the way he came. A vast crowd followed him, and seemed astounded at his feat.

IMPROVEMENT CLAIMED.—Mr. W. Rice, of Boston, Lincolnshire, has patented an invention which will tend greatly to decrease the labor of draught-horses. It consists of a spring-link, formed of steel or india-rubber, attached to the traces, hame-chains, or any part of the harness, so that, instead of a horse taking a dead pull at starting, and frequently coming down, the load is gradually admitted to the shoulder.

NEW COAL FIELDS.—Professor C. T. Jackson, of Boston, has been lately engaged in an exploration of some new coal-fields at Deep River, N. C., about forty miles from Fayetteville, and reports that there is a rich deposit of coal there well worth working.

OBSTRUCTING THE SIDEWALKS.—Teamsters in most of our cities need information on the rights of foot-passengers. It often happens that a teamster, wishing to unload his team, will back it across the sidewalk to the door of a store, without any regard to the convenience of pedestrians. In the police court this morning, James A. Douglass, charged with obstructing the sidewalk in Atkinson street, in this manner, was fined $5 and costs.—*Boston Paper.*

CRYSTAL PALACE.—Circumstances have compelled us to omit, for this month, any account of this great show. But it remains unchanged in most of its departments, and has received large additions in others, many of which are of the highest order of merit. With the return of warm weather, the number of visitors will no doubt be much increased.

PIANO-FORTES.—It is not generally understood that the pianos manufactured by Messrs. Grovesteen & Truslow have a peculiarity that no others possess. Its base or bottom-board is peculiarly constructed. The makers have a patent. It can neither settle nor spring, while it is light, being partly hollow. It consists of several pieces; the principal ones being the upper and lower boards, supported by an arch which is itself supported above and below in different places. For tone or beauty of finish, nothing of the kind excels them. The juries at the Crystal Palace awarded three prize medals to these gentlemen for the best piano-fortes on exhibition. The American Institute also awarded them prize medals for five years in succession.

THE NEW-YORK STATE POULTRY SOCIETY have chosen the following officers for the ensuing year:

President—D. S. Heffron, of Utica.

Vice-Presidents—Francis Rotch, Butternuts; M. Vassar, Poughkeepsie; Lewis F. Allen, Black Rock.

Corresponding Secretary—R. C. McCormick, jr., Woodhaven, L. I.

Recording Secretary and Treasurer—R. U. Sherman, Utica.

Managers—Samuel T. Tabor, Duchess; Thos. W. Ludlow, jr., Yonkers; Samuel Thorns, New-York City; C. W. Godard, Albany; A. P. Hammond, Westport, Essex county; W. H. Southwick, New-Baltimore; Samuel S. Breman, Hampton, Washington county; George St. George, New-York Mills, Oneida co.; A. A. Hudson, Syracuse; R. H. Van Rensselaer, Otsego county; F. W. Collins, Ontario county; Isaac E. Haviland, L. I.; Abner Baker, Rochester; William Walsh, Bethlehem, Albany county; John H. Cole, Columbia county; D. W. C. Van Slyck, Warner county; J. Wyman Jones, Utica; N. S. Smith, Buffalo; Curtis Moses, Syracuse; Thos. Gould, Cayuga county.

NEW BOOKS.

FOUR YEARS IN THE GOVERNMENT EXPLORING EXPEDITION, COMMANDED BY CAPT. CHARLES WILKES; a Narrative of a Cruise to the Island of Madeira, Cape Verd Islands, Brazil, Coast of Patagonia, Chili, Peru, Paumato Group, Society Islands, Navigator Group, Australia, Antarctic Ocean, Friendly Islands, Fejee Group, Sandwich Islands, North-west Coast of America, Oregon, California, East Indies, St. Helena, &c. By Lieut. GEO. M. COLVOCORESSES, U. S. Navy. 1 vol. Cloth, gilt. 12mo. pp. 350. 25 illustrations. Price reduced to $1. New-York: R. T. Young, 140 Fulton street.

THIS work, by an officer of the expedition, has reached its fourth edition. It contains a description of the natural scenery, manners, customs, religions, &c., of the countries visited. It is an interesting book of voyages, full of useful information, written in a good, easy style, that is calculated to impress the facts related upon the memory of the reader.

It is compiled from a journal kept by the author in obedience to a "general order" from the navy department, and for the general reader it is in a more desirable form than the massive government editions.

ELLIOTT'S FRUIT BOOK; or, the American Fruit-Grower's Guide, in Orchard and Garden. Being a compend of the history, modes of propagation, culture, &c., of fruit-trees and shrubs, with descriptions of nearly all the varieties of fruits cultivated in the country; notes of their adaptation to localities and soils, and also a complete list of fruits worthy of cultivation. By F. R. ELLIOTT. New-York: C. M. Saxton, agricultural book publisher, 152 Fulton street.

THIS is a work of more than five hundred pages, profusely interspersed with cuts, illustrating not only the great variety of fruits, but the modes of planting, pruning, grafting, budding, laying, training, &c., &c. It treats understandingly of manures and the general culture of plants and trees, and the best modes of guarding against the various insects that prey upon our fruit-trees and fruits. It is evidently the result of long experience, careful study, and persevering industry. To the fruit-grower or gardener it will be found of great value, and the plain farmer, who cultivates only his small apple-orchard, will find here all he needs to know in securing the object at which he aims.

THE FARMER'S MISCELLANY AND AGRICULTURIST'S GUIDE; Treating upon Gases, Salts, Atmosphere, Manures, Seeds, Hot-Beds, Grains, Vegetables, Fruits, Gardening, Grafting, Pruning, and Animals; with forms of agreement with laborers, and a great variety of agricultural matter, and an appendix of valuable receipts, &c. By GEO. W. MARSHALL, author of the Farmer's and Emigrant's Hand-Book, &c. Sixty illustrations. New-York: R. T. Young, publisher, 140 Fulton street.

THIS is a valuable cabinet of information. No one can peruse it, and not find for himself a thousand truths of importance, which he may not have learned before. It is of good print and paper, well bound, and we commend it to our young farmers, gardeners, and all others.

MEYER'S UNIVERSUM.—We have on several occasions referred to this series of illustrations, and numbers subsequently published have been quite as good as the preceding. The two volumes thus far published, contain a good variety of views of well-selected scenery in both continents, well executed, and form a handsome ornament for the centre-table and for the library. We commend it without hesitation to all our readers. The text, written by Mr. Dana, of the *Tribune*, is worthy of its accomplished author. The numbers are but twenty-five cents each, and contain at least four engravings, with well-arranged descriptions.

HOMŒOPATHIC PRACTICE OF MEDICINE. By Dr. FRELIGH. New-York: Lamport, Blakeman & Law, 8 Park Place.

A VOLUME of 576 pages, devoted to this subject, has been published by one of our enterprising houses. It is from one of no little eminence in the profession, and is well recommended. It may be regarded as the highest authority in the school to which the writer belongs, and will, no doubt, take rank among the best text books in that department. Its price is only $1.50.

Illustrated Record of the Crystal Palace.—This handsome volume, worthy of the publisher, Mr. G. P. Putnam, Park Row, is now closed. Mr. Putnam deserves much, not only of commendation, but of returns more substantial, for his efforts to do the subject justice. He has succeeded to the entire satisfaction of all reasonable men. The task was full of difficulty; every thing was to be prepared for it; artists were not easily found for so extensive and varied labor, but all has not only been done, but well done. The editors have done their part equally well, and furnish matter for the gratification and profit of the reader.

List of Patents Issued,

FROM FEB. 7 TO MARCH 7.

A. H. Caryl, of Sandusky city, Ohio, for improvement in picking and cleaning flax.

Matthias W. Baldwin and David Clark, of Philadelphia, Pa., for improved arrangement of vertical tube feed water-heaters, in locomotive smoke stacks.

Lewis S. Chichester, of Brooklyn, N. Y., for improvement in machines for cleaning wool.

John Griffiths, of Philadelphia, Pa., for improvement in valve-cocks.

F. C. Goffin, of New-York, for improvement in fire and burglar-proof safes.

Jonathan Knowles, of Trenton, N. J., for improvement in process of treating vegetable fibre. Patented in France, April 4, 1853.

Sam. G. Lewis, of Delaware Co., Pa., for improvement in making thick paper.

Thos. Cook, of New-York, assignor to Starkie Livsey, of same place, for improvement in fire-arms.

John Standish, of Cuyahoga Falls, Ohio, assignor to John Standish and Horace A. Miller, of same place, for improvement in machines for pegging boots and shoes.

Robert Preston, of North Pownal, Vt., for improvement in drying cloth.

Warren Robinson, of New-Haven, Conn., for improvement in ships' ventilators.

Jacob Reese, of Sharon, Pa., for improvement in hanging the fore-plate to iron-rolling machinery.

W. G. Sterling, of Bridgeport, Conn., for improvement in planting-hoes.

Henry S. William, of Malta, Ohio, for improvements in apparatus for controlling the pressure of steam.

Jacob D. Woodruff, of Newark, N. J., and J. H. Butterworth, of Dover, N. J., for improvement in drop-bridges.

Arcalous Wyckoff, of Wellsburgh, N. Y., for improvement in machines for making links of jack-chains.

Jno. Webster and Orson Spencer, of Cleveland, Ohio, assignors to Jno. Webster, of same place, for improvement in gas-burners.

Geo. B. Ambler, of Trumbull, Conn., for improvement in saddle-trees.

Frederick H. Bartholomew, of New-York, for improvement in water-closets.

Jason Barton, of Middle-Haddam, Conn., for improvement in horse-bells.

J. L. Burdick, of New-York, for improvement in machinery for paging blank books.

John W. Newell, of New-Paris, Ohio, for improvement in machines for stuffing horse-collars.

Horace Smith and Daniel B. Wesson, of Norwich, Conn., for improvement in fire-arms.

Allen Goodman and Lyman Wheeler, of Dana, Mass., for improved machine for scraping and toothing veneer.

Joel R. Bassett, of Cincinnati, Ohio, assignee to Caleb H. Williams, of same place, for improvement in ball-valves for pumps.

Frederick T. Andrews, of Georgetown, D. C., for improved method of operating saws.

Jason Barton, of Middle-Haddam, Conn., for improvement in the mode of attaching horse-bells to straps.

Jeremy W. Bliss, of Hartford, Conn., for improvement in window-cord pulleys.

E. G. Connelly, of Indianapolis, Ind., for improved carved sash-bolt.

Jno. T. Foster, of Jersey City, N. J., for improvement in stone-picking machines.

Wm. Perry of New-York, for improvement in oar-locks.

John B. Holmes, of Boston, Mass., for improvement in derricks.

Daniel J. Stearns, of Pittsfield, Mass., for improvement in stretching and drying cloth.

Jos. M. Schuyler and Wm. Zern, of Pottsville, Pa., assignees to Daniel L. Easterly, of same place, for improvement in weaving wire-screens.

Samuel F. Holbrook, of Boston, Mass., for improvement in contrivances for protecting passengers in railroad cars.

Amos P. Hughes, of Philadelphia, Pa., for improved tool for dovetailing.

Richard Montgomery, of New-York, for improvement in corrugating metal plates.

Martin Newman, 2d, and N. C. Whitcomb, of Lanesborough, Pa., and G. C. Cook, of Hartford, Conn., for improvement in whiffletree-hooks.

Elnathan Sampson, of Claremont, N. H., for improvement in attaching hubs to axles.

Jno. B. Smith, of Sunapee, N. H., for improved machine for slitting clothes-pins.

James Foster, Jr., of Cincinnati, Ohio, for improvement in seal presses.

Jno. Gledhill, of New-York, for improvement in treating hair for weaving.

Chas. F. Packard, of Greenwich, Conn., for improved machine for cutting lath.

Smith Thompson, of Newburyport, Mass., for improvement in spooling yarn from the cop.

Jno. Zink, of Greensville, Va., for improvement in thrashers and separators of grain.

Rufus Porter, of Washington, D. C., assignor to George Stephenson, of Northfield, Ind., for improvement in machinery for making cordage.

Solomon Smith, of Acton, Mass., assignor to himself and Wm. Schoaler, of same place, for improvement in parti-coloring machines.

Hiram Tucker, of Cambridgeport, Mass., assignor to himself and Joseph Storey, of Boston, Mass., for improvement in applying colors to stone. Patented in England, Sept. 14, 1852.

S. B. Batchelor, of Lowville, N. Y., for scythe fastenings.

J. W. Chittenden & Wm. C. Mead, of Vevay, Ind., for machine for splitting hoops.

John P. Conger, of Newark, N. J., for improved salt-kilns.

Lewis W. Colver, of Louisville, Ky., for a seed-planter.

R. W. Davis, of Rodgersville, N. Y., for improved churns.

A. K. Eaton, of New-York City, for machine for pulverizing ores.

Abijah Hall & Sylvanus Sturtevant, of South Paris, Me., for improved snow-ploughs and railroads.

Timothy D. Jackson, of New-York City, for dies for making seamless metal tubes.

Smith W. Bullock, of New-York City, assignor to Stillman, Allen & Co., of same place, for improved quartz-crushers.

Michael M. Gray, of Philadelphia, Pa., for railroad chair-machines.

Thomas D. Henson & George Rohr, of Charleston, Va., for seed-planters.

Wm. Burnett and John Absterdam, of Boston, Mass., for fusible discs in steam-boilers.

James Renton, of Newark, N. J., for zinc white furnaces.

F. G. Johnson, of Brooklyn, N. Y., for table to hold bank-notes when cut.

A. S. Lyman, of New-York City, for improved air engines.

Wm. McBride, of Bristolville, Ohio, for machines for making bed-pins.

James Pitts, of Lancaster, Mass., for cotton-picker cylinder.

Joseph Sawyer, of South Royalston, Mass., for socket for bench-hooks.

Wm. Sumner, of Worcester, Mass., for improvement in organs.

Solyman Bell, of Marseilles, Ill., for an improved harvester.

George A. Rollins, of Nashua, N. H., for a tool-rest for turning-lathes.

John S. Snyder & Joseph Young, of Wheatfield Township, Pa., for an improved seed-planter.

Linus Yale, of Newport, N. Y., for improvement in bank-locks.

Jacob Zook, of Harrisburg, Pa., for new carrier for lathes.

L. O. P. Meyer, of Newtown, Conn., for new mode of vulcanizing India-rubber and other gums.

James F. Brodhead, of Rondout, N. Y., for improved Forceps saw-sets.

Stephen P. Ruggles, of Boston, Mass., for an improved printing press.

David Swartz, of Tonis Brook, Va., for additional improvement in ploughs.

William Burnett, of Boston, Mass., for improved arrangement of fusible plugs or disks for steam-boilers.

Issac Hussey, of Harveysburg, Ohio, for improvement in machines for plastering.

Caleb Cook, of Nashville, N. H., for improved arrangement of valve motion for locomotive-engines.

Warren Gale, of Louisville, Ky., for improvement in the gauge of straw-cutters.

William G. Phillips, of Newport, Del., for improved method of opening and closing gates.

Joel P. Heacock, of Marlborough, Ohio, for apparatus for rounding and bevelling barrel-heads.

George W. Cooper, of Palmyra, Ga., for improvement in cotton seed-planters.

Henry P. Kimble, of Rochester, N. Y., for improvement in sash-fasteners.

Wm. H. Johnson, of Granville, Mass., for improvement in sewing-machines.

George C. Hinman, of New-Haven, Conn., for improvement in sash-stainers.

George Levan, of West Earl Township, Penn., for improvement in reeling machines.

Samuel Loveland, of Astoria, N. Y., for improvement in sectional dry docks.

Levi B. Tyng, of Lowell, Mass., for improvement in tail-stocks for turning-lathes.

R. J. R. Stone, of Berlin, Ohio, for improvement in machines for boring and morticing carriage-hubs.

Joseph Sollenberger, of Higginsport, Ohio, for improvement in carriage-brakes.

James W. Stoakes, of Milan, Ohio, for improvement in apparatus for paying the seams of vessels.

Chauncey D. Woodruff, of Toledo, Ohio, for improvement in suspending eaves troughs.

Luther B. Fisher, of Cold Water, Mich., for improvement in seed-planters.

Jeremiah C. Gaston, of Reading, Ohio, for improvement in seed-planters.

Charles Miller, of St. Louis, Mo., for improvement in sewing-machines.

Clark Polley, of May's Landing, N. J., for improved method of operating hydraulic rams.

David B. Marks, of New-York, N. Y., for improvement in artificial legs.

Seaman C. Ripley, of New-York, N. Y., for improvement in brick-machines.

Joseph Sawyer, of South Royalston, Mass., for improvement in machines for splitting rattans.

Addison M. Sawyer, of Templeton, Mass., for improvement in machines for splitting rattans.

William Wickersham, of Boston, Mass., for improvement in sewing-machines.

Robert W. Andrews, of Staffordville, Conn., for improvement in Britannia tea and coffee-pots.

Jesse Young, of Franklin Furnace, Ohio, for improvement in connecting the joints of air-heating pipes.

William C. Wright, of Boston, Mass., for improvement in machines for drilling stones.

Ashley Hotchkin, of Shenevus, New-York, N. Y., for improvement in hanging gates.

Daniel Ryan and John Flanagan, of New-York, N. Y., for improvement in water-closets.

Joseph Wilson, of Hartford, Conn., for improvement in self-acting railroad switches.

Christopher Hodgkins, of Boston, Mass., assignor to Nehemiah Hunt, of same place, for improvement in sewing-machines.

Thomas Klegg, of North Andover, Mass., assignor to Thomas Clegg and Nathaniel Stephens, of Andover, Mass., for improvement in wire heddle-eyes for looms.

The Plough, the Loom, and the Anvil.

Part II.—Vol. VI. MAY, 1854. No. 5.

COAL-FIELDS—PENNSYLVANIA MINES.

The extent of the coal regions of this country is very remarkable. This important mineral is absolutely inexhaustible. The quality of it, at various places, and the value, vary, of course, according to its geographical and geological position.

As we explained in the last number, there is no coal, comparatively, on the Atlantic slope, or between the Atlantic and the Appalachian chain. But here the anthracite coal-measures at once present themselves; and as soon as the summit of these mountains is passed, the Appalachian coal field, properly so called, abounding in bitumenous coal, also extends over an immense extent of country. This mountain range extends, in fact, from Vermont to Alabama, a distance of more than a thousand miles, and varying from fifty to a hundred and fifty miles in width. The structure of these ranges is very complicate, from the frequent occurrence of fractures, and deviations from right lines; but as we go westward, the strata are less disturbed, until they regain a horizontal position. On the south-easterly side of the chain, numerous dykes also are found, consisting of igneous or plutonic rocks, which essentially interrupt the regularity of the strata.

It is estimated that the extent of the coal-fields in the several States named below are as follows: Alabama, 3400 square miles of coal; Georgia, 150; Tennesee, 4300; Kentucky, 13,500; Virginia, 21,195; Maryland, 550; Ohio, 11,500; Indiana, 7700; Illinois, 44,000; Pennsylvania, 15,437; Michigan, 5000; Missouri, 6000; or a total in these twelve States of 133,132 square miles.

In Pennsylvania, nearly 10,000,000 of acres are occupied by anthracite coal, or more than one third of the whole area of the State.

The coal-beds decrease in thickness as we advance toward the West. Near Pottsville, in Pennsylvania, where the thickness of the coal-measures is the greatest, there are thirteen seams of anthracite coal, one above another, several of which are more than two yards thick. Following along this tract for several miles, it is found that seven of these seams successively unite into one, forming in the region of Mauch Chunk a mass between 40 and 50 feet thick. According to the statement of our friend, Mr. W. White Smith, of Philadelphia, in his "Off-hand Sketches," "the coal strata appear to have *over-tilted*, thus forming an almost solid area of coal of great thickness. Lying near the surface, it was for many years mined in open quarry."

The phraseology here used by our friend in the passage just cited, reminds us of a very ingenious theory, but recently broached, by which geologists undertake to account for the state of things we have been describing, namely, the union of different coal seams into one. A diagram would be very convenient; but even without one, we will endeavor to make ourself understood.

First, then, suppose a layer of roots of trees and other vegetable matters, resting upon a bed of coal. Above this "layer" is a growing forest. Let one extremity, or perhaps half or a third of this forest, become submerged by some great convulsion, sinking down some 20 or 30 feet. A lake is formed. The trees are in all conceivable positions, and many slowly decay. Their stumps, and the lower part of the trunks of those still standing, become enveloped in sand and mud, with which the lake is gradually filled up. In the process of time, another forest starts up from this new-formed land, and other masses of vegetable matter accumulate, each of which in its turn is to be transformed into coal; and the process of sinking and filling up, &c., is repeated again and again, as before. These various beds will evidently be united at the point at which the original formations, which remained quiet, and the sunken portions unite, and there will be as many beds of coal, one above another, and in a position like rays from a common centre, as there are repetitions of the process we have described.

It will not be expected, of course, that these changes will all commence and terminate at the same spot, and hence frequent irregularities in the number, thickness, and direction of these seams must be almost inevitable.

But to return to the extent of these veins. In the South basin, in Pennsylvania, that is, from the Sharp Mountain to the Mine Hill, there are thirteen veins, some of which are white ash and some are red—the whole thickness of the coal-veins ninety feet.

The Appalachian coal-field extends, according to the report of Professor Rogers, for a distance of 720 miles, continuously, from N.E. to S.W.; its greatest width being 180 miles; and its superficial area exceeding 63,000 square miles.

Toward the western limits of this field, the strata become more nearly horizontal, as already suggested, and the coal is more bituminous. Thus in the eastern sections, near Pottsville for example, it contains only some 10 or 12 per cent. of bitumen, while on the Monongahela and Ohio, it contains 40 per cent.

There are three well-marked divisions in the anthracite coal fields of Pennsylvania, known as the South anthracite region, the Middle, and the North or the Wyoming coal-field. The South anthracite region extends from its eastern extremity near the Lehigh, to its western terminus near the Susquehannah, a distance of about 75 miles. Its greatest breadth is about six miles. The Middle region extends from the Lehigh to the Susquehannah, about 50 miles. The Northern from the head-waters of Lackawanna Creek to Shickshinny, on the north branch of the Susquehannah, a distance of more than 60 miles.

The Southern district includes the Lehigh, Tamaqua, Tuscarora, Schuylkill Valley, Pottsville, Minersville, Swatara, and the Lykens' Valley, and Dauphin; the last two being the North and South forks of its Western extension.

The Middle includes Shamokin, Mahany, Girardsville, and Quaquake coal districts, with several contiguous basins.

The North contains the Shickshinny, Wilkesbarre, Newport, Pittston, Lackawanna, and Carbondale districts.

These sections are separated by various rocks, namely, a conglomerate of white quartz pebbles, red slate, sandstone strata, &c.

The discovery of these coal-fields has given an immense value to these wild, precipitous mountains and to the more level tracts beyond them. Much of this land had no market value, in the proper sense of the term, before the discovery and mining of the coal, and none, or next to none, of any sort. But estimating the value of the coal buried beneath them at 25 cents per ton, the value of the land in the Schuylkill basin, for example, one of the richest in the State, will be worth twenty or thirty thousand dollars. A single vein, as we are informed by Mr. Smith, in the Mine-Hill region, "has returned an annual rental of over $62,000," to its proprietors. The *Mining Register* (Pottsville) considers an acre of coal-land worth $18,000.

But not only is the value of these lands much better appreciated now than formerly, but the increase of railroads and other facilities is essentially adding value to them every year. In fact, there is no coal-field that will not pay for the construction of a railroad of considerable length, provided its terminus is practically at or near a good market.

Before we proceed to describe other and more westerly sections, it will no doubt interest our readers to give them a rather amusing account of the discovery and early mining operations in the Lehigh district, which we find in the volume repeatedly referred to in this and a former number, the "Off-hand Sketches," published by Mr. Smith of Philadelphia, recently described among our "New Books."

DISCOVERY OF ANTHRACITE COAL.

The discovery of coal in the Lehigh district is said to have been purely accidental. There had been legends of long standing, supposed to have emanated from the Indians, that coal abounded in this section of Pennsylvania; and among some of the credulous German farmers in Lehigh, Berks, Lancaster, &c., one is occasionally reminded of them, and grave intimations thrown out that coal is reposing in "certain places" beneath the luxuriant soil of those counties. Such traditionary reports prevailed for a long time among the early settlers of the territory now comprising the several counties of the anthracite regions; and if similar ones in the counties above named should ever be realized in the same happy manner, all will unite in admiration of the German stoicism with which they are still maintained by the "older inhabitants." The story of its discovery near Mauch Chunk, in the present county of Carbon, is doubtless already familiar to many. Nevertheless, it is so curious and romantic in itself, and is fraught with such miraculous results upon the physical and mental condition of mankind, that we can not omit it here. The account was given by the late Dr. James, of Philadelphia, who, in the year 1804, in company with Anthony Morris, Esq., of the same city, visited some lands, held jointly by them, near Sharp Mountain.

"In the course of our pilgrimage, we reached the summit of Mauch Chunk mountain, the present site of anthracite coal. At the time, there were only to be seen three or four small pits, which had the appearance of the commencement of rude wells, into one of which our guide, Philip Ginter, descended with great ease, and threw up some pieces of coal for our examination. After which, whilst we lingered on the spot, contemplating the wildness of the scene, honest Philip amused us with the following narrative of the original discovery of this most valuable of minerals, now promising, from its general diffusion, so much of wealth and comfort to a great portion of the United States.

He said that when he first took up his residence in that district of country, he built himself a rough cabin in the forest, and supported his family by the proceeds of his rifle; being literally a hunter of the backwoods. The game he shot, including bear and deer, he carried to the nearest store, and exchanged for other necessaries of life. But at this particular time, to which he then alluded, he was without a supply of food for his family; and after being out all day with his gun in quest of it, he was returning, toward evening, over the Mauch Chunk mountain, entirely unsuccessful and disappointed; a drizzling rain beginning to fall, and night rapidly approaching, he bent his course homeward, considering himself one of the most *forsaken* of human beings. As he strode slowly over the ground, his foot stumbled against something, which, by the stroke, was driven before him; observing it to be black, to distinguish which there was just light enough remaining, he took it up, and as he had often listened to the traditions of the country of the existence of coal in the vicinity, it occurred to him that this might be a portion of that *stone-coal*, of which he had heard. He accordingly carefully took it with him to the cabin, and the next day carried it to Colonel Jacob Weiss, residing at what was then known by the name of Fort Allen, (erected under the auspices of Dr. Franklin.) The Colonel, who was alive to the subject, brought the specimen with him to Philadelphia, and submitted it to the inspection of John Nicholson and Michael Hillegas, Esqrs., and also to Charles Cist, a printer, who ascertained its nature and qualities, and authorized the Colonel to pay Ginter for his discovery, upon his pointing out the precise spot where he found the coal. This was readily done by acceding to Ginter's proposal of getting, through the regular forms of the patent-office, the title for a small tract of land, which he supposed had never been taken up, comprising the mill-seat on which he afterward built the mill which afforded us the lodging of the preceding night, and which he afterward was unhappily deprived of by the claim of a prior survey."

Coal was known to exist in the vicinity of Pottsville more than seventy years ago, and searches for it had been made repeatedly; but the coal found was so different from any previously known, that it was deemed utterly valueless—more especially as no means could be devised to burn it. Searches for it were abandoned, at least for a time, when a blacksmith, by the name of Whetstone, luckily chanced upon some, and immediately undertook to use it in his shop. After experimenting with it for a short time, his efforts proved successful, and his triumph having been duly communicated, in the shape of local gossip, to the citizens of the surrounding neighborhood, attention was very soon after directed to the expediency of instituting further inquiries as to the nature and extent of the deposit, and its applicability for other purposes. Among those who at a very early period did not hesitate to declare his belief in the existence of coal in this district, was the late Judge Cooper; and it was through the influence of such persons that searches were continued through circumstances and prejudices at once discouraging, and seemingly fool-hardy. Among the first, if they were not the first, who undertook explorations for coal, were the Messrs. Potts. They made examinations at various points along the old Sunbury road, but in no instance did success attend them. The late William Morris, soon after the operations of Messrs. Potts were terminated, became proprietor of most of the lands lying at the head of the Schuylkill; and about the year 1800 he was fortunate enough to find coal, and in the same year took a considerable quantity to Philadelphia. It was in vain that he held forth its peculiar virtues, and vast future importance; all his efforts to convince the people of its adaptation to use proved abortive; and when, occasionally, an individual was found who could be induced, through the force of argument and eloquence, to coincide in the merits of "stone-coal," the well-known lines—

"A man convinced against his *will*,
Is of the same opinion still"—

would be involuntarily forced upon his mind; and finally he had no other alternative but to dispose of his lands, and abandon his projects as altogether fruitless.

We do not know that any further notice had now been taken of this coal, for six or seven years afterward. Peter Bastons made some discoveries of its deposit, while erecting the forge in Schuylkill Valley; and a blacksmith, named David Berlin, continued to improve upon the suggestions of Whetstone, (who, by this time, had discontinued business, or perhaps left the vicinity,) and imparted his successes freely to others of his craft. But few, however, could be prevailed upon to use it. Prejudice—prejudice was ever keen, and it seemed to keep men of ordinary spirit at a respectful distance. Men of iron nerve could only oppose themselves to the current.

In the latter part of the year 1810, a practical chemist, combining science with practice, made such an analysis of the coal of this region, as convinced him that there was inherent in the mass all the properties suitable for combustion. He therefore erected a furnace in a small vacant house on Front street, between Philadelphia and Kensington, to which he applied three strong bellows. By this means he obtained such an immense *white heat* from the coal, that platina itself could have been melted! From this experiment was derived such proofs of its qualities, as ultimately favored its general introduction into that city.

But although it might easily be inferred that such experiments could not fail to have secured for it immediate favor, yet such was by no means the fact. Intelligent men, it is true, calmly deliberated over the subject, but that was all; the time had not yet come to act. Two years after this, the late Colonel George Shoemaker and Nicholas Allen discovered coal on a piece of land which they had but recently purchased—in times past called Centreville—situate about one mile from Pottsville. They raised several wagon-loads of it, but no purchaser could be found. Mr. Allen soon became disheartened, and disposed of his interest in the lands to his partner; who, having received some encouragement from certain citizens of Philadelphia, persevered in his operations. He got out a considerable quantity, and forwarded ten wagon-loads to Philadelphia, in quest of a market. Its arrival there was, as usual, greeted with the warmest *prejudice*, and there were few who appeared to evince any curiosity or interest in the subject. Nearly every one considered it a sort of *stone*, and, saving that it was a "peculiar stone"—a stone-coal—they would as soon have thought of making fire with any other kind of *stone!* Among all those who examined the coals, but few persons could be prevailed upon to purchase, and they only a small quantity, "to try it;" but alas! the trials were unsuccessful! The purchasers denounced Colonel Shoemaker as a vile impostor and an arrant cheat! Their denunciations went forth throughout the city, and Colonel Shoemaker, to escape an arrest for swindling and imposture, with which he was threatened, drove thirty miles out of his way, in *a circuitous route to avoid the officers of the law!* He returned home, heart-sick with his adventure. But, fortunately, among the few purchasers of his coal, were a firm of iron factors in Delaware county, who, having used it successfully, proclaimed the astounding fact in the newspapers of the day. The current of prejudice thereafter began to waver somewhat; and new experiments were made at iron works on the Schuylkill, with like success, the result of which was also announced by the press. From this time, anthracite began gradually to put down its enemies—and among the more intelligent people, its future value was predicted.

The first successful experiment to *generate steam* with anthracite coal, was made in 1825, at the iron works at Phœnixville. Previously, however, John Price Wetherell, of Philadelphia, made several efforts to accomplish this, at his lead works—but we have understood that he only partially succeeded.

NOTE.—The printer made us talk in the last number, of "Peruvian" system of rocks. We wrote "Permian," and of course intended it should be so printed.

THE COAL TRADE.

To such an extent has our coal industry been developed, that at the present time not less than 37,000,000 of tons are annually raised, the value of which at the pit's mouth is little less than £10,000,000; at the places of consumption, including expense of transport and other charges, probably not less than £20,000,000. The capital employed in the trade exceeds £10,000,000. About 400 iron-furnaces of Great Britain consume annually 10,00,0000 tons of coal and 7,000,000 tons of iron-stone, in order to produce 2,500,000 tons of pig-iron, of the value of upward of £8,000,000. For the supply of the metropolis alone 3,600,000 tons of coal are required for manufacturing and domestic purposes; our coasting vessels conveyed in 1850 upward of 9,360,000 tons to various ports in the United Kingdom, and 3,350,000 tons were exported to foreign countries and the British possessions. Add to this, that about 120,000 persons are constantly employed in extracting the coal from the mines, and that in some of the northern counties there are more persons at work under the ground than upon its surface, and some approximate idea may be formed of the importance of this branch of our industry. The extent of the coal areas in the British Islands is 12,000 square miles, and the annual produce 37,000,000 tons; of Belgium, 240 miles, annual produce, 5,000,000 tons; of France, 2000 miles, annual produce, 4,150,000 tons; of the United States, 113,000 miles, annual produce, 4,000,000 tons; of Prussia, 2200 miles, annual produce, 3,500,000 tons; of Spain, 4000 miles, annual produce, 550,000 tons; of British North America, 180,000 miles, annual produce not known. Taking the British Islands alone, and dividing them into districts, we find the supposed workable area as follows, in acres: Northumberland and Durham, 500,000; Cumberland, Westmoreland, and West Riding, 99,500; Lancashire, Flintshire, and North Staffordshire, 550,000; Shropshire and Worcestershire, 79,950; South Staffordshire, 65,000; Warwickshire and Leicestershire, 80,000; Somersetshire and Gloucestershire, 167,500; South Wales, 600,000; Scottish coal-fields, 1,045,000. Irish coal-fields—Ulster, 500,000; Connaught, 200,000; Leinster, 150,000; Munster, 1,000,000. Our exports, which in 1840 amounted to 1,606 000 tons, valued at £576,000, had increased in 1850 to 3,531,000 tons, of the value of £1,284,000. In 1841 our exports to France were 451,-800 tons; to Holland, 173,378 tons; to Prussia, 116,296 tons; and to Russia, 77,152 tons. In 1850 they were to France, 612,545 tons; to Holland, 159953 tons; to Prussia, 186,528 tons; and to Russia, 235,188 tons.—*Durham Chronicle.*

PURE WATER.

A full supply of good water is not only a very great convenience for culinary and other household purposes, but is of very great importance as a matter of health. We are, therefore, glad to see movements in any quarter for an increased supply for the wants of our cities and large towns. The following statements, we believe, will be found essentially correct in reference to these matters:

Cincinnati is supplied with water from the Ohio, raised 175 feet into a reservoir of stone, upon a hill 700 feet high, containing 5,000,000 gallons, through iron pipes 800 feet long. These works were carried on by private enterprise till 1839, at which time they were purchased by the city. Cost $1,000,000. Further improvements are contemplated.

Pittsburgh is supplied from the Allegheny River with water raised into two reservoirs successively: the first being 160 feet, into which the water is forced through a pipe 2000 feet long, and from which it is raised by another engine into the upper reservoir, which is 390 feet above the river level, through pipes $\frac{1}{4}$ mile long. The works have cost $700,000.

Allegheny City has water works costing $331,000. The reservoir is of earth embankment, and of 10,000,000 gallons capacity.

Buffalo works are owned by a company. The water is drawn from the Niagara River, and passed under the Erie Canal through a tunnel 300 feet long and 6 feet square, cut in solid rock. Reservoir of earth embankment, will contain 13,000,000 gallons, on Prospect Hill, about a mile from the centre of the town. Cost $400,000.

Albany is supplied with water from a creek, across which, six miles from the Hudson, a forty-foot dam is thrown, forming a pond called Rensellaer Lake, containing 160,000,000 gallons of water; the water is conducted thence to the city in a brick aqueduct, four miles long. These works, and another dam lower down on the same creek, cost the city $800,000, and will deliver ten million of gallons per day.

New-York.—This city is supplied from the Croton River. The work was commenced in 1835 and completed in 1842, at an expense of $12,000,000. The Croton Dam is in Westchester county, 50 miles from the Battery in New-York. The length of the aqueduct from the dam to Harlem River is $32\frac{3}{4}$ miles. To this point the water flows through a conduit of hydraulic mason work, $7\frac{1}{2}$ feet in height, and 7 feet in width. It crosses the Harlem River at High Bridge, 11 miles from the City Hall, in huge pipes, resting upon arches supported by 14 piers of heavy masonry, eight of which are 80 feet span, and six are 50 feet, the height of the bridge being 114 feet above the tide-water. The cost of the bridge was $900,000.

The water is first conducted into the Receiving Reservoir, near Yorkville, and thence, through a double line of iron pipes, three feet in diameter, to the Distributing Reservoir, by the Crystal Palace, from which it is distributed through the city. The average supply of water is 30,000,000 gallons daily, which may be doubled.

The Receiving Reservoir, bounded by 79th and 86th streets, is 1825 feet by 836, and covers 33 acres. Its capacity is 150,000,000 gallons. The Distributing Reservoir is between 40th and 42d streets, is 420 feet square, and covers an area of 4 acres. Its capacity is 23,000,000 gallons.

The FAIRMOUNT WORKS, on the Schuylkill, are the oldest and most celebrated in the country. The water is forced to a height of 96 feet, through the mains of sixteen inches diameter, varying in length from one hundred and eighty-three to four hundred and thirty-three feet. On the hill at Fairmount are four reservoirs, containing in the aggregate 22,031,976 ale gallons, and at a distance of three fourths of a mile is a fifth reservoir, containing 16,646,247 ale gallons, making the total storage of the Fairmount works equivalent to 38,678,223 ale gallons. During the year 1852 the average quantity of water pumped daily was 5,731,745 gallons, which was distributed in a district containing 26,821 houses, in which there were 29,582 rate-payers. The cost of these works to January 1st, 1853, was $3,247,894.

BOSTON is supplied from Cochituate, formerly "Long Pond," from which it is conducted by means of a brick aqueduct (except at the crossing of Charles River, where there is an inverted syphon of fifty-eight feet dip) fifteen miles in length, with a fall of four and one fourth feet to the Brookline reservoir. This reservoir covers an area of twenty-two and one-third acres, and has a capacity of 88,909,730 wine gallons. From the Brookline reservoir the water is conducted through iron pipes to three distributing reservoirs, as follows: one on Beacon hill, in Boston proper, capacity 2,678,968 gallons; the second on Telegraph hill, in South Boston, capacity 7,508,246 gallons; and the third on Eagle hill, in East Boston, capacity 5,691,816 wine gallons.

CHICAGO, for the last two years, has been engaged in constructing water works, which are now so far advanced that they will soon be brought into use. An inlet-pipe, made of pine staves, thirty inches in diameter, is extended into Lake Michigan, a distance of 600 feet, through which water is supplied to the pump well, from which it is elevated, by means of two steam-engines, (a condensing and a duplicate non-condensing,) into a reservoir at a height of 80 feet. For want of elevated ground, they are compelled to make use of a tower and tank similar to the one in use at Detroit. The tank is made of boiler iron, braced across its centre with wrought iron rods, is 60 feet in diameter, 28 feet deep, and contains about 493,000 gallons. Other reservoirs, of like capacity, will be constructed as required. The works are calculated to furnish a daily supply of 3,000,000 gallons, and have cost about $400,000. The unprecedented growth of that city will probably require the immediate extension and enlargement of the works.

The following analyses of the water of three cities are given by Professor Silliman, Jr.:

PHILADELPHIA.

Chloride of sodium,	.1470
" magnesia,	.0094
Sulphate of magnesia,	.0570
Carbonate of lime,	1.8720
" magnesia,	.3510
Silica,	.0800
Carbonate of soda, and loss on analysis,	1.6436
Total solid matter,	4.2600
Carbonic acid in one gallon,	3.879

NEW-YORK.

Chloride of sodium and trace of potassium,	.167
Sulphate of soda,	.153
Chloride of calcium,	.372
" aluminum,	.166
Phosphate of alumina,	.832
Carbonate of lime,	2.131
" magnesia,	.662
Sulphate of lime,	.235
Silica colored by manganese,	.077
Carbonate of soda and loss,	1.865
Total solid,	6.660
Carbonic acid in one gallon,	17.817

BOSTON.

Chloride of sodium,	.0323
" potassium,	.0380
" calcium,	.0308
" magnesium,	.0764
Sulphate of magnesia,	.1020
Alumina,	.0800
Carbonate of lime,	.2380
" magnesia,	.0630
Silica,	.0300
Carbonate of soda, and loss,	.5295
Total solid,	1.2200
Carbonic acid gas in one gallon,	10.719

MANAGEMENT OF THE LOCUST TREE.

The editor of the *Ohio Farmer* gives the following very useful article on this valuable tree.

The Locust, *Robinia pusedo-acacia*, is a native of the United States.

Method of Cultivation.—"It is capable of being raised from the seed, cuttings, layings, and suckers; but the seed method is said to afford the best plants. The seeds should be sown about the end of March, or beginning of the following month, on a bed of light mould, being covered to the depth of about half an inch. The plants usually appear in the course of six or eight weeks. They should be well weeded and watered, and, when sufficiently strong, should be set out in the spring, or autumn, in nursery rows, for two or three years, in order to remain to have a proper growth for final planting."—*Rees' Cyclopedia.*

Dr. Drown, of Rhode Island, says that "The easiest method of raising the locust is as follows: Plant fifteen or twenty trees on an acre, and, when fifteen or twenty feet high, run straggling furrows through the ground, and, wherever the roots are cut with the plough, new trees will start up, and will soon stock the ground with a plentiful growth."

Use.—It is observed in the *North American Sylva*, a celebrated work, by F. Andrew Michaux, that "The greatest consumption of locust-wood is for posts, which are employed in preference for the inclosing of court-yards, gardens, and farms, in the district where the tree abounds, and the circumjacent country. Tney are transported for the same use to Lancaster, Baltimore, Washington, Alexandria, and the vicinity. When the trees are felled in the winter, while the circulation of sap is suspended, and these posts are allowed to become perfectly dry before they are set, they are estimated to last forty years. Experience has shown that their duration varies according to certain differences in the trees from which they are formed; thus about Lancaster, and at Harrisburg, a small town on the Susquehannah, where a considerable trade is carried on in wood that is brought down the river, those trees are reputed the best whose heart is red; the next in esteem are those with a greenish-yellow heart; and the least valuable are those with a white heart. From this variety in the color of the wood, which probably arises from a difference of soil, are derived the names of *red*, *green*, and *white* locust. In the Western States there is a variety which is sometimes called the *black* locust."

It is probable that the locust with a "greenish-yellow heart," spoken of by M. Michaux, is the same with that which Mr. Briggs calls the *yellow* locust; and although M. Michaux supposes "this variety in the color of the wood probably arises from a difference of soil," it is not impossible that there may be permanent specific differences in the several varieties. If so, the discovery is of importance.

M. Michaux says, "In naval architecture, the shipwrights use as much locust-wood as they can procure. It is as durable as the live oak and the red cedar, with the advantage of being stronger than the one, and lighter than the other."

With regard to the insect which destroys the locust, M. Michaux says, "Within eighteen or twenty years, an obstacle has unhappily appeared, which will contribute greatly to prevent the multiplication of the locust in all the anciently-settled parts of the United States; this is a winged insect, which attacks the tree while standing, penetrates through the bark in the centre of the trunk, and, for the space of a foot, mines it in every direction, so that it iseasily broken by the wind. This inconvenience is already so serious as to induce many people to forego all attempts to form plantations of locust. In Virginia, I have not learned that trees of the natural growth have been visited by this destroyer, but those that have been reared about the plantations have already felt its ravages. This evil, which is hard to remedy, will be more sensibly felt when the destruction of the forests now on foot—an inevitable consequence of the neglect of all measures of preservation—shall force the inhabitants to have recourse to plantations which they will wish to form, in a certain proportion of the locust. Hence it may result that, disappearing from the American forests, by constant consumption, and not being reproduced on account of the insect, the locusts will become extremely rare in their native country, and abundant in Europe, where no similar catastrophe forbids their propagation."

The *Massachusetts Society for the Promotion of Agriculture* have offered a premium of fifty dollars "for a mode of extirpating the worm that attacks the locust tree, which shall appear to the satisfaction of the trustees to be effectual."

The following, copied from a report of a committee of the *Essex Agricultural Society*, on farms in Essex county, Mass., places the advantages to be anticipated from the culture of the locust in a fair, and, we believe, just point of view:

"A practical illustration of the advantages of cultivating the locust tree, presented itself on the farm of Dr. Nichols. Several acres, that were, a few years since, barren and gravelly pastures, are now covered with a good coat of grass, almost entirely by reason of planting and permitting a growth of locust trees upon the land. This is easily done, after a few trees have taken root, either from the seed, or by being transplanted, and taking care that horned cattle do not go upon the land while the trees are young. In addition to the increase of feed, the trees themselves are well worthy of cultivation. No growth is more rapid, and none more in demand, or of greater value when arrived at maturity. It may be doubted whether an acre of land can be made to yield more in the course of twenty-five or thirty years, without the application of any manure, than by planting it with locust trees. On a fair computation, the number of serviceable posts that might be obtained in this time would be from three to six hundred, worth from fifty cents to one dollar each. The increase of feed and surplus wood would fully pay the labor of cultivation; so that the proceeds of the timber would be the profits of the land.

An objection to the cultivation of the locust tree is often brought, from the fact that they are sometimes destroyed by worms. This is true; but the ravages of this insect are found to be greater where the trees are few and scattered. In the grove on this farm, which extends over a number of acres, and in the groves in the vicinity, but very few of the trees are at all injured by the worms. This objection is by no means sufficient to authorize the neglect of their cultivation. It certainly is of the highest importance to the farmers of Essex, to inquire how they can improve their pastures; or rather, how they can save them from ruin; for it must be obvious to all, that, as at present managed, they are constantly growing worse, and many of them have already become of very little value. If, by planting them with trees, by ploughing, by applying plaster, as has been done with good success on the farm of Mr. Bartlett, or in any other way, they can be reclaimed, it surely is worthy of the experiment."

SONG-BIRDS—BREEDING OF FISH.

The following was brought out in one of the discussions of the American Institute, at a late meeting of the Farmers' Club:

Song-Birds.—Mr. Hooper, a distinguished naturalist of this city, read a paper upon the introduction of the song-birds of Europe into this country. He stated that in 1852, a committee of gentlemen undertook to introduce these birds into Greenwood Cemetery. Mr. Woodcock, of Brooklyn, then in England, introduced fifty goldfinches, fifty English larks, fifty robin redbreasts, and some others, which have been let loose in the groves of the cemetery. These are now probably well established upon Long Island.

Breeding of Fish.—Dr. Adams communicated the success of those engaged in the business, as it has now become a business, of breeding fish. Fish eggs can be transported between folds of wet linen in a box, and 500,000 eggs can be hatched in a stream under a sieve fifteen inches in diameter. Another paper treated of the mackerel fishing of the Black Sea and Bosphorus.

The fishing season commences at Constantinople February 12. The fish are then five or six inches long. By the time they reach Gibraltar, the mackerel are about half grown. In September, the same fish arrive on the American coast, and are then full grown. Hundreds of thousands of people are engaged in the fishing in the spring of the year in the Bosphorus. The water seems alive with these fish as they come down from the Black Sea.

Mr. Pell said upon the subject of fish, that he would give the Club some information. He was convinced by his own experiments that all salt-water fish can be bred in fresh water, and that fish are easily domesticated. He feeds his fish upon liver, Indian meal mixed with blood, and boiled rice. He says his pike are very voracious: he has seen one strike into a school of small fish he was feeding, and take a full mouthful in an instant. He said a perch or golden carp can be frozen in ice solid and thawed out without injury. He spoke of the great value of fish as a manure, containing all the elements necessary for the farmer to fertilize his crops. He said that he had succeeded in producing Swedish leeches in his fish ponds. By cutting off the tail of the leech, the blood will pass off, and the leech do double the duty.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

METEOROLOGY, CROPS, FRUIT CULTURE, &c., IN VIRGINIA.

Messrs. Editors: The opening of the spring month, March, was beautiful. Its balmy air induced the belief that we were to have an early and very favorable spring. The gardeners were every where at work, seeds for early vegetables were planted, oats sown, wheat-fields looked green and gay, with a bright promise to the husbandman, meadows and clover-fields wore the spring livery; up to St. Patrick's Day the weather was delightful. Since the 17th March we have had blighting winds to the 29th, when the mercury stood at sunrise at 22°, and the ground in many places too hard froze to plough till 9 A. M. The range of the mercury from the first to the 30th March, at sunrise, stood as follows: 33°, 44°, 59°, 46°, 40°, 33°, 44°, 55°, 58°, 63°, 42°, 33°, 40°, 53°, 52°, 58°, 40°, 40°, 28°, 36°, 32°, 28°, 41°, 38°, 30°, 26°, 36°, 34°, 22°, 36°, rising at noon as high as 75° in the early part of the month. It is now snowing, which I hope will take the frost out of the air, and give us more genial weather. The mercury has not rose above 50° for the past ten days at noon, for about which period we have had fine weather for ploughing and getting ready to plant corn, which, with early farmers on sandy lands, is usually put in by the 15th April in the Valley. Our clay lands, are not usually planted till 1st to 10th May, and good new lands are sometimes planted as late as 1st June, and fair crops realized.

It is too soon to say any thing with regard to the wheat crop; many fields look very well, the ground being completely matted, and promise well. Thin, sandy, badly-farmed lands, as is usual, look badly. The crop of old wheat has nearly all been ground out, and gone to market; the last crop with us was short, and the bulk of it went into market early, and at short prices. The oat crop was also short, and is worth at home 35 to 40 cents. Corn crop good, and commands 50 to 55 cents. Much of our corn is fed to fat cattle, which now command $8 to $10 per hundred in the Richmond market. We yet have a few distilleries in my neighborhood, on a small scale; four are left in a district which in 1827 numbered above forty. They are a bane to any country—a curse to any community. Public opinion has done much to suppress them, and good men of every name and party have labored long and earnestly to banish the evil from our beloved country, and I pray they may not cease in their efforts until alcohol, in all its phases, may be placed under the care of the apothecary, and only dealt out as a medicine. Where is the family in all our broad land that can not point to some one near and dear to them who has brought sorrow and sadness to their hearts from a too free indulgence in intoxicating liquors? Degradation, disgrace, crime, and death follow the inebriate, and woes are denounced against him who putteth the cup to his neighbor's lips. May the day not be far distant, when enlightened public opinion every where will banish the evil from the length and breadth of our widely-extended republic.

There is beginning to be much attention paid to fruit culture in this part of Virginia, and many of our farmers are getting select varieties. Too little attention, however, is paid to the trees after being set out; many believe it is only necessary to stick a tree in the ground, and after a while they will have good fruit. In order to insure success, the ground should first be snugly secured by a good fence, then carefully cultivated and regularly manured. If the trees are carefully spaded under for two or three yards round, and in dry seasons three or four inches of half-rotted straw put round them to keep the roots moist, they will grow as much in one year as they will in two or three, if neglected and left to take care of themselves. While the trees are young, they should be carefully pruned every spring, cutting off only small branches, so as to form a well balanced head, and that no main branches will be crossed, thereby rubbing each other. Where land is rich, the trees should be planted forty feet apart; if the soil is thin, thirty to thirty-five will answer. My trees, set out nineteen years since, at thirty-three feet each way, are now nearly touching each other where the land is good, and in a few years more the ground will be too much shaded for cultivation. On the hill-side there is yet ample space, the fruit appearing equally good, but the trees not so well grown. I have cultivated and manured my orchards regularly, and for ten or twelve years have kept my hogs in them from August to October. The fruit, with a small feed of corn, cut up and fed, stalk and all, fattens them very finely, and it requires only a few weeks' feeding to make very superior pork.

The article in your March number, from Mr. Bacon of Elmwood, on peach culture, meets my views exactly. I have no doubt the woollen cloth wrapped around the root of the peach tree, will keep the tree safe from the depredations of the borer. Fruit trees will become acclimated. I have now a fig tree that stands the winter tolerably well, which for many years was killed to the ground; for the last two years it has borne full crops of figs. I also find that some of your fine winter apples in the northern States are fall apples with us, when they first come into bearing, but in time become good winter fruit here. Yours, &c. H. B. Jones.

Near Brownsburg, Rockbridge Co., Va., March 30, 1854.

American Forest-Trees.—In North America we have fifty species of the oak, while all Europe has only thirty species. North America has forty species of pines and firs, the United States over twenty, while Europe has but fourteen species.

THE HOP AND ITS CULTURE.

The Committee of the N. H. Agricultural Society, upon root and grass crops, report as follows as to the article of hops:

They award the first premium of $5 to Gen. William P. Riddle, of Manchester. To William Riley of Hooksett, the 2d premium, a diploma.

The average price of hops per pound, for 48 years, is 12 4-5 cents.

The whole amount of hops grown in the United States for the year 1849, as computed in the census returns of 1850, is 3,467,514 pounds.

New-England raised	707,856 lbs.
New-York "	2,536,299 lbs.
	3,244,155 lbs.
Balance for other States, ...	223,359 lbs.

From the above table, it will also be seen that the price of hops during 48 years never has gone below five cents per pound, the actual cost of growing a pound of hops. Of what other agricultural product can the same be said, that is grown in New-England? Then, this very year, and at the time of writing this report, hops readily bring 45 cents per pound, giving the enormous profit of $450 per acre!

The hop, *lupulus humulus*, in botany, is a genus of plants, neither the male nor female flower of which has any corolla; the cup of the male flower is composed of five leaves; that of the female is made up of only a single leaf, very large, and of an oval figure; the seed is single, roundish, covered with a coat, and contained within the cup.

Mortimer reckons four kinds of hops: 1st, the wild garlic-hop. 2d, the long and square hop. 3d, the long white. And 4th, the oval hop. The first of these is not worth cultivating. The second is a good hop, but looking generally red toward the stalk, it will not fetch so good a price at the market. The long white hop is the most beautiful of all, and produces the greatest quantity; this kind and the oval will grow very well together. They delight in a deep, rich garden mould.

The hop sends its roots four or five yards deep, and for this reason it thrives best in that land where there is a good bottom below what is usually stirred, or manured, for agriculture. If the hop-land be wet, it must be laid up in high ridges, and drained, that the roots be not rotted or chilled.

New land is found to succeed better with hops than old.

The following is General Riddle's method of cultivating, curing, and drying:

SETTING THE ROOTS.

The spring of the year is the proper season for setting the roots. Prepare the ground by ploughing and manuring in the same manner as for a grass crop. Plant the hops in hills seven feet apart each way, putting three pieces of the root, each about four inches long, in a hill.

The roots will not vine the first year, consequently a crop of corn may be taken from the same ground, by planting in intermediate rows. In the fall succeeding, put a shovel-full of manure upon each hill of the hop-yard, as protection of the roots against the frost.

SETTING THE POLES.

Nothing further is necessary for their welfare till May, the proper time for setting the poles.

Hemlock is the best material for poles—18 feet long, shaved on four sides in order that they may season well, thereby lasting the longer. Set two poles to a hill, about nine inches apart, and in ranges, leaning a little to the south, so that the branches of the vine may swing free. When the vines have grown to the right length, select two of the most thrifty, and tie them with woollen yarn to each pole. This is very important. And attention also should be given to keep the main vines always upon the pole.

Cultivate the yard well, so as to keep it free from grass and weeds, and prevent the branch vines from growing about the hill.

The hop generally blossoms about the 2d of July, and is matured fit for picking by the 5th of September. When the burr beginning to open at the base, acquires a yellowish tinge, and the lupulin or flower has covered the tip of its stem, the hop is ripe and ready for harvest.

PICKING THE HOPS.

The method of securing the hop crop when ripe is quite simple.

The vines are cut at the hill, and the poles, pulled from the ground, are laid across a box into which the hops are picked. This box is usually about six feet long, three feet wide, and three feet high. Four or more can work at the same box. Females are generally the most expert in picking. A man or boy is necessary to tend the box and handle the poles. One person can pick from 25 to 30 pounds of dry hops per day. They should be gathered as free from stems and leaves as possible.

CURING THEM, AND THE KIND OF KILN.

After picking, the green poles are brought to the kiln to be dried, which is the most important part of the hop-growing process. It requires no inconsiderable degree of skill to be successful in this department, as knowledge of the mechanism and nature of a kiln is also necessary.

The most approved kiln is constructed after the following plan:

A brick foundation-wall is built seven or eight feet high, and ten by eleven feet in dimension. It is well to have this wall plastered internally. In the centre of the front wall at the base, there is placed a large stone or brick furnace, suitable to receive fuel from without, and furnished with a funnel passing around within the foundation, above three feet from the top, and terminating in a chimney provided for the purpose. At the base also of this front wall, and on each side of the stove or furnace, there are two small openings, one foot by three feet in diameter, to let in cold air at the bottom of the kiln. The top of this foundation is laid with lathing one inch wide, the strips being one inch apart, and covered with a thin flaxen cloth. Boards about ten inches wide, are placed lengthwise around this cloth, leaving a narrow walk around the kiln. The superstructure is placed upon the foundation-wall, as convenience may require, with a roof for shedding the rain. The walls are about eight feet high, and provided with slide or blind openings, suitable to admit the air for driving off the dampness which arises in the process of drying the hop. Such a kiln is capable of curing 150 pounds of hops in twelve hours, if properly regulated.

The green hops are placed in the kiln-box and spread upon the cloth about eight inches deep.

DRYING AND BAGGING.

A constant heat must be kept up until the dampness of the hops has passed off. Attention also should be paid to the regulation of the windows above spoken of.

To ascertain when the process of curing is over, take a medium-sized hop and snap it; if the leaves fall off, and the stem breaks short off, it is sufficiently dry. The hops may then be removed to a room as free from light as possible, but provided with windows to admit a free circulation of air. A room adjoining the kiln is most convenient, where they should lie ten or twelve days before bagging. Hops are pressed into bales five feet long, eighteen inches thick, containing about 200 pounds—much in the same manner in which cotton is packed. The cider-press is commonly used for this purpose.

EXPENSE OF GROWING HOPS.

It requires 1 1-4 acres of land to grow 1000 pounds. Good soil produces one to one and a half pounds to the hill, if properly cultivated.

The cost of hemlock poles prepared for setting is two and a half cents a-piece.

It requires six feet of hard wood to cure 1000 pounds of hops.

The cost of a kiln, after the above plan, is $50, or thereabout.

The whole cost of cultivating a field of hops, including picking, curing, and pressing, is about five cents per pound.

THE CRANBERRY.

It has frequently been asked, What is the most successful method of *cultivating* the cranberry? This may perhaps be a somewhat difficult question to answer, as it has been grown "successfully" in a great variety of ways, and on almost every description of soil, intervening between dry and dusty sands, and those composed of viscid and tenacious clay. It is indigenous to low, boggy lands, and consequently to such its cultivation has, till recently, been almost exclusively confined. When grown on such lands, the plants are generally "set" in the fall. The bog-land requires no preparation, except a covering of sand about two inches deep. The vines are removed from their original position, with a small quantity of soil attached to their roots, and transplanted two or three feet apart. They develop foliage rapidly, and require hoeing only during the first two years after being set out. When circumstances admit of it, it is a good plan to keep the water on them from December till about the first or second week in April, and after that to keep it, if possible, level with the ground's surface, so as to retain a supply of moisture about the roots, during the first part of the season. Early frost, or frost in the autumn, before the fruit begins to ripen, proves fatal to the crop. Cranberries are obtained from vines thus managed, the second or third year, and the plants, when once established, never run out.

A writer in the *Massachusetts Plowman* gives an experiment in transplanting cranberries from low, swampy land, into good corn-land, "in hills far enough apart to admit the cultivator, and clean hoeing." The work of transplanting was performed early in the spring; at midsummer they blossomed, and in the fall produced fine fruit. The berries were large, very handsome, and many of the hills produced a pint of fruit."

In 1846, the *Cultivator* contained an interesting article on cranberry culture, in which it was asserted that Mr. Sullivan Bates, of Bellingham, Mass., had raised this fruit in great abundance, "by transplanting the vines from low ground to high." The system this gentleman pursues is, it seems, to plant them in lines, or drills, twenty inches apart, (whether vines or seeds, it is not stated,) and seven inches in the drill. His plan is always successful. He has from a single acre in one season, cranberries to the amount of *four hundred bushels!* It is essential, however, to the success of this plant, that the soil be such as will not parch or bake, and should be replete with energetic humus in a state of slow but uniform decomposition and decay.

It is also asserted in the Farmer's Dictionary, that the cranberry is a plant easily and successfully cultivated on uplands, and that the powers of prolification, and the general health and physiological character of the production, appear to be ameliorated and greatly improved by changing its medium, and also that the product is more desirable, being of a fairer development, and superior flavor. "The runners," says this authority, "can be 'layered,' or seed sown in the spring. They grow rapidly, covering nearly every thing, and are but little subject to the attacks of insects. The plants are set about eight inches apart, and are kept clean at first. The yield increases for several years, and becomes as great as four hundred bushels per acre, in five years, although two hundred is a good average. The fruit is gathered with rakes, which serve to prune the plants at the same time. When the berries are intended for keeping, they should be rolled over a gently inclined plane of wood, in order to remove such as are soft or rotten. They keep well for a year in tight casks, filled with water, and headed close."

It is stated in the *American Agriculturist*, that Mr. William Hall, of Norway, Maine, "sowed the berries on the snow, in spring, on a boggy piece of land, about three rods square. The seed took well, rooted out the weeds, and produced accordingly." It is greatly to be hoped that the cultivation of this plant, now ascertained by so little trouble and expense, will become more common.—*Germantown Telegraph.*

ALSYKE CLOVER.

We copy the following from the *London Gardener's Chronicle*, and ask the attention of our readers to it. The seeds of this clover have been distributed by the Patent Office for a year or two, but we have not heard of any one giving it a fair trial.

The following is from a printed circular: "Alsyke," or Perennial Hybrid Clover Seed, is indigenous in Sweden, where it has been cultivated in the native pastures of that country for the last hundred years, and has in some cases been known to grow to the height of five feet, although in England it attains only that of two feet. The root is fibrous, and the heads globular.

The plant bears a greater resemblance to the white than to the red clover; and although its stems are recumbent, they do not root into the soil like those of the white clover; in short, it may be described as a "giant" white clover, with flesh-colored flowers. The plant yields two mowings annually. Linnæus observed the Alsyke clover growing on poor, bare, obdurate clays in the Morea, where no other plant could be made to vegetate; and yet, under such unfavorable circumstances, this clover flourished with an uncommon degree of luxuriance, and yielded shoots as tender and succulent, although not so abundant, as if reared in the most richly-manured fields. Micheli mentions the plant as growing in open situations on a clayey soil, and as being, in his opinion, worthy of cultivation. Sturm says it is found in Holland, and that he tried its cultivation along with that of a great number of other clovers, placed under the same circumstances, and that the result convinced him that there is no other kind of clover equal to it for the purpose of feeding cattle. The red clover will last only two years in perfection, and often, if the soil be cold and moist, nearly half of the plants will rot, and in the second year bald places will be found in every part of the field; beside that, in September and October many crops left for seed are lost in consequence of the heavy rains during that period; while the Alsyke clover, on the contrary, ripening its seed much sooner, and continuing in vigor much longer, much risk and expense are avoided, and a large profit accordingly accrues. Further, when this plant is once established, it will remain for a great many years in full vigor, and produce annually a great quantity of herbage of excellent quality. The best method of disposing of the Alsyke clover crop is either by mowing it for hay, cutting it occasionally as green food, or feeding it down with sheep, in which latter case it may be turned on sooner than any other clover; and if eaten down quite bare, and the stock taken off the first week in June, the next crop will come sooner to the scythe than any other species of clover so treated; and if saved for seed, the seed will be ripe sooner than any other, and the plant will again afford a good bite for the sheep until the land be required to plough for wheat—a heavier crop of which is invariably produced after Alsyke than any other clover. If mown for hay, it should be cut as soon as most of the heads are in full bloom, and before they begin to turn brown and die away. Observe the foliage in the lower parts of the plants—when the leaves turn yellow, decay, and drop off, the crop should be cut; for by standing longer, the plant will lose more at the bottom than it gains at the top. The weight of the seed required to be sown is, according to circumstances, from ten to fifteen pounds per acre, an extent of crop which will produce many tons annually of green herbage, independent of a crop of seed. The hardy nature of the plant is proved by the fact of its thriving by transplantation; it will admit of being taken up at the expiration of two or three years and planted in any other situation; the plant when taken up is merely divided, and its fibrous roots cut a little with a pruning-knife; so that the farmer need never be at a loss for a crop of clover. The Alsyke does not suffer from the severest frosts; it will flourish on the most barren land, where few grasses will grow at all, producing a heavy crop of seed, and affording an abundance of nutritious herbage for horses, oxen, and sheep; and when land has become clover-sick, and can not be depended on for a crop of the ordinary sorts of clover, this has never been known to fail.—*Farmer's Companion and Horticultural Gazette.*

SOUTHERN FRUIT.

No luxury, within our knowledge, can be had at so low a cost, considering its value, as good fruit. Good fruit can be raised in all climates except that of the polar regions; for where one kind fails, another is found readily to adapt itself. But we would now refer especially to our Southern States. A change of climate modifies essentially, in many cases, the character of a given kind of fruit. Some are improved by going South, some are deteriorated, and it is the business of the efficient horticulturist to ascertain, by actual experiment, what good fruits remain good, and what poor fruits are greatly improved by being transplanted from the Northern to the Southern States. Not a few experiments have been made, and we should be glad to avail ourselves of an early opportunity to set them forth in an accessible form. But other experiments are yet to be made, and these we shall not fail duly to chronicle.

We are specially moved to these remarks by reading a valuable "Address on Fruit," by Robert Nelson, of Macon, Ga., which we find in *The Soil of the South*, and gladly make the following extracts:

"Many splendid fruits have sprung up in the South, and are lost again for want of the proper way of propagation; but from the great impulse at present given to this matter, I venture to predict, that in a few years the South will have its own collection of fruits, independent of Northern varieties, adapted to its climate, in many parts peculiar to itself, and inferior to none.

And why should we not have them? Did not the Romans, in an equally warm climate, cultivate twenty-two varieties of apples, thirty-six of pears, and eight kinds of cherries? Are not the plums and peaches natives of Persia, and thence introduced to Italy?

It was at the Agricultural Fair at Macon, Ga., in October, 1852, that a few gentlemen collected and exhibited for the first time our native Southern apples; and those that examined and tasted the beautiful specimens exhibited by J. Van Buren, Esq., John Murray, Esq., and Z. Jones, Esq., all of Georgia, will admit that they were of superior quality. Who will doubt the possibility of raising Southern winter-apples, when it is a fact that an excellent apple for culinary purposes, which will keep until April, is already grown in Thomas county, Ga., close to Florida? I am confident that the South will soon produce apples enough, not only to supply the home market, but even to export, and our early Southern apples will become a very acceptable article in the Northern cities.

In spite of all carelessness, peaches will grow every where in the South though often of very inferior quality for want of proper attention. For some time the opinion has prevailed, that many fine varieties of peaches from Northern and Middle States would not bear well here. This is quite contradictory to my experience, as I for several years have raised heavy crops of such varieties, and therefore I can not see any reason for rejecting them, particularly as we have but few, if any, early Southern seedlings, that can replace them. But as to *late* peaches, where can they be obtained? Not from the North, for the latest peach in the Philadelphia market, the "Heath Cling," which there ripens during the month of October, is here gone by the first of September, and still we have a pretty warm fall left, during which we would very much relish a fine peach. For such late varieties we must rely entirely upon Southern seedlings, several of which have already been raised, and are now in propagation. The "Baldwin" peach, raised by Dr. Baldwin, of Montgomery, Ala., and ripening about the first of November, is a very superior fruit, and the finest late free-stone peach yet known. When we once get all these late Southern seedlings, (and I have now a good many of them under propagation,) we will have fine peaches, ripening in succession for five months, namely, from the beginning of June to the beginning or middle of November, and this more than hitherto has been met with in any country.

* * * * * * *

For a long time it was the common opinion, that pears could not be grown successfully in the South. The splendid specimens, however, shown by Dr. T. Camak, of Athens, Ga., and Rev. Henry Deane, of Griffin, Ga., have sufficiently proved what skill and cultivation will do. It must always be borne in mind, that the pear requires a rich and deep soil, and when worked upon quince stock, which brings it into bearing early, it also ought to be rather moist. It is further not to be forgotten, that top-dressing, well intermixed with charcoal, ashes, and rusty iron, and well worked in, near the tree, has a very beneficial influence upon pears. The number of varieties is almost endless, a great many of them having been raised from seed by the celebrated Prof. Van Mons, in Belgium. Here we again see the influence of our hot climate; for those varieties that in France and in the North are late winter fruit, can here hardly be kept longer than October. The pear, therefore, disseminated by J. V. Jones, Esq., of Atlanta, Ga., which in all its lusciousness will keep till April, must be considered a great horticultural acquisition; perhaps it may even be a native Southern seedling, as well as the pear recently distributed by J. L. Moultrie, Esq., of Chunnenuggee, Ala., and which was found in an old Indian yard, may be one of the very few native Southern pears in existence. Such facts certainly ought to encourage the planting of all seeds of superior fruits, and much good may result from it.

There is no difficulty in raising plum, apricot, and nectarine trees, and the trouble in raising the fruit is to be attributed to the plum-weevil, against which insect, however, frequent syringing of the trees with lime-water, and afterward dusting it over with air-slacked lime, when the fruit is as big as a pea, has lately been highly recommended. I also know a man in my vicinity, who is always raising fine crops of nectarines and apricots. His remedy is to build a lightwood fire, and let the smoke draw through the trees for several times during the dangerous period. It is but fair here to mention that S. Rose, Esq., of Macon, Ga., has succeeded in raising from the seed a magnificent, large, and pure white nectarine, which I think a great acquisition.

Though the Romans cultivated eight varieties of cherries, though this splendid and luscious fruit is grown in abundance as well as in great perfection in the South of Spain and Italy, amongst grapes and oranges, still it is almost a failure in Georgia and Alabama, south of latitude 34°. Several trials have been made, and more will be made, and probably some successful means of raising them will yet be discovered. Perhaps the surest method for cherries also, would be to raise new Southern varieties from seed.

It is indeed surprising to see the immense quantity of dried figs, annually imported from the Mediterranean to America, when this fruit can be raised in the Southern States in such an abundance as to make the crop profitable even as food for pigs and poultry; and still no body thinks of drying them for market, which would, unquestionably, be as profitable a business as the operation is an easy one. The ripe figs are only placed on hurdles or trellis-work, and exposed to the heat of a spent oven for about twenty-five minutes, in order to kill the vegetable life, after which they are dried fully in the sun, and packed in drums. As there yet are but few Southern nurseries, and figs are not valued in the North, on account of their being too tender for out-of-doors cultivation, it is rather difficult to get a good collection of this fruit. I have been fortunate enough to procure the celebrated genuine "Smyrna" fig, as well as the luscious Portuguese fig, "Lambe Deidos," (Lick the fingers.)

In a climate so warm and pleasant as that of Alabama and Georgia, any body would suppose that grapes would grow to the highest perfection. This is, however, not the case. But few of the European grapes can be grown with any thing like success, and even the American varieties, the Catawba and Isabella, will not come up to what they are in Ohio. It appears to me that their blasting is caused by the sudden changes from heat to cold, and then to heat again, from which the European grapes are so much more liable to suffer, as they bloom pretty early, and have a tender skin; for I have often found that, whenever a grape-vine has been allowed to run on the ground amongst weeds and grass, where the temperature is more uniform, the fruit is quite perfect, while that on the trellisses, and exposed to the sun, will blast. I am therefore inclined to think that they might do better, when the vines are trained on the shady side of a rather close trellis. Amongst the foreign grapes I have as yet succeeded best with the "Golden Chasselas," "Blue Frontignac," "Muscat of Alexandria," and "Warrenton," which, though often considered a native American grape, undoubtedly is a European variety. But amongst all the varieties of grape-vines, the "White Scuppernong," a native Southern seedling, stands alone, as a peculiar grape, and unquestionably takes a high rank. It is a never-failing bearer, of most luxuriant growth, and, though in flavor very different from all other grapes, of superior quality. It can not be too highly recommended for the South. Though it almost invariably is deteriorating, when raised from seed, still it might be worth a trial, I think, to raise hybrid seedlings between this and the European varieties. It may perhaps not be generally known, that few plants are more benefited by having a mixture of rotten leaves, ashes, and soap-suds worked in by the roots, than the grape-vine.

The successful cultivation of strawberries, as described by Charles A. Peabody, Esq., of Columbus, Ga., is above all praise, and I can not give it any higher recommendation than by calling attention to his method, as my pen would be insufficient for the task.

Beside speaking of hardy fruits, I must finally draw attention to the orange family. It is true, oranges and lemons can not be grown successfully unprotected in the open air, with any certainty, north of latitude 31°. With a slight protection, however, they can be raised a couple of degrees farther north. For this purpose, I would recommend to arrange the slope of a hill in terraces, about six feet high, on which oranges and lemons could be trained, on trellisses, as wall-trees. A slight covering in hard frosts would protect them, as they are not so much injured by the frost itself as by the sudden thawing up, and thus they could be grown profitably even for market.

But in order to be successful in growing all these fine and wholesome fruits, we must bestow some care and attention on our fruit-ground, for surely it will not do to "plant a tree as you would plant a gate-post." When a thing is worth doing at all, it is worth doing well, and as it is worse than useless to spend labor and expense on planting fine fruit-trees, without some expectation of raising fine fruit, let us at once go to work and *prepare* the ground.

If deep working of the soil is valuable in a cold climate, how much more so must it be in a warm one? Work your soil *deep*, put your manure *deep*, give all your plants a chance to strike their roots a couple of feet down, where they always will find it cool and moist, and you will see how finely they will grow, and how well they will withstand a drought. Five years ago I took the very top of a dry, piney-woods sand-hill: it was a worn-out and abandoned plantation. I manured it, and worked it two feet deep, where nothing but yellow sand was to be found, and where, before that time, not more than one bushel of corn could be raised to the acre. Now you can on the same spot see a complete nursery, where fruit-trees, shrubbery, roses, and even hard-headed cabbages, are growing in the greatest luxuriance; and this, I think, will sufficiently prove the advantage of working the soil deep. Therefore, throw aside the hoe, which will only scratch the soil; get a good spade, spread good stable manure over the ground, (even fresh from the stall will answer, when worked in during fall or winter,) and trench the soil two feet deep. Don't be afraid of putting the manure too deep; I know it is a common error, that manure will sink too deep. I say *error*, for ammonium, the essential element of manure, is a gas, which will always rise and evaporate. Very important, however, is it to mix the manure thoroughly with the soil, as it otherwise may become too dry in the summer. When your soil is thus prepared, there will be nothing like failure. If this method should be too troublesome or expensive, the soil may only be ploughed deep, and sub-soiled, by running the turn-plough twice in the same furrow, and every time as deep as possible, previous to running the sub-soil plough. Then make holes at proper distances, but not less than three feet wide by two feet deep. Throw up the surface to one side, the sub soil to the other, and place eight or ten shovels full of manure on the third side. In filling the holes, it is most convenient to go at it with three hands, one to each pile of soil and manure, and throw it in promiscuously. Plant the tree a little higher above the general surface than it was before, allowing about three inches for settling with the soil; water the tree, and tie it to a pole."

The lecture suggests that our progress would be still more accelerated by a regard to the following particulars:

"1. If our agricultural associations should appoint a *standing* committee, for the purpose of describing and classifying all new fruits, as well as such older varieties which are deserving of general cultivation.

2. If a small fund could be raised, and a suitable person appointed to travel over the country at different times during the fruit season, to pick up and describe all fine new varieties now scattered over the South, and procure twigs for propagation in the proper season.

3. If these scions were placed in the hands of such gentlemen as would take care of them and propagate them, that they should not be lost again."

We append to this the remarks of a traveller, in the same paper, on the same general topic. He says:

"Few of our up-country readers can realize the capacity of the soil and climate around New-Orleans for horticulture. We saw in a garden on the lake, oleanders in the open grounds, with trunks larger round than our body, massive floral trees! The pecan-nut tree flourishes in great luxuriance. We saw groves of them near Carrollton, which resembled the massive oak groves of Georgia. The pecan-nut meets a ready sale, and may be profitably cultivated through all the Southern States. They grow freely from seeds, producing fruit in four to six years. We were astonished to find the top or tree onion so common in New-Orleans; they are sold by the prominent seedsmen at about one half the price they bring in the North.

The celery of New-Orleans is not first-rate; that of Mobile is very superior. Mobile has many advantages over New-Orleans, horticulturally. Not the least interesting portion of the horticulturist's travels, is the magnificent steamers which float upon the waters. Here he sees the vegetables and fruits, and all the horticultural luxuries, and can form some proper conception of the importance of his profession, not only to the denizens of the crowded city, but to the travelling public. There is untold wealth yet in the undeveloped horticulture of the South."

COMPARATIVE VALUE OF CROPS AS FOOD FOR MILCH COWS.

The following extracts from the report of the Essex County (Mass.) Agricultural Society, are worthy the attention of our readers:

In the spring of 1850, I sowed forty-two square rods of land to carrots, on which corn was raised for fodder the year previous, ploughing in two cords of well-rotted manure. There were sixteen young apple-trees growing on the land, which had been set out three years; the soil a black, strong loam; the yield was one hundred and fifty-six bushels.

January 1st, 1851, I purchased twelve new milch cows and commenced selling my milk. After the first two weeks, my son observed that he did not have milk enough for his customers by about three gallons per day, and that I had better buy more cows; but, believing as I did at that time, I could easily increase the milk of my present number one quart each per day, by feeding with carrots, I accordingly ordered the man who tended the stock to commence the next morning (January 15th) to give two and one half bushels ef carrots to the twelve cows, morning and night, for the next seven days. I then inquired of my son how much the cows had increased, and to my surprise, his answer was not quite two gallons for the week. I then resolve to attend to the feeding myself, and fed the next seven days with hay only. The result was no diminution. I then fed with carrots as before, the next seven days, and there was less than one gallon increase. I continued the same feed alternately for the next four weeks ending March 12th; during which time the cows fell off some in their milk, but not more than one gallon when fed on hay only, than when carrots were added. The hay used during the trial was first quality English hay, with a small foddering of salt hay in the morning. I continued feeding the same kind of hay night and morning, giving at noon as much rowen hay as they would eat in thirty to forty minutes, which increased the milk more than one quart to each cow daily for the next four weeks. By this time I was fully satisfied it would not pay to raise carrots for milch cows, and that I would try some other method.

In April, 1851, I prepared and sowed the same piece of land with onions, where carrots grew the year previous, using the same quantity of manure. The yield was one hundred and sixty-eight bushels, which I sold for forty-seven cents per bushel, amounting to seventy-eight dollars and ninety-six cents. In November following, I bought four tons of shorts in Boston, at nineteen dollars per ton—freight to Bradford one dollar and forty-five cents per ton, making eighty-one dollars and eighty cents, or two dollars and eighty-six cents more than the onions brought. I then had four tons, or about four hundred bushels of shorts, costing but two dollars and eighty-six cents more than the one hundred and fifty-six bushels of carrots. I think the labor was no more to raise the onions than the carrots, and the labor less to feed the cows with shorts than with carrots.

December 1st, 1851, I commenced giving my cows from four to eight quarts of shorts each per day, and continued through the winter, except eight days in February I left off feeding four cows with shorts that had been having eighteen quarts per day, and measured the milk the first four days. I found they decreased on an average three pints each per day. The next four days I fed them with about an equal quantity of rowen and coarse hay, which increased the milk full up to the quantity when fed with shorts.

The next experiment I commenced December 25, 1852, by selecting three of my best cows as nearly equal in size, conditions, and goodness as I could.

No. 1, eight years old, dropped her calf Nov. 25.
No. 2, nine " " " " " "
No. 3, eight " " " " " "

I continued the experiment eight weeks, giving to each cow the same money's worth of the different kinds of feed by weight as the same cost at the time, namely, shorts, twenty-six dollars per ton; oil meal, thirty dollars per ton; Indian meal, eighty cents per bushel of fifty lbs.; rye meal, one dollar per bushel of fifty lbs.; giving to each cow fifty-two and a half cents worth per week, seven and one half cents per day.

The first week forty-two lbs. of shorts were weighed for each cow, and fed night and morning, being about four and one half quarts each time, wet with six quarts of water two hours before feeding. (Beer measure is used for the milk.)

No. 1 gave in seven days	82½ qts.
No. 2 " " "	78¼ "
No. 3 " " "	79 "
Total	239¾ qts.

Second week, thirty-five lbs. oil meal were weighed for each cow, wet and fed same as the shorts, being about four quarts per day.

No. 1 gave in seven days	87¼ qts.
No. 2 " " "	81¾ "
No. 3 " " "	82¼ "
Total	251¼ qts.

Third week, thirty-two lbs. thirteen ozs. of Indian meal were weighed for each cow, wet and fed the same, being about three quarts per day.

No. 1 gave in seven days	85 qts.
No. 2 " " "	84¼ "
No. 3 " " "	84 "
Total	253¼ qts.

Fourth week, twenty-six and one quarter lbs. of rye meal were weighed to each cow, being about two and one half quarts per day, wet and fed same as above.

No. 1 gave in seven days	81¾ qts.
No. 2 " " "	83½ "
No. 3 " " "	78½ "
Total	243¾ qts.

Fifth week, thirty-five lbs. of shorts, weighed and fed as before.

No. 1 gave in seven days	76¼ qts.
No. 2 " " "	78½ "
No. 3 " " "	74 "
Total	228¾ qts.

Sixth week, forty-two lbs. of oil meal, weighed and fed as before.

No. 1 gave in seven days	82 qts.
No. 2 " " "	84½ "
No. 3 " " "	81¼ "
Total	247¾ qts.

Seventh week, thirty-two lbs. thirteen ozs. of Indian meal, weighed and fed as before.

No. 1 gave in seven days	86¾ qts.
No. 2 " " "	89½ "
No. 3 " " "	84 "
Total	260¼ qts.

Eighth week, twenty-six and one quarter lbs. of rye meal, weighed and fed as before.

No. 1 gave in seven days	78½ qts.
No. 2 " " "	83 "
No. 3 " " "	78¾ "
Total	240¼ qts.

Three hundred and fifty pounds of English hay, and seventy pounds of salt hay, were weighed and fed to the cows each week. When the cows were fed on shorts and rye meal, the whole quantity was consumed. When fed on oil and Indian meal, an average of fifty-eight pounds of English hay per week was not consumed.

Cost of feeding three cows two weeks on shorts	$3 15
750 lbs. English hay, 75 cts. per hundred	5 62
140 " Salt hay, 50 " "	70
Total	$9 47

Quantity of milk for the two weeks, 468½ qts.

Cost of feeding three cows two weeks on oil meal	$3 15
692 lbs. English hay, 75 cts. per hundred	5 18
140 " Salt hay, 50 " "	70
Total	$9 03

Quantity of milk for the two weeks, 499 qts.

Cost of feeding three cows two weeks on Indian meal	$3 15
692 lbs. English hay, 75 cts. per hundred	5 18
146 " Salt hay, 50 " "	70
Total	$9 03

Quantity of milk for the two weeks, 513½ qts.

Cost of feeding three cows two weeks on rye meal	$3 15
750 lbs. English hay, 75 cts. per hundred	5 62
140 " Salt hay, 50 " "	70
Total	$9 47

Quantity of milk for the two weeks, 484 qts.

It will be seen from the above experiment, that Indian meal possesses the highest value for producing milk, differing, however, but little from oil meal. Many farmers object to the free use of grain of any kind, believing such feed to be too stimulating. But my experience is otherwise. I have twelve cows which, for the last five years, have dropped their calves in the fall of the year, and have been fed during the winter and spring, till they went to pasture, with as much meal or shorts as were used in the above trials, and were uniformly in as good health and better condition than a like number that dropped their calves in the spring, and had no grain of any kind during the year.

It should have been stated above, that my cows are kept in a tight barn, sufficiently ventilated during the days and nights, except when they are turned out to water about nine o'clock, A.M., and four o'clock, P.M., when they remain out about twenty minutes each way.

William F. Porter, Chairman.

SWEET POTATOES.

We are rather late for the following directions, but in some situations it may still be seasonable, and it will do for all another year:

In the spring, as soon as all danger from frost is past, the hot-bed for sprouting the potatoes should be made, by boarding off the space intended therefor in a warm situation, and filling it to the height of two or three feet with manure from the horse-stable, and upon this a layer of three or four inches of fine chip-dirt must be placed, upon which the potatoes may be laid as closely as possible, and covered about two inches in depth with the same material, or with any fine rich earth. If the weather should prove very dry, an occasional watering with tepid water, or warm soap-suds, would be beneficial, or, if the nights should be cold and frosty, the hot-bed should be protected by covering it with any material most convenient. When the sprouts are sufficiently large to warrant good roots, they may be pulled from the potatoes and planted in ridges previously prepared.

The ridges are mostly made by throwing two furrows apart with the plough, and applying some well-rotted manure, then covering the same by returning the earth, thus forming a ridge of the height of ten or twelve inches, in which sets are to be planted six or eight inches asunder. The best time to plant them is immediately before or after a rain, or during a spell of damp weather, or even in the cool of the evening, if watered occasionally until fairly established.

The ground must then be kept mellow and free from weeds until the vines prevent further culture. When the vines are killed by frost, the potatoes should be taken up, and after remaining in the shade a short time to dry, those not intended for immediate use may be packed away in dry sand or earth in barrels or boxes, by first placing a layer of sand and then one of potatoes, until the vessel is filled. Upon the approach of cold weather, they should be placed in a situation secure from frost. In this manner they have frequently been kept till May or June. In packing them away, all potatoes that have been injured in taking up should be laid aside for present use. A soil moderately fertile and somewhat sandy, with a southern aspect, is mostly preferred for the sweet potato.

NIGHT-SOIL, ETC.

We commend attention to this subject, and invite our readers to notice the following from the volume recently published by Prof. Nash. We have given similar advice heretofore:

"In European countries, as also in some of our cities, this has been wrought by various processes into a dry, portable, inoffensive, but very powerful manure, under the name of *poudrette*. This is one of the forms in which the fertilizing agents of the city are returned to the country, whence they came.

On the farm the night-soil may be put to good use in a less troublesome way. After being carried off in the spring—or better, in the latter part of winter, while it is yet cool—the bottom of the vault should be covered, at least a foot in depth, with fine black peat or mud, previously prepared and dried for the purpose. A little of the same should be thrown down daily through the summer, and once a week or fortnight during the winter. If a little plaster be occasionally added, it will be well, though this is not essential. The peat itself will be sufficiently *deodorizing*, if put down in such quantities as to be kept fairly moist and no more. It will withhold all foul odor. It is well to have an opening in the rear of the building, and a pile of prepared peat lying near, that it may be thrown down without much trouble, lest it be neglected. Good farming requires daily attention to many little things, and unless a previous preparation for them be made, these little things, important in the aggregate, are apt to be lost sight of. A farmer might better bring peat several miles for the foregoing purpose than not to have it. In an ordinary family, as many as five loads of a kind of poudrette can thus be made, not as concentrated nor as portable as the article bought under that name in our cities, but sufficiently so for home use, and excellent for any soils except peaty, and for any crops except it may be for potatoes and other roots. For cabbages, wheat, corn, or clover, it would be first-rate. If used for corn, and especially if used as a top-dressing for old mowing, it would be well to apply plaster pretty plentifully with it. I know of nothing that will bring up red and white clover on an old mowing like it.

Many families make use of chloride of lime as a *deodorizer*, or *disinfecting agent*, about the privy. They pay for it ten or twelve cents a pound; and, at that, it is ineffectual unless used in considerable quantities. Peat is cheaper and better. When peat can not by any means be obtained, black, vegetable mould from the edge of the wood, or wherever great quantities of leaves have drifted together and decayed, will answer. If this can not be obtained, there is a sort of home-made chloride of lime, which can be prepared easily, and is worth more for agricultural purposes than it costs.

To prepare it, take one barrel of lime and one bushel of salt; dissolve the salt in as little water as will dissolve the whole; slack the lime with the water, putting on more water than will dry-slack it, so much that it will form a very thick paste; this will not take all the water; put on, therefore, a little of the remainder daily, till the lime has taken the whole. The result will be a sort of impure chloride of lime; but a very powerful deodorizer, equally good, for all out-door purposes, with the article bought under that name at the apothecary's, and costing not one twentieth part as much. This should be kept under a shed or some out-building. It should be kept moist, and it may be applied wherever offensive odors are generated, with the assurance that it will be effective to purify the air, and will add to the value of the manure much more than it costs. It would be well for every farmer to prepare a quantity of this, and have it always on hand."

Again, he says:

"Night-soil should be removed to the land every spring. Its value, as a fertilizer, is greatly increased, if mixed with six or eight times its bulk of dried peat or swamp mud. Its value would be still more increased, if the peat or mud, in a dry state, could have been thrown in with it daily, or once in a few days during the previous year; and this either with or without (better with) a little plaster, would have prevented the bad smell from that source, which is too often noticed about premises. *Poudrette* can be prepared in this way at little expense, and quite as effective as much that is offered in market at a high price. Night-soil is valuable for grass-land, and for all kinds of grain. In whatever form it is used, it should be spread thinly over a large surface, rather than be put in large quantities in one place.

There is another article to which the last remark applies with great force. It is old plastering from the walls of rooms. This contains silicate of lime, carbonate of lime, and what is of more value than all the rest, *nitrate of lime.* This last is a very soluble salt, and is so valuable for any of the grain crops, but more especially for wheat, that not a particle of it should be lost. Every ounce of old plastering should be put upon the field. Even the rubbish of old brick walls should be pounded up and put upon the land. But this and old plastering should be spread thinly over a large surface. Probably a ton of either, if mixed with a compost that was to cover five acres, would benefit the first year's crop more than five tons spread on a single acre.

Whether the new occupant of this farm should go largely into the use of plaster, is a question for him to settle on the ground. He should, at any rate, have some on hand to use about his manures. There is a strong presumption in favor of plaster on a farm upon which nothing is known of its effects by experience. He should inquire of his neighbors. If their testimony is against the use of plaster in that region, *let him not believe it*, but let him make the trial for himself. He may make it on a small scale at first, so as not to injure him much if it fails. If, on the other hand, the testimony of the neighborhood is favorable to the use of plaster, he might take it as undoubted. A hundred neighborhoods have testified falsely against the use of plaster in their particular location, to where one has over-estimated its value. Very few are the locations where plaster is not worth the purchase-money, or more.

It is very true that plaster can not be relied upon alone. It is not a manure in the fullest sense of the word. It contains but two ingredients, and those are not all that plants need. Plants could not grow in plaster *alone*, but that does not prove that they should have *none.* The truth is, *it acts partly as a manure*—feeding the plants with its sulphuric acid and lime, the very ingredients which clover, corn, potatoes, and some other crops, largely require—and *partly as a stimulant*—hastening, by its lime, the decay of vegetable matter in the soil. In other words, *it feeds the plants a part of their food, and it hurries the vegetable matter in the soil to feed them more.* On dry soils it performs *another important office*—that of *attracting moisture.* Some say it has not this effect. I know very well that in its unaltered state it has not. Set an open barrel of plaster in the air, and it will remain dry. But it does not long remain unaltered about the roots of plants. The sulphuric acid and the lime part company, and in their transformations they perform the three offices I have described—*feed the plants, convert half-*

decomposed matter into vegetable nutriment, and attract moisture from the air and from the sub-soil. This last office is important on lands that are dry. On wet lands it should not be used till they have been thoroughly drained.

Plaster will not do well permanently without other manure. It requires that organic matter should be present In pastures, this is supplied by the droppings of the cattle and by the decay of grass-roots. On mowings, it should be supplied by top-dressings; and on plough-lands, by harrowing in manure. It would be as unreasonable to complain of plaster because it will not act well always without other manure, as to find fault with roast-beef because it does not afford a suitable diet without other food. The same might be said of ashes. Land dressed with ashes alone, will soon be found in a sad condition; and yet the potash, soda, and lime they contain, are worth far more for agricultural purposes than the price generally allowed by soap-boilers. Their alkaline salts act favorably upon the silicates in the soil; they render insoluble silica *soluble*, and are therefore valuable on uplands; while on peaty lands, if well drained, and on any lands which abound in inert vegetable matter, their value is very great."

UNITED STATES AGRICULTURAL SOCIETY.

In our last number, we gave an epitome of the journal of the late meeting of this organization. But we had no opportunity for comments, on account of absence from home. We now say a word in relation to it.

We published an account of the organization of this Society at the time of its formation, and used hopeful terms in reference to its future. But our comparative silence since that has not been from any change in our views in relation to it, but because the circumstances of the Society as to funds, &c., did not furnish them convenient facilities for accomplishing very much, while other matters were constantly pressing upon our attention, and asking a place in our pages. The Society has had no means by which to wield the great energies which its list of members, well instructed in the art and in the science of agriculture, might otherwise have put forth.

Again: The result of their collected and concentrated wisdom, nearly to the present time, was put forth in but two issues—of moderate-sized pamphlets, only one of which was ever received at this office, and that one, so far as we can recollect, did not excite any special admiration, on our part, for the marvellous ability of their official organ, and hence, in the absence of such stimulus, we were content to remain silent.

The state of things in this last respect has now materially changed. The last and recent issue of the Journal of the Society, under the editorship of Mr. King, of Boston, is an admirable collection of well-written and practical treatises. A copy should be in the hands of every agriculturist. One of our late numbers contains several pages taken from that issue, though being in some doubt whether they were original there, we thought it proper to credit the author himself. We are not better informed now on the question of "first appearance," but presume, on the whole, that their *first impressions* were in the pages of that journal. With Mr. Wilder, Mr. King, Mr. French, Mr. Proctor, Mr. Poore, and other gentlemen, for its directors in that section of country, of whose remarkable abilities we are personally informed, failure is a mere impossibility, and inefficiency, except from actual withholding of the pecuniary means, entirely out of the question. Leaving these Northern regions for the sunnier South, we find the same class of learned, talented, and influential gentlemen, officers of State Societies, and other members, all united to make the Society energetic and useful. Their treasury is also in very tolerable condition, and we look for results of no small importance from the combined movements of these gentlemen. We earnestly bid them anew, God speed. Their influence will be felt in every part of the country.

AMERICAN POMOLOGICAL SOCIETY.

The fifth session of this National Association will be held at Horticultural Hall, in the city of Boston, Massachusetts, commencing on Wednesday, the 13th day of September next, at 10 o'clock, A.M.

It is intended to make this assemblage one of the most interesting that has ever been held in this country on the subject of Pomology. All Horticultural, Agricultural, and other kindred Associations, of North America, are therefore requested to send such number of delegates to this Convention as they may deem expedient.

Pomologists, nurserymen, and all others interested in the cultivation of good fruit, are also invited to attend the coming session.

Among the objects of this Society are the following:

To ascertain, from practical experience, the relative value of varieties in different parts of our widely-extended country. To hear the reports of the various State fruit committees, and, from a comparison of results, to learn what fruits are adapted to general cultivation; what varieties are suitable for particular localities; what new varieties give promise of being worthy of dissemination; and especially, what varieties are generally inferior or worthless, in all parts of the Union.

In order to facilitate these objects, and to collect and diffuse a knowledge of researches and discoveries in the science of Pomology, members and delegates are requested to contribute specimens of the fruits of their respective districts; also papers descriptive of their art of cultivation; of diseases and insects injurious to vegetation; of remedies for the same, and whatever may add to the interest and utility of the Association.

The Massachusetts Horticultural Society has generously offered to provide accommodations for the Society, and also to publish its proceedings free of expense.

All packages of Fruit intended for exhibition may, therefore, be addressed as follows: "For the American Pomological Society, Horticultural Hall, School street, Boston, Mass.;" where a committee will be in attendance to take charge of the same.

All Societies to be represented will please forward certificates of their several delegations, to the President of the American Pomological Society, at Boston. MARSHALL P. WILDER, President.

H. W. S. CLEVELAND, Secretary.

Boston, Mass., April 1, 1854.

DISCUSSION ABOUT CATTLE.

At a late meeting of the Agricultural Club in Boston, Mass., Sanford Howard presented the following excellent suggestions upon the comparative merits of various kinds of cattle:

Breeds may be classed as *natural* and *artificial;* the peculiar characteristics of the former are the result of natural causes; those of the latter, the result of man's interference. The Merino and Scotch black-faced sheep, West Highland and Devon cattle, are examples of natural breeds; the Leicester and improved Cotswold sheep, Ayrshire and improved Short-horn cattle, are examples of artificial breeds. Breeds of cattle must be chosen according to the situation in which they are to be placed, and the purposes for which they are designed. Cattle are wanted for beef, milk, and labor. These properties are in some degree antagonistical; they can not be combined in the highest perfection in the same animal. For instance, the fattening animal should possess, as much as possible, a rotundity of form, with a broad chest, and an even balance of the fore and hind quarters; whereas the milker should be characterized by flatness rather than roundness, and a considerable preponderance of weight in the hind quarters. Animals which have the most extreme tendency to fatten, are deficient in the muscular fibre and nervous energy necessary to confer activity and strength. Opinions in reference to the comparative merits of breeds for this section, must be in a great degree conjectural, owing to the limited trials which have been made; but we may be guided in selections for particular purposes, from what is known of their characteristics. On this basis, the lecturer submitted the following list:

As Dairy Stock—

1. For poor and rough soils, the Kerry breed, indigenous to the mountains of Ireland, and represented by all authorities as combining remarkable hardiness of constitution with superior dairy qualities, especially for the production of butter.
2. For better soils, and for milk-selling establishments, the Ayrshires.
3. For cities and towns, the Jerseys, at the same time testing them by fair trials, as to general adaptation.
4. A selection from the common, or so-called native stock, to be subjected to a systematic course of breeding.
5. Crosses of the Ayrshire, and of the Jersey, with the common stock, the offspring to be kept separately for a sufficient period to ascertain their qualities.

As Fattening Stock, of Secondary Value for the Dairy—

1. For poor and rough soils, and a severe climate, the West Highland Scots.
2. For somewhat better soils, the Galloways and Devons.
3. For medium quality of soil, the Herefords.
4. For the best soils and milder climate, the fattening variety of Short-horns.

The Herefords, Devons, and West Highlanders are excellent draft cattle.

In this climate, owing to the extremes of heat and cold, strength of constitution is an important requisite in cattle that are obliged to undergo more or less exposure at all seasons. On this account, as well as for other intrinsic properties, the lecturer advocated strongly the introduction of the West Highlanders.

INQUIRIES FOR FARMERS.

EDITORS OF THE PLOUGH, THE LOOM, AND THE ANVIL:

GENTLEMEN: Permit me, through the medium of your invaluable publication, to make one or two inquiries. I hope they will be answered by practical farmers:

The best mode of cultivating wheat when sown in drills? The best implement, or implements, in use for cultivating wheat sown in drills? The best machine for drilling wheat? Together with any remarks of practical utility on this subject, that may suggest themselves to the mind of the writer.

I have never seen wheat sown any other way than broadcast, and I doubt if a dozen farmers in the county have seen it drilled. Most of our farms lie in the prairies; consequently, we have neither roots, stumps, nor stones to interfere with the use of the best agricultural implements. Our prairies, in a state of nature, are covered with a thick coat of sedge-grass. To draw a fifteen-inch plough in it, requires a team of six or seven yoke of oxen. After the sod has been turned, it lies several months, before the grass-roots rot sufficiently to admit tillage. It is then generally "cross-broken," with a yoke of oxen, or pair of horses, harrowed, or brushed, and either sown in wheat or planted in corn. It pays better to sow it in wheat the first year. Our average crop of corn is about thirty bushels per acre. Of wheat, the average, according to the present mode of cultivation, will not exceed twelve bushels. But I am saying more than I designed. Yours, R. SANSOM.

Prairie Home, Williamson Co., Texas, April 1, 1854.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

BREEDING DOMESTIC ANIMALS.—NO. I.

BY P. A. BROWN, LL.D., PHILADELPHIA.

THERE is no subject relating to agriculture more important than *breeding.* Without the aid of domestic animals, this honorable and useful branch of industry could not be carried on for a single season: where would be the use of the plough, with no horses or oxen? what would become of the dairy were the cow annihilated? and how is the farmer's family to be protected from the inclemencies of the seasons, but by the covering of the sheep and the goat? It follows, therefore, that any discovery which relates to the domestication of the lower animals, must always be of the first importance. But of domestic animals there are various kinds, as regards their usefulness, and consequently their relative value to the agriculturist, and to the community of which he is a member. It ought to be borne in mind, that a miserable horse, that can hardly draw his own weight, eats as much hay and oats as the high-bred animal who performs the greatest tasks. Beside which, it has often been remarked that hirelings will always take more care of a fine-looking animal than of a poor, sorry-looking beast, who appears to be waiting till his turn comes to die. A friend of mine had a fine Durham cow, which his hired man was constantly currying, and when, by accident, she died, the fellow was melted into tears. And, lastly, if the farmer has to pay more for an animal that is well bred, he always gets a higher price for the progeny, of which he may feel an inclination to dispose. The great aim, therefore, of every farmer should be to have about him *the best breeds, and nothing but the best breeds*, of domestic animals. Whenever I visit a farm, and encounter a miserable, ill-proportioned horse, or a raw-boned, slab-sided cow, or a narrow-breasted, long-legged sheep, I set the owner down for a slovenly, thoughtless person, who is destined never to rise in his profession. Such a one never reads, attends no cattle-shows, and profits nothing by the improvements that are in his neighborhood.

Some of these persons endeavor to excuse their inattention by urging that there is a difficulty in understanding the rules of breeding; but this is an entire mistake; for although it is true that the breeding of domestic animals depends upon the laws of nature, (the perfect understanding of which requires some study and forethought,) yet these rules, like all those emanating from this high source, are in themselves so simple, and so easily understood, that the industrious farmer will find no insurmountable difficulties to encounter.

The first rule is, to breed from nothing but a *pure stock*. This rule is so obvious upon its mere statement, that one is surprised that it should ever be misunderstood or contravened. Yet there are many persons, well informed in other respects, who set it at defiance as if it was of no value. It is no uncommon occurrence for a sheep-breeder, for instance, to purchase at a high price, a first-rate merino ram, and breed him with the commonest native sheep that happens to be on his farm. But such a one ought to reflect, that both the sexes concur in the formation of the individual that is to represent them; and that the mother gives birth, sometimes, to one made in her own image, and at other times to one in the image of the father. Here it is seen that she is capable of producing two distinct types of animals. This twofold effect is so certain, that naturalists have often referred the individuals derived from the same parents as distinct species. Now, if we apply this rule to the case above supposed, of a pure merino ram being coupled with a common country sheep, we will see at once what sort of a flock the farmer who follows this practice is preparing from his ill-timed parsimoniousness. He goes to rest under the expectation, that having used, as the male breeder, one of pure blood, he will be sure, after a few generations, to have a *pure flock;* but he wakes up to the certainly that all his time and labor have been uselessly expended, by adopting this half-way or rather less than half-way measure. And the worst part of the affair is, that this well-meaning, but badly-instructed farmer, has in a few years involved his flock in a difficulty for which there is no remedy but to begin his breeding all anew, and upon the approved plan of using nothing but the *pure* blooded of both parents. This generally proves to be not only a loss of time and money, but is very apt to disgust the breeder, who is too prone to lay the blame on any body or any thing but himself; when it is obvious to every one else that he alone has been in fault.

We would therefore sincerely recommend to all breeders of domestic animals, to make use of none but the *pure breed of both parents*, when he will find that having done his part, nature will never deceive him, but will always perform hers.

But several persons on whom I have endeavored to enforce this rule, while they acknowledge that it is correct, complain of the difficulty they encounter in determining upon a *pure* animal. The vender, sometimes from dishonesty, but more frequently from ignorance, insists that the animal is of the pure breed; and sometimes offers, in confirmation, a true or imaginary pedigree, of the validity of which the purchaser is not a perfect judge. To obviate this difficulty, I have laid down (in Frichologia Mammalium) a rule by which the plainest farmer (in the case of sheep, to which I have given the most attention) can decide for himself, without running the risk of being deceived.

I was once waited upon by a gentleman, who was about to enter largely into the business of sheep-breeding, to give him some information. I exhibited to him my collection of pile, and made him acquainted with some of the rules of breeding. He made the complaint to which allusion is above made, whereupon I instructed him how to judge of the purity of breeds of sheep. He declared that he esteemed that information worth more to him than one thousand dollars. Upon this I handed him the subscription-book for my work on hair and wool. He read it over attentively, and returned it, but *without his signature!*

"Aviendo pregonado vino, venden vinagre."—*Spanish proverb.*

SQUASHES AND PUMPKINS.

BY THADDEUS WILLIAM HARRIS, HARVARD COLLEGE.

I AM now acquainted with ten different kinds of pumpkins and squashes, belonging to the same group as the Valparaiso, Cuba, and Marrow.

1. The mammoth pumpkin, of Potiron, (*Cucurbita maxima.*) The fertile flowers have five stigmas, and the fruit five carpels; having raised it in my own garden during the past summer, I can vouch for the fact.

2. A glaucous or grayish-green pumpkin or squash, more or less turbinated or top-shaped, growing to a large size, (three and a half feet or more in circumference,) mistaken by some seedsmen for the mammoth pumpkin. It was raised in my garden in the summer of 1851, and was found to have four or five stigmas, and the same number of carpels.

3. Mr. Cole's Connecticut pie-squash or pumpkin. Spherical or spheroidal, three and a half feet in circumference. Raised in my garden in the summer of 1851. Stigmas mostly four; in a few flowers, five. Carpels mostly four; a few of the fruit had five.

4. Elongated Valparaiso squash, tapering very much at each end, striped longitudinally with white. Raised from Valparaiso seed in the summer of 1851, in my garden. Stigmas and carpels five in number.

5. The common ovate Valparaiso I have not raised; but have bought and cut many specimens, in all of which I found four carpels. I have examined the young fruit, growing in grounds of my friends, and found often five carpels.

6. The autumnal marrow, introduced into notice and use by Mr. Ives, of Salem. This forms an exception to the general rule in the fruits of this group; having ordinarily only three carpels, and but three stigmas. Four in some rare cases are, however, to be found, as already stated.

7. The Cushaw squash, probably introduced from Louisiana, where it was known and cultivated more than one hundred years ago. It is mentioned by Le-Page du Pratz, in his Histoire de la Louisiane, Vol. II., p. 11, by name of *Giromon en forme de corde-chasse*, (hunting-horn,) and by the translator

of the work, by the vernacular name of *Cushaw*. This is a crook-necked squash, with permanent nipple-formed style, and stem like that of the marrow. It has only three carpels, at least I found but three in the few specimens that grew in my garden in 1852. It is so tender and delicate, that it rots in our climate before it becomes fully ripe.

8. The Acorn squash, evidently nothing but a variety of the one called by French writers, *Le Pepon turban*, (*Cucurbita piliformis* of Duchesne.) Fine specimens were raised in my garden in the summer of 1851. It is the heaviest squash of its size that is known to me, and one of the best flavored. Flowers mostly with five stigmas, some with four; carpels five or four.

9. Mr. Stetson's Cuba squash. Though I have not yet cut it, I am convinced from its external characters that it must contain five carpels.

10. Mr. Dunn's round, rough-skinned pumpkin or squash, weighing one hundred and fifty pounds, which was exhibited at the last annual Horticultural Exhibition. This probably had five carpels, if its external characters are to be relied upon.

In the same group are to be placed Mr. Hyde's Coquimbe squash, and Mr. Pope's California squash, which were exhibited last September. The number of carpels in these is unknown to me, not having seen them cut. Probably in both will be found *more* than three carpels.

I have enumerated these kinds, in order to show that the group characterized by me has been established upon personal examination and dissection of most of the known varieties; and that the character of five or four stigmas and the same number of carpels (rarely three) is one which prevails in this group.

Heretofore it has been generally understood, and is so stated by most botanists, that pumpkins and squashes were originally natives of Asia. On the contrary, I find in ancient works abundant evidence that they were unknown in the Eastern hemisphere before the discovery of America, and that they were originally natives of the tropical and warm parts of America, and that they were extensively cultivated by the native Indians from Canada to Chili, before any European settlements were made on this continent.

After a very careful examination of the plants and the fruits of as many kinds as I could obtain or raise, I have discovered certain distinguishing characters which will enable us to class all of them in three natural groups. These are:

1st. Summer squashes—such as the broad-scalloped, the long and warted, the round or orange, the variegated or gourd-squashes, and various other kinds. Most of these (but not all) have upright vines which do not run, (hence sometimes called bush-squashes,) and small or feeble tendrils or claspers. Their leaves are very rough, and mostly five-lobed, (like a grape-vine leaf.) The fruit when cut across, is found generally to have five double rows of seeds; more rarely, only three double rows. The fruit-stem is enlarged next the fruit, and is deeply five-furrowed and five-angled. The fruit (which ripens early) is fit to be eaten only in an unripe state, or while it still remains tender. When fully ripe, the rind becomes whitish or pale, hard and brittle, lik a gourd-shell; and the pulp is dry and spongy. The seeds are small and thin, and of grayish or dirty yellowish color.

2d. Pumpkins and winter squashes—including our common New-England field-pumpkins, the crook-necked squashes, the custard-squash, and many other kinds. All these have running vines, with strong-branched tendrils or claspers, very rough, more or less deeply five-lobed leaves, and a five-furrowed and five-angled fruit-stem, which is very much enlarged toward the fruit.

On being cut across, the fruit is found to have only three double rows of seeds. The fruit is fit to be eaten only when fully ripe, and it may be kept, with care, all winter. It does not dry up like summer squashes, but finally rots and becomes soft and spoiled throughout. The rind, mostly thin and tender, never becomes dry, woody, and brittle; and the pulp remains fleshy and succulent till it decays. The seeds are larger than those of summer squashes, but are also thin and grayish or yellowish.

3d. Nippled pumpkins and squashes—such as the mammoth pumpkin or potiron, your Cuba squashes, Valparaiso squashes, the acorn squash, the autumnal marrow-squash, and some others. All these have running or climbing vines, with strong branched tendrils. The leaves are rather soft, some of them as soft and velvety as those of the mallow; they are never deeply lobed, but more often nearly round or heart-shaped. The fruit stem is short, thick, wrinkled, but not five-angled and not five-furrowed, and when green is nearly as thick at one end as at the other. The fruit, when cut across, is found generally to have four or five double rows of seeds, more rarely only three double rows; and I have found this smaller number only in the autumnal marrow-squashes, and it is by no means a constant character even in them, four or five double rows being occasionally found in them. The fruit is fit to be eaten in autumn and winter, and only when fully ripe. It is always distinguished, however various the shape and size, by having a small, nipple-like projection at the blossom end; this projection being the permanent style of the blossom, the rind, which is generally remarkably thin and tender, never becomes hard, dry, woody, and brittle. The flesh, often of a rich orange color, and remarkably sweet and fine grained, never dries up or becomes spongy, like that of summer squashes, but remains succulent till it rots. The seeds are large, broad, thick or plump, mostly of a beautiful, clear white color; but in certain very dark-fleshed varieties, the seeds are of the color of old ivory, or cream-colored.

Now, I am strongly inclined to the belief that all the pumpkins and squashes of this third division were *originally natives of the western side of America*, as Chili, Peru, Mexico, and California. Some of them have doubtless been introduced into the West Indies, whence they occasionally are brought to our markets.—*Journal U. S. Agricultural Society.*

CULTURE OF MELONS, &c.

WITH judicious culture, melons of excellent quality may be produced in abundance. Those who wish to be in season, should lose no time now in preparing the ground for it. For each hill, dig a hole two feet deep and three feet wide, and fill one foot of the bottom with rich manure; then fill to the natural surface with fine compost of rich earth and mould. In this, when the weather is warm enough to insure quick germination, plant your seeds at equal distances apart. If the weather should be very dry, the hills should be watered once a day, with water that has been exposed to the air long enough to attain an equal temperature with the atmosphere; or better still, set a tall and narrow box on the centre of this hill, and fill it with horse-stable manure; once in a day or two, at night, pour in a few quarts of water, and let it leach through the manure. When the plants show themselves above ground, defend them by a box covered with millinet, to keep off the bugs, which will also serve to ward off cold winds. When the plants are well established, select a few of the best, and pull up the others. Keep the plants free from weeds.

Cucumbers may be treated in the same way.

CINCINNATI HORTICULTURAL SOCIETY—STRAWBERRIES.

THIS Society held a meeting on the 15th of April. We find the following report of Dr. John A. Warder among its proceedings, illustrating a subject of especial interest to our readers generally:

FINALITY ON THE STRAWBERRY.—Wild or cultivated, the strawberry presents, in its varieties, four distinct forms or characters of inflorescence.

First: Those called *Pistillate*, from the fact that the stamens are abortive, and rarely to be found without a dissection of the flower. These require extrinsic impregnation.

Second: Those called *Staminate*, which are perfectly destitute of even the rudiments of pistils, and are necessarily fruitless.

Third: Those called *Hermaphrodite*, or perfect, having both sets of organs, stamens and pistils, *apparently* well developed. These are not generally good and *certain* bearers, as we should expect them to be. With few exceptions they bear poorly, owing to some unobserved defect, probably in the pistils. One tenth of their flowers generally produce perfect and often very large berries.

Fourth: A rare class—a sort of *subdivision* of the preceding, has not only hermaphrodite flowers, but also some on the same truss that are of the pistillate character; and sometimes, in the same plant, a truss will be seen, on which all the flowers are pistillate.

Now these four divisions are *natural* and *real;* they are also founded upon permanent characters, so far as we have been able to discover, after a most thorough investigation, extending through a long series of years, during which millions of strawberry blossoms have been examined with the severest scrutiny. Other forms may exist, and it is not claimed to be impossible that we may yet find a seedling which will have the general character of a *pistillate*, that may show an occasional perfect or *hermaphrodite* flower, as a peculiarity of that individual, but we have never yet observed such a variety; and further, we believe that whatever impress, as to peculiarities of foliage, pubescence, habit, inflorescence, or fruit, each distinct seedling may receive with its origin, it will be retained in its increase by runners, so long as the variety remains extant. Seedlings may vary from the parent, but off-shoots will not be materially different, except by accidental malformation, or by development of unimportant organs. On motion, adjourned.

THE ORANGE FAMILY.

THE more remarkable varieties of the Orange, as given by Mons. Boiteau, in the *Histoire Naturelle des Orangers*, and published in the *Bon Jardénier* for 1842, are as follows:

The China, pear-shaped, Nice ting-fruited, fingered, blood-red, ribbed, sweet-skinned, Mandarin, and St. Michael's. The last two are by far the best worth cultivating for their fruit. The *Mandarin* orange is small, oblate, with a thin rind, which separates of itself from the pulp, so much so that, when fully ripe, the latter may be shaken about in the inside like the kernel of some nuts. It is originally from China, but is now cultivated in Malta. The flesh is of a deep orange color, and its juice and flavor superior to those of most varieties. The *St. Michael's* orange is also small, but the skin, instead of being of an orange color, like that of the Mandarin, is of a pale yellow; the fruit is generally without seed, the rind thin, and the pulp exceedingly sweet. It is the most delicious of all the oranges, and the tree is a great bearer. It is generally cultivated in the Azores, from which it is shipped in great quantities. The *Tangerine* orange is strongly recommended by some.

The *Bigarade, Seville*, or *bitter orange*, has elliptic leaves, with a winged stalk, very white flowers, middle size, globose, deep yellow fruit, the pulp bitter and acid. This is the hardiest variety of the orange, and that which has the largest and most fragrant flowers, which are produced in great abundance. The fruit is chiefly used in making marmalade. The tree is that chiefly grown by the French gardeners for its flowers, to gather for nosegays; the varieties are the horned, the female, the curl-leaved, the purple, the double-flowered, the Seville, the myrtle-leaved, and the Bizarre. The *curled-leaved Bigarade* has small curled leaves, thick clusters of flowers at the end of the branches; the plant is very hardy, and it is that most generally cultivated in French gardens for its flowers and its fruit. The *double-flowered Bigarade* is prized on account of its fragrant double flowers, which last longer than those which are single. The plant requires a very rich soil. The *Seville Bigarade*, or Seville orange of the shops, has round, dark fruit, with an extremely bitter rind. It is imported from Spain, and used for marmalades, bitter tinctures, candied orange-peel, and for flavoring curaçoa. The *myrtle-leaved Bigarade* is a *lusus naturæ*, with deformed leaves, purplish or white flowers, and fruit half Bigarades and half lemons.

The *Bergamot orange* has small flowers and pear-shaped fruit, the whole plant having a peculiar fragrance, much valued by the perfumer, who obtains from the flowers and rind of the fruit his bergamot essences. The rind, first dried and then moistened, is pressed in moulds into small boxes for holding sweetmeats, to which they communicate a bergamot flavor. There are several varieties of this species in the Genoese nurseries.

The *Lime* has obovate leaves on a wingless stalk, small white flowers, and roundish, pale-yellow fruit, with a nipple-like termination. The leaves and general habit of the plant resemble those of the lemon; but the acid of the pulp of the fruit, instead of being sharp and powerful, is flat and slightly bitter. It is principally used in flavoring punch and confectionery. Among the varieties are the Pomo d'Adamo, in which Adam is supposed to have left the marks of his teeth.

The *Shaddock:* the leaves are large and winged, and the flowers and fruit very large and roundish; the skin of the fruit is yellow, and the rind white and spongy; the pulp is juicy and sweetish. The plant forms an excellent stock for grafting other kinds upon; the fruit makes a splendid show at table, and is found cooling and refreshing. It has been grown successfully in the open air in the city and vicinity of Mobile. M. Boiteau considers the "forbidden fruit" of the shops to be a variety of this species, but others make it a variety of the lemon.

The *Sweet Lemon:* the fruit has the leaves, the rind, and the flesh of the lemon, but with a sweet pulp. There are many varieties in Italy, but very few are cultivated in France or England. The flowers differ from those of the lime in being red externally.

The *True Lemon:* leaves ovate-oblong, pale green, with a winged stalk, flowers red externally, fruit pale yellow, with a juicy and acid pulp. Unlike the other kinds of citrons, the lemon on the continent is generally raised from seed, and hence the great difference in the quality of the fruit obtained in the shops, as also the sweet orange daily imported from the Island of Cuba.

The *Citron:* leaves oblong, flowers purple externally, and fruit yellow, large, warted and furrowed; rind spongy and thick, very fragrant; pulp subacid. Supposed to be the Median or Persian apple of the Greeks. As an ornamental tree, it is one of the best of the genus citrus; a delicate sweetmeat is prepared from the rind of the fruit, and the juice, with sugar and water, forms lemonade, and is used to flavor punch and negus, like that of the lemon. The Madras citron is the largest and best variety, and has been grown to an enormous size.

Oranges, like most other fruit-bearing plants, are propagated from seeds. The seeds may be sown at any period of the year, and slightly shaded during the hottest hours of the day. When the plants are from sixteen to twenty inches high, they are fit for grafting, taking care that the leading shoot be not injured, nor any superfluous side-shoots allowed to remain on them. They can be grafted, when about the thickness of a quill, in the following manner: Young shoots of a favorite variety are selected, being rather smaller than the stock, and about four to six inches in length; the stocks are prepared for them by taking a thin slice off one side (at about half their height) just merely to remove a very small portion of the wood; the graft is prepared in like manner, by merely taking off a thin slice of it; they are fitted together in the usual manner and fastened with fresh matting, which is wound round the stock from about an inch below the union, and carried up about an inch above it; no clay, but a little fine moss, is used to envelop the part operated on, and kept constantly moist; the head or leading shoot is not now shortened, but left growing until some weeks after the union is ascertained to be complete. It is then headed down as close to the part of the union as convenient, but not too close, for fear of displacing the graft; the remaining piece of stock is removed some months after the graft is established, and, if carefully done, the part of the union will, in a few months longer, scarcely be visible. Orange-trees are also propagated by budding, either when the stocks are young, or even when they are of considerable size. Handsome plants may be formed by this method when young stocks are used, but this can not be the case when the stocks have attained a large size; and hence arises a great defect in many of those that are annually imported into this country from France, and particularly from Italy, &c., when the stock operated on is often from one to three inches in diameter at the top, and in consequence seldom forms a union so complete as to conceal the amputation of the stock. Seedling orange-trees in this climate will fruit in six years. Observing that young seedlings put out thorns at the base of the leaf, and as long as they appear on the young wood, no fruit can be looked for, as the tree is in too luxuriant a state, which should be corrected by cutting in the roots and reducing the soil with loam, turf, and fine gravel. The practice of trimming and heading down orange-trees is radically wrong—as by that treatment it is impossible for the tree to bear fruit, for in spring they bring forth strong thorny wood, and are no nearer bearing fruit than when only one year old.

In the management of orange-trees in large boxes and tubs, great care is requisite to ascertain that the water reaches the roots of the plants; for the balls of soil become so firm and compact that the water will not penetrate them, but passes off between the balls and the sides of the box; the compactness of the ball often arises from the fineness of the soil used in potting. The present mode in every case is to use comparatively rough, turfy soil, more or less mixed with fragments of stone. When orange-trees in boxes are placed in the open air in the summer season, the situation ought always to be partially shaded.

A CHEAP MODE OF PROCURING A VALUABLE BONE MANURE.

A WRITER in the *Country Gentleman* says, in reference to the cultivation of the potatoe, and successful attempts to prevent attacks of the rot: "We know a gentleman who for eight years has manured potatoes with bones fermented in ashes, has had good crops uniformly, and not one of them has rotted; but unfortunately for the conclusion to which he would have been glad to come, he has planted other potatoes, every one of these eight years, with all sorts of manures, and some without any, and neither one of these rotted, except a very few where no manure was put. The bones in the case just alluded to were treated thus: In a large family, consuming much butchers' meat, the bones were thrown into a hogshead from day to day; ashes as taken from the fires daily were thrown upon them; enough water to keep the whole moist and to prevent the gases escaping, were added from time to time, the falling rain generally being sufficient, as the hogshead was placed in the open air, away from all buildings. When one hogshead was full, another was taken. The bones treated in this way retained their form and size, but became so soft as to be easily cut through with the shovel and rubbed down with the back of the shovel into powder, with some extra ashes or dry earth. The oily matter of the bones, together with the potash of the ashes and the water thrown on, becomes a saponaceous mass, and the phosphate of lime in the hardest part of the bones is diffused through the soapy mass in a state of exceedingly fine division. Bones thus fermented in ashes are exceedingly valuable for potatoes and for Indian corn, and probably for all crops. There is reason, from actual trial, to believe that the effect on the land is permanent, lasting for several years."

CURIOSITIES OF THE PATENT OFFICE—AGRICULTURAL IMPLEMENTS.

DURING the last year, 144 patents were granted for agricultural implements, twenty-seven of which were for harvesters, power-reapers, mowers, &c. The following abstract of this interesting department of invention, as exhibited in the Patent Report, is given in the *Scientific American:*

"Three patents were granted for horse-power potatoe-digging machines; the models of two of these we have seen, but have not yet had the pleasure of seeing a large one in operation. Fifteen patents were granted for improvements in ploughs, and four for cultivators. No less than twenty-six were granted for seed-planters. This number is very large, considering that such machines are of no recent origin; it shows the importance of this class of mechanics, and the dissatisfaction entertained with those already in use. The devices patented, however, were mostly confined to the mode of distributing the seed; the novelties patented are said to be small, but that of B. D. Sanders, of Holiday's Cove, Va., for operating the shove-rod to work the valves by friction-rollers and rotary-cam, is a very good one. Three patents were granted for horse-rakes, and threshers and separators; one of the latter consisted in having an inclined, rotary, cylindrical straw-carrier, supported on friction-rollers. This cylinder is full of holes, and as the straw is carried, the grain falls down through the openings. Ten patents were granted for hullers and smut-machines—one of them being for washing and scrubbing, and drying the grain. One patent was granted for a weigher combined with a winnower. The weighing apparatus is secured in such a manner to the machine, that when the measure is filled up to the proper weight, the balance tips the weighed grain, which is thrown upon inclined ways, and immediately starts off on a railroad track to the grain-depot. Four patents were granted for corn-shellers; in one the ears are allowed to accumulate, to act in the mass as an elastic bed against the spiral shelling projections. Three patents were granted for straw-cutters, and nine for miscellaneous agricultural implements, one of them being for a metallic tube scythe-snath."

NEW-YORK.—"THE SEASON."

New-York promises fine opportunities for affording gratification to the thousands of visitors that are to visit the city the coming season.

The Crystal Palace stands in all its beautiful proportions and graceful architecture, and within it offers a richer show than can be seen elsewhere on the continent. It is true that some very rich goods are removed. It is always with a degree of sadness that we pass the court so lately occupied by our excellent friend, M. La Hoche, in whose goods we were more interested than in those in any other part of the exhibition. The next court was ornamented by the Gobeline tapestries, which have also disappeared; and on the opposite side of the nave the devotional face of St. John no longer captivates us by its unrivalled artistic excellence. But a stranger finds all these sections occupied with excellent wares. France does her next best, after the show of M. La H.; and for the Gobelines we have the best of Turkish goods. Powers' group of statuary is removed from beneath the dome; but, while Pagani's "Eve after the Fall" remains, the finest statue ever yet seen in this country is within reach; and though we miss "The Child's First Grief," "The Industrious Girl" is there, and defies competition. But few pieces of statuary are removed except those above-named. Of course this part of the show is still very rich and extensive. The Picture Gallery, to one not familiar with its arrangement, would still appear undiminished in its attractions, though we look in vain for not a few pictures which we have gazed upon so often with undiminished pleasure. The Machine Arcade requires most labor to bring it up to a standard that will compare at all with the abilities, and indeed with the obligations of the country. We should like to devise some mode—through the Patent Office, for example, by which exhibitors in this department should be entitled to receive some especial privilege. Such, for instance, as priority of examination—diminution of charges—or some other consideration that should be effective in securing a satisfactory display of the extent and excellence of American machines.

This exhibition will merit the attention of visitors for a long time to come, and will no doubt excite even a more general notice than during the preceding summer. (See notice on another page.)

Musical attractions will also, no doubt, be well and abundantly provided. We expect again to listen to the unrivalled strains of Madam Sontag and her troupe, so universally and so deservedly admired. New aspirants for public favor will also, no doubt, present themselves, while the various "Minstrels" will continue to delight crowded houses as heretofore.

Magicians of different sorts. The unrivalled Blitz, who for years has stood without an equal in his peculiar department, and who tells you that he is deceiving you in each of his wonderful tricks, and the far less worthy spirit-rappers, tippers, writers, *et id omne genus*, who not only deceive many others, but themselves too, while they constantly avow themselves no cheats at all,—all these open their doors for all who will enter them. On the stage, little Eva will still converse, with the wisdom of age, with the childlike Uncle Tom; and Wild Maggies be nightly transformed into devout and efficient ministers of the truth. "The Elephant" will still be gazed upon, at Barnum's Museum, while one of the most remarkable of all the wondrous things, is the manly form of the industrious, persevering, and efficient owner of this great concern, who, among the "intelligent," judicious, and business men of this great city, has few equals and no superiors. Giants and dwarfs, lions, hyenas, and a long list of curious animals, natives of other climes; picture galleries, and other exhibitions of kindred sorts; the cemeteries, the libraries, the churches, and other public buildings of the city; and, more glorious than all, the beautiful scenery of the harbor of New-York, its shores almost covered with the cities of Brooklyn, Williamsburgh, Jersey City, &c. All these will consume a week or a month, as the circumstances of the traveller may permit.

The Latting Observatory gives an opportunity for obtaining a bird's-eye view of the city, particularly in its upper half, which is not only extensive, but minute, each street lying at your feet, like the block-town of the nursery, while the North and East rivers, and even the harbor itself, are but narrow strips in the great map you look upon.

Hence we expect great crowds among us in the months to come.

SCULPTORS AND SCULPTURE.

We purpose to give our readers a somewhat extended view of this subject, in the months to come, and begin with Grecian art. We are moved to this, not only by the fact that Mrs. Lee, in her book noticed in another page, has given us peculiar facilities for such service, but also to qualify our readers for enjoying such treats as they have had, and may again have, at the Boston Athenæum and the Crystal Palace, and also in travels abroad. An untutored sailor would enjoy a bold figure-head as well as Pagani's Eve. It requires culture to be interested in the fine arts.

Phidias was born at Athens 488 years before Christ. His first attempts were under the immediate influence of Homer's poems. He amused himself with imitations of insects and fishes, so perfect that it used to be said, "Give them water and they will swim."

The Parthenon is the work of Phidias, who was eminent in geometry, etc., as well as in painting. This superb structure was of white marble, 270 feet in length and 98 in breadth, supported by 46 fluted pillars of the Doric order, 8 being at each front and 15 on each side, and each 42 feet in height and 17 in circumference. The pediments of the fronts were ornamented with numerous statues, larger than life and of admirable workmanship. Basso-relievos, of admirable design and workmanship, were also added to other embellishments. In the interior of the building was the noblest work of Phidias, the chrysoliphantine figure of Minerva. The eyes of the statue were of precious stones, that changed their lustre with the changing rays of light, seeming almost like emotion of soul. The robe of vestment was entirely of gold. The face, neck, and nude parts, of ivory; the ægis, the helmet on her head, the drapery, and the wings of the figure of Victory, which she held in her left hand, were all of burnished gold. The statue of the goddess measured 27 cubits, or 39 feet 7 inches, in height. It stood in the centre of the temple.

Phidias had previously produced a statue of Pallas, in bronze, a branch of art which he brought to perfection. This statue was placed on the acropolis, representing a guardian deity. So lofty was her height, that voyagers who rounded Cape Sunium, beheld her crested helmet and pointed spear above the battlements of the city.

The works of Phidias are arranged in distinct classes,—those of mixed materials, ivory and gold, bronze and marble. He also worked in clay, wood, and plaster.

The most celebrated of all his works was his Jupiter. He was seated on a throne, which, like the statue, was of ivory and gold. He wore a crown upon his head, in imitation of a wreath of olive. In his right hand was a sceptre of curious and exquisite workmanship, on the top of which was an eagle, composed of various kinds of metals. The robe and sandals of the figure were of gold. The throne was variegated with gold and precious stones, and inlaid with ivory. Four figures of Victory were represented at the foot of the throne. Other figures stood at the feet of Jupiter, which is supposed to have been sixty feet high.

Mrs. Siddons was so overcome by viewing one of the groups of female statues by Phidias, as actually to shed tears; and Mr. West, in speaking of a horse, says, "Would not one almost suppose that some magic power, rather than a human hand, had turned the head into stone, at the moment when the horse was in all the energies of his nature?" We feel the same, when we view the young equestrian Athenians; and in observing them, we are insensibly carried on with the impression that they and their horses actually existed, and we see them at the instant when they were converted into marble. While it is the fashion to doubt the genuineness of all ancient works of art, the works of Phidias are undoubted, and stand out from all others in unrivalled and unquestioned excellence and originality.

Phidias was as remarkable for his integrity as for his skill. But he was obliged to endure the persecution of enemies and rivals, and fell at last a victim to their accusations in the fifty-sixth year of his age. Having surrendered himself as a prisoner, awaiting the trial that should prove his innocence, he died in prison, and perhaps by poison.

Pericles, Plato, Socrates, Alcibiades, and Asphexia, Protagoras, Zeno, Anaxagoras, etc., are among the renowned characters of history who were contemporaries, and many of them friends, of this great artist.

Alcamenes and Agoracritus were pupils of Phidias, and they, with Polycletus, a cotemporary, formed what is called the "canon," from which all succeeding artists borrowed their proportions. Ctesilaus was a rival artist, and to him, erroneously, it is said, has been attributed the celebrated "Dying Gladiator."

In the Boston Athenæum are to be seen the Head of Jupiter, by Phidias; the Apollo, the Venus de Medici, and other casts of the antique.

The most celebrated works of Agoracritus were the statues of two youths, the Diadumenus and the Doryphorus.

Naucides, Lysippus, Scopas, etc., were also cotemporaries with Phidias. To

Scopas was attributed the group, Niobe and her children. one of the finest studies of ancient art. He represents them as pierced by the arrows of Apollo. The originals are in the Gallery of Florence.

Winkelmann allots three epochs to sculpture. The style hard and stern; the style great and strongly marked; the style graceful and flowing. The first lasted to Phidias; the second to Praxiteles, Lysippus, and Scopas, the first of whom commenced the third epoch.

PRAXITELES was born about 364 years before Christ. The place of his birth is uncertain. Some contend that he was born at Cnidus, perhaps on account of his beautiful statue of the Venus of Cnidus. There is a copy of this Venus, drawn by Flaxman.

The youthful mind of Praxiteles was kindled by the noble works of Phidias. It has been said that art has not attained, and can not attain, any higher excellence than Praxiteles gave to it; and whether this is true or not, it is at least a sentiment highly commendatory of this ancient sculptor. But few of his works remain. The Faun, the Thespian Cupid in the Capitol, the Apollo with a lizard, command the admiration of the uninitiated as well as the scientific.

LYSIPPUS was cotemporary with Praxiteles, and was born at Sicion. He was originally a brazier. His chief works were in bronze; his Tarentine Jupiter, 60 feet high, and his twenty-one equestrian statues of Alexander's body-guards, were held in the highest estimation. So great was his reputation, that centuries after him, an attempt to remove one of his statues from the public baths, occasioned an insurrection which made even Tiberius tremble. Of six hundred works attributed to Lysippus, not one remains.

CHARES.—The famous Colossus of Rhodes is attributed to Chares of Lindus. This immense work is too well known to require a description. But finding that the sum granted to him was utterly inadequate to complete the work, in a fit of insanity he committed suicide. The statue was completed by Laches, a fellow-countryman and a celebrated artist.

The famous group *Laocoon*, found in the baths of Titus in 1506, is supposed to have been executed during the period we have been considering, and to be the united work of the preceding artists, as also many of the antique marbles. So also is the Amazon of the Vatican, but its author is unknown. The Knife-grinder at Florence, called by the Italians, "Il Rotatore," is much admired. Silenus and the Infant Bacchus, and Hercules in Repose, by Glycon, belong in this catalogue. The celebrated Venus de Medici, in the Florence Gallery, and which is thought to have been suggested by the great Venus of Praxiteles, is represented as landing on the shores of Cythera. As early as the 16th century, it was placed in the gardens of the Medici at Rome, and was carried to Florence in 1680. Napoleon sent it to Paris. In 1815 it was returned to Italy.

During forty-five years after the death of Alexander, the schools of Lysippus and Praxiteles maintained their rank. But after their death, original works of magnitude were not produced, and, according to Pliny, sculpture lay dormant a hundred and twenty years.

The singular notions entertained by the unenlightened in reference to works of art, are well illustrated by an anecdote given by Mrs. Lee. The Etrurians highly valued a certain picture of Bacchus, and did not conceal their anxiety when the Roman soldiers, their conquerors, had converted it into a table. The Romans concluded that gold must be concealed in it, and the Roman General gave it to the keeping of a common messenger, charging him to deliver it safe, under pain of being obliged to paint *another equally good*.

The Etrurians, who properly regarded these Romans as barbarians, inhabited the countries now known as Tuscany and Florence, which still excel, not only in painting and sculpture, but also in architecture and other kindred arts.

The Augustan age, so notable in Roman history, was not the age of the fine arts. During this period, all their eminent sculptors were Greeks. It was the age of war and conquest, not of the arts. Their sculptures were obtained from conquered enemies. Augustus favored them, but he did not revive them. Tiberius, his successor, had no regard for them. Caligula collected statues from Greece, and ordered that the Júpiter of Phidias should be brought to Rome; but, as this could not be accomplished, he consoled himself by placing his own head upon one of the beautiful Grecian statues. This was decapitated for that purpose. But it was not till the reigns of Vespasian, Trajan, and Adrian, that the arts can be said to have had a home in Rome. Trajan's Column, which stood in the centre of the square of the Forum, is well known. The Head of Antinous, which was found at Tivoli, where stood the house of Adrian, is now in the Boston Athenæum. But under the reign of Commodus, the love of the arts almost totally disappeared. The Arch of Severus is a poor imitation of more ancient works.

In the eleventh century, Germany outstripped all other countries in their regard for works of art. Statues were executed at Aix-la-Chapelle, by order of Charlemagne; German artists practised in Italy, Spain, and France. Nicholas of Pisa, about 1250, introduced improvements, and formed the first school of sculpture for modern Europe. In 1350 his grandson, Andrea Pisano, established the first academy of design at Florence, and before the close of the century sculpture had become a national art.

CONSUMPTION OF FOREIGN GOODS.

The following table gives the amount of the several kinds of goods entered for consumption, at the port of New-York, in 1853, and which passed from the warehouse into consumption:

Cotton,	$27,357,550
Silk,	33,315,116
Flax,	8,446,208
Miscellaneous dry goods,	5,742,018
Total entered for consumption,	$90,530,782

SUPPLY OF COTTON.

The New-York *Journal of Commerce* shows the distribution of the cotton supply for the last ten years, expressed by per centage. For 1852–3 it is as follows:

Total supply, crop and stock,		3,354,058
Great Britain,	51.78	
France,	12.72	
North of Europe,	5.10	
Other foreign ports,	5.77	
United States,	20.59	
Burnt, and stock on hand,	4.04	

IRON MANUFACTURE.

We pursue our general account of the various steps in the process of manufacturing iron from the ore. We have shown the different processes for the production of pigs and blooms. It next becomes us to show the use made of the latter. But before we go further in that direction, we will give the reader a view of another process by which the pig is converted into a bloom. This is by what are termed Squeezers. When the pig-metal is sufficiently boiled and worked in the puddling-furnace, it is rolled into a compact ball, and hastily borne, in huge pincers, to the squeezer. One form of this machine is given in figure 1. The ball being placed in its jaw at *d*, is pressed at every revolution of the wheel, by the crank on its axis, the metal being still held in the pincers, and turned as it may require. The impurities which it contains are thus worked out, and the metal becomes solid and compact, and is a " bloom."

Fig. 1.

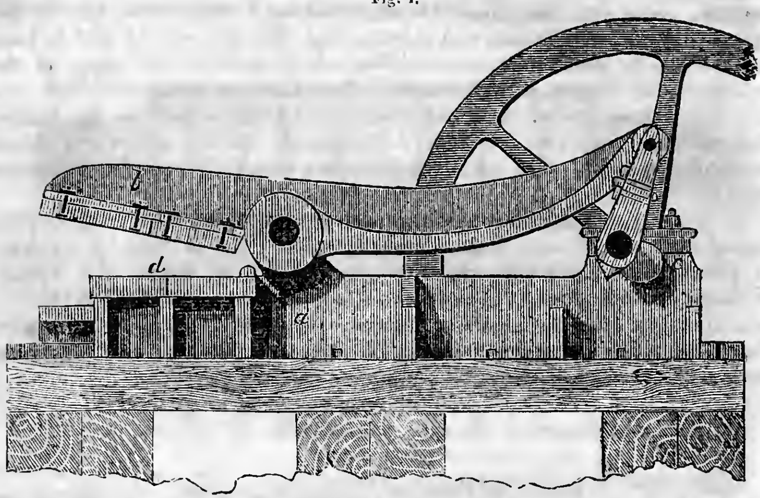
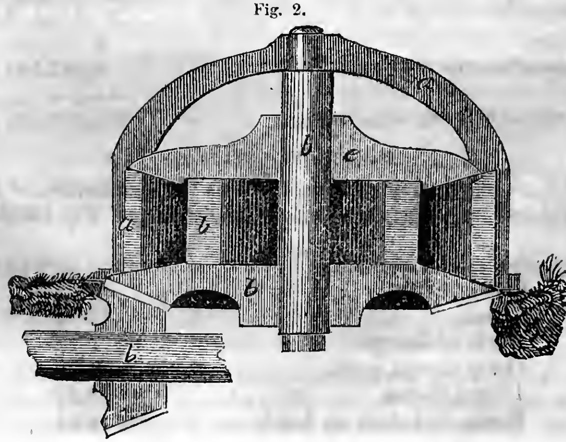


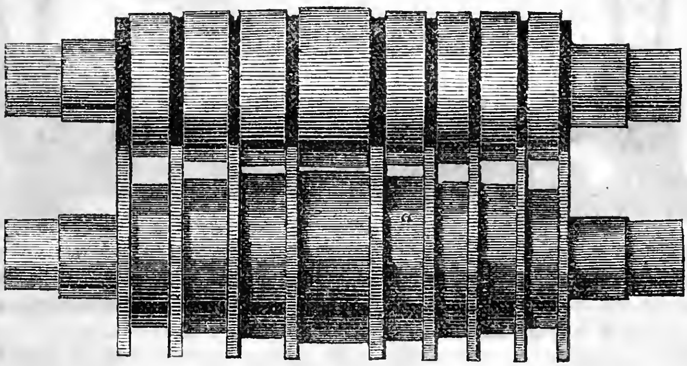
Fig. 2.



Burdon's Rotary Squeezer (fig. 2) is a more efficient machine for accomplishing this result. It is an American invention. The stationary part of this powerful engine is represented at *a a*, and consists of a cast-iron cloak, which incloses the movable parts *b b b*. An eccentric space is thus left between the main parts, in which the melted pig is formed into a bloom. The ball is inserted between *a* and *b*, and moved through nearly an entire revolution of the squeezer, and comes out on the other side of the opening a bloom. A few minutes will suffice to work off a heat of 800 lbs. This squeezer is coming into very extensive use, rapidly superseding all others.

The bloom is already in the condition of wrought iron, but in a form wholly impracticable for the use of the smith. Hence the manufacturer changes its condition in this respect, by means of Rollers. These are of various models and for various ends. One is called the Flat Roller, and is exhibited in figure 3.

Fig. 3.



This engraving illustrates and explains itself. The rollers are about 14 inches from centre to centre. The groove marked *a* is the finishing groove, and is 4 inches wide and $\frac{3}{4}$ of an inch thick. The next groove is $1\frac{1}{8}$ inches high and about $3\frac{7}{8}$ wide. The third is $1\frac{5}{8}$ by $3\frac{3}{4}$, then $2\frac{1}{2}$ by $3\frac{5}{8}$, and the last $3\frac{1}{2}$ by $3\frac{1}{2}$. The other half of the roller may be arranged for bars of different dimensions.

Another is for Railroad Iron, of which a representation is given in

Fig. 4.

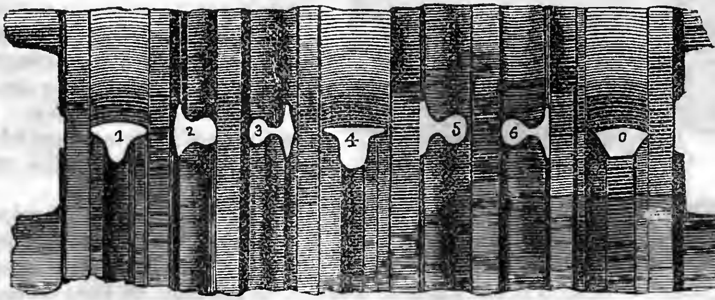


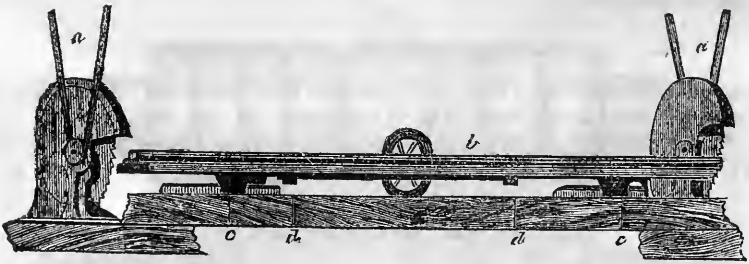
figure 4. It shows the gradual formation of the T rail from the square billet. It is first received into the left-hand groove, or No. 1, then No. 2, and so on. The first three work out both flanges to a certain extent, but leave

them imperfect; the fourth presses the top and bottom smooth, and improves the bottom flanch. Nos. 5 and 6 finish the rail.

This is very heavy work, and requires the aid of machinery. Chains are suspended from sliding pulleys, fixed over the heads of the operatives, to which huge tongs are affixed. These are guided by the workmen, who conduct them to the groove, while the hot metal is seized by the rollers and carried through them. When the rail appears on the other side, another set of men, with similar machinery, grasp it and return it through the next groove.

Having thus secured the proper shape to the railroad bar, its length and the shape of its ends require attention. Figure 5 represents a sawing apparatus, by which these changes are produced.

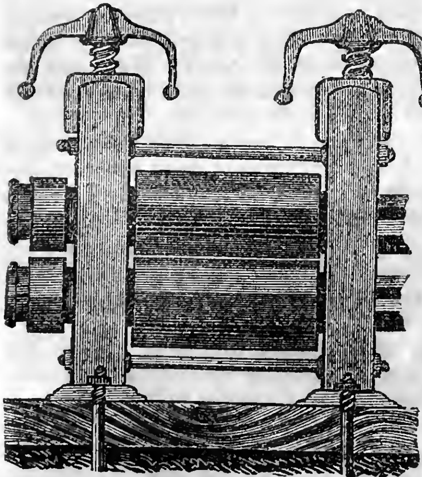
Fig. 5.



The saws are circular, and are put in motion by the belts at *a*. But one end of the rail is cut at a time; that being finished, the other end is drawn under the saw and cut in a similar manner. The rail is then straightened; after which it is ready for the market.

The next engraving represents a roller for the manufacture of sheet-iron.

Fig. 6.

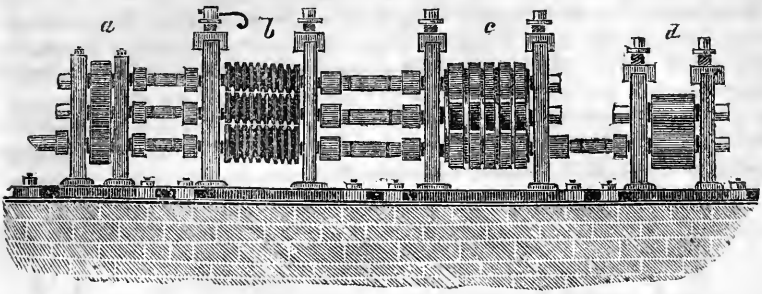


After leaving the rollers above described, if it is intended for broad sheets, it is passed through those represented in figure 6. If it is designed for small round or square bars, rollers are used like those represented in figure 7.

The iron intended for sheets must first be formed into flat bars. Such was not always the practice. The sheets, in ancient times, were flattened out by forge-hammers, and afterward smoothed by smaller hammers, on the anvil. In some parts of Europe, where labor is very cheap, this practice still prevails.

In the "*Locomotive Sketches*," it is stated "at this time, (1854,) there are probably not less than $15,000,000 invested in the production of iron in the State of Pennsylvania, exclusive of about $6,000,000 invested in rolling-mills, and similar works for the conversion of the metal into forms for use. The number of persons employed in mining the anthracite and iron ore is about 5000, in making the charcoal about 15,000, and the number of persons dependent on this description of labor about 70,000; the number of those engaged in the conversion of pig-iron, 90,000, and the population connected with the production of

Fig. 7.



iron, 100,000, making a total of 280,000 in that one State. This estimate does not include those engaged in its transportation, sale, &c.

We are indebted for our engravings in this and the former article on this subject, to our friend, Mr. Smith, publisher of the book so often referred to.

CORRUGATED IRON PLATES.

In this invention it is claimed that rolling the iron in small curves or arches, instead of planes, gives it largely increased strength. The inventor, Mr. Richard Montgomery, thus describes his invention and various tests to which it has been put:

"The boiler-plate now in use is rolled in planes. This invention consists in the employment of corrugated plates of metal in the construction of cylindrical flues, curved fire-arches, and curved shells of boilers. The plates are rolled into curves or arches. The roll is so constructed as to leave a margin or flange on each of the four sides of the plate, for punching and riveting.

The simplicity of the invention is evident. It borrows from the science of architecture the *principle of the arch*, and impresses it upon the manufactured iron, and thus imparts to shells of iron, rolled into this new form, a strength at least ten times greater than that possessed by plates at present in use. *It is equivalent to the discovery of a new metal of increased strength.*

The 'corrugated boiler-plate' is intended to be used in the construction of all forms of boilers, flues, and locomotives. The following are some of its manifest advantages:

Various tests have been applied to the corrugated iron in New-York and elsewhere. In New-York, the test was as follows: Four strips of boiler-iron were used, one fourth of an inch thick, 7 feet 11 inches in length; *two* of them were bent in the form of an arch in the direction of their length, the remaining two strips were corrugated by passing them through the rollers of the required shape, the rise of each corrugation being one inch. The curved ribs were placed in pairs, side by side, and weighed with pig-iron. The first pair, consisting of plain iron, yielded with a pressure of 3126 lbs.; the pair of corrugated strips were loaded with 16,094 lbs., and afterward with 27,000 lbs., without any perceptible deflection. The subscriber prepared in New-

York a boiler six feet long. The flue was made of plain boiler-plate *one quarter* of an inch thick, and *nine inches* in diameter; the outer shell was made of corrugated iron *one eighth of an inch* thick, and 20 inches in diameter. Hydraulic pressure was applied to the boiler and the *flue collapsed*, without affecting the thin outer shell of corrugated metal.

In addition, it is charged that about 30 per cent. is saved in the construction of boilers with the corrugated plates, besides a great saving in space, about 8 feet in 30. The corrugated boiler also presents one third more fire-surface than the present boiler. The advantages claimed for this discovery are, greater strength, safety to life, economy of space, economy of expense, economy of fuel, less draught of boats, detection of defects in iron, greater generation of steam, durability, economy of repairs, and increased diameter of flues and boilers."

GUTTA PERCHA—ITS NATURE, USES, ETC.

Gutta Percha, the Malayan term given to a concrete juice taken from the Isonandra Gutta tree, is indigenous to all the islands of the Indian Archipelago, and especially to the Malayan Peninsula, Borneo, Ceylon, and their neighborhoods, in which are found immense forests of this tree, all yielding this product in great abundance. Its fruit contains a concrete edible oil, which is used by the natives with their food. The gutta, or juice, circulates between the bark and wood of the tree, in veins whose course is distinctly marked by black longitudinal lines. The natives were formerly in the habit of peeling the tree when they required a supply, but have been taught by experience that the juice can be obtained by cutting notches at intervals in the trunk, and thus preserve the tree for future tappings, as our maples for successive years yield their sap to the sugar manufacturers. The juice consolidates in a few minutes after it is collected, when it is formed by hand into compact oblong masses of from seven to twelve or eighteen inches in length, by four to six inches in thickness, and these, when properly dried, are what is known as the Gutta Percha of commerce.

It is only ten years since the knowledge of the existence of this ductile secretion dawned upon the world. Dr. Montgomerie, an assistant-surgeon at Singapore, observed in the possession of a native the handle of a wood-chopper, of such singular material that it awakened his attention, and, on inquiry and examination, he found it to have been made of the juice of this strange tree, becoming plastic when dipped in hot water, and when cold resuming its original stiffness and rigidity. Within these few years, the exudations of these dense forests have assumed, more especially in England, innumerable forms.

The gutta percha of commerce is of a light-brown color, exhibiting a fibrous appearance, much like the inner coating of the white-oak bark, and is without elasticity. When purified of its woody and earthy substance, it becomes hard, like horn, and is extremely tenacious; indeed its tenacity is wonderful.

The strength of tubes of this material is so great that no visible effect was produced upon them by the proving-pump of the Water Company of the city of Stirling, in Scotland, which gives more pressure than any other pump in Great Britain—a pressure that would scatter the rivets of leather-hose in all directions.

The application of heat to the crude material makes it soft and plastic, and in a temperature of about two hundred degrees it becomes ductile, when it can be moulded into any desired shape, which it retains when cool. It can be dissolved by sulphuret of carbon, or chloroform, or if immersed for a time in spirits of turpentine. It is a repellant of, and completely unaffected by, cold water, and, unlike India rubber, it resists the action of oil and other fatty substances without injury. It is a non-conductor of electricity; is proof against alkalies and acids, being only affected by the sulphuric and nitric, in a highly concentrated state, while the most powerful acetic, hydrofluoric, or muriatic acids, or chlorine, have no perceptible effect upon its structure or capabilities. This gum has qualities entirely different from India rubber. It can not be worn out. It can be melted and re-melted, and repeatedly re-moulded without changing its properties for manufacture, or losing its virtue. It is lighter than rubber, of finer grain, and possesses certain repellant properties unknown to that material; and is extremely tough. It disregards frost, and displays remarkable acoustic qualities.

In its crude state, gutta percha has no resemblance whatever to India rubber in appearance, nor are its chemical or mechanical properties the same, nor does the tree from which it is taken belong to the same family, or grow in the same latitude or soil; yet, from the fact that it can be dissolved, and wrought into water-proof wares, many, not informed on the subject, have inclined to the belief that the two materials are substantially the same, and that a process for the manufacture of one would apply equally well to the manufacture of the other. But nothing could be more erroneous, as may be seen by the following comparisons:

Gutta percha, when immersed in boiling water, contracts considerably in bulk. India rubber, when immersed in boiling water, expands very materially, and increases in bulk.

Gutta-percha juice is of a dark-brown color, and consolidates in a few moments after exuding from the tree, when it becomes about as hard as wood. India-rubber sap is perfectly white, and of the consistency of thick cream. When it coagulates, it gives from four to six parts water out of ten. It may be kept like milk, and is frequently drank by the natives.

Gutta percha, first treated with water, alcohol, and then dissolved with spirits of turpentine and precipitated, yields a substance consistent with the common properties of gutta percha. India rubber, similarly treated, results in a substance resembling in appearance the gum arabic.

Gutta percha, by distillation, yields 57 2-3 per cent. of volatile matter. India rubber, by the same process, yields 85 3-4 per cent.

Gutta percha, in its crude state, or in combination with other materials, may be heated and re-heated to the consistency of thin paste, without injury to its future manufacture. India rubber, if but once treated in the same manner, will be destroyed and unfit for future use.

Gutta percha is not decomposed by fatty substance; indeed, one application of it is for oil vessels. India rubber is soon decomposed by coming in contact with fatty substance, as is well known.

Gutta percha is a non-conductor of cold, heat, and electricity, and, in its natural state, is non-elastic, and with little or no flexibility. India rubber, on the contrary, is a conductor of heat, cold, and electricity, and by nature highly elastic and flexible.

The specific gravity of gutta percha is much less than that of India rubber—in the proportion of one hundred to one hundred and fifty—and it is much finer in quality, and a far better conductor of sound.

Fabrics wrought of India rubber require a separate varnish to give them polish. But the gutta percha possesses a nature of inherent polish, equal in lustre to the varnish, and permanent.

From its first appearance in Europe up to the present time, all writers upon the subject have spoken of gutta percha as certain to become a most important article in the mechanic art; but its manufacture everywhere presented the same objections that existed from the beginning, namely, non-elasticity and rigidity, variableness and extreme sensibility to heat and cold—so that, for a great number of articles, the trade has diminished rather than increased.

Numerous attempts were made, up to the year 1850, to obviate the objections to gutta-percha goods, as then manufactured. Eminent chemists, through several years, toiled in vain for the secret which they believed to exist, which would endow gutta percha with permanent elastic qualities. For it was discovered that if this hidden secret could be unlocked, and the art discovered of superadding pliability, in the strange capabilities this wonderful gum already possessed, the already extensive range of its uses would be indefinitely enlarged. But the attempts were signal failures.

A final attempt, however, based upon a series of novel experiments, wholly of original character, by Mr. William Rider, of the firm of Rider & Brothers, of this city, and brothers Emory and John Rider, resulted in the astounding discovery of a process of vulcanization, by which gutta percha was made permanently elastic and flexible, like India rubber, contrary to the conclusion of all other experiments, in this country and Europe.

No time was lost in making application for letters patent, which were granted.

Under this discovery, gutta percha, which before was a fibrous, non-elastic and horny material, and affected by the changes of climate, is converted into pliable and elastic fabrics, which remain the same under all changes of climate, is not injured by acids or fatty substances, is free from offensive smell, and, unlike India rubber, does not decompose and get sticky. With such advantages, this invention must prove one of vast importance in the arts.

SELF-MADE MEN.

It is one of the most pleasing features of the genius of our government, that it opens a wide door for individual progress in the various professions and occupations in which our vast population are engaged. The man who wills it, has it in his power to arrive at almost any eminence, whether in professional life, or in those pursuits in which the physical prevail over the mental energies. Hence it is that our nation has had and will continue to have so many self-made men whose career affords strong motives of encouragement to American youth who are rapidly crowding upon the stage of action. Every populous town in our country can point to some one of its number who has risen from obscurity to a position that now makes his name familiar with every public enterprise connected with the growth of his town, village, or city. Boston has had its Billy Gray, New-York its John Jacob Astor, and Philadelphia its Stephen Girard—men who began the world with nothing but their native energies, yet whose names will long be connected with these cities from the institutions to which they gave rise while living, and with which their names will be associated down to the latest period of time.

We have been led to these remarks from a description, in one of the popular Philadelphia magazines, of an establishment which is attracting much attention both in that city and elsewhere, whose proprietor, according to the journal in question, began life with comparatively nothing, but whose establishment now exceeds any thing of the kind in that city, and who bids fair, at no distant day, to be ranked as one of the most successful business men of the country.

Charles Oakford, according to the authority already quoted, commenced the hatting-business in Philadelphia twenty-five years since, with a capital of five dollars. His stock of course was limited, his store small, but he devoted himself untiringly to his business, and many times was seen trundling his own wheelbarrow through the streets, a feat which many young men at the present day would hardly be willing to perform. A few years found his place too small for him, and he moved; and in a few years longer he moved again, and again, and yet again, until now he occupies one of the largest and most princely establishments in Chestnut street. His present store is the middle one of three, planned by himself, and built with the fruits of his own industry, after successfully toiling a quarter of a century. Its number is 158, and it attracts the attention of many a passer-by, from the magnificence and splendor of its finish, no less than from the exeellent hats, for the manufacture of which Oakford has become so deservedly renowned.

Charles Oakford is an example, in point, of the principle which we laid down in the commencement of this article. His career, like that of many other self-made men, is full of encouragement to the energetic and industrious youth of our country. Success will surely attend him who labors for it, rewarding him abundantly for his enterprise and perseverance.

Baby-Show in Georgia.—The following are among the premiums to be awarded at the Southern Central Agricultural Association, for the "handsomest and finest" specimen of babies. We give this timely notice, that those who may find themselves able to comply with the conditions above annexed, may get ready for this great show of infantile humanity which is to come off next fall:

First Premium.—Silver pitcher $50, for the handsomest and finest babe two years old.

Second Premium.—Silver pitcher, $25, for the handsomest and finest babe one year old.

Third Premium.—Silver goblet, $10, for the handsomest and finest babe six months old.

The children to be clothed in domestic fabrics; the premiums to be awarded under the direction of the executive committee.

We must confess that this and one or two other similar notices, look to us like going beyond the legitimate limits of an agricultural society. Do they expect to improve *the breed?*

If these societies will give a premium for the best-disciplined family, for the daughter best instructed in the duties of the head of a family, a boy best imbued with good principles and devoted to good practices—if they will by premiums or HONORABLE MENTION, commend instances of unwavering filial obedience, or of PARENTAL FIDELITY, the nation may have substantial cause to rejoice. It might be a *notice* of an early dismissal of thousands of policemen and other peace-officers.

EDITORS' JOTTINGS AND MECHANICAL RECORD.

General Agency.—The publisher of *The Plough, the Loom, and the Anvil*, believing it in his power to be of essential service to the readers of that journal in the purchase or sale of various articles, and the transaction of various kinds of business, would announce to them that he is ready to execute any such commission which he may receive, including the purchase of books of any description, implements connected with agricultural, manufacturing, or mechanical operations; artificial manures; farm and garden seeds, &c., &c. One of the gentlemen connected with the journal is a proficient in music, and experienced in the selection of piano-fortes, flutes, &c., and will execute orders in that department.

He will also act as agent in the purchase and sale of Real Estate.

☞ Particular attention to business connected with the Patent Office.

Letters of inquiry on these matters will be promptly attended to.

A MONUMENT TO JOHN S. SKINNER, ESQ.

A DONATION TO HIS WIDOW.

A Special Appeal to our Readers.—The attentive reader of *The Plough, the Loom, and the Anvil*, has observed occasional paragraphs on the subject which heads this article. Our last number contained the action of the United States Agricultural Society in relation to the matter, including the resolution in which the object was recommended to the favorable consideration of the agricultural community throughout the United States. An event of recent occurrence has induced the friends of the measure to couple with the movement a donation to Mrs. Skinner. The particular circumstance which led to this measure, is best stated in the following extract from an appeal issued in behalf of the object, by a committee whom we will presently introduce to our readers:

"Our deceased friend had but few of this world's goods in possession at the time of his death, and those who had been dependent upon him during his sojourn upon earth were, in a measure, thrown upon the charities of a cold world. His estimable widow found a residence in the family of her beloved mother, whose decease, on the 17th of February last, at the advanced age of eighty-four years, has deprived Mrs. Skinner of a home, and has entirely frustrated all her plans for the future. A proposition was before the Maryland State Agricultural Society, soon after the decease of Col. Skinner, to raise five thousand dollars as a donation to Mrs. Skinner, which was received with much favor, but was never successfully prosecuted. It has been earnestly recommended that the raising of this amount for Mrs. Skinner, be united with the one thousand proposed to be raised for the monument, especially since the death of Mrs. Bland, the mother of Mrs. Skinner, has left Mrs. S. in circumstances of destitution."

It will be perceived that the whole amount proposed to be raised for the two objects is six thousand dollars, to wit: one thousand for the block to be placed in the National Washington Monument, and five thousand as a donation to Mrs. Skinner.

The following gentlemen are the acting committee for bringing these objects before the American public: Henry C. Carey, Esq., Chairman; the venerable GEO. WASHINGTON PARK CUSTIS, Hon. Marshall P. Wilder, President of the U. S. Agricultural Society; Hon. James M. Porter, President of the Corporate Council of Easton, Pa.; Dr. M. W. Phillips, a distinguished planter and farmer in Edwards, Miss.; Lewis G. Morris, Esq., ex-President of the N. Y. State Agricultural Society; Roswell C. Colt, Esq., of Paterson, N. J., a distinguished importer and breeder of stock; Hon. Allen Trimble, ex-Governor of Ohio; Dr. Alfred Langdon Elwyn, President of the Pennsylvania Agricultural Society; Peter A. Browne, LL.D., of Philadelphia; Hon. W. M. Meredith, late Secretary of the Treasury; C. M. Saxton, Esq., the extensive Agricultural book-publisher of New-York; G. Blight Browne, Esq., ex-President of the Montgomery County (Pa.) Agricultural Society; Benj. Perley Poore, Esq., of the Indian-Hill farm, and member of the Ex. Com. of the U. S. Agr. Soc.; J. D. B. De Bow, Esq., of the Census Office, Washington, and Editor of De Bow's Review; David S. Brown, Esq., merchant, and President of the Philadelphia Board of Trade; Hon. John Perkins, Jr., Member of Congress from Louisiana; Saml. Sands, Esq., Editor of the American Farmer, and Secretary of the Maryland State Agricultural Society; D. Jay Browne, Esq., author of the American Muck Book, and Head of the Agricultural Department of the Patent Office, Washington; Aaron Clement, Esq., agent for the sale of stock, Philadelphia; Hon. A. G. Brown, ex-Governor of Mississippi, and Senator from that State; David Landreth, Esq., proprietor of the extensive farm and garden-seed store, Philadelphia; H. D. C. Wright, Esq., merchant of Baltimore; Major John Jones, of Delaware, member of the Executive Committee of the U. S. Agricultural Society; Dr. J. W. Thomson, ex-President, and Chauncey P. Holcomb, Esq., President of the Delaware State Agricultural Society.

In an appeal recently issued in behalf of these objects, the committee use the following language:

"The committee are anxious that you should act as promptly as possible in this matter, as they wish to place the block in the hands of an artisan as soon as they can be assured of the necessary funds to warrant them in giving the order. The work on the National Monument at Washington, which has been suspended during the cold weather, is now resumed. The committee earnestly desire that the block to the memory of our deceased friend may have a conspicuous position in that stupendous pile, that the millions who shall visit it in ages to come may be reminded of JOHN STUART SKINNER, the distinguished friend and patron of the Agricultural, Manufacturing, and Mechanic Arts in America. They confidently hope that you, dear sir, will not only be liberal, but prompt, in responding to this appeal. Shall these objects be accomplished? Shall a block, which shall perpetuate the memory of a great, because a useful man, be placed in the Washington National Monument, and the widow's heart be made to rejoice in the receipt of a donation which shall relieve her from temporal anxiety the residue of her days? The committee are unwilling to believe that objects so worthy, and which commend themselves so earnestly to every feeling heart, shall be suffered to fail for want of the very small amount which they ask each individual to contribute. They make this appeal to every planter, farmer, merchant, manufacturer, mechanic, artisan, horticulturist, and professional man; for John S. Skinner was the friend and patron of all these promoters of our country's prosperity and greatness. It is expected that the personal friends of the deceased will exert themselves in effecting the objects contemplated by the committee."

The very small amount which they ask each individual to contribute, is the price of one year's subscription to *The Plough, the Loom, and the Anvil*, for which the donor shall receive that work one year from the commencement of the volume beginning with the July number, and containing a partrait of Mr. Skinner, engraved from a daguerreotype taken a few days before his death, with a Biographical Sketch, written by Benjamin Perley Poore, Esq., from materials furnished by Mr. Skinner himself a few days before the close of his eventful life. The number for July will contain the Portrait and Sketch, and the number for June, 1855, being the last number of the volume, will contain an engraving of the Monument, the inscription, names, and post-office address of donors, final report of the committee, and every thing of interest connected with the movement.

The committee have made an arrangement with the publisher, by which any person not now a subscriber, who contributes the price of one year's subscription to *The Plough, the Loom, and the Anvil*, may, if he request it, receive that work one year from July next, while one half thus contributed goes to the objects contemplated by the committee. They thus state their reasons for this arrangement:

1. Every donor, by this arrangement, receives the full value of the money contributed, in the monthly journal, which will be sent to his address one year from July, 1854, making a volume of the choicest agricultural, mechanical, and manufacturing reading matter, of 768 pages.

2. This arrangement secures to each donor a life-like portrait and biographical sketch of Col. Skinner, which every one, it is presumed, would be glad to possess.

It will be perceived that six thousand subscribers on the foregoing plan, would give the committee the six thousand dollars desired for the monument and donation to Mrs. Skinner, while each subscriber will receive back the full value of his subscription in the yearly volume of *The Plough, the Loom, and the Anvil.* Thus will each donor aid in the successful accomplishment of the praiseworthy objects undertaken by the committee, and at the same time receive a full equivalent for the money he contributes.

We believe our readers have it in their power to raise, by this means, the full amount of money required by the committee for the monument and donation to Mrs. Skinner. Take the journal to your neighbor who is a non-subscriber, tell him that by contributing the price of one year's subscription, he aids in rearing a monument to a useful man, makes the widow's heart rejoice, and secures to himself a yearly volume of 768 pages of choice reading matter.

The committee have desired the publisher to act as their agent in the movement, and thus announce the subject in their published appeal:

"The committee request that letters and donations in behalf of this object may be directed to Myron Finch, Esq., Office of *The Plough, the Loom, and the Anvil*, No. 9 Spruce street, New-York, whom they have constituted their agent for that purpose. The pages of that journal will contain statements, from time to time, of the progress of the work, in addition to the full account which is to be published in the last number of the volume, beginning in July next, and which is to be sent to each person contributing towards the object."

We confess to a feeling of pride in our desire to see these objects accomplished. We should feel flattered, as the successor of Col. Skinner, if the whole amount required could be raised by the present subscribers to *The Plough, the Loom, and the Anvil.* And we repeat it, this could easily be done, if every subscriber would take a lively personal interest in the subject, and send *at least* one name, with a year's subscription, one half of which is to aid the committee in the furtherance of these objects. Will each one of our subscribers devote an evening, a half day, or a whole day if need be, in behalf of these measures? Remember, it is for the widow that we make this appeal, and the widow of one who has done more than any man living to help forward those industrial pursuits in which you are all engaged. Let not this appeal be made in vain. While the subject is fresh in your minds, seek some one who will contribute the requisite amount, and forward it for that purpose; or failing in this, contribute the money yourselves, and let the journal be sent to some friend. But act promptly, without any delay—act decidedly and energetically—act generously, and you shall have the blessing of the widow and the widow's God! Need we say more to insure a hearty response to this appeal?

DEATH OF RICHARD C. THOMSON.

It is with no ordinary feelings of sorrow that we record the death of one well known to our readers as the Philadelphia publisher of *The Plough, the Loom, and the Anvil,* to wit: Richard C. Thomson, Esq. Mr. Thompson was born in the city of Philadelphia, and at the time of his death was about thirty-two years of age. His father was a druggist, in Arch street, below Second, and Mr. Thomson's early years were passed in his father's store. He subsequently entered the book-store of Carey & Hart, and became perfectly conversant with the book-trade in all its various departments.

Soon after the commencement of *The Plough, the Loom, and the Anvil,* he entered the employment of Col. Skinner, and at his decease became his administrator. It was in this capacity that the writer first became acquainted with him, in June, 1851, in negotiating the purchase of that work. After the sale was effected, Mr. Thomson became associated with Henry Carey Baird, in the book-trade, but continued to conduct the agency of *The Plough, the Loom, and the Anvil,* at Mr. Baird's store in Philadelphia. His avocation caused him to make frequent visits to New-York, and what commenced with the writer as a business acquaintance, soon ripened into the most intimate friendship.

His last visit to New-York was on the 8th and 9th days of March. The writer parted with him at our office in the afternoon of the 9th, he purposing to return to Philadelphia in the evening train. He was too late, however, for the train, and returning, took lodgings at a hotel until morning; and it was there, as he informed the writer, that he took a cold which was the immediate cause of his death. He said the sheets of his bed were *damp,* and he soon found himself chilled through and through, in which condition he remained some time before going to sleep.

On returning home the next day, he found himself suffering with a severe attack of the asthma, but, unwilling to yield to the disease, he continued in the store until Friday, the 17th of the month. The writer saw him at his house on Wednesday, the 22d, at which time he stated the origin of his disease, attributing it to the dampness of the sheets at his hotel, as already stated. There was no day between the time of his taking to the house and his death, that he was not able to be up and post his books, which he had taken home with him for that purpose. The writer was in Philadelphia at the time, but the condition of Mr. Thomson was so comfortable, that he did not deem it advisable to call on him again, before being informed of his death.

On Wednesday evening, the 29th, he was apparently much easier, and his immediate friends felt not the slightest uneasiness in relation to his recovery. Early on the morning of Thursday, the 30th, his symptoms became more alarming, and his disease continued to increase in malignity until five o'clock, when he ceased to breathe.

Our friend was constitutionally predisposed for such a disease as the one that finally removed him from earth. He had long had a consumptive cough, and it was the opinion of his friends that he would finally die of that disease. There was nothing in his case, however, before taking the cold, which indicated that he might not live many years. His cough was not unusually severe at the time, and his general health was good. It was the asthma, in its most malignant form, that was the immediate cause of his death.

Mr. Thomson has left a wife, and a child two years old, a mother and a sister, beside a numerous circle of friends, to mourn his loss. In all the relations of life he sustained an untarnished reputation, being an affectionate friend, a kind husband, father, brother, and son. His death has caused a void to be felt in many a heart, which it will not be easy to fill. To the writer he was like a brother, warm in his attachments, and kind and obliging to a fault. He has left behind him the savor of a good name, derived from the practice of those virtues which, if cherished by the living, would deprive the dying hour of many a sad reflection, and rob death of its terrors. His memory will long be cherished by many who will mourn his loss, and by none more fondly nor more sincerely than by him who has penned this hasty tribute to his excellence and worth.

M. F.

Crystal Palace.—This great exhibition has been closed for a few days to open on or about the first of May, with a new inauguration and with large invoices of goods just arrived from Europe, as well as others from this country. A season of great popular favor now awaits this great industrial institution. We can not doubt it. Make your calculations to see for yourself.

The Crystal Palace.—American enterprise is about to acquire new laurels under the reformed management of this great Exhibition. The former board did as well as they could in the entire absence of experience, but the show promises to be far better for the coming season than it has yet been. The nation has already been honored, though at the cost of individual stockholders. We trust that all will now receive benefit, corresponding with their interest in the exhibition. We give below the principal part of the letter addressed by Mr. Barnum to the directors. It will be read with interest by every man, woman, and child in the country, who takes pleasure in exhibitions of the beautiful, or in the prosperity of the country in these numerous departments of art.

After speaking of the successful progress of the effort to raise $100,000, in its behalf, by the sale of tickets, &c., he proceeds thus:

"I have directed, therefore, that the Exhibition, in view of its new character, be temporarily closed on Saturday evening the 15th inst., to reöpen with a popular reïnauguration and appropriate ceremonies on the 4th of May next, the details of which will be furnished by the Committee of Arrangements, Messrs. Horace Greeley, Charles Butler, John H. White, Edward Haight, and P. T. Barnum.

The interval mentioned will afford a much needed opportunity for the reception and arrangement of a world of rare and beautiful articles that have recently come consigned to us from Europe, as well as some exceedingly interesting American and foreign specimens in machinery, manufacture, and general art, that have awaited our determination to place the Crystal Palace among the imperishable enterprises of the age and the nation.

The Dutch Government has just contributed a large and choice variety of singularly unique articles of luxury and use from Japan. They number about one thousand, and can not but prove wonderfully attractive, as tending to throw much light upon the peculiar habits of a reserved and extraordinary people.

Our Foreign Agent, Mr. Charles Buschek, advises us, that in consequence of the unsettled state of the European Continent, the number of costly paintings and valuable *chefs d'œuvres* in sculpture ready to be placed at our disposal is unusually great, and will be forwarded without delay now that every apprehension that the Exhibition will be a transitory speculation has been disposed of. His report in relation to the more novel and elegant manufactures of Europe is equally gratifying; and I may add that arrangements are being perfected for the purchase of a collection of admirable copies of all the celebrated statues of the Antiques—a collection that, in itself, will present the highest claim to the popular taste and attention.

A perfectly correct and handsome model of Venice, covering about one thousand square feet, and exhibiting every minute detail of that beautiful city, in carved wood, from the reality itself, will also be added.

Several eminent Horticulturists have manifested a desire to embellish the Crystal Palace with a profuse variety of uncommon plants and flowers. A number of musical societies and bands have also intimated a wish to add, in turn, their attractions to the popularity of the Exhibition. With all these, suitable arrangements will be effected.

The Committee, (consisting of Messrs. Mortimer Livingston, Watts Sherman, Wm. Whettan, Wm. B. Dinsmore, and Charles H. Haswell,) appointed to solicit our own citizens for fine-art contributions, find that but one feeling pervades all classes of the people in reference to our undertaking. All seem to manifest the most earnest interest in its success, and all are anxious for an opportunity to aid us in its popularization. We may confidently depend, therefore, upon a very extensive selection of gems of art from private and domestic sources, worth in the aggregate several hundred thousand dollars, and in point of intrinsic merit approached by no similar exhibition on this continent.

The amplest facilities will be extended to exhibitors, among which will be the important right to affix the price to any article of which they may wish to dispose, to direct visitors where duplicates may be obtained, and remove their contributions, at any time, by giving only one week's notice in advance.

The machinery department will be much fuller and more effective than hitherto.

There will be operating specimens of nearly every great invention, and in some instances the entire process of manufacturing various fabrics will be exhibited.

As steam-power and space will be gratuitously furnished for the most interesting processes in art and industry, and as inventors and exhibitors will be permitted, under certain judicious regulations, to run the machinery for their own benefit, this branch of the Exhibition is expected to become especially interesting.

Allow me to recommend, in this connection, that the Board of Directors announce at an early day, its determination to award medals and other marks of merit to those who may be, by competent judges, pronounced worthy of the distinction. The medals and diplomas awarded for 1853, will be ready for delivery in the beginning of May. Under the new organization, every article will be classified to facilitate inspection. Those of the same kind, as far as practicable, will all be grouped together, no matter from what quarter of the world contributed. The visitor may thus at a single glance, institute a just comparison between the different developments of taste and skill in different countries. A novel and useful plan of reärrangement has been decided upon that will nearly double the space previously appropriated to exhibitors throughout the entire building. We need not hesitate to publish, therefore, our ability to find room for any thing pleasing or useful that may be intrusted to us, and to invite every man and woman in the world to originate something for this concentration of the "Industry of all Nations," that may redound to their credit and benefit our common humanity.

Among the accommodations arranged for visitors to the Crystal Palace, will be found two telegraph-offices, letter-boxes for the mails, express-boxes, a police-station, an office for property lost and found, and two spacious refreshment saloons, where every thing will be provided of unexceptionable quality at unexceptionable prices.

Arrangements have been completed with some, and are in progress with other steamboat and railroad companies connecting this city with various portions of the Union, agreeably to which visitors will be conveyed to the Crystal Palace from the remotest spot, at greatly reduced rates of travel. Nothing else shall remain undone, on my part, to conduct this magnificent enterprise with that liberality which is due to the public, and that energy and economy which are due to the interests of the Association."

Dr. Roehrig, of whom we made mention last month, has shown us testimonials from some of the greatest oculists in Europe. For a time he was first assistant of Dr. Deval, the most eminent oculist in Paris. His name also occurs with commendation in "*Annales d'Oculistique*, vol. 17, 1847. We have also witnessed his very successful management of a case of hemiope, or half-sight—where the upper half of any object was entirely invisible. We have also known his successful treatment of a case, in which almost total blindness had been occasioned by small-pox. He rarely uses instruments, and only when utterly indispensable.

American Gas Company.—The demand for the machines of this company are greater than their ability to supply them. They have contrived a portable gas-light.

New-England Wine.—We find that in many localities in Connecticut, wine of excellent quality has been made from the native grape within a few years, on a small scale, but in sufficient quantities to test the question, whether good wine can be made from the native grape of this State. In every instance a superior article has been produced. A gentleman of Andover made two barrels a few years since, and the physicians in his neighborhood ordered it to be used in sickness, as a much better article than the imported. He readily sold it for $2.50 a gallon. Two gentlemen of this city, each made a barrel last fall, from grapes purchased at $1 a bushel in the market. Six or eight bushels will make a barrel. We find on our desk a bottle from Mr. A. G. Graham, of New-Briton, and suppose from the word left with it, that it is from the native grape. We are satisfied that wine can be produced in Connecticut in large quantities, and at a great profit to the producer.—*Hartford Times.*

MORE IMPORTED STOCK.—We learn that S. W. Jewett, of Middlebury, Vt., has lately returned from Europe, where he has been spending the winter, with more French sheep, Suffolk swine, of Prince Albert's stock, a large collection of fowls, comprising Dorking, Spanish, and Normandy breeds. He also brought three varieties of the basket-willow.

THE HOG TRADE.—The Cincinnati *Price Current* publishes its final report of the hogs packed in the West, showing a net increase in the number of three hundred and thirty-three thousand, being equal to fifteen per cent over last year. The report embraces two hundred and sixty points, and is the fullest ever published.

A HAPPY EDITOR.—The editor of the *Ohio Cultivator*—fortunate man!—is so happy as to be able—with a good conscience of course— to indite and print the following:

ACKNOWLEDGEMENTS.—"We have the best set of subscribers in the world, so many of them are willing to act as a committee of one to increase our list. The late response to our friendly hint has laid us under renewed obligation, and we will not trouble you again in that way till next December; meanwhile we are willing to have it understood that we are *still taking!*"

If we could say the same of ours, how happy we should be! But we are not so fortunate. We would add the promise of a *gift premium* for all such, and even then, we scarcely dare hope. Friends, what say you?

THE LITTLE MIAMI RAILROAD is said to be one of the most successful roads in the country. It has divided 10 per cent and has earned 14, with a fair prospect of equal success hereafter—the result not of peculiar facilities, but of judicious management.

NATIONAL POULTRY SHOW.—An official statement informs us that at the late Poultry Show, at Barnum's Museum, there were 215 exhibitors, 700 coops, and 4000 fowls. The number of visitors was 30,000. It is pronounced the best exhibition ever made in this country. Another is proposed some time next autumn, perhaps in October.

OHIO AND MISSISSIPPI RAILROAD.—The opening of this road from Cincinnati to Aurora was celebrated on the 4th of April. 1200 guests from the city were conveyed by three trains, and partook of a grand banquet at Aurora.

HORSES.—The Middlebury (Vt.) *Register* states that Messrs. Douglass, of Cornwall, have sold their chestnut horse, by "Black Hawk," to parties in Lockport, N. Y., for $2600. We also learn that S. G. Foot, of Cornwall, has lately sold a horse of the same stock for $2000, to come to Ohio. Who has got him?

L. G. Morris, of Fordham, N. Y., has purchased the celebrated race-horse "Monarch," of Col. Wade Hampton, of South Carolina.

HOW TO TREAT YOUR BOOTS AND SHOES WHEN PARTIALLY BURNED.—On one of the coldest days of the present month, I pulled off my boots and set them close to a stove which was very hot. The room was filled with a smell as of something burning. Turning round, I saw my boots smoking at a great rate. I seized them and immediately besmeared them with soft soap, much of which, owing to their highly heated condition, quickly disappeared in the leather. When the boots became cold, the leather was soft and pliable; and now, after several days of subsequent wear, they exhibit no marks of having been burned.

We have some knowledge of the above in our experience, and commend it as worthy of attention.

SHOWER-BATH.—Daniel P. Baldwin, of San Francisco, Cal., has invented a form of shower-baths, which consist in employing two revolving, trumpet-shaped shower-baths connected together by a collar, in combination with a passage in the horizontal end of the main supply-pipe; one serving, when fixed in the proper position, to throw the water upward, so that it shall descend in the form of spray, while the other may be so placed as to direct the stream of water against any portion of the body. Either warm or cold water, or both, may be supplied to the sprinklers.

ONE-PRICE CLOTHING STORE IN PHILADELPHIA.—Lippincott & Co., at the red store, south-east corner of Fourth and Market streets, Philadelphia, have a very large assortment of ready-made clothing, both for men and boys, of a superior quality and at low prices. They have adopted the one-price system, which they find to work well, as they sell much lower than other establishments. We purchased a suit from their ample stock, and can bear testimony to the cheapness of the goods, and the excellence of their workmanship. Persons visiting our sister city, in want of clothing, can not fail to be satisfied as regards price, quality, and an extensive assortment from which to select, at the one-price store of Lippincott & Co.

POWERFUL LOCOMOTIVE.—The motive power of the Baltimore and Ohio Railroad Company has been improved and rendered more efficient by the completion of one of those first-class, powerful, coal-burning passenger-engines. It is designed for the heaviest of the mountain grades, commencing at Piedmont, 207 miles from Baltimore, and running about sixty miles near Three Forks, the junction of the Parkersburg road. The engine has ten wheels, six of which are drivers, and a truck of four wheels. The drivers are 50 inches in diameter, and the trucks 30. The cylinders measure 19 inches in diameter, with 20 inches stroke of piston. The cylinder part of the boiler is 48 inches diameter and 14 feet long. The drivers are connected, and have a weight of 45,000 lbs., equally distributed between them by means of levers and springs. The whole weight of the engine in running order is 60,000 lbs., or 30 tons, and the entire length from back of foot-board, to point of fender in front, is 28 feet. It is supplied with a cut-off, for working steam expansively. This engine is intended to draw five passenger cars up the heavy grades at a speed of twenty miles per hour; is known as No. 203, and was designed by, and built under the direction of, Mr. Hays, of the Company's foundry.

NEW BOOKS.

FAMILIAR SKETCHES OF SCULPTURE AND SCULPTORS. By the author of "Three Experiments in Living," "Sketches of the Lives of the Old Painters," &c. Boston: Crosby, Nichols & Co. 2 vols. 1854.

THESE volumes are exactly what they should be. The learned authoress has shown great tact in selecting proper topics of remark, and in treating the several characters she describes. We know of nothing so desirable on these subjects for the general reader. Her style is finished, while it is graceful and familiar. She deserves a high rank among American writers.

OUTLINES OF THE GEOLOGY OF THE GLOBE, AND OF THE UNITED STATES IN PARTICULAR, with two geological maps and sketches of characteristic American fossils. By EDWARD HITCHCOCK, D.D., LL.D. Second edition. Boston: Phillips, Sampson & Co. 1854.

THIS is a book much needed. It fills a gap which has long remained a blank. We need not say it is done by one admirably qualified, and in a manner worthy of the author. It is a condensed epitome, to refresh the memory of him who is well read in the subject, and to give a bird's-eye view, and yet a comprehensive one, to him who can devote but little attention to the subject. The maps are well designed and well executed.

THE RELIGION OF GEOLOGY AND ITS CONNECTED SCIENCES. By EDWARD HITCHCOCK, D.D., LL.D. Eighth thousand. Boston: Phillips, Sampson & Co. 1854.

THE first point of interest which attracts attention in opening this volume, is its dedication to his wife, a lady whose illustrations of his Report on the Geology of Massachusetts added so much to the interest of the work. Without sentimentalism, it is affectionate and respectful. The work itself has been written and been before the public for several years, but has received from time to time such "additions and alterations" as the many discoveries in the science meanwhile have suggested. They are the convictions of his mind, deliberately formed and thoroughly examined. The work embodies fourteen lectures, as follows: Revelation illustrated by Science; The Epoch of the Earth's Creation Unrevealed; Death a Universal Law of Organic Beings on this Globe from the Beginning; The Noackian Deluge Compared with the Geological Deluges; The World's Supposed Eternity; Geological Proofs of the Divine Benevolence; Divine Benevolence as Exhibited in a Fallen World; Unity of the Divine Plan and Operation in all Ages of the World's History; The Hypothesis of Creation by Law; Special and Miraculous Providence; The Future Condition and Density of the Earth; The Telegraphic System of the Universe; The Vast Plans of Jehovah; Scientific Truth, rightly applied, is Religious Truth. These topics, among the most important that can be discussed, are illustrated with great ability.

De Bow's Review, Industrial Resources, etc.—The April number of this very elaborate monthly is uncommonly rich in its contents. Mr. De Bow deserves the patronage of the entire community. He has an able corps of contributors, and he gives us a monthly treat not inferior to the best of the kind ever published in this country. It is "primarily adapted to the Southern and Western States," but is full of interest to all. We have often commended this work, and every month but confirms our high opinion of it. May his shadow never be less!

Putnam's Monthly.—Some men can laugh at competition, and even rejoice to see strong men labor to secure an advantage over them. Putnam is one of these. His corps of racy writers moving along, *in solid column*, under the lead of equally able editors, go on from month to month, without fear or doubt, and have nothing in fact to do but just write on, while they thankfully receive the laurels which the hosts of their delighted readers, apparently as a matter of course, entwine for their brows. Success to Putnam!

Harper's New Monthly.—Fires can not consume human enterprise, though its fruits may be buried in ashes fathoms deep The Harpers illustrate this in an eminent manner. The April number of their magazine was promptly issued, and its contents are as good as ever. Success to these excellent and enterprising men!

List of Patents Issued,

FROM MAR. 7 TO APRIL 11.

Geo. B. Field, of St. Louis, Mo., for improvement in rotary cultivators.

Oliver Leslie, of Attica, Ind., for improved saw-set.

Orrin Newton and J. A. Crever, of Pittsburgh, Pa., for improvement in excluding dust from railroad cars.

Andrew Overend, of Philadelphia, Pa., for improvement in machine for damping printing paper.

Joseph W. Robinson, of Kirkland, N. Y., for improvement in form of scythes.

Edwin Milford Bard, of Philadelphia, Pa., for improvement in mould-boards of ploughs.

James Perry, of Roxbury, Mass., for improved method of constructing moulds for making printing-blocks.

Russell D. Bartlett, of Bangor, Me., for improvement in machines for making shovel-handles.

Frederick Espenschade, of Mifflintown, Pa., for movable tapering nozzles to the exhaust-pipes of locomotives.

Chas. W. Billings, of South Deerfield, Mass., for improvement in seed-planters.

Joshua Cross, of New-London, Ohio, for improvement in faucets for measuring liquids.

Edward S. Haskins, of Boston, Mass., for improvement in spring-clamps for clothes lines.

Elbridge G. Hastings, of Brooklyn, N. Y., for improvement in machines for dressing stone.

Albert Hock, of Paris, France, for process for gilding or plating fibrous substances. Patented in France, Dec. 15, 185 .

J. B. Larwill and J. Cross, of Bucyrus, Ohio, for improvement in faucets for measuring liquids.

Eldridge H. Penfield, of Middletown, Conn., for improvement in metallic grummets for sails.

Orson C. Phelps, of Boston, Mass., for improved stop-cock.

Ezra Ripley, of Troy, N. Y., for improvement in rotary engines.

Nathaniel Smith and Asa Crandall, of North Kingston, R. I., for improvement in machines for grinding cotton-cards.

Welcome Sprague, Ellicottsville, N. Y., for improvement in seed-planters.

Jas. H. Sweet, of Pittsburgh, Pa., for hanging of the griping-jaw of spiking machines, in weighted levers.

Philander Shaw, of Abington, Mass., for improvement in rotary cultivators.

Abijah Taylor, of Pekin, Ill., for improvement in steam engine faucet-valves.

Mansel Blake, of Sutton, N. H., assignor to himself, Jas. B. McAlestee, and Erastus Blake, of same place, for improved folding-blinds.

Westel S. Daniels, of Pauama, N. Y., for improvement in obstetrical supporters.

Lewis Fagan, of Cincinnati, Ohio, for improvement in smut-machines.

Alpheus Kimball, of Fitchburg, Mass., for improvement in securing window-sashes.

Daniel S. Middlekauff, of Hagerstown, Md., for improvement in grain-harvesters.

Simon Pettes, of New-York, for improvement in machines for drilling stone.

Jonathan Burrage, of Roxbury, Mass., assignor to himself and Frederick W. Newton, of Newton, Mass., for improvement in processes for making varnishes.

J. G. Macfarlane, of Perry County, Pa., for improvement in seed-planters.

Victor Beaumont, of New-York, N. Y., for improved machine for distributing types.

Henry Green, of Ottawa, Ill., for improvement in grain-harvesters.

Ralph Bulkley, of New-York, N. Y., assignor to G. S. Cameron, of Charleston, S C., for improvement in machines for rubbing type.

F. C. Goffin, of New-York, N. Y., assignor to Alfred B. Ely, of Boston, Mass., for improvements in safe-locks.

Obadiah Marland, of Boston, Mass., for improvement in iron safes.

R. P. Benton, of Rochester, N. Y., for improved machine for dressing spokes.

Jeremy W. Bliss, of Hartford, Conn., for improvement in lifting-jacks.

Chas. T. Appleton, of Roxbury, Mass., for improvement in processes for dyeing.

A. C. Carey and Jeremiah Smith, of Ipswich, Mass., for improved hydraulic engine.

Dexter H. Chamberlain, of Boston, Mass., for improvement in screw-wrenches.

Thos. Carpenter, of Manlius, N. Y., for improvement in concaves of clover-hullers.

Chas. H. Fonde and T. B. Lyons, of Mobile, Ala., for improvement in dredging-machines.

J. L. Garlington, of Snapping Shoals, Geo., for improvement in grain-threshers.

Chas. W. Hawks, of Boston, Mass., for improvement in nippers for printing-papers.

Philip H. Kells, of Hudson, N. Y., for improvement in harvesters.

Jordan L. Mott, of New-York, N. Y., for improvement in railroad car-wheels.

Ambrose Nicholson, of Poland, N. Y., for improvement in self-fastening shutter hinges.

J. G. Shands, of St. Louis, Mo., for improvement in machines for dressing mill-stones.

C. V. Ament, of Dansville, N. Y., for improvement in devices for preserving hens' eggs in the nest.

David A. Morris, of Pittsburgh, Pa., for improvement in anti-friction boxes.

Charles T. Appleton, of Roxbury, Mass., for improvement in dyeing apparatus. Patented in England, Jan. 7, 1854.

D. A. Cameron, of Butler, Pa., for improvement in belt-saws.

Thos. Dougherty, of Erie, Pa, for improvement in shoe-lasts.

George W. Livermore, of Cambridgeport, Mass., for improved machinery for making barrels.

Samuel McKenna, of Cincinnati, Ohio, for improvement in portable metal-punches.

David and Herman Wolf, of Lebanon, Pa., for improvement in seed-planters.

Alex. Wilbur, of Lancaster, Pa., for improvement in machines for jointing staves.

Heman Gardiner, of New-York, N. Y., for improvement in quartz-crushers. Patented in England, July 5, 1853.

Jeremiah W. Brown, of Hartford, Conn., assignor to S. M. Folsom, of Charlestown, Mass., for rotary smoothing-iron.

Elijah Valentine and Abel Bradway, of Monson, Mass., for improvement in machines for jointing staves.

Elbridge Webber, of Gardiner, Me., for improvement in ship's blocks.

Ellsworth D. S. Goodyear, of Stapleton, N. Y., assignor to New-York Rubber Company, of New-York, for improvement in processes for treating India rubber.

Robert H. Harrison, of Washington, D. C., assignor to Robt. H. Harrison and Jno. S. Gallagher, Jr., of same place, for improvement in churns.

A. J. Cook, of Enon, Ohio, for improvement in the discharging-apparatus of harvesters.

H. G. Ellsworth, of Auburn, N. Y., for improvement in belt-clasps for machinery.

Benjamin G. Fitzhugh, of Frederick, Md., for improvement in harvesters of grain.

Luther B. Fisher, of Coldwater, Mich., for improvement in seed-planters.

Benaiah Fitts, of Worcester, Mass., for improvements in feed-water apparatus for steam-boilers.

Richard Jones, of the county of Burlington, N.J., for improvement in making zinc white.

Seymour Ketchum, of Lancaster, Ohio, for improvement in smut-machines.

Charles P. Bailey, of Zanesville, Ohio, for portable head-rest for chairs.

Anson Balding, of Olney, Ill., for improvement in submarine scoops.

Thos. W. Chatfield, of Utica, N. Y., for improvement in hot-air furnaces.

Joseph Marks, of Dunkirk, N. Y., assignor to Wm. Whiting, of Roxbury, Mass., for improvement in machinery for operating car-brakes. Patented in England, Nov. 23, 1852.

Joseph Marks, of Boston, Mass., and John Howarth, of Salem, Mass., assignors to Wm. Whiting, of Roxbury, Mass., for improvement in machinery for operating car-brakes.

John Absterdam and Wm. Merrell, of Boston, Mass., assignors to Jas. A. Woodbury, of Winchester, Mass., and Wm. B. Merrell, of Boston, Mass., for improved device for tonguing and grooving tapering boards.

Richard D. Mott, of Spring Garden, Pa., for improvement in stereotype-pans.

Nicholas G. Norcross, of Lowell, Mass., for improvement in feed-motion for sawing lumber.

David B. Rogers of Pittsburgh, Pa., for improvement in machines for forming cultivators' teeth.

Wm. H. Seymour, of Brockport, N.Y., for improvement in harvesters.

Ephraim, Titus and Emerson Sizer, and Amos Halladay, of Westfield, Mass., for improvement in Sacket's braiding-machine.

Joseph Smart, of the Northern Liberties, Pa., for improvement in pumps.

Henry C. Smith, of Cleveland, Ohio, for improved construction of shingle-machines.

Thos. G. Stagg, of Jersey City, N. J., for machine for tenoning, &c., blind-slats.

Jonathan C. Trotter, of Newark, N. Y., for improvement in furnaces for zinc-white.

Geo. Trott, of Pittsburgh, Pa., for improved oil-cup for steam engines.

Wm. Webster, of Morrisania, N. Y., for improvement in machines for bending sheet-metal.

R. A. Wilder, of Schuylkill Haven, Pa., for improvement in railroad car-wheels.

Edward H. Ashcroft, of Boston, Mass., for improvement in track-cleaners for railroads.

Joseph Leeds, of Philadelphia, Pa., for improvements in cooking-stoves.

Henry Underhill, of Canandaigua, N. Y., for improved hand printing-press.

James Baxendale, of Fall River, Mass., assignor to himself, and James Ferguson, of Taunton, Mass., for improved method of operating the doctors of calico-printing cylinders.

Solomon Andrews, of Perth Amboy, N. J., for improvement in drop and die forging and punching machine. Patented in England, Oct. 7, 1852.

Bernard J. La Mothe, of New-York, N.Y., for improvement in railroad cars.

B. A. Lavender and Henry Lower, of Baltimore, Md., for improvement in treating cane-fiber for paper and other purposes.

Rodney Miller, of Middlefield, Ohio, for improvement in carriage-tops.

Oldin Nichols, of Lowell, Mass., for improvement in chain-cable stoppers.

Elijah Roberts, of Rochester, N. H., for improvement in gates for water-wheels.

David A. Wells, of Cambridge, Mass., for improved preparation of vegetable fibers.

Wm. H. Atkins, (assignor to Samuel J. Parker,) of Ithaca, N. Y., for improvement in cops for sewing-machines.

Lorenzo D. Goodwin, of Pennville, N. Y., for improvement in water-wheels.

Willis Humiston, of Troy, N. Y., for improved candle-mould apparatus.

E. R. Ball, of Kalamazoo, Mich., for improved bedstead-fastenings.

Solomon G. Booth, of New-York, N. Y., for improvement in machines for corrugating sheet-metal.

Benjamin Eakins, of Spring Garden, Pa., for improvement in valve-cocks.

A. K. Eaton, of New-York, N. Y., for improvement in amalgamating gold and silver.

Henry W. Farley, of East Boston, Mass., for improvement in railroad frog-guards.

Phanuel Flanders, of Lowell, Mass., for improvement in cranberry-winnowers.

William Gates, Jr., of Frankfort, N. Y., and H. J. Harwood, of Utica, N. Y., for improved machine for making friction-matches.

Charles Goodyear, of New-Haven, Conn., for improvement in treating vulcanizing-gums.

Carmi Hart, of Bridgeport, Conn., for improvement in machine for cutting veneers.

Stephen Hedges, of New-York, N. Y., for improved combined table and chair.

Morris Mattson, of Boston, Mass., for improvement in enema syringes.

L. O. P. Meyer, of Newtown, Conn., for improvement in treating caoutchouc and other vulcanizable gums.

Jno. Nesmith, of Lowell, Mass., for improvement in machines for making wire-netting.

Abiel Pease, of Enfield, Conn., for improved drill for metal-drilling.

Joseph Sollenberger, of Higginsport, Ohio, for imrovement in training the vine.

Jacob Edson, of Boston, Mass., for improvement in pumps.

Jas. McCarty, of Reading, Pa., for improvement in heating skelps for the manufacture of wrought-iron tubes.

Wm. S. Loughborough, of Victor, N. Y., for improvement in bit-fastening for cast-iron bench-planes.

Geo. W. Livermore, of Cambridgeport, Mass., for improvement in crozing the ends of staves. Patented in England, Aug. 31, 1853.

T. W. Lafetra, of New-York, N. Y., for improvement in machine for drying tobacco.

John Ogden, of Philadelphia, Pa., assignor to Chas. S. Ogden, for improvement in making railroad chairs.

James MacGregor, Jr., of Troy, N. Y., for improved coffee-pot.

Elbridge Marshall, of Clinton, N. J., for improvement in seed-planters.

Wm. Ball, of Chicopee, for improvement in mills for grinding ores, &c.

Thos. Carter, of Laurens District, S. C., for improvement in seed-planters.

Stephen Colwell, of Philadelphia, Pa., for improvement in iron buildings.

Samuel J. Parker, of Ithaca, N. Y., for improvement in sewing-machines.

Hiram Stafford, of Mount Pulaski, Ill., for improvement in rat-traps.

Thos. E. Seay, of Columbia, Va., for improvement in brick-machines.

Wm. A. Shaw and Geo. Parker, of Boston, Mass., for improvement in street gas-lamps.

Henry Sigler, of Houston, for improvement in fish-hooks.

Chas. Leavitt, of Quincy, Ill., assignor to Sterling B. Cockrill, of Nashville, Tenn., for improvement in machines for cleaning cotton.

James Harrison, Jr., of Milwaukie, Wis., for improvement in sewing-machines.

Jose Toll, of Locust Grove, Ohio, for improvement in rat-traps.

George W. Thayer, of Springfield, Mass., for improvement in trusses for iron bridges.

Nathan Thompson, Jr., of Williamsburg, N. Y., for improvement in reversible life-boats.

John Webster, of New-York, N. Y., for improved lubricator.

Henry Allen, of Norwich, Conn., for improved boring and mortising machine.

Francis Arnold, of Haddam, Conn., for combination of foot-stoves and lanterns.

Stephen P. Brooks, of Boston, Mass., for improved iron-frame upright piano-forte.

Julio T. Buel, of Whitehall, N. Y., for improved attachment for fish-hooks and artificial baits.

Lewis S. Chichester, of Brooklyn, N. Y., for improvement in dressing flax and hemp.

Albert G. Corlis, of Portland, Me., for improved swell-mute attachment to piano-fortes.

John Elgar, of Baltimore, Md., for improvement in door-hinges.

Richard H. Emerson, of Chicago, Ill., for improvement in earth-cars.

Alex. Hall, of Lloydsville, Ohio, for improvement in piano-forte actions.

The Plough, the Loom, and the Anvil.

PART II.—VOL. VI. JUNE, 1854. No. 6.

GEOLOGY.—COAL FORMATIONS.

THE mining of coal or iron is by no means so simple a matter as one who has not studied the subject may suppose. The error often made here is not unlike that which is entertained of gold-hunting in California. Many have had the impression that the precious metal is readily found there, in larger or smaller lumps, scattered everywhere upon the surface, and that the only work of the adventurer was to pick it up. Those who have read "Golden Dreams and Leaden Realities," or who have in any way become familiar with the modes of life and the severity of labor usually required for success in that field, have come to a very different conclusion. This pursuit is fraught with many difficulties, the result of the numerous disruptions and other disturbances, through which the crust of the earth has passed.

It has been supposed that the surface of the sea has been changed, its line of altitude having been depressed. More careful observation has led to the conclusion that, instead of this, the surface of the land has been elevated. It was thought, for example, that the waters of the sea once covered the beds of fossil rocks, which were always at their present level. The opinion now prevails that these beds have been elevated, upheaved; and this conclusion seems almost necessary, when we look into the processes which it is well known are now actually in operation. The evidence is conclusive, that in parts of Sweden, and along the gulf of Bothnia, a slow but constant upheaving movement has been going on for centuries. The relative level of the water and the land is essentially changed; and that this change is not in the sea is evident, because, among other reasons, this would necessarily involve a change in the levels of all oceans or seass in connection with these waters; that is, a change of level throughout the great system of oceans. But this phenomenon is by no means universal, while, on the other hand, there are localities, as in the southern part of Sweden, where the land has become comparatively lower than it once was. Where the change described has in fact taken place, to a greater or less extent, the ratio or extent of change has been very unequal, varying from a few inches to several feet in a century.

But though the general level of the seas remains the same, there is evidence, as we have before taken occasion to remark, that the level of the bottom of the sea has in many instances been essentially changed. One of the most obvious proofs of this fact is found in the condition of many coral islands. It is well known that the coral insect can not live many fathoms below the surface of the water, and yet coral formations are known to exist at very great depths. Hence the elevations, on which these formations rest, must have been materially depressed. Again, other formations of this sort have been greatly elevated. Such are many of the islands in the Pacific ocean, and in other regions very remote from these.

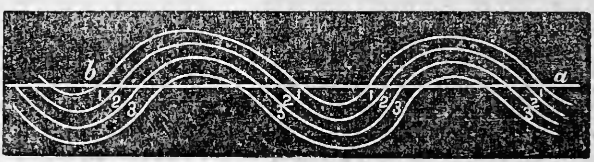
The remarkable position of many of the stratified rocks, seems to require us to entertain this opinion. Their regularity has been more or less disturbed, and sometimes completely destroyed, at least to the eye of the unskilled observer. Sometimes the strata are inclined, and in different regions, at very different angles. Sometimes they are nearly vertical. We have seen huge masses of stratified rocks presenting every appearance of having been bent, by some tremendous blow, like the concussion of two planets, nearly at right angles, and the solid rock broken by the violence to which it was subjected. In other cases, the strata have yielded to the force exerted upon it, and bent as if they were elastic. The thickness of some of these *bent* strata is also worthy of special note, and shows the immensity of the force exerted upon them. In Scotland, certain strata which are found bent with considerable regularity for some twenty miles in breadth, are nearly two thousand feet in thickness.

The more general appearance of these rocks is such as might be witnessed were powerful pressure applied to their extremities. For example: lay cloths of various colors over each other, upon a table, and then cause their extreme edges to approach each other. They will form waving lines, of more or less regularity, resembling the curves in figure 1. If this *disturbance* is continued to a given extent, the horizontal layers will assume a vertical position, like an inverted ox-bow, or like a manuscript *v* inverted. Under certain circumstances, the layers will be quite vertical and in close contact throughout. Such facts prove that the land, rather than the sea, has been subjected to various disturbing forces, which have produced great changes in its condition.

Such changes in the condition of stratified rocks necessarily occasion great uncertainty as to the value of what seems to offer great facilities for mining operations.

But these are not the only cause of doubt and difficulty to the practical miner. Suppose, again, that the upper portion of these strata are exposed to violence a sufficient length of time to be worn way, as if those portions of the

No. 1.

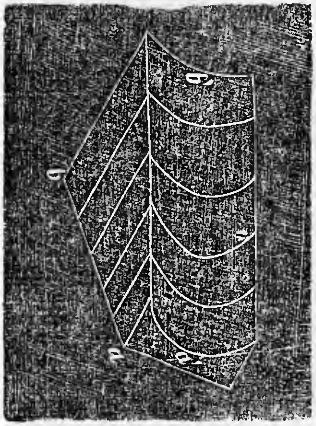


curved strata in figure 1, above the line *a b*, had disappeared, what phenomena would then present themselves? Plainly these: The various strata, numbered 1, 2, 3, would appear at four different places on the surface, so that, to an unskilled eye, it would seem that there were distinct independent strata at each of these four points, while in fact there is but one of each, though that one is exposed, or *crops out*, in different positions, four times.

But we have only begun to expose the difficulties the miner must encounter from this or similar disturbances. Instead of being *denuded*, or worn down to a horizontal surface, as shown by the line *a b*, in figure 1, suppose a deep channel should be worn into these rocks. Then, standing in this channel, it is obvious we should see the several strata, one above the other, and, for aught that could be seen, we might suppose they extended in a horizontal direction; and if we should make an attempt to trace a given stratum for a considerable distance parallel to the surface, we should soon discover our error, and be obliged to change entirely our mode of operations.

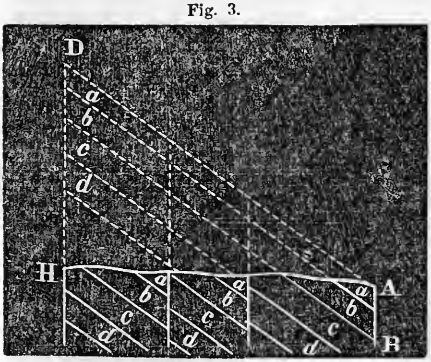
Or suppose the strata are found to *dip* considerably; that is, that they extend in an oblique direction, with reference to a plain surface, and that a channel or valley is scooped out in a direction *contrary to the dip of the strata*, as in figure 2. Here *b* is the lowest stratum or rock, and *a* the highest; that is, they were such before they were tilted from a horizontal position; and they still are such, since the others must be removed ere any given part of the *flat surface* of *b* can be exposed to view. But in the channel, in figure 2, the lowest stratum *b* is seen at the highest point *b′*, while *a*, the highest stratum, is seen at the lowest point *a′*. In other words, the order of the series, under such circumstances, appears reversed. For it must be borne in mind that the rocks are in fact visible only within this channel, their other parts being covered with earth, or otherwise hidden from view, or only a single stratum perhaps is visible.

No. 2.



We present but one other difficulty which the practical miner must encounter, and for which he ought to be prepared, and that is, the occurrence of FAULTS. While the *dip* of the strata may be uniform, and the relative position of the several rocks be well understood, through their entire extent, a given stratum may crop out in various places, and lead the observer to suppose that there are several strata of the same rock. Figure 3 will illustrate this. If A H represent the surface of the earth, where the strata *a b c* crop out at several places, an observer might suppose that each of these was a continuous stratum, and prepare his machinery to dig out the coal or the iron at one or all of these points, when by advancing a few feet only, he would come to a complete termination of the material sought for.

Fig. 3.



Originally these rocks formed one regular and uniformly inclined series of strata, as indicated by the dotted lines. But by successive, or at least by several distinct *depressions* of its different parts, an equal number of faults have been produced, as denoted by the perpendicular lines; and, instead of several extensive strata of coal or iron, etc., each of which might have been thought valuable property, the disappointed owner does not possess even one that will pay him for the outlay necessary to commence his mining operations.

The various phases presented by *denudation*, in these and other cases which we can not well illustrate by any means within our reach, are of very great importance to the practical miner. The value of a vein of metal, or of coal, is a question which science alone, without actual experience, can determine; and yet this is the question which is first in order, as well as first in importance, and he who essentially errs in its decision, may either waste a fortune in the fruitless endeavor to increase it, or he may have a fortune just beyond his fingers' ends, which remains of no practical value, because that value is not understood.

But there is another view in which this matter of denudation assumes gigantic proportions. We refer to its bearing upon the question of the earth's antiquity. It is obvious that the process which produced such changes, must have been carried on, however slow its action may have been, to an amount equal to all the alluvial and diluvial formations now existing. The unstratified rocks must have furnished the material for all the formations that have been poured over them. No new creation of matter for such purposes can be supposed, and hence it must be taken for granted that the unstratified rocks furnished primarily the material of all stratified rocks.

That this was a gradual process, and not the result of some sudden overflow, from volcanic eruptions or the like, is evident from the nature and condition of the new formations. These are not chiefly angular and fragmentary bodies, thrown promiscuously into heaps, but rather disintegrated particles, fine sands, rounded pebbles, and the like; and they often form thin and regular beds, as if the work of a skillful craftsman. Hence we infer that these changes were the result of that gradual process called denudation. But the results achieved are mighty in extent. There are regions of country, as in Rosshire, in Scotland, for example, where this process of denudation has removed a body of sand-stone, many miles in extent, and of a depth varying from one thousand to three thousand feet in thickness. Those widely-separated mountains bear striking evidence that they are but detached masses, from which the material formerly uniting them from base to summit, has been removed. According to Prof. Ramsey, in his *Survey of Great Britain*, there must have been removed from around the summit of the Mendips, a mass nearly a mile in thickness; and in South Wales and adjacent counties, strata not less than 11,000 feet in depth must have been thus carried away. Nor will such statements tax our credulity, when we call to mind the immense extent of territory formed by these means, on continents and islands, and in filling up the mouths of rivers and bays. Indeed, whole countries, almost, have been thus rescued from the sea.

Nor could changes of this sort have been the result of some single sudden revulsion, for another reason. Living animals were buried in the soft, and probably liquid mass, which, in the lapse of time, became hardened, so as to be unaffected by a subsequent overflow, in which other animals, of a totally diverse character, and indicating an almost entire change of circumstances, became again part and parcel of solid rock above them.

There are localities which furnish evidence of as many as ten or a dozen distinct disruptions and new formations. The mass once liquid became solid, and then disruption followed. After which the crevices thus formed were filled with matter which in its turn became solid rock, which rock, thus formed, was again subjected to sufficient violence to cause its rupture, and its fissures were again filled with matter, which passed through the same process of hardening and disruption, and so on.

The number of these formations, and the length of time required for each, indicate a period of inconceivable length, and all attempts to establish the date of the actual creation of the earth, as described in the opening of Revelation, is shown to be utterly impossible.

THE CENTRE OF POPULATION, AND OF COMMERCE, AND LOCOMOTION.

What really are the sources of commerce, and where commerce must ultimately tend, seems to be little understood by many persons. We hear much of the immense commerce of New-York; that the revenue is collected there; that the public money must be expended there, because it is collected there; and various assertions and opinions of this sort, based upon the idea that an importing city is the centre or source of commerce. Nothing is, in fact, more absurd than such an idea. New-York, like all importing cities, is merely an agent for the transfer of fabrics, money, and persons, to the place of their ultimate destination, and makes its living and its wealth by its receipts for this agency, like a commission merchant. The importer of silk goods, for example, adds his commission on the price, for his services and capital in transferring them from France to Ohio. The broker adds his commission on the money, which he transfers from the capitalist to the borrower. All this makes a commercial city, but does not make commerce, and is not its end, any more than a farmer's wagon makes the hay and wheat carried on it. The sources of commerce are in a people and soil able to produce, and a people and wealth able to consume. It is the producer who furnishes the articles for the commercial agency to transfer, and it is the consumer who takes them from him. New-York collects revenue, but who pays it? Ohio pays one tenth the revenue of the United States. The government informs us it has collected fifty millions of revenue. Then Ohio has paid five millions of it; Indiana and Kentucky have paid five millions more.

The sources of commerce are production and consumption. Now let us see where production and consumption are. If the wealth of a country were very unequally distributed, they might be one-sided, especially if some portions of the country were barren. But in the United States, the advantages of the country and the wealth of the country are very equally distributed. The older States have the largest share of manufactories, but the new ones in soil, and all natural productions. Ohio is probably as wealthy, in proportion to its inhabitants, as any State, except, perhaps, Massachusetts or New-York. In this nearly equal distribution of advantages, the centre of production and consumption is practically not far from the centre of population. Where is the centre of population, and what has been its progress? Without calculating it to a single mile, we may state that in 1790 the centre of population was in Adams county, Pennsylvania; and in 1850, it was in Belmont county, Ohio. Thus, between 1790 and 1850, (sixty years,) the centre of population has travelled two hundred and twenty miles almost due west. The centre of population travels about 37 miles decennially, or nearly four miles per annum. In half a century it will be in Indiana; and it will be a century at least (if ever) before it crosses the Mississippi. Probably, if the Union continues as it is, it will never cross the Missisippi. The reason is obvious. Between the California mountains and the west line to Missouri, there is but a small portion of fertile lands; while east of the Mississippi, and west of the Alleghenies, every acre may be made a garden spot. West of the Mississippi to the Pacific, is a greater distance than from the Atlantic to the Mississippi, but far less fertile and productive.

The centre of population is in Ohio, and it is evident from the preceding facts that it will be so for half a century. Here in Ohio, then, is the centre of commerce; and it is this fact which so rapidly creates its wealth, develops its industry, and gives such activity to locomotion; and this activity, industry, and development, is not likely to be at all diminished; on the contrary, it will increase. The commercial growth of its chief ports have never been equalled by the growth of any part of the world. Cincinnati, Cleveland, Sandusky, and Toledo are all growing rapidly; and to these we should add the interior towns of Dayton, Columbus, and Zanesville, more immediately dependent on manufacture, but connected with the others by railway. To illustrate the growth of commerce in Ohio, we will give the aggregate population and growth of these towns; for it is well known that the commerce of these places has increased more rapidly than the population, so that in giving the growth of the towns, we really represent the growth of commerce.

The aggregate population of Cincinnati, Cleveland, Sandusky, Toledo, Dayton, Columbus, and Zanesville, at different periods, were as follows:

In 1820	13,141
In 1830,	32,722
In 1840,	72,512
In 1850,	180,351
In 1853,	about 247,512

Here is a steady increase of 140 per cent decennially, or 14 per cent per annum. The population of these towns in 1860 will, in all human probability, exceed half a million of people. Cleveland will then have its 60,000, Toledo its 40,000, and other towns in proportion.

This growth of towns is not so much the growth of general population as it is of surplus production and of commerce. The following sums are something like the aggregate commercial value which passed through these places in 1852:

Cincinnati,	$110,000,000
Cleveland,	30,000,000
Sandusky,	59,600,000
Toledo,	57,300,000
Dayton,	5,000,000
Columbus,	5,000,000
Zanesville,	3,000,000
Aggregate	$269,000,000

The values at Toledo and Sandusky are said to be accurately ascertained; that of Cincinnati is very nearly correct. The others are estimates. The value of flour, wheat, corn, and hog products exported from Toledo were equal to eight millions of dollars. The value of the same articles exported from Sandusky and Cleveland was probably equal to that at each place. The value of the same articles, with whiskey, candles, and soap, exported from Cincinnati, was equal to thirteen millions. The value of wool, cheese, and butter exported from the State is equal to four millions of dollars. Thus we have in the exports of half a dozen agricultural articles, fifty-one millions of dollars. When we consider an hundred other articles of domestic export, the vast consumption of these, or four millions of people for whom we import, and the already great extent of the manufactures of Cincinnati, Dayton, Zanesville, Columbus, Pomeroy, and other places—the vast amount of iron, coal, stone, and other heavy articles carried on river, canal, and railroad, it is not difficult to comprehend that the internal commerce of Ohio already amounts to three hundred millions of dollars. When we add to this the commerce of Indiana, of Kentucky, Tennessee, and Illinois, lying in the Ohio Valley, we see that the boasted commerce of the Atlantic cities becomes altogether an inferior thing. Important and highly useful and profitable as foreign commerce is, we should never overrate its value. It is the internal commerce of a country like this, which spreads from sea to sea, and almost from pole to pole, which gives profit to enterprise and value to improvement.

This westward march of population, and the growth of commerce, carries with it the centralization of locomotion. Already we see the comparatively small town of Indianopolis become the greatest crossing-place of railways. Already we see twenty railroads made, or making, into Cincinnati. Already we realize the geographical certainty, that through here must flow all the great channels of commerce which will intersect and irrigrate the valley of the Ohio. Here North and South, East and West, must shake hands, and if not friends, we will make them so. We will show them the great inheritance of freedom, as it spreads out in beauty and glory over the continent. We will show them the silver Ohio, winding its way through the garden of America, and bringing greater wealth than golden sands into the lap of its happy people.

Centuries will pass away before the centre of population, of commerce, of wealth, and glory and grandeur shall pass from this valley. Happy will it be, if contented to dwell amidst peace and plenty, and casting away the avarice and the passions which make men the slaves of Mammon, or of Moloch, they live in harmony with God and man. Thrice happy will they be, if, unlike the Hebrews, they shall realize that this is the promised land, and obey the God who brought them there. Fair is the inheritance, hopeful the prospect, inspiring the progress, and beautiful that law of freedom, which gives us security, order, and liberty.—*R. R. Record.*

RAILROAD TO THE PACIFIC.

We have received a long and elaborate report, approving of the "Northern Route," by Edwin H. Johnston, C. E., 2d edition. We are happy to avail ourselves of the opportunity to add our mite in behalf of this great national work. We can scarcely conceive of any thing which can have so immediate and so vast an influence in favor of the commercial enterprise of this country. Not a State, and not a county, but would realize substantial benefit from it. It opens a direct communication with China and Japan, and the countries adjacent. An immense trade is carried on from this region with the whole world.

Chicago is assumed as the starting-point for several routes, being nearly in a direct line from the Eastern cities, and connected with them already by several railroads and by the lakes, and which need not here be described. There is also easy communication from Chicago to the cities of the South. The Western terminus of the road is not so easily selected. One plan proposes to adopt the Straits of de Fuca, at the southern extremity of Vancouver's Island. This point is 1752 miles, air line, from Chicago. But the geological features of the country demand that the track should deviate essentially from a straight line, and pass round the great bend of the Missouri River, thereby avoiding the great elevation of the Black Mountains, and the crossings of the Mississippi, Missouri, and Yellow Stone rivers, where they are navigated by large boats. By this route, a convenient opportunity is afforded for a branch-road with the west end of Lake Superior, a matter of no small account.

From the great bend of the Missouri, the route proposed extends along the northern side of that river, to one of the passes between its sources and the sources of the Flat-head, or Clark's branch of the Columbia River. It then follows down that and the Columbia River, to a point in the vicinity of Fort Okanagan. The Rocky Mountains are not an unbroken range, but rather a series of groups, like the White-hills and the Adirondacks. At different places there are very marked depressions in the elevation of this range. The point already named is one of these.

The length of this route is estimated thus: In Illinois, 70 miles; Wisconsin, 290 miles; Minnesota, 620; Missouri, (N. W.) Territory, 420; Washington, 560. Total 1960. Of these, 990 are embraced in existing acts of incorporation. The portion in Illinois is already under contract, and 40 miles of it are graded, and the road will be completed to the Wisconsin line the coming season. In Wisconsin, 55 miles are located and under contract, and the grading is in progress. This portion extends to Madison, the capital of the State, and will be completed in a few weeks. The same company are authorized to build a road from Janesville to Lake Superior, and this branch is also under contract to Fond du Lac, and is partly built, 86 miles from Janesville; 40 miles are graded. No locations have been made, for any considerable distance, beyond the Wisconsin River, though several routes have been examined and reported upon favorably.

The Straits of de Fuca are 96 miles in length and 11 miles broad. They connect with Hood's Canal, Puget's Sound, Admiral Inlet, and the archipelago of Arro. The country around is desirable in all respects, and is well supplied with water, with many fine harbors and bays. Bituminous coal is abundant, and the quantity of good timber is "inexhaustible." As an agricultural country, it is said to be remarkably productive.

Another point selected for the Pacific terminus is Astoria, at the mouth of the Columbia. This, it is said, will lengthen the line of the road about 150 miles, but the Cascade Mountains would thereby be avoided; and if no convenient pass can be found at those mountains, the mouth of the Columbia may be found the most desirable terminus.

San Francisco is also suggested for the Western terminus; but the valley of the Sacramento and its tributaries, where the population is now chiefly collected, could not, it is said, be conveniently connected with that city by railroads.

In making the round trip to Shanghai or Jeddo, or to any port in China or Japan, vessels from San Francisco must traverse nearly 1000 miles further than from the Straits of de Fuca, while the route to China from these straits passes near the Alentan or Fox Islands, the Kurile Islands, and the Japan Islands, which form a chain nearly two thirds the whole distance to China, and affording convenient opportunity for repairs, fuel, water, etc., beside making valuable contributions to the trade of the Pacific.

The point of divergence from the Northern route above described, if the mouth of the Columbia be selected for the Pacific terminus, is in the Clark's River Valley, where that river emerges from the hill-country, thence across the elevated prairie-plain, southerly, near to the junction of Lewis's River with the Columbia, and thence along that river to its mouth.

Mr. Whitney's plan proposes a line from *Prairie du Chien*, on the Mississippi, in Wisconsin, to the valley of White River, or White Earth River, west of the Missouri; thence to the valley of Salmon river, and along that and Lewis River, and the Columbia, and afterward bearing northerly to Puget's Sound.

A route still more Southern, follows the valley of the Platte River, thence through the South Pass across the head-waters of the Colorado, and the tributaries of Great Salt Lake, thence into the valley of Lewis River and the Columbia to the Pacific.

Still other routes have been proposed, but they are probably much more expensive than those before mentioned.

Walker's Pass, situated 35° 17′ N. lat. and 118° 36′ W. long., is probably about 5000 feet above the sea. But this is, perhaps, the best passage across the Rocky Mountains *proper*. It is only 70 miles, in a direct line, from the Pacific. From this, three routes have been proposed to the valley of the Mississippi. One runs from Walker's Pass, north-easterly, to the Vegas de Santa Clara, or the Rio Virgen; thence to the Colorado, and its Grand River branch, to the Coshotope Pass, in the mountain range, between the Colorado and the Del Norte, to a point near Fort Massachusetts, in the valley of the Del Norte; thence by Bent's Fort, on the Arkansas River, to the Smoky Hill Fork, of the Kansas, and along that river, across the State of Missouri to St. Louis, making a total of about 2130 miles.

Still another route leads from Walker's Pass, or from the Tejon Pass, which at the junction of the Sierra Nevada with the coast range, and is further south than Walker's Pass, and about 60 miles distant from it, and thence across the valley of the Colorado, near the 35th parallel of latitude, to that of the Del Norte, crossing the latter a little south of Santa Fé, near the Albuquerke, thence to the valley of the Canadian River, and terminating on the Mississippi, near the mouth of the Ohio. This is substantially the route proposed by Mr. Gwin, in the United States Senate, in the last session. By this route the distance from San Francisco to St. Louis is about 2140 miles.

The last route we shall describe proposes a direction as follows: From Walker's or the Tejon Pass, to the mouth of the Gila, on the Colorado, 50 or 60 miles from the mouth of the latter; thence along the valley of the Gila, and thence across the elevated plateau to the valley of the Del Norte, down the latter to El Paso, and thence through the northern part of Texas to the Mississippi. This distance probably exceeds 2200 miles.

CHARLESTON, LOUISVILLE, AND CINCINNATI.

We make the following abstract from one of our Western exchanges:

The connection of these three flourishing cities by a direct railroad communication, which has been in contemplation for so many years, it is said will in a short time be consummated. The whole of the line from Knoxville south, is under contract, and a large force is now engaged in grading the road. A corps of engineers will commence the location of that portion of the southern part of the road in Tennessee, and the work will be earnestly commenced this summer, and diligently prosecuted to completion.

The late Legislature of Kentucky, which has just adjourned, granted a charter, with liberal provisions, for a railroad through that State from Louisville and Cincinnati, to connect with the Knoxville and Kentucky road at the Tennessee and Kentucky line. For that portion of the road which is in Tennessee, sixty-five miles, more than half the amount that is necessary to complete it is already provided.

Cincinnati has always taken a lively interest in this enterprise. In fact, if we mistake not, the project of uniting the southern Atlantic seaboard at Charleston, and the Ohio River at Cincinnati, by a railroad, originated with the citizens of the latter city. The management of this grand enterprise is in the hands of gentlemen of such intelligence, enterprise, and credit in the city, as leaves no doubt of its speedy and successful accomplishment. They see clearly the great advantages and benefits their city is to derive from this connection. It will open out to her manufacturers the richest portion of the wealthy South. They will have complete possession of Western Virginia, East Tennessee, South Carolina, Georgia, Alabama, and Florida, where scarcely an article from their workshops is at this time to be found. It will make Cincinnati the great heart of the great West. Her streets will be thronged by men from the East, the West, the North, and the South.

Charleston has cotton and rice, and is the *entrepot* for the products of the West Indies and South America. She needs the flour, bacon, corn, and other necessaries of life, which this road will give her. East Tennessee alone, in the course of two or three years, by the time this road is completed, will send her five hundred thousand barrels of flour; and whenever an exigency may demand it, she may draw any supply she will want from Kentucky and Ohio. It is more than probable that Europe, as well as the West Indies and South America, will hereafter look to the United States annually for a large proportion of their breadstuffs. When this railroad connection is formed, Charleston will be able to make up an assorted cargo for any part of the world. Now she labors under the great disadvantage of being only able to export the two articles of cotton and rice. With this railroad, she may yet rival Richmond and Baltimore in flour and tobacco, and other northern cities in the sale of mess-beef and pork. She will be directly connected with a country celebrated for its stock of all kinds, and its immense agricultural resources.

But beside the exchange of the commodities of different sections of the country, which will be produced by this railroad connection at its extreme, the development of the resources along the middle of the line, is a subject of equal if not still greater consideration. The mineral wealth of the range of the Cumberland Mountains, between Tennessee and Kentucky, is unsurpassed. Coal and iron of the very finest quality are found in these mountains in inexhaustible quantities, and in close proximity. Both these minerals have been tested by our manufacturers in this city and elsewhere, and pronounced to be of the best quality. Coal could be delivered from these mountains at Louisville, Cincinnati, and Knoxville, at from six to ten cents per bushel. An abundant supply could always be had at any season of the year. The beneficial effects of tapping these mountains by a railroad, will not only be felt by these cities, but a dense population would fill up the valleys of these mountains, and people what is now a comparative wilderness. Towns and villages would spring up along the line of the road, and the busy hum of industry awaken echoes from the solitude of the mountains and the hills.

IMPORTANT RAILWAY ENTERPRISE.

The completion of the central link in the great chain of railway communication connecting the Atlantic cities with the Mississippi, was justly regarded as the commencement of an important era in the history of railway enterprise; and although an almost unbroken line of communication has thus been formed, much yet remains to be done to afford the increasing population of the Western States such facilities as their growing wealth and intelligence entitle them to. The cities of Boston and New-York have been placed within about thirty-six hours' distance of Chicago and Milwaukee. From the former city, the most populous, although perhaps not the most important, in the West, a continuous line of railway extends to the Mississippi, which, connected with the Michigan Central, Great Western, and New-York Central Railways, brings New-York within forty-eight hours of St. Louis. Milwaukee, less fortunate than its rival, is deprived of a direct communication with the Eastern States, and is at present compelled to pay tribute to Chicago, the great bulk of the travel and traffic of the State of Wisconsin, as well as that of Iowa and the neighboring territories of Missouri and Minnesota, finding the route via Chicago and the shore of Lake Erie the only outlet to the East. Situated as Milwaukee is, on the opposite side of Lake Michigan, her people are compelled to travel at least 150 miles further than they ought, in order to reach New-York or Boston. To remedy this, and render Milwaukee independent of her powerful rival, a line of railway is being constructed from Detroit to Grand Haven, on Lake Michigan, opposite Milwaukee. This road is called the Oakland and Ottawa. From Milwaukee to Madison, the capital of the State, a distance of 100 miles, a road is in full operation. From Madison it is now proposed to run a line to Prairie du Chien, on the Mississippi River, which is about 100 miles from Madison. Of this remaining portion of what is called the Milwaukee and Mississippi Railroad, twenty-five miles more will complete the road to the Wisconsin River, which is navigable to Prairie du Chien. This portion of the road is under contract, and is being pushed vigorously forward. The great object, however, is to carry the road through to the Mississippi, and this the capitalists of Milwaukee are confident of accomplishing.

It may be said that such a scheme can be of no interest to Canada, but we regard it as one of the greatest importance. The travel and traffic from Wisconsin over the Great Western Railway is already great; but the choice of route is not taken on account of any saving in distance; for, once at Chicago, the travel is more likely to find its way down the south shore of Lake Erie than via Detroit. In order to secure the immense trade of the West, it has been deemed advisable to construct the Oakland and Ottawa road, in which the Great Western and Michigan Central companies are, we believe, a good deal interested. This connection being formed, it is desirable that some means should be devised to form outlets for the territories of Missouri and Minnesota, which are now being so rapidly populated. These objects being secured, there is still another, and by far the most important, to be considered. It is settled beyond a doubt that a continuous line of railway from the Atlantic to the Pacific must be built, the United States government having now taken the matter in hand. Public opinion in the United States is divided on the question of what route it shall take; but there can be no doubt that the most direct and cheapest route will ultimately be decided on. Such being the case, then, on referring to Mr. Johnson's map of the Northern route of the proposed Atlantic and Pacific Railroad, it will be found that the most direct route to the Pacific is from the point on the Mississippi at which the Milwaukee and Mississippi road will terminate. With a continuous line of railway, such as the one projected will form, the benefits to be derived, both by Canada and our neighbors to the East and West, will be immense. The roads forming the connection between the Atlantic and the Mississippi will form the most important chain of railway communication on the American continent, while it will traverse the most populous and wealthy portion of it. —*Hamilton Spectator.*

OHIO AND CINCINNATI.

The first permanent settlement was made in Ohio, by the New-England Ohio Company, in 1788, at Marietta, at the mouth of the Muskingum. Gen. Arthur St. Clair was appointed Governor of the Territory. The second was made at Columbia, five miles above Cincinnati, in October, 1788. The first cabin built on the soil now covered by the city of Cincinnati, was erected in December, 1788, on what is now Front street, a little east of Main street. That region was then covered by dense forests. The settlement was first called Losantiville. Other points were soon occupied, namely, Manchester, in 1790; Gallipolis, 1788; Hamilton, 1794; Dayton, 1795; Chillicothe, 1796, etc.

Soon after the commencement of these settlements, the Indians became very troublesome, wars were undertaken, with various success, and it was not till 1794 that the Indians were so reduced, and the strength of the Americans appeared so formidable, that they were induced to sue for peace. In 1798, the number of inhabitants was 5000, in eight organized counties. The first meeting of the Territorial Legislature was in September, 1799, and William Henry Harrison, since President, was then elected a delegate to the American Congress. In 1802, a State constitution was established, and Cincinnati was incorporated as a town. It had about 1000 inhabitants. That portion of the State which lies west of the Cuyahoga river, was acquired, by treaty with the Indians, and afterward the Maumee and Sandusky regions. In 1811, the Indians were defeated in the great battle of Tippecanoe, by Gen. Harrison; and in 1816, the seat of government was removed from Chillicothe to Columbus, its present capital, on the Scioto river. The population of the State, in 1850, was 1,980,408.

The limestone portion of the State, which comprises nearly the western half of it, is admirably adapted to wheat and grass. This section commences at the lake, near the mouth of Huron river, and running in a southerly direction, touches the Ohio river in Adams county. The counties forming the Connecticut Reserve, which is a slate and sandstone formation, are less productive, but need only careful cultivation to secure good crops of grain and fruit. The middle and south-eastern section of Ohio, is more uneven, its soil is excellent, and its fertility almost inexhaustible. The State embraces an area of 25,000,000 acres, almost the whole of which might be put under cultivation, and is competent to support more than 10,000,000 of inhabitants. Her capacities of production are immense—far more than has yet been called into action, although in her race of improvement she has made rapid and healthful progress.

The lakes and the Ohio river furnish ready communication with an immense territory, while railroads and canals have been made to multiply these facilities to a very great extent. The Ohio canal, begun in 1825 and finished in 1832, extends 300 miles; its width is 40 feet and depth 4 feet. Its branches are the Columbus feeder, 9 miles long; the Hocking canal, 56 miles; the Muskingum "improvement," 91 miles; the Washonding canal, 25 miles; the Canton side-cut, 19, and the Mahoning, 87 miles. The last named is connected with direct and continuous routes to Philadelphia. The Wabash and Erie canal, in Ohio, with its side-cuts, is 91 miles long. The Miami canal is 170, and has navigable feeders, increasing the total length to 321 miles, and terminates at the western extremity of Lake Erie. The sum total of canals in Ohio is 920 miles.

She also has 46 railroads, either constructed or in progress. The number of miles in operation in January last, was 2867, and miles in course of construction, 1578, at a total cost of $44,927,058.

The geological formation of Ohio is comparatively simple. Five distinct rocks occur, namely, blue limestone, estimated to be 700 to 1200 feet thick; black shale, 250 feet thick; fine sandstone, 350 feet; conglomerate, 200 feet; and coal-beds 2000 feet in thickness. All these occur in some counties, only a part of them in others. The coal region is on the west bank of the Ohio, and occupies about one fourth part of the State. Iron ore also occurs, in large quantities, some 1200 square miles, as it has been estimated, being underlaid with it.

Manufactures.—These are chiefly confined to the production of raw material, as leather, sugar, wax, potash, etc., beside those described elsewhere. Vast quantities of beef and pork are annually sent to Eastern cities for exportation.

Mineral Resources.—Prof. Mather says, in his report, that the single county of Tuscararas contains eighty thousand millions of bushels! The county of Muskingum can furnish ten thousand millions of bushels; Meigs, Athens, and Summit contain much more. Coal occurs in twenty counties. In 1848, 6,538,968 bushels were mined within their limits. By 1860, from present appearances, the annual product will probably reach 20,000,000 bushels.

Butter Trade.—Cincinnati has become the great distributing point for butter and cheese for the South and South-West. During the year ending Sept. 1, 1852, the imports of butter were 3,412,600 lbs., and the exports 3,321,250 lbs. These two quantities differing only about one million of pounds, it follows that a quantity nearly equal to that actually consumed by the inhabitants, must be received from private conveyances, and this is computed to be about 4,000,000 lbs. annually. On this supposition, 3,000,000 lbs. being received by private conveyances, the whole quantity actually supplied annually, from all sources, must be six and a half millions of pounds.

Tobacco.—Formerly this was but one branch of the business of grocers, but within a few years it has assumed a new importance, and large commission houses have been established, devoted exclusively to this product, and it is now through these agencies that the wholesale dealers are chiefly supplied. A city inspection has been established, and a tobacco warehouse, on an extensive scale, is already erected. This city is the centre of a great tobacco region, and is its most convenient market.

Candles.—This business has been greatly increased within a few years, and has now acquired no little importance. In 1846–7, the exports were

16,622 boxes. In 1851–2, they were 121,727 boxes, and this perhaps is scarcely a moiety of the entire manufacture.

WHISKEY.—This article was manufactured in and around the city, in 1852, to an extent of more than 4000 barrels, beside what was consumed by its inhabitants. We hope this product is not destined to increase.

By the census of 1850, the annual products of Ohio, in the several articles named, are as follows:

Pig-iron, entire value,	$1,255,850
Castings,	3,069,350
Wrought-iron,	1,076,192
Woollen goods,	1,111,027
Cotton "	39,4700

The agricultural statistics are as follows:

Acres of improved land,	9,730,650
Value of farming implements, etc.,	$12,716,153
" live stock,	43,276,187
Wheat, bushels,	14,967,056
Indian Corn, "	59,788 750
Flaxseed, "	185,598
Wool, lbs.	10,089,607
Butter, "	34,180,458
Cheese, "	21,350,478
Maple Sugar, lbs.	4,521,643
Wine, gallons,	44,834
Hay, tons,	1,360,636
Dew-rotted Hemp, tons,	628
Water " " "	464
Value of home-made manufactures,	$1,696,601

The steamboats and barges constructed and registered during the year 1853, were 10,252 tons, custom-house measurement.

COMMERCE.—In 1852, 267 steamboats arrived at the wharf, the registered tonnage of which was 60,543 tons, and their capacity about 120,000 tons. The total number of arrivals was about 3675, or more than 10 daily, and from the following places: New-Orleans, 219; Pittsburgh, 574; St. Louis, 218; other ports, 2654. The total arrivals in 1853 were 3630.

The value of the total imports imports into Cincinnati during the year ending August 31, 1852, was $41,256,199, and for year ending 1853, was $51,230,744. The exports for these two periods were, severally, $33,234,896, and $36,266,108.

AGRICULTURE OF THE SANDWICH ISLANDS.

WHILE these Islands are being rapidly depopulated of their native inhabitants, the foreigners are rapidly developing their agricultural resources.

By the Report of 1853 of the Royal Hawaiian Society, it appears that sugar is one of the staple productions. The cane, although a native of that island, does not grow so well as in the East Indies. The product of sugar for the year 1853 was estimated at 700 tons, which, with the molasses, was valued at $100,000. This is far below the capability of these sugar-fields, as hundreds of them are lying idle for want of money and enterprise.

Coffee grows well there.

Wheat, until recently, has been little grown. Now they are erecting mills, and it is thought this grain may succeed well. Indian corn has not succeeded well. Potatoes grow abundantly. The production of sweet potatoes is astonishing. They grow well upon all the islands, and upon hills of broken lava, where there is not a particle of earth to be seen. The sweet potatoe is the great article of food in the dry, burnt districts of Hawaii. The amount of labor required to raise a crop is very small, even where a pretense is made at cultivation, and the yield is from fifty to seventy-five barrels per acre; but the quality is inferior to those grown in Bermuda or the southern United States.

Apples, pears, plums, quinces, and cherries have not succeeded well. They find the same difficulty there that is met with in several of our most southern States. The scale insect affects the trees, and the extreme heat of summer dries them up so that the fruit fails to come to perfection. But they have figs, grapes, bananas, oranges, etc., and no doubt will be able to grow peaches to great perfection. Mr. Parker, of Hamahua, and Mr. Green, of Makawao, have fine trees bearing fruit equal to New-Jersey or Delaware peaches.

Tobacco.—Some attempts have been made to grow tobacco from Cuba seed, which promises fair success.

Neat Cattle.—It is stated that this branch of farm business may be made very profitable in all the Sandwich Islands. Cattle require no shelter, no labor to provide winter food, no salting, and very little care. Horned cattle are worth an average of $5 a head at Oahu, and upon some of the islands not more than half that sum. Most of the cattle imported have come from Australia. Messrs. Hopkins and Moffit have introduced the Hereford and Angus breeds, which have proved profitable. Efforts are now making to import Devon cattle from the United States, though the expense is very great and the risk considerable. It is even talked of that butter and cheese can be exported profitably from the islands. A Mr. Parker, of Hawaii, has a herd of 140 cows, and although he gets a very small yield of milk and butter, he sells it for fifty cents a pound, and receives $2340 a year for his sales, and fats a large number of swine with the milk.

Sheep.—Several persons upon Hawaii and Oahu have engaged extensively in sheep-raising, and have flocks of 1000 to 3000, though but little value is placed upon the fleece—the meat and fat being the great object. Consequently but little attention has been paid to breeds. Generally, the stock are derived from the Merino and Saxon, principally from Australia. We notice a late importation of South Downs from the flocks of Mr. McIntyre, of Albany, and L. G. Morris, of Mt. Fordham. The ewes produce lambs at a year old, and two a year afterward. The greatest difficulty there in the way of sheep-raising is the same that afflicts all parts of the United States—the packs of worthless dogs, the most worthless of all animals except their owners. The only way to rid any district of these thieving curs is to administer a grain of strychnine, disguised in a piece of meat, to each cur.

Swine.—Whoever knows any thing of the importations at San Francisco for a few years past, must have come to the conclusion that pigs are among the spontaneous products of the Sandwich Islands. Very large numbers have been taken from the islands to California and Oregon, until the price has risen from almost nothing to equal the price in this city—say four to six cents a pound. Every native can raise swine there as well as in this country, and with some they constitute their entire possessions. Several importations have been lately made with a view to improve the breeds. The Agricultural Society have obtained some of the Suffolk and Mackay breeds from Boston. Capt. John Meek has imported a number of valuable swine of English and American varieties, and the royal family have the pure Chinese breed.

Horses.—A very marked improvement has been made in this branch of business by recent importations. Some of the improved colts have sold for $300 each. It is calculated that the expense of freight, etc., upon one horse from here to Honolulu would be $200, beside the risk; and this deters parties from getting some of our improved breeds of horses out there, though we have no doubt they would do well, as the wild animals on the islands when run down and caught with the lasso, and broken in or broken down by a rider wilder than the horse, seldom make good domestic animals for the carriage or farm work.

Mules.—They are very common in these islands. Now and then they are seen ten or twelve hands high, but generally they are small and inferior. These little mules are used by the natives to bring their produce to market, and often present a ludicrous appearance, being so covered over with packs as to be hardly discernible.

Poultry.—The hen-fever has reached the Sandwich Islands in a modified form. The Shanghai is said to be too delicate to be raised with profit, but makes a good cross upon the native fowls. Mr. H. M. Whitney has imported some black Spanish and Dorking fowls, which will make a better breed than either native or Shanghai.

Honey-bees.—Several efforts have been made to introduce bees into the islands as well as into California; and as the experiment has been successful in the latter country, we hope it will be in the former. Mr. Henry A. Pierce, of Boston, shipped a hive, packed in ice, last year, but we have never learned whether they reached their destination in safety. The Agricultural Society of Honolulu numbers one hundred and twenty-four members, who have paid $620, while the Society has received $500 from the Hawaiian Treasury.

One of the greatest obstacles in the way of agriculture is the indolence of the native inhabitants, who can not be induced to work for themselves or for others upon reasonable terms. There is a great difficulty in cultivating the lands in the interior of the islands, because there are no wagon-roads upon which to bring produce to market. There is also a great lack of capital among those who are disposed to apply it to the production of crops. Like almost all southern climes, this seems to be the home of all sorts of destructive insects, which the farmer has to contend against.

The surface of the islands is formed of decomposed volcanic matter, which is productive of many crops, and particularly of grapes, wherever it exists. Wherever tried, grapes yield most luxuriantly, and an acre well set in vines is valued at one thousand dollars; yet there are thousands of acres lying idle and waste, which might be rendered equally valuable.

A fruit called "papaya" is raised with facility from seeds upon any good soil, and is a wholesome vegetable, and much used for tarts, and makes a nutritious food for poultry and swine. It is stated that forty tons an acre can be produced of papaya, and a crop of pumpkins at the same time; the vines shade the roots of the plants, and those in their turn shade the vines. Another advantage of growing this plant is one that would make it highly valuable for this vicinity; for a tough piece of beef suspended among the leaves of the growing papaya is rendered perfectly tender in a few hours.

It is stated that the imports of flour, corn, rice, tobacco, and wine amount to $125,000 a year, all of which might be produced at home without any difficulty.

GOVERNMENT PATRONAGE.

THE connection between our government and the various interests of the country, and the policy to be pursued in reference to them, has been a fruitful topic of discussion. Believing as we do that government is not a mere cold abstraction, nor a senseless machine, whose only business it is to crush what comes under its power in a manner contrary to the general notions of propriety, but rather an institution for promoting, by positive enactments, the good of the whole, and of its several parts, we fully agree with the spirit of the article below, taken from *De Bow's Review* for April, and we commend it to careful attention. Says this writer:

"General Washington, Mr. Jefferson, Mr. Madison, Mr. Monroe, and Mr. Adams, for a period of thirty-six years consecutively, all recommended an improvement of agriculture, or national schools; and the same principles and powers are involved in each of their recommendations, and no one of the subsequent presidents advising against it; Mr. Taylor and Mr. Fillmore strongly recommending, and their secretaries; the resolutions of legislatures, petitions of agricultural societies and of the people, and the interest of eighteen millions of our inhabitants, yea, of the whole, I ask, if all this combined is entitled to any attention, to any consideration? It has received but very little. But I am told there is a patent office, and the farmers are abundantly enlightened with the crumbs that fall from its table. The patent office, until 1831, during General Jackson's administration, when he called Mr. Ellsworth to it, was a burlesque, and is now, upon farming, compared with the wants of this great nation. Mr. Ellsworth was a practical farmer; but he had all to do, and nothing to do with. He was the first in that office to give any attention to agriculture. But the first appropriation for that object was in 1839, $1000, for collecting agricultural statistics; in 1842, $1000; in 1843, $2000; in 1844, $2000; in 1845, $3000; in 1847, $3000; in 1848, $3500; in 1849, $3500; in 1850, $4500; in 1851, $5500;—total, $29,000 in seventy-five years. The cost of printing is not included, and can not be ascertained, as the report of the Commissioner was all published in one volume until the last two years. What can this small pittance do for this great nation? Scarcely enough in any one year to defray the ordinary expenses of correspondence.

The fund is to be distributed by the Commissioner of Patents, who is not selected for his knowledge of agriculture, (whose main business is of a different character, and more than he can do,) and may or may not be acquainted with it. The business must therefore be done by an unaccredited agent. Where is our agricultural department? Pent up in the cellar of the patent office, and can not be found at midday without a candle; and when found, a single clerk, struggling to get up the report. When it is up and out, there are but four hundred volumes for each Congressional district of one hundred thousand population, and that a reading people; and there is more call for this document than all others of a public character, and fast gaining in reputation from editors over the Union, and the public generally, inadequate as it is.

There is no country where the mind is so inquisitive and information so generally desired and possessed as in America. Travel over the whole world and return, and the truth is seen and felt more palpably. To us the masses of the world are looking for improvement, physically and morally, and for it they seek us in thousands daily. In the United States there are but about thirty agricultural periodicals published, and there are five hundred thousand copies taken and read by the people—a mere drop to the ocean. There are agricultural journals in the State of New-York that have six times greater circulation than any single paper of the kind in Europe. This only shows how great the thirst we ought to assist in gratifying. In America, there is not an agricultural school aided or patronized by the government; and, in fact, it may be said, there is none at all. Some are just beginning to struggle for life, but the faint, feeble feeling of the general government infuses itself into every part of its great family, and paralyzes the whole body. There is not what may be regarded as a text-book in any branch of agriculture or rural economy in America.

Compare what America as a nation has done, with what has been done by other nations. I can but glance at it. Russia has in all sixty-eight schools and colleges. She has an agricultural institution with forty college buildings, occupying three thousand acres of land, and attended by several thousand students. The Agricultural Society of St. Petersburg was established by Queen Catharine. There are under the patronage of the French government seventy school-farms, besides five first-class colleges, in which professors are employed to lecture on botany, zoölogy, chemistry, agriculture, and the treatment of diseases in cattle; on the culture of woods, forests, etc. These are supported throughout the country. National establishments for the improvement of breeds of stock, and colleges for the education of veterinary surgeons, and investigating the uses of all discoveries contemplated for agricultural improvement. The government expend in three veterinary schools, a year, for instruction, 754,200 francs; for instruction in agriculture, 2,731,468 francs; for encouragement in agriculture, 700,000 francs; for improvement in the breeds of horses and science connected with it alone, 1,776,400 francs. The requirements for admission into these veterinary schools are as follows: The applicant must be not less than seventeen years of age, and not over twenty-five, and have the following qualifications: to be able to forge a horse or ox-shoe after two heatings; pass an examination in the French language, arithmetic, and geography, and after four years' study, is permitted to practise veterinary surgery, and receive a diploma. In Belgium, great attention is paid to the subject. There are a hundred agricultural schools or colleges established by the government—a high school of veterinary surgery. The science of agriculture is the most fashionable in the kingdom. They have their palaces furnished more or less with rare specimens of the products of the land, and are farmed like a garden. These facts I know, having travelled over considerable part of that country. In Saxony, they have five schools; in Bavaria, thirty-five; in Wurtemberg, seven; in Austria, thirty-three; in Prussia, thirty-two; in Italy, two; in Scotland, two; in Ireland, sixty-three. The one at Glassnevin, near Dublin, I visited. It now consists of one hundred and twenty-eight acres of good land, and convenient buildings, and are about to add to their farm, and increase their buildings, so as to accommodate one hundred or more students. With the teacher, Mr. Donaghy, I became acquainted. He is an intelligent, practical man. With him I viewed the farm, and their farming and buildings, etc., and it is carried on very successfully. These schools are doing more for Ireland than any other attention the government is giving them. They have colleges and agricultural schools in England sustained by the government—some four or five with large farms attached to them—where all the sciences connected with the general business are taught with great perfection, and millions of money each year invested in the general science of agriculture by the nation. It is an investment, and not an expenditure. Other countries are engaged in the same business, but I can not go further into detail. Sufficient is said to draw a parallel between their views and ours. Abroad, they invest millions each year in a country not larger than an average of our States. Here, in all our country, for seventy-five years, for the general object we have expended $29,000. * * * The number of agricultural societies in this country are thus given: New-York has a State society, and from seventy to eighty county societies. Pennsylvania has from twelve to twenty county societies, and many grouped together. Ohio has a State society, and seventy county societies. Massachusetts has twelve societies, and in many of these societies several counties together. Michigan has twenty county societies. Indiana, a State society. Kentucky, five county societies. Georgia, a State society, and fifteen county societies. South-Carolina has six county societies. Virginia has a State society, and three county societies. Maryland, a State society, and four county societies. Vermont, a State society, and four county societies, and was the first *State* to ask us to establish a National Board. New-Hampshire, a State society, and eight or nine county societies, and also asked Congress to establish a Board. Connecticut, a number of county societies. Rhode Island has also passed resolutions asking Congress to establish a Board. Maine has six county societies. Iowa, a State society, and six or eight county societies. Wisconsin, a State society. Illinois, three county societies. Tennessee has some county societies, and two years since, unanimously recommended a National Board. Florida has passed a resolution for a National Board. Louisiana, in 1848, passed a law for a Bureau."

SCULPTORS AND SCULPTURE.

During the middle ages, which extended from the sixth to the twelfth century, universal darkness prevailed. The arts and artists were alike unheeded and unknown. Faint glimmerings of light only are visible till about 1064, when the great cathedral or Duomo was commenced, under Buschetto, the first eminent sculptor in Italy. Venice was the first to establish her liberty, but Pisa first founded a native school of art. In 1154, Il Bueno, both an architect and sculptor, founded at Naples the Capuan castle, and erected the spires of St. Mark's at Venice. Niccola da Pisa introduced a decided improvement in sculpture. He was called Niccola of the Urn, from a superb work which he sculptured at Bologna, about 1225. His greatest work was the altar of San Donato, at Arezzo, which cost 30,000 gold florins. Giovanni Pisano was his son, and a distinguished sculptor and architect. Andrea Pisano, his grandson, produced several eminent works in the fourteenth century.

The great cathedral, called the Santa Maria del Fiore, in Florence, not only from its magnificence, but from the connection which it has with the history of more than one eminent artist, deserves especial consideration The Florentines resolved to erect a cathedral which should exhaust the power of human skill. The work was commenced with great pomp. At the laying of the foundation, "the birth-day of the Virgin," great throngs were assembled, and the greatest enthusiasm prevailed. Free indulgences were granted by the Pope to those who contributed to the enterprise. The work was committed to Arnolfo di Lapo, who died soon after it was undertaken, and ere long his associate, Andrea Pisano, followed him. Here the work was left unfinished. Arnolfo's plans for the cupola were not understood, and the work was considered almost beyond human ability. This was near the commencement of the fifteenth century. But in 1420, the wardens determined that the cupola should remain unfinished no longer. Proposals were accordingly issued, inviting all eminent architects to meet in Florence upon a certain day, and present their ideas upon the subject. The day came. All nations, in their peculiar costumes and various languages, were represented. Each one was permitted to speak for himself. Some asserted that a huge scaffolding was necessary; others, that a column should be built in the centre of the church, etc., etc.

Among these artists was Filippo Brunelleschi, a man diminutive and deformed in body, but of remarkable intellect. He was first educated as a goldsmith, and he soon excelled in setting precious stones. He executed also small images in silver, and figures of half length which attracted much attention. Filippo became acquainted with Donatello, a young sculptor of great promise, with whom he was ever afterward very intimate, and by whose counsel he was often guided. Filippo turned his attention also to perspective, and did much to reduce it to a science; also to geometry, in which he became a proficient. These two friends often worked together, and with mutual appreciation. Among others, he presented a plan and design for reconstructing the two doors of the church of San Giovanni, which none were thought capable of doing since the days of Andrea Pisano. Lorenzo Ghiberti was the successful competitor, and both Filippo and Donatello pronounced his plan superior to theirs, and declared that he ought to be the artist. The two friends then departed for Rome. The sight of the magnificent churches and buildings of that city filled Filippo with surprise, and he determined, under the influence of the enthusiasm thus inspired in him, to devote himself to architecture, leaving sculpture, in which he had become eminent, to his friend. After a while he returned to Florence.

It was at this time, that the measures already described were taken for the completion of the cupola of Santa Maria, and that, among others, Filippo presented his plans and designs for that work. After the other rival artists had been called upon in turn, and each had given his own opinions, Filippo came forward, and assured them that the work could be done at much less cost than had been proposed, and without any scaffolding. He became at once the subject of ridicule, and was even ejected from the hall by force. He then urged his views upon the attention of the judges upon paper, and was at last able to convince them that his judgment was the best, and that the work should be committed to him. As it was a work of very great responsibility, however, it was judged that another should share it with him, and, much to his chagrin, Lorenzo Ghiberti, above named, was appointed his colleague. It was in vain that he protested, and he accordingly proceeded with his work, Ghiberti being often called upon to sanction the plans of Filippo. Soon, however, the latter was taken ill, and when the workmen still came to Filippo for his directions, he utterly declined giving any, referring them to Ghiberti, his colleague. But Ghiberti was utterly incompetent to direct them; and as Filippo did not hasten his recovery, the work came to a stand-still, and his colleague was obliged to confess that he was unable to proceed with or direct it. The wardens at last, seeing that such was the fact, gave the whole management to Filippo. He resumed his work with new energy, and was extolled as the greatest architect in the world. And this was true. His own plan for the lantern was also accepted, though he had many competitors, and he was left to execute it alone. But in the midst of this project, he was called away. He died in 1446, deeply deplored, and was more honored when dead than when living. He was buried in Santa Maria del Fiore, the place of his noblest work.

DONATELLO, who has been so prominent in the scenes just described, was born at Florence, in the year 1383. From early life he devoted himself to sculpture. His first work which had especial reputation was the *Annunciation*, placed in the church of Santa Croce, in Florence. He also executed a crucifix, in wood, which was much admired. But the following scene, given us in the volumes of Mrs. Lee, is too good to be omitted:

"While all the world were admiring the crucifix, and the artist himself could see no fault in it, he conceived the idea that Filippo was cold toward it. At first he proudly determined to provoke no criticism by questions. At length, however, his pride yielded, and he said, 'You have never told me what you think of my work.' 'Are you not satisfied with the approbation you have received?' said Filippo. 'No,' replied Donatello, 'I must have yours. Come, tell me honestly if you see any faults?'

They took their station before the piece of sculpture; Brunelleschi looked long and earnestly at it. 'It is well carved,' said he; 'there is no fault in the crucifix.'

'Nay,' said Donatello, 'this is cold approbation; I demand of you, by our long friendship, to tell me truly what you think of the whole.'

Filippo knew the irritability of his friend; but, thus implored, he spoke: 'I have ever imagined the figure and form of Jesus Christ as perfect. The sublimity of his doctrines, the grandeur of his conceptions, and the sweetness of his character, have thrown a human idea of beauty over the whole. When I think of Christ, I contemplate him in his transfiguration on the mount, and I behold in him divine loveliness.'

'Well,' said Donatello, 'go on; what have I done?'

'Thou hast placed a boor on the cross. Look at his robust limbs, at the resolute, almost fierce look of his countenance. In vain I seek for the benign expression that must have distinguished the Saviour—the submission and resignation which triumphed over the agonies of death.'

'That is thy opinion, is it?' said Donatello, his eyes sparkling with sensibility. 'Were it as easy to execute a work as to judge it, thou wouldst not be so severe on my Christ. Thou hadst better try to make one thyself, after thine own idea.'

Filippo made no reply, but determined to try his skill. He worked laboriously and secretly for several months, neither Donatello nor any one else conjecturing his occupation. One day he invited his friend to dine with him, and, according to the custom of artists at that time, they went to the market together. When there, Filippo purchased various articles, and requesting Donatello to take them home, said he would follow. 'Do not be impatient,' said he, 'but look about and amuse thyself; I will be after thee in a few minutes.'

Donatello took the articles in his apron, and proceeded to the house. When he entered, the first object that struck his eyes was a Christ upon the cross, which Filippo had been secretly carving. Donatello, overcome with astonishment, let the contents of his apron fall, and when Filippo entered, he found him gazing in speechless admiration upon the Christ.

'Why, what hast thou been doing with my dinner?' said he, laughing.

'I have no appetite for dinner to-day,' said Donatello; 'I acknowledge that thou alone hast executed as it deserved the figure of Christ. I see now that mine is a boor, as thou hast said.'"

This was Brunelleschi's Crucifixion, which, it is said, has aroused infidels to adoration. The two friends were more strongly united than ever.

In the Santa Maria del Fiore are two singing-boys, by Donatello, represented in alto-relievo, of uncommon beauty. In the Florence Gallery is a bronze statue, supposed to be a Mercury, which is thought to equal the works of ancient art. His marble statue of St. George is unrivalled.

His life is full of interesting incidents. He died in 1446.

U. S. AGRICULTURAL SOCIETY: CATTLE CONVENTION.

SPRINGFIELD, Ohio, May 1, 1854.

TO THE EDITORS OF THE PLOUGH, THE LOOM, AND THE ANVIL:

GENTLEMEN: The 25th, 26th, and and 27th days of October next, have been fixed by the United States Agricultural Society, for holding its first Cattle Convention, in the city of Springfield, Clark county, Ohio.

Six thousand dollars will be distributed in premiums for the best stock of the various breeds of cattle subject to competition without territorial limit.

The Executive Committee of the United States Agricultural Society have been careful to select a time that will not, so far as they are aware, conflict with any of the State Fairs or other meetings of general interest; and, after due deliberation, have selected this place as the most eligible for holding the Cattle Fair. Springfield is centrally located as regards the cattle region; it is most convenient of access by railroad from almost every point of the compass. The means for accommodating, at very moderate charges, a large number of persons, are ample. Private houses will be opened for the reception of guests. There are also eighteen cities and towns within reach by an hour's ride on the railroads, on which extra trains will be placed to accommodate such as wish to go elsewhere for lodgings.

About twenty acres of ground have been inclosed, and more than three hundred stalls will be prepared for the shelter of cattle during the Convention.

It is expected that very liberal arrangements will be made by all the railroad companies, both for the transportation of cattle and the conveyance of passengers to and from the Fair.

We respectfully solicit your attendance on the occasion, and that you will furnish us with such aid as you may feel disposed in making known the objects, time, and place of the Convention; and if you have improved stock of cattle, of any description, we cordially invite you to enter them for competition.

A list of premiums and a copy of regulations will shortly be published.

Very respectfully, yours,

J. T. WARDER,
C. M. CLARK, } *Local Exec. Com.*
CHANDLER ROBBINS,

We respectfully request you to give this communication a prominent insertion in your paper, accompanied with such editorial remarks as may promote the objects in view.

[We commend the above to general attention, and shall refer to it hereafter.—EDS. P., L., AND A.

A SPLENDID BARN.

Few farmers can afford to erect a building equal to one that they can plan, and still fewer to build one like that described below. Still, we publish a description of it, because he who can not obtain all its advantages may secure a part. Perhaps some of them can be provided for in those already occupied. We ask especial attention to the manner of feeding. The italics in that paragraph are ours. The description was given, as appears below, by a correspondent of the *Rural New-Yorker.*—[Eds. P., L., & A.

"A correspondent of the *Rural New-Yorker* gives an account of a barn belonging to David Leavitt, Esq., a merchant-prince of New-York city, who has a farm in Great Barrington, Massachusetts, pleasantly located upon the Housatonic.

It is two hundred feet in length, with a centre wing on the east side, three stories high, with an arched roof covered with tin, and a cupola on the centre, and erected at an expense of nearly $20,000. It is based in a ravine which it spans, thus affording an easy entrance into the third story. Through this ravine runs a durable stream, with which is formed a beautiful reservoir of water directly above the barn, that operates upon a wheel twenty feet in diameter, thus forming an excellent motive power, that is used for a great variety of purposes, such as sawing wood and lumber, threshing, cleaning, and elevating the grain, cutting straw and stalks, unloading the hay, depositing it in any desired loft, churning, grinding, etc.

The first story is used as a manure vault; the second for stabling; the third for grain, hay, and apartments for domestics. The arrangement for feeding the cattle is most ingenious and convenient, the following description of which I give in the language of Mr. Wilkinson, namely: 'All the manual labor required in feeding the cattle is to run a car which contains twenty-five bushels of feed, before the line of cattle, and shovel the food into the feeding-boxes, which are of cast-iron, quadrant-shaped, of about one bushel capacity, and one to each stall. The boxes are placed one on each side of a partition, that divides two stalls, and are each attached at the right angle corner of the box to the front partition-stud by hinges, so that the boxes may be swung around into the feeding-hall, in front of the cattle, and over the feeding-car, that the feed which spills in filling the boxes, may fall into the car instead of on the floor. After the boxes are filled, they are turned with a slight touch, before the cattle again. In the centre, between the next or adjoining pair of stalls, is an erect cylinder, two feet in diameter at the bottom, and one foot eight inches at the top, which projects equally into each stall, and extends from about a horizontal line with the tops of feed-boxes (on the opposite side of the stalls) to the upper surface of the hay-loft floor, directly over the cattle, that it may be filled from that floor. There is a circular aperture six inches in diameter, in each side of the *hay-tube*, at a convenient height from the floor, so that two animals may eat from the tube at the same time. Under the tube is a drawer into which all the loose hay-seed falls through its latticed bottom, which drawer, when full, is emptied, and when a large quantity of seed accumulates, it is cleaned for use or market. *The seed obtained is of a superior quality, and the quantity ordinarily saved by this arrangement will pay for all the manual labor required about the building throughout the year.* Across the front of the stalls there is also an ordinary box-manger, directly under which, and running the whole length of the stable, is a trough for water, with suitable opening in the bottom of the manger through which the cattle may be watered by removing the iron slides that close them, which is done by means of a lever opening the line of slides at once, and in an instant.

The very great economy and convenience of this arrangement is obvious at a glance, and may be taken as a specimen of the perfection exhibited throughout. Under one of the drive-ways, into the third story, is an arched room, well ventilated, and lighted with a glass front, which is used as a milk-room, and has a great many conveniences connected with it for diminishing the labor of taking care of the dairy, which can all be performed without the least exposure to the weather, and within the compass of a few feet. The herd is fed with hay, cut feed, and steamed roots that are reduced to a pulp by the revolution of a cylinder in which the roots are placed after steaming, with four cannon-balls of ten pounds each; and, I believe, during the summer season, the soiling system is to be practised in part. The building is well lighted and ventilated, so that no diseases are generated by the confinement of impure air and the deleterious gases, an important feature that is too often overlooked. On the side of the barn facing the Housatonic, which is but a few hundred feet distant, are projections of cut stone, so arranged as to convert the water which falls over them into a sheet of foam, from which it justly derives its name of *Cascade* Barn."

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

WORK—WORK RIGHT, WORK EVER.

Let the cobbler stick to his last. This is an old adage, and if I were to strictly observe its mandate, might never venture a line for publication. But such is the waywardness of man, that he is seldom satisfied to stick to one thing always. No; *change* and *variety* is rather more congenial to his nature. For an humble farmer in the hill-country of East Tennessee, who can only lay claim to the name by occupancy, since all his earlier energies were engrossed differently, to now turn agricultural writer smacks somewhat of strangeness; and that, too, to first meet the eye of thousands of well-experienced practical men, deserving the name, ought well nigh to prove too much embarrassment for me. But, disclaiming here any vanity at all about seeing my desultory and perhaps useless ideas printed, and relying upon the more ripe discretion of *The Plough, the Loom, and the Anvil,* with many thanks to its generous conductors for the information it has yielded me, I come now humbly, I trust, to award them—and next, if I should say a word thought to be of any value, and it shall appear, I shall be amply requited. *Let the cobbler stick to his last.* Yes, and why not—hammer, lapstone, and awl? Well, this lays down a principle of assiduous application to work for the cobbler. Let it be understood, too, that it impliedly forbids meddling with other matters. Then, brother farmer, let me drop you, as meekly as I may, but with as much candor, the key of success in farming. *Work*, and work right, and work ever, and success is bound to be the result. But, when some of our farmers who turn to other pursuits, and make farming a *dernier ressort* to kill time, may truly complain of the barrenness of this occupation in furnishing suitable matter for the press. Why, it is said by many that farming is merely a consecutive bundle of experiments adapted to the great order of nature. Admit it—and the same might be said of steam, of electricity, magnetism, etc., etc.—and what, I ask, would be fate of all the wonders of nature and art of man, if God did not speed the plough? It is, we know, inconvenient for planters to meet together in organized bodies, and deliberate like others upon questions of policy that interest them. Then they should, (should they not?) read, correspond, note down experiments, study to shorten and lighten labor, fertilize the soil, grow the best seeds of the best crops, raise the best stock, the most valuable fruits, the healthiest vegetables, and build the most durable fences, dwellings, etc. A farmer's own interest always prompts him to raise a surplus of that which is most marketable in his locality; and, as for market, I have heard the remark, that he that has nothing to sell is farthest from it. Already, and long ago, have our worthy farmers known that education, to their children, is of much importance; and much to their praise be it spoken, again and again, that they carry out the thing to the very letter. Our greatest, best, most conspicuous, most learned, and most honored men, are mainly farmers or farmers' sons. Then, as of cobbling, so of farming; as I borrow the adage, I return it—Let the cobbler stick to his last, and I add, the farmer to his plough. A. L. B.

Mill-Bend, Tenn., April, 1854.

PROPER USE OF GUANO.

This is a fruitful topic, on which much more light is needed. With the view of adding something in this way, we give place to the following judicious article in *The Farmer and Visitor.* It deserves careful attention.

Mr. Editor: All the agricultural papers teem with articles on the use of guano, which declare chemical principles and practical experiments. One says, "Do not mix it with plaster—as I have tried it." Another puts *half a shovelful* of hen-dung (guano) in a hill of corn, and the corn utterly failed; yet the same writer says, "to guano a small quantity of house-ashes or caustic lime might be added advantageously, and perhaps a small quantity of gypsum would be of use." These are experiments of theory and practice, without any *true principle* to guide. Just as well (and it is strange the farmer does not seize the idea as of universal application) might the wheelwright expect to make a symmetrical circular wheel by hewing out the hub, taking sticks for spokes of any shape and dimensions, and setting them at random in the hub, as that the farmer, who is now most rapidly becoming a "Practical Chemist," can usefully, economically employ purchased or any manures unless *intelligently.*

Some look upon guano more mysteriously, because it comes from the other side of the continent—from desolate, rocky islands, and covered there many feet deep—sold in the cities at a great cost, and brought up into the country; yet it is, after all, nothing more nor less than the "manure of the *hen-house.*" There is no rain in the regions of these islands; *hence it is preserved.* All rocky islands inhabited by sea-fowl would furnish guano, if their climate were dry; but now it is decomposed and washed into the sea in all moist climates.

In this neighborhood, *fifty tons* of guano have lately been purchased from New-York; and it is a very important matter, therefore, whether or not the cost, $2500, is to come back into the pockets of the farmer or be a dead loss

Should they put half a shovelful into each hill of corn, or spread it on the barn-floor "to slack," or grind it at the mill, or mix it with caustic lime or ashes, there would in every case be a loss.

Guano kept in bags wastes on the same principle that the druggist loses his ammonia or harsthorn, if the bottle is left open, and how rapidly if he pours it out into a dish.

The smell of ammonia passing off is always present; the closest cask, therefore, keeps it best.

Seeds put into guano, or on it, where in quantities, and covered, are "burned," like the manure-heaps when the heat of fermentation is too great.

Guano mixed with sand would certainly not be acted on by the sand; and guano, it is believed, when mixed with plaster, is not at all affected by it. Guano mixed with ashes is rapidly decomposed, and with lime more rapidly than by ashes.

I have made these experiments in a way that can be repeated by the farmer; and if you please, I wish you to repeat them. I send you inclosed a sheet of *red litmus* paper for the purpose.

If you take tea-cups, and place in one a tablespoonful of guano, mix the same quantity of guano with an equal part of plaster in another, and with ashes and lime in two others. Cut the sheet into squares, wet them in clear water, and lay one tight over each cup, and observe the change, from red to blue. The rapidity of the change, and the intensity of the blue tint, will illustrate the passing off of the *ammonia* in the gaseous form.

The decompostion with ashes and lime was exceedingly rapid; the other two seemed to advance about equally, unless the guano alone exhaled more ammonia than when mixed with plaster.

If the plaster *acts* on the guano to separate ammonia, the sulphuric acid must take it and form sulphate of ammonia, set free the lime. Guano, mixed with common salt, does not seem to lose ammonia, and if the two are decomposed, still the ammonia ought to be retained, in combination with the chlorine, as sal ammoniac. The first point is to *retain the ammonia;* and any compost of guano that does not act to set free the ammonia, can not be injurious.

De Bow's Review for May also contains the following excellent remarks upon the uses of guano as a fertilizer, based upon the experiments of D. J. McCord, an intelligent planter of South Carolina:

"LANGSYNE, March 22, 1853.

MY DEAR SIR: In the winter I reside entirely on the plantation here, and my post-office is Fort Mott. Your letter, being directed to Columbia, was not forwarded to me until yesterday. I fear now that my answer will reach you too late, especially if you wish to apply guano to your corn. For many hereabouts have planted, or nearly done. I am not half done. But to begin with my answer.

For two years I mixed four bushels of dry sand with one bushel of guano. This year, to save trouble, I will mix two bushels of sand to one of guano. Fine charcoal, taken from the railroad, a blacksmith-shop, or coal-kiln, is excellent, because, like gypsum, it will retain the ammonia; any dry, fine dirt, will do as well as sand. My object for mixing is to increase the quantity to be put down more accurately by dull and careless hands.

My mode of mixing is this. I take for the purpose some dry shed—free from the wind is better, for it may mix and blow away much of it. I then take a coarse iron sieve and sift a layer of sand, and on that a layer of guano, until I get it all mixed for the field. If the sand or earth is damp, it will cause evaporation and loss. When thus prepared, you may put it into the ground just before you plant, or a month before. If put under the seed of corn or cotton, it should be covered by the plough or hoe two, three, or four inches, so that when you put the seed in the ground over it, there may be two, or three, or four inches between the seed and guano; for if they come in contact it will kill the seed; but by the time the roots reach it, it will be diffused in the soil, and nourish and not destroy it.

I have only once tried it on an acre of corn. It was a very unfavorable year for corn, being dry. I put a tablespoonful (not heaping) of guano in each hill, and covered it with fresh earth, and the corn was then covered about two inches. The adjoining acre was manured as usual with stable-manure and cotton-seed mixed.

The acre manured with stable-manure and cotton-seed was seven or eight inches high, while that manured with guano was so small and so wretched that I had some idea of cutting it up and replanting them. It rained, and in one week afterward the guanoed corn was as large as the other, and soon became larger, and with much stouter stalks, and continued much the largest, yielding much better fodder; but the produce of corn was about the same, each acre producing between sixteen and seventeen bushels. I planted in five-feet rows the stalks two feet apart. A tablespoonful a hill will take from 180 to 200 lbs. But if I were intending to use guano on corn, I would not put the guano to it until it was up, and at the first ploughing run a bull-tongue near the corn, and sprinkle the guano opposite the corn—a tablespoonful on each side might do, or half a tablespoonful on each side. It must be followed by another plough, and covered immediately. I have heard of much less doing. I have never made any other experiment with corn.

A bushel of guano weighs 58 lbs.

Now for cotton.

On cotton, I have used guano for three years.

The first year my experiment was a small one, but clearly showed the importance of guano.

In 1851, I manured twenty acres old, worn-out red lands with two hundred pounds guano to the acre. It yielded:

1st picking, - - - - - - -	900 lbs.
2d " - - - - - - - -	1,700 "
3d " - - - - - - -	4,995 "
4th " - - - - - - - -	4,053 "
5th " - - - - - - -	76 "
	11,724 lbs.

Average per acre, 616½ lbs.

One acre adjoining, same quality exactly, unmanured, yielded:

1st picking, - - - - - - -	00 lbs.
2d " - - - - - - - -	00 "
3d " - - - - - - -	60 "
4th " - - - - - - - -	108 "
5th " - - - - - - -	76 "
	244 lbs.

Difference per acre in favor of guano, 372½.

In 1852, I manured 36 acres with 180 lbs. per acre. It produced 31,540 lbs. seed cotton, or 875 lbs. to the acre. More than half of the land was very old, sandy land, never manured; the rest inferior, old red land. Of the adjoining acres unmanured, my overseer by mistake did not keep the weights; but I do not believe that it averaged 450 lbs. At that rate, the difference was 426 lbs. per acre.

For 1853, I intend to manure 34 acres with 174 lbs., which is 3 bushels of guano, and 10 acres with 100 lbs. to the acre. I am told that quantity produces well, and perhaps pays best, costing so much less. One of my neighbors last year used 1 bushel (58 lbs.) per acre. He kept no account of weights. His overseer told me that he thought it produced more than twice as much as that not manured.

Now for my mode of putting down.

My acres are 42 compasses square—60 rows to the acre.

To put down 174 lbs. to the acre requires 3 bushels guano; and if 2 bushels of sand or dirt are put to each bushel of guano, it will take of the mixture 4 quarts, 1 pint, and 1 gill to each row.

To put down 100 lbs. to the acre of the same mixture requires 2 bushels of guano, (less 1 gallon,) and takes 3 quarts of the mixture to the row.

If you mix 4 bushels of sand to 1 of guano—

17½ bushels of mixture will give 200 lbs. to the acre.

15½ bushels of mixture will give 180 lbs. to the acre.

15 bushels of mixture will give 174 lbs. to the acre.

13½ bushels of mixture will give 150 lbs to the acre.

So you must make your calculation in proportion to the material you mix with the guano, and divide by the number of rows in your acre.

Let each hand have a small box to hold the quantity measured out of the bags for each row, and take care that it hold out as even as it can be put. They soon learn, after trying one or two rows.

You must not attempt to put it down in windy weather, or it will be blown away. Take out what you want for the day only, in bags, to keep from wind, and covered, if rain should come, for it would be injured by getting wet before covered in the ground. I forgot to say why you should sift it. In the first place, you mix it better by so doing; and beside, the guano has many lumps, and by sifting you get them out, and should break them in a mortar or trough, so as to mix it with the earth; otherwise these lumps would burn up every thing.

I believe I have told you all I know. Gypsum is said to be excellent for mixing with the guano; and no doubt it would be so, as it would retain the ammonia.

This year I bought guano in New-York. It cost me, delivered here at Fort Mott, $50 for 2000 lbs. If many planters would unite and take a large quantity, it could be got still cheaper. By the new charter to the railroad to Columbia, they can only charge 12½ cents per 106 lbs.

The fullest account that I have seen of the methods of using guano, is an Essay on Guano, by J. E. Teschemacher, Boston, 1845. It was distributed some years since, to those who bought guano, gratis. It was published by A. D. Phelps, 124 Washington street, Boston, from whom, perhaps, it can be had; and by Saxton & Huntington, 295 Broadway, New-York.

I have been amused with some of the modes I have seen recommended by knowing ones in the newspapers, namely, rubbing the cotton-seed with it, etc. It killed the seeds wherever it touched it, the first year I used it; and my gardener, not regarding my cautions, burnt up every thing.

Let me know how you succeeded with your guano. I hope you will receive this in time."

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

PLANTING IN MISSISSIPPI.

BY H. W. STACKHOUSE.

I WILL now endeavor to redeem my promise, by giving you something on the planting in this portion of Mississippi, being the southern border of this county.

I do not offer my remarks for the purpose or with the expectation of instructing my brother planters. I present them, that you of the North may have an idea what we are, and how we manage our crops.

The annalist, when he gives the history of a campaign, endeavors to present, before the mind's eye of the reader, the topography of the country where the events have transpired. The same should be the course of the agricultural writer. To understand the mode of farming which he wishes to delineate, it is necessary he should offer a cursory view of the country, and the growth, color, and depth of soil.

Our uplands are generally gently rolling, except where they border on the streams; very often they terminate in abrupt hollows, forming ridges, frequently not thirty feet across. Our level land is found on our streams. Most of these streams only flow in the winter, or in wet weather. Very often when we pass from the upland to the lowland, we strike a slip of wet land, lower than that on the margin of the stream. This kind of land is a great trouble to us; it is either too wet or too dry, too hard or too soft, where ditching renders a very poor equivalent for the expense. To make it available, we should sink a ditch at the brow of the hill, another in the lowest part, then cause the rows to point to the latter ditch. After leaving this wet land, we come to a rich body, bordering the stream, the width of either being governed by the size of the stream.

The growth on our uplands embraces pine, several varieties of oak, dogwood, muscadine vine, and red elm. On the best cotton-land, in addition, we have hickory, two kinds of gum, slippery-elm, the bunch-grape, with an occasional poplar and walnut, and also chestnut; but where the last grows, the soil is rather too sandy. The lowlands have all of the above, the pine being very scattering, indicating a poverty of soil. We farther have the magnolia, linden, and wild peach, on the best; whilst on the second-rate, considerable beech and holly. We have other trees, but these, I think, are sufficient.

Our upland soil is from two inches to six in depth, based on a close, tenacious, yellowish clay, with almost all shades of color from gray to black. That on the margin of the streams is in depth six inches to a foot, color a light snuff to a black, based on a light-colored, sandy clay. The wet land is whitish, terminating in a sub-soil of the same appearance. The most distinctive feature of this land is a soft pebble, of the size of buck-shot, being a species of iron-ore, which is black within and yellowish without. This pebble extends into the sub-soil two or three feet, or until it reaches another stratum of earth.

Our lands are deficient in lime. I think that deficiency affects the staple of our cotton. In my next I shall treat on rotation of crops and the oat-crop.

Hinds' County, Miss., April, 1854.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

WOOL-GROWING IN LICKING COUNTY, OHIO.

Licking County claims, and we believe justly, to be the banner county of the United States in wool-growing, having nearly two hundred thousand sheep, many of them the very best Saxon and Merino, and a soil and climate well adapted to growing the best of wool. Our farmers also, being in the habit of keeping their pastures free from burrs, and washing and putting up their wool in the best manner, it is a field well worthy the attention of the manufacturer who purchases his supplies of this material from the grower. He will find it to his interest to visit us about the first of June, and see for himself. Also, persons wishing to improve their flocks will find all the varieties of fine-wooled sheep, in the greatest perfection, not excepting some of the best imported French and their descendants, with some good middle-wooled sheep.

W.

CORN CROP: ITS MODE OF CULTIVATION.

Mr. Luther Gilbert, of Grantville, Mass., thus reports his crop and his cultivation.

To the Committee on Grain Crops:

Gentlemen: The field of corn entered by me for premium, contains two acres; the soil is a black loam generally, and part of it a mixture of gravel. The condition of the field was poor; it was sowed down to grass in the fall of 1846, without any manure; it has been in grass ever since, until September, 1852, when I had it broken up about ten inches deep. The manure used on this field was a compost, made entirely between the 18th of November, 1852, and the last of April, 1853, from one horse, one cow, and sods taken from the above field and composted in my barn-cellar by my hogs. As the bulk of the manure was taken from the same field to which it was returned, I shall only estimate the value of the horse and cow-manure, the use of the hogs for composting, and the carting the sods into the cellar, as that was the only cost to me. The compost was carted directly from the barn-cellar (without turning over) about the last of April, and spread as evenly over the whole field as it could well be, and immediately ploughed in. The quantity spread in this way was about sixteen cords to the field, (or eight cords to the acre;) it was then harrowed and furrowed both ways, three feet four inches one way, three feet the other. There were about two cords of scrapings of the cellar put in the hill; on such parts of the field as the soil was poorest, one shovelful in the hill. On the 10th and 11th of May, I planted it with the Plymouth-county corn, putting six to eight kernels to each hill; cultivated and hoed it twice, taking out all but five, and sometimes four, stalks at hoeing-time.

On the 18th of October, the Society's committee, after examining the whole field, selected two places in separate parts of the field, and measured one square rod in each, which the committee considered to be a fair average of the whole. They measured from the centre between two rows, and gathered, shelled, and weighed each rod separately. The first rod weighed $44\frac{1}{4}$ lbs., the second $46\frac{1}{4}$ lbs., making the average $45\frac{1}{4}$ lbs. to the rod; reckoning

56 lbs. to the bushel, as per rule of the Society, and it gives me 129 16-56 bushels to the acre. The corn was well ripened, and I commenced on the same day to harvest it.

DEBT AND CREDIT ON THE ABOVE FIELD.

Land valued by the assessors at $225 an acre, interest on ditto,	$27 00
Taxes on the same this year,	2 56
Ploughing in September, 1852,	5 00
Carting sods into barn-cellar for hogs at sundry times,	10 00
Manure of horse and cow, 5½ months,	8 00
Use of hogs to work over sods and composting,	10 00
Applying manure, $10; ploughing, harrowing, and furrowing, $6,	16 00
Seed-corn and planting, $3.50; cultivating and hoeing, $6,	9 50
Cutting stalks and harvesting,	16 00
	$104 06

VALUE OF CROP.

Stalks and husks,	$30 00
258 4-7 bushels shelled corn, at 90 cts.,	232 20
Increased value of land, benefited by manure,	14 00
	$276 20
Deduct cost as above,	104 06
	$172 14

INCOMBUSTIBLE WASH, AND STUCCO WHITE-WASH.

The following preparation has been recommended as of great value, in several of our exchanges, but appeared originally, we believe, in the *Railroad Journal*. We give it to our readers as we find it. Some of our acquaintances have used it, and value it highly.

The basis for both is lime, which must be first slacked with hot water, in a small tub or piggin, and covered, to keep in the steam; it then should be passed, in a fluid form, through a fine sieve, to obtain the flour of the lime. It must be put on with a painter's brush; two coats are best for outside work.

First. To make the fluid for the roof, and other parts of wooden houses, to render them incombustible, and coating for brick-tile, stone-work, and rough-cast, to render them impervious to the water, and give them a durable and handsome appearance. The proportions in each receipt are five gallons. Slack your lime as before directed, say six quarts, into which put one quart of clean rock-salt for each gallon of water, to be entirely dissolved by boiling, and skimmed clean; then add to the five gallons one pound of alum, half a pound of copperas, three fourths of a pound of potash—the last to be gradually added; four quarts of fine sand or hard-wood ashes must also be added; any coloring matter may be mixed in such quantity as to give it the requisite shade. It will look better than paint, and be as lasting as slate. It must be put on hot. Old shingles must be first cleaned with a stiff broom, when this may be applied. It will stop the small leaks, prevent moss from growing, render them incombustible, and last many years.

Second. To make a brilliant stucco white-wash for the buildings, inside and out. Take clean lumps of well-burnt stone-lime; slack the same as before; add one fourth of a pound of whiting or burnt alum, pulverized, one pound of loaf or other sugar, three pints of rice-flour, made into a very thin and well-boiled paste, starch, or jelly, and one pound clean glue, dissolved in the same manner as cabinet-makers do. This may be applied cold within doors, but warm outside. It will be more brilliant than plaster of Paris, and retain its brilliancy for many years, say from fifty to one hundred. It is superior; nothing equal. The east end of the President's House, in Washington, is washed with it.

PATENT FERTILIZERS.

The business of manufacturing fertilizers, like many other kinds of business, good in themselves, is so easily converted into a swindling speculation, that we have not had the disposition, oft-times, to encourage it. If the proprietor is honest, the workmen may not be so; and though self-interest may direct both to honesty in such business, it urges also to the same course in all other business, and yet how often is its voice unheeded. With regard to fertilizers, if half or even a quarter of the quantity sold is "genuine," and a useful article, puffs enough may perhaps be secured to make sale of the other three fourths to those who would try a hopeful experiment. All samples direct from the manufactory, *as a test*, fail, in our view, to prove the value of articles in general, and especially of that bought of second hands; and unless there is some indorsement by uninterested parties, of competent skill, we should ever feel some doubt as to the actual worth of the mixture.

But we fully accord to the remarks of our neighbor of the *Agriculturist*, below, and can see no possible objection to the proposition of Mr. De Burg, as here set forth:

"There is so much opportunity for deception or collusion on the part of manufacturers of various artificial fertilizers, that we have uniformly declined to publish reports of experiments made to test their value, and we have refused to receive samples of any kind of special manures for our own experiments, if we were asked to publish the results. We have no confidence in the specimens put up for such experiments or for analysis; neither do we value the results obtained by the first samples sent into the market for sale, for it is to the interest of manufacturers to furnish a good article at first, even if at a loss. These doubts we have expressed plainly to different manufacturers, to Mr. De Burg among the number.

Mr. De Burg, however, has called upon us, and made a proposition which we think obviates the above objections, and we cheerfully lay it before our readers; and we will with the same cheerfulness give the free use of our columns to any other manufacturer who will make a like fair and open proposition. Mr. De Burg's proposition is as follows: He will furnish, at his own expense, three to five hundred pounds (or more if desirable) of his superphosphate of lime, to any agricultural society, or club, or association of men, who will give it a fair trial, and report the results, favorable or reverse; and mark, ☞ the samples for experiments are not to be taken from the factory, nor from any particular lots, but from any that has been or may be sent into market. To prevent any chance for deception, those proposing to make such experiments may first select their samples from any they can find in the country, and then apply to Mr. De Burg, and he will give an order for its delivery to them free."—*American Agriculturist.*

Persons wishing to try the super-phosphate, as proposed, can obtain it by addressing C. B. De Burg, Williamsburgh, N. Y.

THE AMERICAN CAMEL COMPANY.

A pamphlet has been given us by the Chairman of the Commissioners, Mr. Wm. G. King, containing the act of incorporation of this Company, which was granted by the State of New-York in April last, and with it the natural history of that useful animal, the camel. Perhaps we can do no better service than to give this history, in its essential features, a place in our pages.

This company purposes to introduce the camel into this country. They say, quoting from the late report of the Secretary of War:

"The absence of navigable streams in a large portion of our recently-acquired territory, and the existence of the vast arid and mountainous regions, described in another part of this report, have entailed upon the government a very heavy charge for the transportation of supplies, and for the services of troops stationed along our new frontier, and operating against the predatory and nomadic Indians of those regions. The cost of transportation within that country for purposes connected with military defense, amounted, in the year ending June, 1853, to $451,775.07.

The modes of transportation now used—wagons drawn by horses, mules, or oxen—beside being very expensive, are necessarily circuitous on the routes travelled, slow, and generally so unsatisfactory, as to prompt inquiry for means which may be attended with better results. In any extended movement, these wagon-trains must depend upon grass for forage, and their progress will seldom average more than twelve miles per day; and it often happens, in traversing the country just referred to, that long spaces are encountered in which there is neither grass nor water, and hence the consequence must be severe privation and great destitution of the animals employed, if not the failure of the expedition. These inconveniences are felt in all movements between the distant parts of that section, and seriously obstruct, sometimes actually defeat, the pursuit of the mounted Indians of the plains, who, by their intimate knowledge of the places where the small supplies of water and grass are to be found, are able to fly across the most arid regions after having committed depredations on our frontier population, or upon the trains of merchants and emigrants.

Beyond the difficulties here contemplated in connection with transportation to the interior, it is proper to look to those which would arise in the transportation of supplies for the defense of our Pacific coast in a contingency of a war with a maritime power. Our experience has been confined to a state of peace, and to the use of routes of communication which pass beyond the limits of our territory. Reasoning from the difficulties which have been encountered in supplying points where it was necessary only to traverse a part of the space which lies between the Pacific coast and the points of supply, it may be claimed as a conclusion that it would not be practicable, with the means now possessed, to send across the continent the troops, munitions, and provisions which would be required for the defense of the Pacific coast. A railroad, such as has been contemplated to connect by the most eligible route the Mississippi River with the Pacific coast, would but partially remove the difficulties. It would serve to transport troops, and to supply depots along the route and at the extremity of the line, but there would still be vast regions of the interior too remote from its depots materially to feel its effects."

THE NATURAL HISTORY AND COMMERCIAL VALUE OF THE CAMEL.

General Characteristics.—The camel, belonging to the class of ruminants, is one of the larger quadrupeds, being six or seven feet from the ground to the highest part of the back, and carrying its head, when erect, about nine feet above the plane on which it stands. The carcase weighs about three or four hundred pounds; but the size and weight are far from being alike in all. The neck is long and slender, and seems to grow out of the lower part of the body, between the fore-legs. The head is small, and the ears short. The eyes are of various colors, from a black to almost a white, bright and sparkling with instinctive intelligence, and placed on the sides of the head in such a manner that the animal can see before, behind, and on every side. The tail is short, and hangs down, with a small bunch at the end. The legs are long and slender, though their points are stout and strong. The feet are divided somewhat like those of an ox, with hoofs on the extreme points of the toes. The soles are soft, yielding, and remarkably broad.

The camel is generally of a light color, from which it varies to a dark-brown, and sometimes reddish-brown; it is also marked with white spots or stripes on the forehead and on different parts of the body. It is subject to the mange, to cure which the Arabs bedaub it with *kitran*, or tar. Physiologists, in accounting for the peculiar property of the camel in resisting the want of water, have supposed that it is provided with an additional stomach, of peculiar conformation, to retain what is imbibed. But it does not appear that there is a particular reservoir for the purpose; and there is reason to think that the same end is attained by the singular structure of the second stomach, being composed of numerous cells, several inches deep, the orifices of which are apparently susceptible of muscular contraction. It is conjectured that when the animal drinks, it has the power of directing the water into these cells, instead of allowing its passage into the second stomach. From the structure of the second stomach, it neither receives food in the first instance, nor does it afterward pass into its cavity. The orifice of the cells composing it are so constructed as to prevent the entrance of solid food into them.

Fleece, Fabrics.—The camel annually casts its hair, in the spring; and it all goes, to the last fragment, before the new comes on. For about twenty days it is as naked as if it had been shaved from head to tail. While in this state, it is extremely sensitive to cold, rain, and the annoyance of flies, from which latter its keeper is careful to preserve it by the application of tar. But by degrees the hair grows again. At first it is extremely fine and beautiful, and when it is once more long and thick, the camel can brave the severest frost. The fleece of an ordinary camel weighs about ten pounds; but its color and abundance depend entirely on the particular species of camel and the climate which it inhabits. That of the Arabian camel is thin and whitish; that of the Bactrian camel, thicker and darker-colored. From the hair a coarse kind of clothing, almost impermeable to water, is made for camel-drivers and shepherds; and the same commodity, for an analogous purpose, is used as wrappers of merchandise long exposed to wet in heavy rains. But in Persia and the Crimea, more valuable manufactures are produced in narrow cloths of different colors, and fine stockings, of which white are the highest-priced. It is wrought into shawls, carpets, and coverings for the tents of the Arabs. The Tartar women of the plains manufacture a kind of warm, soft, and light narrow cloth from the hair of the Bactrian camel, preserving the natural colors. The hair, of different colors, is an article of export from Asia and Africa; its value is proportioned to the fineness and depth of color, that which is black being the dearest.

Milk, Flesh.—The Arab generally rises before early dawn, and his first task is to milk his camels, who have been prevented straying away from his tent during the night, by tieing up one of their legs and fastening it with a noose; while at the same time he removes a net which is placed so as to prevent the young camels sucking the mothers, until a certain portion of the milk is drawn for the use of the tent. The milk is excellent, both for butter and cheese. The natives of Africa esteem camel's flesh more than that of any other animal. It is related that Heliogabalus had camel's flesh served at his banquets, and that he was especially partial to the foot. This latter dainty the emperor had the honor of discovering.

Food, Sustenance.—The camel feeds on thistles, on the stunted shrubs and withered herbage of the desert, and can pass successive days in total want of water; thus seeming as if purposely designed by nature for the most cheerless and inhospitable regions. It is exceedingly fond of the huge, succulent leaves of the cactus, the strong, needle-like thorns seeming to act upon its leathern palate as an agreeable stimulant. It also munches with great gusto the dry bones with which the routes in the desert are strewn. On long journeys over a desert destitute of herbage, a few beans or flower-balls, or a little barley, suffice to enable it to perform its task. Over large expanses of desert, where the soil is dry and powdered with saline matter, the water, when water there is, is brackish. This want of fresh streams is very unfavorable to cattle, but occasions no suffering to the camel, which delights in salt in every shape.

Intelligence, Docility Training.—The camel grows up like a child under the tent of its master, partakes of his plenty as well as his penury, enjoys his songs, and understands his bidding. Its docility springs from habit and reflection—nay, we may almost say from moral feeling; for it rebels when its temper is not sagaciously managed. When the French went to Algiers, and got possession of camels, they thought that their obedience might be enforced, like that of mules and asses, by simple beating; but they soon showed their conquerors that they were not to be so treated, and that both their kick and their bite were rather formidable. The Arabs assert that the animal is so sensible of ill-treatment, that when this is carried too far, the inflictor will not find it easy to escape its vengeance. Eager, however, to express its resentment, it no longer retains any rancor when once it is satisfied; and it is even sufficient for it to believe that it has avenged its injury. When an Arab has excited the rage of a camel, he throws down his garments in some place near which the animal is to pass. It immediately recognizes the clothes, seizes and shakes them with its teeth, and tramples on them in a rage. When its anger is thus appeased, it leaves them, and the owner may then appear and guide it as he wills. There is no trouble in littering or feeding the camel. As soon as its load is taken off, it is turned out to graze on whatever it can find around its owner's tent, and never looked after until it is again required to continue its journey. At other times it shelters the weary traveller stretched along the sand, watches over his slumbers, and like the faithful dog, warns him of the enemy's approach. Its instinct enables it to smell the distant water, and it recognizes the spot with wonderful precision. It is the very type of patience, fortitude, and perseverance. Charged with a heavy load, constantly travelling over the sand—from which its nostrils, shaped like narrow oblique slits, and provided with a sphincter muscle like the eyelids, are defended with hairs at their margins—exposed to hunger, thirst, and the hottest rays of the sun, it suffers the fatigue and pain with incomparable meekness. It lies down on the burning sand, without betraying the least degree of impatience; while at all able to support its load, and continue the journey, it strains every nerve to proceed; it neither flags nor relaxes, until absolutely worn out, when it falls, to rise no more; thus rendering its last breath on the very spot it ceases to be useful. The camel is occasionally employed in the plough and other agricultural pursuits, like oxen or horses; and in many Tartar countries, it is used to draw the coaches of the kings or princes; but physiologists remark that when used in the yoke or harness, the elevation of its shoulders is cause of a waste of strength; beside, for the purpose of traction, it can only be used at all upon flat ground, its fleshy feet, which are two in number, and not externally separated, not permitting it to ascend hills, and draw a carriage after it. It is as a beast of burden that the camel is chiefly valuable; and its qualities in this capacity are improved to a great extent, by the mode in which it is trained. At the earliest period, the legs are folded under the body, in which position it is constrained to remain. Its back is covered with a carpet, weighed down with a quantity of stones, gradually augmented; it receives a scanty portion of food; it is rarely supplied with water; and in this manner is brought to endure privation. When the time of trial has elapsed, and it is broke into subservience, it kneels at the command of the master, who either mounts it himself, or loads it with a heavy burden; and then trusting to its strength, and the privations it can suffer, he ventures to traverse the trackless desert. When it lies down to receive its load, it rests upon the callosities of its breasts and limbs. It is ridden upon, loaded or unloaded, either with or without the pack-saddle; if without, the rider rides behind the hump, using no manner of bridle, guiding the beast only by striking gently with a stick on his neck. The saddle, when used, is placed upon the withers, in front of the hump, and the legs of the rider, when mounted, rest upon the animal's neck; when razzias are made, two men are mounted on each. In rising from its crouching posture, the camel, which is in general so deliberate in all its actions, mounts on its hind legs first very briskly, as soon as the rider leans on his saddle to spring up, and throws him first forward and then backward; and it is not until the fourth motion, when the beast is entirely on its legs, that the rider can find his balance. The camel signifies that it is sufficiently loaded either by a hiss or a shake of the head: it will refuse to rise if laden with even half a pound beyond its exact burden. A drove of camels will all rise or lie down, at the word of command, as if struck by the same blow. They are made to eat in a circle, all kneeling down, head to head, and eye to eye. Within this circle of heads is thrown the fodder; each camel claims its portion, eating that directly opposite to its head.

Travel.—The progress of the camel is in general slow, especially when collected in numbers to compose a caravan; but its pace is regular and uniform, and constitutes no inaccurate measurement of distance over desolate regions, where there is no guide. It does not appear that the load of the camel materially affects its progress; the chief difference, in that case, lying in the daily duration of its march. The camels are tied one after another, held together by strings in their nose, and are not allowed to graze during the march. This is an advantage; for much time would otherwise be lost by the camels cropping herbage by the way. The files are twenty and thirty in number, and sometimes these files are double. In mountainous districts, they are untied; otherwise one camel slipping would draw another after it, and so the whole line would be thrown into confusion. The operation of piercing the nose and passing through it a piece of wood, which is to serve as a bit, is painful, and causes the animal to utter loud wails. "Slow and sure," has in no case so good an application as it has to the progress of the camel's march. It is in the desert it gives proof of its peculiar advantages; its long neck, perpendicularly erected, removes its head from the sand-waves; its eyes, which it keeps half shut, are well defended by thick eyelids largely provided with hair; the construction of its feet prevents its treading deep into the sand; its long legs enable it to pass over the same space with only half the number of steps of any other animal, and therefore with less fatigue. These advantages give it a solid and easy gait on a ground where all other animals walk with slow, short, and uncertain steps. In fact, it is only in mounting or descending, or upon a wet and marshy soil, that it becomes unsteady and unwieldy. Sometimes, when there are many camels travelling together, the drivers beat drums, and attach small bells to the knees of the leading camels, and if it becomes necessary to quicken their pace, the Arabs strike up a kind of song which has the effect of cheering the whole party, and urging them forward.

Foal, Longevity.—Though the camel produces but one at a time, or rarely two, the care which is observed in their multiplication renders them numerous. A caravan will exhibit a thousand, nay, four or five thousand collected together, and a single individual will be the master of four or five hundred. The Dey of Tunis, singly, owns thirty thousand. The period of gestation brings no rest to the camel; the female is delivered by the way, at a halt in the desert; the foal may be seen stretched on the ground as if lifeless, the mother standing over and looking at it. But the foal does not remain so long; for in one or two days it will be up on its legs; in four or five days it will be able to run after its dam a part of a day's march; and in seven or eight days it will be able to continue a whole day's journey. The cry of the foal is very much like that of a child; in marching it is tied upon its mother's back; it remains with its mother and sucks a whole year; it sucks its mother within four hours after its birth. The mother sometimes makes a great noise over her young one. The foal frolics in awkward antics a few days after its birth, but apparently soon loses its infant mirth. The she-camels have a foal every other year, but some few every year. It is five years before the camel attains maturity. The training of the foal commences when about a year old; when first laden with light weights, it will cry, groan, grumble most piteously, and run off like mad, trying to throw off the load. The camel lives between forty and fifty years, but it is not unlikely that the duration of its life depends upon the treatment it receives.

Varieties.—Notwithstanding our familiarity with the camel, the different species and varieties are by no means well understood; which produces some inconsistency in the accounts of the properties which it possesses. There are two species so distinct, however, that they can not possibly be mistaken; the one, the Bactrian camel, having two humps on its back; the other, of somewhat smaller size, called the Arabian camel. The hump, which is of a fleshy or glandular consistence, but not produced by a curvature of the spine, is a prominent character of the whole race.

Bactrian Camel.—This variety is characterized by two humps—one on the rump and another above the shoulders. It is larger, stouter, longer of body and shorter of limb than the Arabian camel. It is able to carry one thousand pounds, and is even sometimes made to carry fifteen hundred pounds for short journeys, or to escape the tribute which is levied upon single burdens; an object which is attained by putting the loads of two or three camels upon one, when about to enter towns where tribute is collected. The usual burden in long expeditions is from five hundred to eight hundred pounds, so disposed that half the weight hangs on each side. Yet under such a heavy load, if care be taken to feed the animal in proportion to the fatigue to be supported, it is afterward sustained on an inconsiderable quantity of beans, or a few balls of barley-meal daily, thrown on the ground when it halts. Whole days, however, may elapse without the animal tasting either food or water. Travellers frequently speak of having experienced this in long marches. Laden with eight hundred weight, it can travel forty miles a day. It often happens that travellers do not give themselves the trouble to dismount at night in order to sleep. When a caravan has reached a fat pasture, the camels disperse themselves this way and that and begin to graze, while the travellers, astride between their humps, are sleeping as soundly as if they were in their beds. A single driver will conduct a number of these camels, tied one to the tail of the other. It is stated that this animal can not swim, and that it has such a terror of water as to make it sometimes impossible to get it into a boat; with a raft there is less difficulty.* This animal abounds in northern, central, and eastern Asia. It was introduced by the Grand Duke Leopold into Tuscany, where it continues to breed in the maremmas of the Pisan territory. Immense numbers of these animals are bred in the Tell of Algeria, a region of country which includes the table-lands adjacent to the Mediterranean, and the gentle slopes of the lesser Atlas. In parts of this region snow falls every year, and lies on the ground several weeks. In Algeria, the price of a camel of this variety ranges from eighteen to thirty dollars. In the city of Algiers, the trade in camels is chiefly in the hands of the Mozabis, a resident tribe.

Arabian Camel.—This variety has only a single hump on its back. It is of smaller size, less hairy, and still more enduring than the Bactrian camel. In the rutting season, it is subject to fits of rage and violence, and it is necessary to muffle it. In the same season, a species of bladder hangs from its mouth, out of which issues a quantity of foam. These animals often fight among themselves, and their hostility affords great amusement to the Moors and Turks. The Arabian camel is able to carry, for long journeys, from three to six hundred pounds. It is supposed the hump serves for its nourishment, as it disappears in the days of starvation and hunger. It makes about two thousand two hundred of its double steps in an hour. This double step covers about five feet and a half of our measure. It will march eight hundred miles in three hundred and twenty-two hours, which is at the rate of two miles and a half

* This terror of water is occasioned by want of familiarity with it as a resisting element, and under the same circumstances is observable in a horse, which has no greater structural ability for swimming than the camel.

per hour. It never stumbles or falls. There is no necessity either to beat or direct it. Its pace is slow, but it makes long strides, and will march fifteen or sixteen hours at a stretch. It carries the women and children of the Arabs in panniers adjusted on either side. Its pace is very steady, and the traveller may sleep, eat and drink, read and write, on its back. By spreading his bed-clothes on the saddle, he will be enabled to change his posture, and to rest himself so as to avoid the direct force of the sun's rays. As the animal walks with long and regular steps, the rider feels the motion no otherwise than if he were rocked in a cradle. When travellers on horseback are weary and faint, from the fatigue of riding and the excessive heat, the rider of the camel will find himself as little exhausted as if he had ridden all day in a chaise. The saddle is always open above, that it may not hurt the hump of the animal. Denham describes it as swimming rivers, with its head fastened to a raft. The female is more valuable than the male, as it contributes more, by its milk, to the sustenance of the tribes. The Arabian camel has spread from Arabia all over the northern parts of Africa, and has long been essential to the commerce of those dry and desert regions.

Dromedary.—This animal is a sub-variety of the Arabian camel, to which it stands in the same relation that a thorough-bred racer does to a cart-horse. The hump is without fat, and very small, and its whole shape exhibits an appearance of strength and spirit. Its habitual pace is a trot, which it is able to sustain the whole day at about the same speed as the ordinary trot of a horse; but over rough or slippery ground the rate of speed is much reduced. The saddle is like a horse's, and covers the hump. The dromedary is managed by a bridle, which is usually fastened to a ring fixed in its nostrils. It is unquestionable that this animal can travel one hundred and even two hundred miles in twenty-four hours. Like the camel, it kneels to receive its load or a rider on its back. At a certain signal, it droops its head and neck, so that one can alight and remount, whenever there is occasion, without making the animal stop. When once fixed in the saddle, the rider has only to give way to the motion of the beast, and he soon finds that it is impossible to be more pleasantly mounted for a long journey; especially as no attention is requisite to guide the animal, except in turning it out of its straight-forward direction, which very seldom happens in the desert, and in a caravan. Its pace is light, the opening angle of its long legs, and the flexible spring of its lean foot, rendering its trot easier than that of any horse, and at the same time full as swift. The sand is truly its element, for as soon as it quits it, and touches the mud, it can hardly keep upon its feet, and its repeated trips alarm the rider for the safety of himself and baggage. The young dromedary is born blind, and continues so for about ten days. The dromedary is found in Arabia, in the great African desert, and in all the Barbary States; but it is chiefly in the Eastern Sahara that it abounds. Mounted on his dromedary, dressed out fantastically in various and many-colored harness, with his sword slung on his back, dagger under the left arm and lance in his right hand, the Touarghee warrior sallies forth to war. A very fine dromedary is six and a half feet in height. The price of this animal is from ten to two hundred times that of the ordinary camel.

Military uses.—In Northern India, the English use camels for the transportation of munitions of war. A corps of mounted dromedaries is also employed. In Algeria, field-pieces are carried by camels; the battery devised for artillery-service in the desert is a model of its kind; guns, *caissons*, and carriages, are folded up in the most compact form, ready to be fastened on the backs of these animals. Sick men, in their beds, are carried by camels, The *ambulance* used by the French army in Africa, is a most ingenious contrivance. This *ambulance*, called *cacolet*, is a species of pack-saddle, made of wood and iron, and adapted for the backs of camels. The *cacolet* has on each side two iron chairs, which fold up within a very small compass; so that a camel may depart with a column, carrying boxes of biscuits, barrels of meat, flour, and other provisions, and may bring back sick or wounded soldiers, to whom these chairs afford a safe and commodious conveyance. It is necessary that the men should be seated so that they may as nearly as possible counterbalance each other's weight. Some of these iron chairs are made to spread out at sufficient length to enable a sick or wounded soldier to lie down. Camel-caravans will be unapproachable by mounted Indians, as the camel, when first seen by horses, inspires uncontrollable terror.

Acclimation.—The natural abode of the camel is in regions abounding with sand or gravel, where food is scanty, and exposure to long-protracted privations unavoidable; and as deserts exist in cold as well as warm climates, so does the camel. Like man, it adapts itself to every clime, nature enabling it to endure with equal fortitude the extremes of heat and cold. Widely as it is now dispersed over Asia and Northern Africa, there is historical evidence to show that there was a period when it was a stranger even in Africa, and when its sphere in Asia was comparatively limited. Now, its geographical diffusion is equal to that of most other domesticated animals; it is not, however, found wild, as are other domesticated animals. It has followed the radiations of war, commerce, and emigration, over a stupendous segment of the earth's surface, stretching across the whole of Asia, and extending as far north as Lake Baikal in Siberia, in the sub-polar climate comprehended between latitudes 56° and 58°. It is much used in Eastern Europe. In Africa, it resignedly plods its weary way across its entire breadth, and from the shores of the Mediterranean to the region of the tropical rains. These facts demonstrate that the camel is easily acclimated, and that its *habitat* is not limited by climate, but by the nature of the soil, which must be suited to the peculiar configuration of its foot.

American Camel-Region.—Recent explorations demonstrate that the high table-lands of Texas, New-Mexico, Utah, Sonora, Chihuahua, Durango, and portions of Central Mexico, are fitted for camel-travel; for over those lands the varieties of the cactus abound, and the soil is gravelly and sandy; the climate being at the same time isothermal with that of the Tell of Algeria.

MANURE FOR ROSES.

Thomas Rivers, in his last rose-catalogue, says that for a neat surface-dressing for autumnal roses, to be applied late in spring, wood-ashes and guano have proved most excellent fertilizers, in the proportion of half a peck of guano to a bushel of ashes, applying two quarts of the mixture to each tree, in a circle eighteen inches in diameter round the stem, and suffering it to remain undisturbed upon the surface. The ashes retain the moisture from the dew and showers, and the effect, in giving a vigorous growth, with an abundant crop of the flowers in the autumn, has been very apparent. In our dryer climate, an occasional copious watering, or a thin grass mulching, placed over this compound, would doubtless be of decided benefit, and during dry periods would in fact be indispensable.

REMEDY FOR THE CURCULIO.

Diverse prescriptions are given for the cure of the various diseases of the human species, and those for vegetable growths are equally numerous. The curculio has proved utterly unmanageable in most cases, but we find recently that many have been successful in getting rid of the pest. Among others, our excellent and judicious friend, Mr. Bacon, has given us one mode of defense, which has stood the test of experience. We cut the following, which seems somewhat akin to his method, from an exchange, and regard this form of obtaining security from its ravages the same thing in principle, and well worth the trial. The writer says:

"I have in my yard two plum trees, which have blossomed well every spring for more than ten years past, and have been literally loaded with young fruit; but one solitary plum escaped the ravages of the curculio long enough to mature, until last summer, when one of the trees produced a fair crop. These trees stand about ten rods asunder; and their circumstances, as to soil, exposure, and situation in reference to other trees, are as nearly alike as may be. During the past ten years I have tried every thing—except '*catching the critter*'—which I have seen recommended in agricultural works for repelling the curculio, but found nothing effectual until last season. I yarded my pigs in a small space about them for several weeks, to no good purpose. They were dusted with lime and ashes every morning for a long time, without success. Holes bored into the body of the tree, and filled with sulphur, and stopped with a plug, had no perceptible influence. Many other remedies proved quite as ineffectual.

But last spring, early in May, in grading my yard around one of these trees, to the depth of ten or twelve inches, coarse unfriable earth from the highway-side was drawn in with a scraper, and the team in travelling over it, packed it down very firmly. I had resolved, that if I found no fruit this year, I would cut them down. The result was, that the tree which had dirt hauled about it, yielded a fair crop of ripe fruit; while from the other one, although it was well filled with young fruit, every plum dropped before they were half grown. I observed when the curculio was committing depredations, and the fruit was dropping daily, that from the tree around which dirt had been drawn, but very few plums fell to the ground in consequence of having been stung.

It would appear from the fact that the curculio itinerates but little, that it hibernates in the soil, under the branches of the trees on which it has flourished the preceding summer; and that paving, or burying it in the soil, a few inches deeper than it is accustomed to burrow, delays its resurrection until the young fruit has grown so as not be injured by these little marauders.

I design to make some experiments this season in repelling the curculio; and if I am successful, I will furnish you with details respecting them, and the result. S. Edwards Todd."

Lake-Bridge, Tompkins County, N. Y.

Similar experiments to the above have come under our own observation, but no covering of the surface of the ground has yet proved entirely effectual. Mr. Manice, of Long-Island, paved the ground under his plum-trees, but did not entirely succeed in keeping out the depredators till he entirely surrounded them with a high board-fence. Against this the curculios would strike in great numbers while attempting to reach the trees.—*American Agriculturist.*

CULTIVATING STRAWBERRIES.

About a year ago, we found in the *Friends' Review*, of Philadelphia, the following note from a correspondent in Baltimore, (we believe,) who had been exceedingly successful in cultivating the strawberry, giving the mode by which this success was attained. We have no doubt it is all he represents it to be. —*Germantown Telegraph.*

"Those who know any thing about the magnificent strawberries, and the immense quantity of them raised in a bed thirty feet by forty, for several years past, in the garden owned by me in King street, may like to know the process by which I cultivate them. I applied about once a week, for three times, commencing when the green leaves first began to start, and making the last application just before the plants were in full bloom, the following preparation: Of nitrate of potash, of glauber-salts, and sal soda, each one pound; of nitrate of ammonia, one quarter of a pound—dissolving in thirty gallons of rain or river water. One third was applied at a time, and when the weather was dry, I applied clean, soft water between the times of using the preparation, as the growth of the young leaves is so rapid that, unless well supplied with water, the sun will scorch them. I used a common watering-pot, and made the application toward evening. Managed in this way, there is never any necessity of digging over the bed, or setting it out anew. Beds of ten years old are not only as good, but better, than those two or three years old. But you must be sure and keep the weeds out."

VARIETIES OF THE CURRANT.

Among the smaller fruits, the currant is entitled to preëminence for its intrinsic usefulness. It will grow on almost any soil, bears without fail every year, and yields a large crop. It is little subject to casualties, and requires but little attention in cultivation. It is a palatable and wholesome fruit, which comes at a season when others are comparatively scarce, and continues a long time. Its value for jellies is known to every housewife. The *black* currant possesses a value for the production of a medicinal wine, which is not appreciated. A gentleman in this State formerly made considerable quantities, which were exported to the Southern cities and the West-India islands, where it was much esteemed for its efficacy in the prevention and cure of summer complaints.

Viewed in reference to all its good qualities, the currant is not generally so highly prized as it ought to be. A late number of the *Horticulturist* contains an article by John Saul, of Washington, D. C., which comprises much valuable information in regard to this fruit, especially relating to the characteristics of varieties. We copy the following from Mr. Saul's communication:

1. *Champagne.*—In foliage, wood, and habit, this belongs to the red class. Color, delicate rosy-pink, and would appear like a cross between a red and white, from the color of the fruit; but wood, foliage, and growth, set it down at once among the reds. This variety is scarce in England. The bunches are small, yet it is much in demand, where known, for preserving.

2. *Red Dutch.*—"Bunches short. This is a sweet, rich, and good currant." Thus it has been described by Mr. Rivers, in the last edition of his catalogue. When we consider the many good qualities of the Red Dutch, it is a free grower, a good bearer, a fair-sized bunch, with large, high-colored, rich berries; and above all, for jams and jellies it has no superior, if it has an equal. It is one of the best red currants.

3. *Red Dutch, Long-Bunched.*—This is a fine, long-bunched, large-berried variety of the above. It is later, and rather more acid.

4. *Red Grape.*—A very fine long-bunched variety, with large berries, but very acid.

5. *Knight's Early-Red.*—Bunches and berries about medium size, moderately sweet. A very good early currant.

6. *Knight's Large-Red.*—Bunches long, berries large, medium season. A fine, large currant, but inclined to be acid.

7. *Knight's Sweet-Red.*—A really good, sweet, red currant, with long bunches and large berries.

8. *Palmer's Large-Red.*—In this we have a very fine, long-bunched, large-berried currant; a vigorous grower and an abundant bearer. It is extensively cultivated in some localities in England.

9. *Pitmaston Sweet-Red.*—Bunches short, with berries below medium size. This is the sweetest of all the red currants. Raised by Mr. Williams, of Pitmaston.

10. *Victoria, Raby, or Houghton-Cattle.*—The bunches are longer than any other variety. A free grower and an abundant bearer. Perhaps, on the whole, the finest red currant known.

11. *Red Striped-leaved.*—A poorly-variegated variety of a bad red currant. Unworthy of culture, either for its foliage or fruit.

12. *Black Bang-up.*—A good variety of black. Bunch and berry nearly if not quite as large as Black Naples.

13. *Black Naples.*—Considered the best of the black currants, and I think deservedly so. Bunches of fair length, berries large.

14. *New Dwarf-Black.*—This variety promises well. It is of more dwarf habit than the other blacks, and in bunch and berry equal to Black Naples.

15. *Green-fruited Black.*—Wood, foliage, and growth is that of the black, while the fruit when ripe is green. In flavor it will not approach the other blacks. It is a most singular variety, but is worthless as a fruit-bearer.

16. *Variegated-leaved Black.*—Here again we have a badly-variegated foliage, and a poor fruit. Not worth cultivating.

17. *Old White.*—This variety now is seldom met with, the larger varieties having taken its place. The bunches are short; berries small, amber-colored, or nearly so, and of higher flavor than any of the other whites. This should be borne in mind by the raisers of new varieties.

18. *White Dutch.*—Bunches of fair length; berries large, deep in color, and of high flavor. This is a very fine variety; every point considered, perhaps the finest of the white currants.

19. *White Grape.*—Bunches long; berries large, pale, not quite as high-flavored as the White Dutch. As a general rule, the closer a white currant approaches in color to amber, the sweeter and richer in flavor it is, like a finely-ripened Muscat grape.

Some of the finest currants I have ever seen grown were in the Isle of Wight. In Guernsey and Jersey they grow equally fine, more particularly the reds and whites. The soil was a strong, adhesive loam, resting on clay, but a well-drained bottom. The climate is very genial, and the fruit is not only large and well-colored, but finely ripened. In the market-gardens about London they are excellently grown, and managed somewhat in this way. They are planted in lines, at given distances apart—say twenty or thirty feet row from row, and three or four feet apart in the rows. The ground, which is naturally good, is highly manured, and cropped between the vegetables. The plants, after the first year or two—when they commence bearing—are pruned very hard. Perhaps it will be better understood what I mean by hard, when I say the greater part of the young wood is thinned out, and what is allowed to remain is shortened back to two or three inches. By this means the trees are always kept short, never attaining a greater height than two or three feet. The bushes being low, with well-thinned-out and shortened branches, they shade little or none of the ground, and are cropped up to the bush. These strong-manured and well-pruned trees produce magnificent fruit, and in great abundance, well remunerating the market-gardener for his trouble.

What will the advocates of no-pruning say to this? Yet the currant, like the foreign grape, must be pruned, and pruned severely, if fine fruit is wanted. The black currant will not submit to this treatment, bearing as it does on the young wood. The latter must be thinned out, and when overlong, moderately shortened. The pruning must be varied to suit the age and vigor of the tree.

There are many soils in which the white currant will not grow—ground to all appearance of the best description, and in which the other currants grow finely; yet in these soils white currants will scarcely live—grow they will not; showing there is something wanting in the soil necessary for the well-being of the plant. Perhaps chemistry could step in to our aid, and tell us what this essential is. Again we meet with soils where the whites vie in vigor with the reds—ground which may be to appearance no better than the other. In a general way, it is more particular to soil than either reds or blacks, which will grow in almost any.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

MR. SANSOM'S INQUIRY: GRAIN-DRILLS.

Messrs. Editors: Your Texas correspondent, Mr. Sansom, wishes to know something in relation to cultivating wheat, and the best implement for drilling it in. There are several modes of cultivation, and several different kinds of grain-drills, and the most of them answer a very good purpose, if the ground is in the right condition to use them. In this region of country, where we have a weedy, soddy, and tough piece of ground, we usually summer-fallow it, ploughing it three times during the season, and thus we fit it for the drill. The seeds decay, the soil becomes mellow and lively, and in a word, is put in the right state to receive the seed. Mr. Sansom's account of the prairie-soil in Texas, would indicate that the prairies are all swarded over, etc. Very well; plough deep, and see to it that your soil is thoroughly pulverized, and there is not the least reason to doubt that grain-drills can be most effectually worked in your country. There being no stones, no roots, or other obstructions to bother you, you can use our York-State drills profitably and beneficially. We have used the drill for some time past, not only in sowing wheat, but in sowing oats, barley, etc. In all cases it works most admirably. I don't know as it would be worth while to go into a lengthy account of the advantages of the grain-drill, but it is sufficient to state that if you have much grain to sow, get a grain-drill. There are those which can be procured that will do good service. We use the *nine-tooth* drill, manufactured at Palmyra, Wayne County, N. Y., by Foster, Jessup & Co. One drill cost us, delivered on the spot, ready for use, $70. It is a good, durable instrument, and can be shipped to almost any part of the United States at a trifling expense. Lemone's drill is said to be good, but I never have used it. I know that the Jessup drill does good work, and by changing your horses, using one team in the forenoon and a fresh one in the afternoon, you can drill in *fifteen* acres in a day, and do your work well.

By using the grain-drill, you *first* save seed; *second*, your grain is put into the ground at an equal depth, and hence does not fail to germinate; *third*, the sun's rays are admitted between the rows where your grain is drilled in, north and south; *fourth*, your grain grows uniformly of one height, the heads all being about of one size and one appearance; and *fifth*, the drill answers the purpose of a drag or harrow, working the soil over to better advantage than even the drag. One man can use the drill, but the help of two men is better, on account of expediting the work and keeping the instrument regularly adjusted.

As people become acquainted with the grain-drill, more and more, they seem to fall in with it, because it combines so many advantages superior to those gained by sowing grain broad-cast. Wheat sown with a good drill, is not near as liable to heave out as that sown broad-cast. It becomes deeply rooted, and therefore remains firmly in the ground. I should advise Mr. Sansom by all means to get a grain-drill to use on the prairie-lands of Texas, and in my opinion he will never regret it.

Very respectfully, W. TAPPAN.

Baldwinsville, N. Y.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

ROTATION OF CROPS: OAT-HUSBANDRY.

MESSRS. EDITORS: Permit me to renew my communication, by offering something on our rotation of crops and oat-husbandry. Changing our lands has only within a few years attracted our attention.

In establishing this system, it is generally admitted that the product grown should be as dissimilar as possible from its predecessor. Cotton is entirely distinct from any thing we produce, so that we have no difficulty in having it succeed either corn, oats, or potatoes. Neither is there any hindrance in realizing a good yield on our fallow-land.

If we omit growing oats, there is no obstacle to carrying it out. Then we have as a rotation, corn, pasture, cotton. Part of the land that has been occupied by cotton the preceding year, can that year be planted in the same, as cotton appears to exhaust or tier land much less than any of the above.

When we grow a full oat-crop, the difficulty becomes greater and very embarrassing. From the similarity between oats and corn, they do not do so well to succeed each other, especially corn after oats. One great objection is, our stand of corn may be materially injured by the ravages of a small worm, that preys on it when small, in the root. The objections to oats following corn are, our land becomes too close and waxy, from stock being permitted to run on it during a portion of the winter, especially if wet. It also may be foul; if so, it breaks up badly. Both belonging to the family of cereals, the similarity certainly does no good. But I believe it is the best we can do. Cotton answers as a predecessor most admirably. Corn being with us the most important crop, claims precedence here.

I have been trying a course, but the result, I apprehend, will not be satisfactory, of corn, fallow, oats, cotton. Potatoes do best after cotton, where this crop is admissible. Oats, to precede potatoes, will answer well, if we do not, after gathering, feed too close. About the latter part of June put in a crop of peas, and, in addition, after the peas are consumed, we can have a good oat-pasture, if we will take off our hogs by the 1st of October.

Our oat-crop is annually becoming more important, especially if we wish to be sure of our meat. The principal oat grown by us is the Egyptian. It is our heaviest. After cutting and pasturing, if the stock is taken off in September, they spring up, affording excellent winter-grazing for sheep. They are not easily injured by the cold. Our average yield is about 25 bushels per acre; they frequently weigh 35 lbs. to the bushel. They should be ploughed in between the 1st of December and middle of January. After this time, in sowing, they are not so good; if earlier, they are very apt to interfere much more with our other crops, as they will require cutting by the latter part of May. We sow about a bushel to the acre. More interferes with their full development, causing them to prove light and dwarfish. Many good planters sow them when they last plough or sweep their cotton. My own experience is not satisfactory. I think they are more vulnerable to the cold, and it interferes with my corn-crop.

This oat has a peculiarity, I believe, not found with any other. Its natural germinating period is about the 1st of October. It may be ploughed in, in the summer, but it will hardly show itself before this time. It will, further, remain in the ground, and if the circumstances do not suit, it will not show itself for a year or two, and then will vegetate.

In my next, I shall show how we are engaged in preparing for a crop.

Yours, etc., H. W. Stackhouse.

Line Store, Hind County, Miss.

FRUITS—APPROVED LIST.

The following list of fruits was adopted by the American Pomological Society, as worthy of general cultivation:

Apples.—American Summer Pearmain, Baldwin, Bullock's Pippin, Danvers' Winter Sweet, Early Harvest, Early Strawberry, Fall Pippin, Fameuse, Gravenstein, Hubbardston Nonesuch, large Yellow Bough, Lady Apple, Porter, Red Astrachan, Rhode-Island Greening, Roxbury Russet, Summer Rose, Swaar, Vandervere, White Seek-no-Further, Wine Apple, or Hays; Winesap. For particular localities: Canada Red, Esopus Spitzenburg, Newtown Pippin, Northern Spy, Yellow Belle Fleur.

Pears.—Ananas d'Ete, Andrews, Belle Lucrative, or Fondante d'Automne; Beurre d'Anjou, Beurre d'Aremberg, Beurre Bosc, Bloodgood, Buffum, Dearborn's Seedling, Doyenne d'Ete, Flemish Beauty, Fulton, Golden Beurre of Bilboa, Louise Bonne de Jersey, Madeleine, Paradise d'Automne, Rostiezer, Seckel, Tyson, Urbaniste, Uvedale's St. Germain, for baking; Vicar of Winkfield, Williams' Boncretien, or Bartlett; Winter Nelis. For particular localities: Grey Doyenne, White Doyenne.

Apricots.—Breda, Large Early, Moorpark.

Nectarines.—Downton, Early Violet, Elruge.

Peaches.—Bergen's Yellow, Cooledge's Favorite, Crawford's Late, Early York, serrated; Early York, large; George the Fourth, Grosse Mignonne, Morris White, Old Mixon Free. For particular localities: Heath Cling.

Plums.—Bleecker's Gage, Coe's Golden Drop, Frost Gage, Green Gage, Jefferson, Lawrence's Favorite, Purple Gage, Purple Favorite, Washington. For particular localities: Imperial Gage.

Cherries.—Belle Magnifique, Black Eagle, Black Tartarian, Downer's Late, Downton, Elton, Early Richmond, for cooking; Graffion, or Bigarreau; Knight's Early Black, May Duke.

Grapes.—Under glass: Black Hamburg, Black Prince, Black Frontignan, Chasselas de Fontainebleau, Grizzly Frontignan, White Frontignan, White Muscat of Alexandria. Open culture: Catawba, Isabella.

Raspberries.—Fastolf, Franconia, Red Antwerp, Yellow Antwerp.

Strawberries.—Boston Pine, Hovey's Seedling, Jenney's Seedling, Large Early Scarlet.

Currants.—Black Naples, May's Victoria, Red Dutch, White Dutch, White Grape.

Gooseberries.—Crown Bob, Early Sulphur, Green Gage, Laurel, Red Champagne, Green Walnut, Houghton's Seedling, Ironmonger, Warrington, Woodward's White Smith.

NEW VARIETIES WHICH PROMISE WELL.

Apples.—Autumn Bough, Melon, Hawley, Mother, Northern Spy, Smokehouse.

Pears.—Brandywine, Brande's St. Germain, Beurre Giffard, Chancellor, Doyenne Boussock, Doyenne Goubault, Duchesse d'Orleans, Duchesse de Berri, Diller, Jalousie de Fontenny Vendee, Kirtland, Limon, Manning's Elizabeth, Nouveau Poiteau, Onondaga, Ott, Pratt, Paradise d'Automne, St. Michael Archange, Stevens' Genesee, Striped Madeleine, Van Assene.

Plums.—M'Laughlin, Prince's Yellow Gage, River's Favorite, St. Martin's Quetshe.

Cherries.—Bigarreau Monstreuse de Bavay, Early Purple Guigne, Reine Hortense.

Grapes.—Diana.

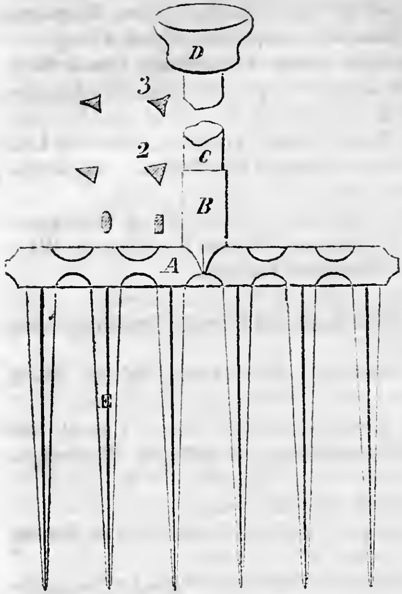
Raspberries.—Knevett's Giant.

Strawberries.—Burr's New Pine.

REMEDY FOR THE BITE OF A MAD DOG.—A Saxon forester named Gastell now of the venerable age of eighty-two, unwilling to take to the grave with him a secret of such import, has made public in the *Leipsic Journal*, the means which he has used for fifty years, and wherewith, he affirms, he has rescued many human beings and cattle from the fearful death of hydrophobia. Take immediately warm vinegar or tepid water, wash the wound clean therewith, and then dry it; then pour upon the wound a few drops of muriatic acid, because mineral acids destroy the poison or saliva, by which means the evil effects of the latter are neutralized.

IMPROVED PREMIUM PATENT AGRICULTURAL FORKS

This improvement is applicable to and embraces all kinds of tined forks and metallic rakes. The accompanying engraving is an illustration of an improvement in manure, hay, and other forks, for agricultural and mechanical purposes, patented by Benjamin H. Franklin, of Worcester, Mass., Dec. 20, 1853. The principal figure is a rear or back view of one of his manure-forks, and figures 2 and 3 are transverse sections of the tines.



His improved mode of manufacture embraces any desirable shaped tine, when made independent and inserted in a head as by him described. But the value of this invention consists more particularly in original shaped tines, which are triangular, and so arranged in the head that one of the flat sides shall be uppermost, the other two consequently receding from the opening in such a manner that any thing passing between the tines will slip through, and thus the fork will not be so easily choked. The head or sockets, A, may be made of malleable or wrought metal, and provided with a socket, B, or ferrule, fitting on the handle C. The tines, E, are triangular, as seen in their section at fig. 2; or the top may be flat, and the under sides concave.

The steel for these forks is imported in a triangular shape, of right size to go into the three-sided holes in the head, and only drawn by machinery to a proper taper; they are then ground, spring-tempered, and forced into their sockets, slightly riveted, so that they may be replaced if broken.

The advantages of a three-sided tine over one of four or more sides, or a round one, are many, and among them may be enumerated that the depth or strength of the metal is precisely where it should be, where the most strain comes upon it, namely, perpendicularly and horizontally; they present a flat surface for the material to rest upon. Beside, any thing passing between the tines can not bind or choke; as the space below is wider than on the top, the material will more easily slip or slide off when thrown from the fork; and there is less metal, and consequently less weight, while the same degree of strength is preserved. There are but three sides to finish instead of more, the tines being three-sided, and also the hole into which it is riveted.

This fork is free from the quivering, vibratory motion of the light forks of parallel tines.

It is said by good judges that the triangular-tined fork is destined to supersede all others. The inventor had persevered in his improvements near two years, and now, instead of selling it for thirty thousand dollars, he has bought a factory-village, in Holden, Mass., five miles from the city of Worcester, in the same county, where he is about to commence the fork manufacture on an extensive scale, in company with Henry F. Holmes, a gentleman of much enterprise, well known in the flour trade. He has also made arrangements with a powerful company at Millbury, in the same county, for their extensive manufacture, at the head of which is T. H. Witherby, the well-known chisel and drawing-knife manufacturer. Under such circumstances, we prophesy better tools in the hands of the agriculturist, and money in the pockets of all concerned.

For further information address the inventor, at Worcester or Holden, Mass.

PROGRESS OF MECHANICS.—No. III.

We resume the illustration of this subject, which was commenced in our March and continued in our April number.

Among the more noticeable improvements in the arts, we may add those connected with the *manufacture of fire-arms*. The invention of gunpowder was a death-blow, comparatively, to the manufacture of armor, for no coat of mail could withstand the force of a bullet at a moderate distance, nor furnish any defense against cannon-balls. Indeed, we wonder that those iron garments could be worn at all. As we have looked upon the coats of mail now in the Crystal Palace, sent from the Tower of London—the same that were actually worn in the time of the Henrys—we wonder that they could be endured; and it seems to us that a Yankee in an ordinary dress, could knock down and trample upon a half dozen of men, encumbered with such defenses.

The first cannons were bars of iron, hooped together, but ere long, guns were cast. They were, however, of enormous size. In Turkey, at this day, they may be seen suited to carry a *stone-ball* of 600 lbs. weight. At one time, gun-barrels were covered with iron wire, the coils being furnished with a smooth surface, and soldered together. The rifle, probably a German invention, is the most effective of "small-arms," and was brought into use as early as the year 1500.

We can not speak in detail of the revolvers and breech-loading guns and pistols of modern times. These are chiefly the invention of the present generation, and the most important are the inventions of our own countrymen. To illustrate them would require numerous engravings, which are not now at our command. We shall be glad of an opportunity to present them hereafter.

The *stamping of coins* and other metallic plates was formerly done exclusively by hand. We have referred to this fact in a former number. The invention of machinery, or perhaps, more strictly, the adaptation of machinery to this purpose, has added greatly to the economy, and also to the perfection of these manufactures.

The use of iron, as a substitute for wood and other materials, is a step of very great importance in the progress of the arts. We can not do justice to this topic, in its broadest extent, and must only allude to facts which may receive more extended notice hereafter. We will attempt a little classification, as follows:

1. Iron for Marble.—No visitor at the Crystal Palace, or at the exhibitions at Castle-Garden, or at the Mechanic-Fairs in Boston, can have failed to notice the fire-frames, and other architectural forms, composed of iron and made to resemble marble. The resemblance is perfect. A close observation, without handling, would often fail to discover the real material.

There are two processes by which this effect is produced. One by a simple coat of some varnish-like material, and the other by the application of some matter more *granular*, so to speak; that is, something more resembling a thin coat of plaster. It is, in fact, a composition applied to the surface of the iron, and reduced to a smooth surface and then polished. As usual, both are urged as the best, and most durable, but we are not sufficiently experienced in the actual use of either to give their relative value. The former, however, is said to stand heat better than the other.

2. Iron for Wood.—Iron ships and steamers at once loom up in the mind at the sight of this phrase. The experiment has been tried; and we have sufficient experience to prove that whether this substitution may or may not eventually be found useful for all kinds of vessels, at least it is the best for some. How many lives, sacrificed by fire in our streams the last year, might have been saved had iron formed the substance of which those steamers were built! Those beautiful life-boats in the Crystal Palace, will for ever silence all disputatious minds, as to the utility of such applications of this most useful metal.

Iron Furniture is already in market, and these manufactures will no doubt increase. Iron chairs are somewhat objectionable in this climate, but no doubt some expedient may be devised for surmounting this difficulty. Iron bedsteads are of unquestionable convenience,—easily managed, easily cleaned, seldom infested with animated dust, and never, we suppose, if painted with verdigris; they can not fail to come into extensive use. Iron frames for sofas, couches, *tete-à-tetes*, etc., etc., and wherever there is opportunity for a liberal use of curled hair, the use of iron must become much more common. As material for book-shelves, it is incomparable.

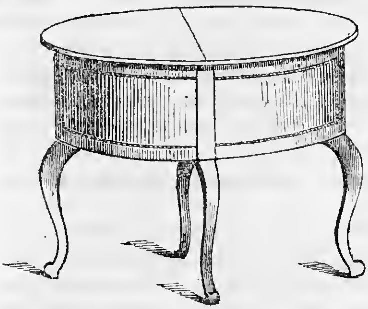
Iron Bridges are already familiarly known. That of Southwark, at London, crosses the Thames by an arched frame-work of iron that has stood more than half a century. Its largest span is 240 feet. Iron suspension-bridges, of which the most renowned is, perhaps, that below Niagara Falls, are an invention of very great importance. The possible application of iron to this kind of architecture is almost unlimited. The tubular bridge at the Straits of Menai, recently erected, shows beyond dispute, that skill and machinery are adequate to any thing in this department that money will pay for.

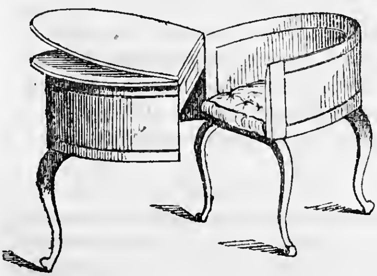
Iron Cables have almost entirely superseded the use of those of hemp. Cast-iron for light-houses must eventually supersede all other materials for such structures, and also for the roofs of ordinary dwellings. The immense supply of the native ore, and the constantly-increasing facilities for working it, insure an immense increase in the demand for iron, for these and a score of other uses, in which it is now scarcely thought of. But these suggestions are eminently in place, in this connection, for our mechanics and artisans are already quite adequate to the production of these and other articles, so soon as the condition of the markets shall encourage their manufacture.

Working in Wood.—Wood can not be manufactured into articles of ornament, or of utility, except in the more simple forms, save in an advanced condition of civilization. This may seem contrary to the fact, at the first thought, because it is so readily worked, and by simple tools. But the reason is obvious. To make graceful forms of wood, requires refined tastes, in the design, and nicely-cutting tools for the execution. Compare the wooden images of barbarous tribes with those of more educated tastes. The Swiss wood-cuttings in the Crystal Palace excel any thing to be found in the uncivilized world, and can not be exceeded in any country. We love, as we look upon them, to reverse the terms of the proposition, and to assure ourself that a people that can exhibit such chaste designs, so beautifully executed, can neither be degraded nor ignorant. Those "works" commend the Swiss to our especial regard.

NEW CENTRE-TABLE AND DESK.

Among the most convenient and desirable contrivances of the day, is a Combination Table, Writing-Desk, and Chair, recently patented, and manufactured by Messrs. Walling & Hedges, No. 252 Ninth avenue. The accompanying cuts represent this new and convenient article of furniture in the form of a simple table, and in that of a writing-desk with its chair, combined. After the occupant is seated, the chair is hooked to the desk part, and thus a very easy arm-chair is formed. Underneath the desk is a drawer. The whole is on castors, enabling the person occupying it to move about the room without rising. When it is in the form of a table, there is considerable space to store articles of clothing or books. It is a most desirable article of furniture, well adapted to offices, sitting-rooms, parlors, and schools. Made in a cheap and durable form, we think they would be an acquisition to schools.





Messrs. W. & H. have found their desk and table to meet with a demand beyond their ability to supply. Orders have been already received from distant parts of the country.

IRON MANUFACTURES.

We have long been surprised at the supineness of our capitalists in regard to this vast and important branch of domestic industry. No single State in the Union presents greater facilities for the manufacture of iron than Kentucky. Immediately contiguous to the many immense coal-fields now being opened in various portions of the State, are inexhaustible bodies of rich iron ore. In many of these localities, all the other materials requisite for the manufacture of iron are within convenient reach. Nothing is wanting but the erection of furnaces and the application of labor to produce an article for which the demand has already increased to an almost incredible extent, and is still increasing daily. A few years ago it was considered difficult, without the aid of a protective tariff, for the iron manufactures of this country to compete with the furnaces of England. It was not because iron could not be produced as cheaply here, even at that time, as in England, for here all the materials for its production, except labor, could be procured more cheaply than anywhere else; but the demand then was limited, and it was in the power of the English manufacturers to supply all that was needed, while their immense capital enabled them not only to raise and depress prices as circumstances required, to break down competition, but also to sell upon such terms as to offer inducements to railroads that could not be afforded by the smaller operators in this country.

Now, however, the times are changed. The demand for manufactured iron has become so vast that foreign competition need no longer deter our capitalists from engaging in this very profitable pursuit. During the last few years, the uses of iron have been greatly multiplied. In building ocean steamers, houses, machinery, and all the various articles of domestic use in which iron has lately been introduced, when we calculate the grand aggregate of its application throughout the whole extent of our great and growing country, it seems marvellous indeed. Taking into consideration the single item of railroad iron, the present and prospective demand is far, very far, beyond the capacity of all the furnaces in England, Norway, and the United States, to supply in many years.

There are now in operation in this country 13,000 miles of railroad. It has been estimated that by January, 1860, we will have completed of roads already constructed and projected, 30,000 miles, making 17,000 miles to be furnished with iron in less than six years. The rails for these roads will consume at least 100 tons of iron per mile, giving 1,700,000 tons of rails required to be furnished by January, 1860. This amount, at $75 per ton, the present price of railroad iron, will cost $127,000,000, to which should be added at least $10,000,000 for repairs and renewals on account of wear and tear, and probably $40,000,000 for locomotives and other necessaries for railroads which require the use of iron—making an aggregate of $180,000,000 manufactured iron required for railroad purposes in this country in the next six years.

These railroads must and will be built. The advantages of railroads in promoting the agricultural, manufacturing, and all other industrial interests, have become so apparent that railroads are demanded in every direction. The cost of their construction is amply and many-fold repaid in the increased value of adjacent lands and their products. The means to build them will be forthcoming at the proper time, and the materials for their construction must be procured. For years past we have been paying tribute to foreign iron manufacturers. Since the introduction of the railroad system in the United States, we have doubtless contributed to foreign producers not less than $100,000,000 for railroad iron alone. It is time that we should cease to depend upon England for this commodity, and expend among our own operatives this immense bonus thus paid to foreign labor.

It has been suggested that a certain number of railroad companies should form a combination, and proceed to manufacture their own iron. We have no doubt that this arrangement, if actively engaged in, would enable the parties to procure all their iron in a shorter time, and at far less expense, than by any other method. It would be the means of building up in our midst an iron manufacture which would render us altogether independent of foreign aid and exempt from foreign extortions. We hope to see this done. We are satisfied that no section of the country can present greater advantages for the location of such a work than many parts of Kentucky; and we believe that if capitalists would turn their attention to iron manufactures in this State with the same eagerness that has been evinced in the improvement of our coal-fields, a source of profit would thus be opened to them greatly surpassing any other investment. In a national point of view, every possible effort should be made to retain among our own laborers and mechanics the vast sum to be expended for manufactured iron.—*Louisville Journal.*

EDITORS' JOTTINGS AND MECHANICAL RECORD.

General Agency.—The publisher of *The Plough, the Loom, and the Anvil,* believing it in his power to be of essential service to the readers of that journal in the purchase or sale of various articles, and the transaction of various kinds of business, would announce to them that he is ready to execute any such commission which he may receive, including the purchase of books of any description, implements connected with agricultural, manufacturing, or mechanical operations; artificial manures; farm and garden-seeds, etc., etc. One of the gentlemen connected with the journal is a proficient in music, and experienced in the selection of piano-fortes, flutes, etc., and will execute orders in that department. He will also act as agent in the purchase and sale of Real Estate.

☞ Particular attention to business connected with the Patent Office.

Letters of inquiry on these matters will be promptly attended to.

Collectors Wanted, in all the States south and west of Ohio and Pennsylvania. Those of experience preferred, and unquestionable references required. Address, post-paid, or in person, at this Office.

Properties of Iron.—In the concluding lecture of Professor Smith, at the Smithsonian Institution, the lecturer dwelt upon the tendency of iron to undergo a change from a fibrous to a granular condition—thus causing the abstraction of an indefinite amount of its tenacity and strength. Fibrous iron, by being for a considerable time subjected to concussion, will become granular and therefore weak. A knowledge of this principle has induced the French government to disallow the use of iron axles on their public *diligences* beyond a certain time; they must then be removed. Iron cannon, originally very strong, become weaker and weaker by use, from the loosening of the texture of their substance.

The New Process of Making Bread.—A baker at Lyons has made a discovery in the art of making bread, which must be very useful in these days of high-priced breadstuffs. From a bag of flour weighing 314 pounds, the Paris bakers make about 400 pounds of bread; by the newly-discovered method, the baker of Lyons makes 440 pounds of bread. Several gentlemen of the Academy of Science have examined the process, which is thought to promise very favorably, though we do not see how the nutritive qualities of a certain bulk of wheat are to be increased by increasing the weight.

This is from the *Maine Farmer.* In speaking of this subject, the *Puritan Recorder* says:

"The bread made is every way as good as that made by the old process. The addition comes from the use of some fermentative material which causes more water to combine with the flour. *Yet this would not show that there is not a gain of solid and nutritive materials.* The case may be illustrated by the slacking of lime; which adds many times the bulk and weight of the original body, through the water passing from a fluid to a solid form in the new combination. We see no impossibility, therefore, on the face of the thing. If it proves to be all that the late experiments seem to show it to be, and thus to add fifty per cent to the amount of bread from a given amount of flour, it will be found to be no unimportant discovery."

It seems from this paragraph that some of our editors, or one, at least, believes in a new system of chemistry, by which new substances are formed out of nothing; or he takes on faith, what can not fail to be an arrant humbug, or something worse. More than one expedient is in common use already, for making *bread weigh;* and if respectable journals are disposed to give to such efforts the reputation of honesty, all we can say is, *God help the poor!* They get quite too little now, from many bakers, but their prospects will become still darker. Let every honest man expose this new machinery for swindling, as "no unimportant discovery," but in a sense entirely the opposite of that intended by the writer of the above paragraph. The italics are ours, and were not in the original.

The illustration of water added to lime, is in point, but goes against the doctrine of the editor. *The quantity of lime is not increased.* It is the same in the case of flour. It may be made to absorb more water, but no nutriment is thereby added, and the result will be that the people have to pay for the water at the same rate as for bread.

Coal in California.—Coal mines of great importance have lately been discovered in portions of Oregon Territory and Puget Sound. To work one of these, a company has been formed in San Francisco, whose capital is $200,000. Already some one hundred tons have been sent to market, and is proved to be of superior quality. The company have contracted to deliver 5500 tons within four months. This, at $25 per ton, (less than the ruling rates, which are $27 to $33,) will yield them a handsome profit upon all labor expended up to the time of delivery.

Guano Deposits.—The Peruvian Government has employed a French Engineer, with several assistants and chemists, to measure the guano deposits on the Chincha Islands. The result has just been made known. It appears that the total deposits on the Chincha Islands amount to 16,501,466 tons (gross,) Beside these, Peru owns several other deposits of considerable extent which are now being surveyed. From this, it is evident that the fears which many have entertained, that the supply of guano would be exhausted, are groundless.

Central Military Tract Railroad of Illinois.—This road extends from Aurora, its northern terminus, to Galesburgh, on the Peoria and Oquawka road, its southern terminus, and when completed will open a really direct route from Chicago to the Mississippi River at Quincy. The country through which it passes is among the best in the State. In fact, the Military Tract is acknowledged to be the Paradise of Illinois. Among the numerous roads proposed and constructing in Illinois, this one has heretofore made but little stir in the market. But from what we can gather, its progress is steadily onward.

New Patent for Making Nails.—There has recently been invented and put into operation in this city a new machine for making cut-nails, the great peculiarity of which is, that it is self-feeding, and will manufacture in a given time nearly, if not quite, as many again nails as any other known process, and that any man, (as it is claimed) with the assistance of a boy, will operate ten machines. There is also a great saving in iron, there being only a waste of about a quarter of an inch in ten feet, which is the length of the piece of iron placed in the machine at a time. It has been shown that one machine will manufacture from three hundred to three hundred and fifty nails per minute.—*Troy Whig.*

Water Works at Watertown.—Messrs. J. Ball & Co., of this City, have been constructing water-works at Watertown, N. Y., under a great head.

We are informed that the water is forced from the Black River through their pipes into a reservoir some 7000 feet from the river, and elevated about 190 feet above the pump well. *The Democratic Union* speaks of the trial as follows:

"The trial of the water-works was in the highest degree gratifying to all the friends of that noble enterprise. Several hydrants were tried, and all worked to admiration. We witnessed the one near the Arcade entrance, which threw water in a perpendicular direction to the distance of 40 feet above the buildings. The fountain threw a jet of water to the height of 80 feet. It is well to remark that the triumph of the water-works at this trial was effected without letting on the full head of water. It is estimated that under a full head, the fountain will throw its jet to the height of 110 feet. The reservoir is situated about one mile from the centre of the village, at an elevation of 190 feet above the fountain. It will contain 3,500,000 gallons. The pump by which the water is forced from the Black River to the reservoir, was constructed by Hoard and Bradford. There are sixty-five hydrants, situated at different points in the corporation. The one at the Railroad depot is said to be over 200 feet below the reservoir. We reckon there will be some spouting if that hydrant should ever be uncapped under a full head of water. Eight of these hydrants can be brought to bear, at the same time, on any of the principal buildings. Mr. Ball, the enterprising and reliable contractor for the construction of the pipes, has finally triumphed nobly, in spite of the cavillings of croakers and fault-finders. The trial was a pretty good indorsement of his bonds. All credit is due to those of our citizens who have projected, encouraged, and sustained this great enterprise."

Hindoo Mechanics.—The Hindoos do their work in such a different manner from the American and Englishman, that he almost appears to be a person belonging to a different order of beings. Our blacksmith stands at work, the Hindoo squats with his knees nearly on a level with his chin; it is the same with their carpenters and masons; their posture is suggestive of indolence and effeminacy. They appear to be defective in the muscular power of their limbs, and the blacksmith hammers away, squatted like a kangaroo, on his haunches. They go barefoot, and if they do not use their feet to stand upon while they work, they make more use of their toes than the Anglo-Saxons. The Hindoo blacksmith, when he has a piece of iron to file, places it between the jaws of a small pair of tongs, and grasping them firmly between his great toes, files away with great force. He also sometimes uses his toes to reach forth and grasp a tool, the same as we our fingers, and so accustomed are they to use their toes, that they sometimes adorn them with gold rings, they being as worthy of such honors as our fingers.

Time does not seem to be valued by the Oriental; his tools and method of working appear to be contrived for the very purpose of consuming as much time as possible. The mason works with a trowel about the size of one of our table-spoons and a small hammer about half a pound weight.

He squats before his work, and has two women attendants to bring him his brick and mortar. These attend, the one with a brick in each hand, the other with a truncheon of mortar about the size of a breakfast-plate. One American mason, with one hod-carrier, will lay as much brick as twelve Hindoos, with their twenty-four *rundees*, or brick-and-mortar attendants.

Barnes' Patent Extension-Bits.—Such has been the success of this article, in giving satisfaction to those who have been able to get them, and such the continued demand for them from all quarters, that Mr. Barnes has been obliged to enlarge his manufactory, and will hereafter hope to supply all demands. The bit is so constructed, that three collectively make a complete set, that will bore any diameter, from $\frac{1}{4}$ to $2\frac{1}{8}$ inches—equal to 31 ordinary bits, beside cutting numerous sizes between. Indeed, it seems to be just what all workers of wood must have to make their kit of tools complete, and almost as essential as a jack-plane or hand-saw.

New Motive Power.—A correspondent of the *Syracuse Standard*, writing from Rochester, speaks of the discovery of a new motive power which is to subvert the present mode of steam propulsion, and a great improvement upon all former discoveries. But we must confess that to us it looks like a very doubtful case. What is the "Bi Sulphate of Carbon?" He says:

"It consists in the use of Bi Sulphate of Carbon as a motive power. An engine has been constructed which works like a charm. The expansive force of this material, as every chemist knows, is many times greater than that of steam, while at the same time it requires a much less degree of heat to vaporize it.

I will give you the result of an experiment with a miniature steam-engine. It required the constant use of eight spirit-lamps to generate steam enough from water to cause it to make one hundred and fifty revolutions per minute. Withdraw two of the lamps and all motion would cease. Withdraw all of them and keep them away *twenty minutes*, then apply the Bi Sulphate of Carbon and there was heat enough remaining to propel the engine at the rate of *one thousand times a minute*. And this will apply on a large scale just as well. This substance being so easily evaporated, heat from 20 to 160 degrees is found sufficient for all purposes. Hence there is no danger of explosions as with steam. It is confidently believed that this new motive power is destined to supersede the use of steam. The inventor has applied for letters patent.

To sum up the whole matter, the inventor claims that a locomotive on this principle can be built at a less expense than a steam locomotive; that the boiler need be only one tenth as large; the engine can be managed with less hands; a greater speed can be obtained; no danger from explosions; and a saving of fuel at the rate of *eighty per cent*. An instance of the value of this invention, if these things are all true, the New-York and Erie Railroad would save annually $300,000 by adopting the invention."

Railroad to the Pacific.—For the encouragement of the extreme southern route, "not north of the town of Fulton in the State of Arkansas," to a suitable point at or near the town of El Paso, on the Rio Grande, the Legislature of Texas has granted a right of way across the public lands of the State, not exceeding 300 feet in width, along the entire length of said road, with all the timber, stone, etc., needed in its construction and support, found in the public lands, with 20 sections of land of 640 acres to the section, for every mile of said road that goes into operation, if constructed in a substantial and workmanlike manner, and according to the provisions of the act. The Governor is to advertise for bids and proposals for the construction of the road, and to make the necessary conveyances to the party or parties judged most worthy. The capital stock of the company is to be $20,000,000, with a right of increase. The act is quite long, all the minutiæ are provided for, and the matter seems taken hold of in earnest.

Crystal Palace.—The following passage occurs in a very sensible article upon the reöpening of this superb exhibition.

"The public most certainly have the utmost confidence in Barnum, and justly. He is industrious, fertile in resources, subtle in conception, skillful in planning, bold in execution, honest, temperate, and benevolent; and under his management we can hope that the Crystal Palace will be made vigorously to serve the legitimate purpose of developing art and industry," etc.

A New and Important Invention.—Capt. B. W. Perkins, of Worcester, has taken out a patent for a pistol-lock, a model of which has been shown to us. The simplicity of the thing renders it surprising that for so long a time the intricate and expensive arrangement of existing locks should have been used. It is constructed with only three pieces, including a small spiral spring; is extremely simple, less liable to disarrangement than those now in vogue, and can be constructed at one third of the expense. It ought to, and we hope will, make the fortune of the inventor.

A New Safety-Guard for Railroads.—A Frenchman by the name of Verite has invented an electric clock, for the purpose of guarding against accidents to railroad trains. The railroad on which they are used is divided into regular stations of eight or ten miles in length, which stations are in their turn subdivided into sections of a mile or less. At the end of every station are placed two dials, facing in opposite directions, the circumference of each being divided into as many spaces as there are sections in the stations behind it. A large iron needle or pointer is attached to the dial. This pointer is connected with a toothed wheel, which in its turn is connected with certain wires of a galvanic battery, passing along the track. When the engine enters upon section number 1, a temporary connection of the wires is produced, making a completion of the circuit, and causing the index on the dial to move to space number 1. As the engine passes to the second section, the index is moved to the corresponding space on the dial, and so on throughout the station. Thus a conductor, before starting for a depot, can always tell whether any train is on the station before him; and accidents by collision will be rendered almost impossible, except by the most culpable negligence.

List of Patents Issued,

FROM APRIL 11 TO MAY 2.

Stephen Ustick, of Philadelphia, Pa., for improvement in brick-machines. Ante-dated Nov. 15, 1853.

Stephen Waterman, of Williamsburgh, N. Y., for improved circular sawing-machine.

Moses T. Rowlands, of Pittstown, Pa., for improvement in tailors'-measures.

J. A. Roth and Joseph Lea, of the county of Philadelphia, Pa., for improvement in machines for bleaching flax.

Matthias P. Coons, of Brooklyn, N. Y., for improvement in iron-fences.

Thomas P. Forsyth, of Dalton, Ind., for improvement in machines for winding and folding cloth.

Garret Meldrum, of West-Philadelphia, Pa., for improved turning-lathe.

Fowler M. Ray, of New-York, for improvement in spiral-springs for railroad-cars.

John D. Seagrave, of Milford, Mass., for improvement in machines for paring apples.

George C. Dixwell, of Boston, Mass., and J. A. Dorr, of New-York, for improvement in gas-regulators.

George Aulick, of Winchester, Va., for improvement in car-couplings.

Ari Davis, of Washington, for improvement in box-machine.

Sam'l T. Field, of Worcester, Mass., for improved apparatus for painting window-blinds, etc.

James L. Cathcart, of Washington, for improvement in attaching propellers to the driving-shaft.

G. M. Conner, of Charlton, N. Y., for improved water-wheel.

Geo. W. LaBaw, of Jersey City, N. J., for machine for cleaning blinds, etc.

Wm. Boggett and Geo. B. Pettit, of Westminster, England, for method of heating, warming, and cooking by gas. Patented in England, Oct. 22, 1851.

Chas. De Saxe, of New-York, assignor to Thos. H. Bate, of Brooklyn, N.Y., for improved landing-net for anglers.

Chas. De Saxe, of New-York, assignor to Thos. H. Bate, of Brooklyn, N. Y., for improvement in fishing-rods and floats.

J. H. Fairchild and Sylvanus Richardson, of Jericho, Vt., for improvement in potato-washing machines.

Thomas Armitage, of Philadelphia, Pa., for improved portable-ladder or fire-escape.

Philos Blake, of New-Haven, Conn., for improved oyster-knife.

James Ballard, of Ashtabula, Ohio, for improved splitting-guages.

Richard M. Bouton, of West-Troy, N. Y., for improved faucet.

David and Samuel K. Flanders, of Parishville, N. Y., for improved fly-trap.

Martin Hallenbeck, of Albany, N.Y., for improvement in grass-harvesters.

Julius C. Hurd, of Medway, Mass., for improvement in cleaning cotton and other fibrous substances.

David A. Hopkins, of Elmira, Mass., for improved ticket-box for railroad cars.

Abram C. Johnson, of Meadville, Pa., for improvement in operating dumping-cars.

Lawson P. Keach, of Baltimore, Md., for improvement in cooking oysters, etc.

Geo. W. Keller, of Philadelphia, Pa., for improved fire-escapes.

Anthony John, of Monroville, O., for improved machine for filling match-frames.

Wm. H. Towers, of Philadelphia, Pa., for improved machine for opening oysters.

Wm. Lapham, executor of Seneca Lapham, deceased, late of Salem, Ohio, for improvement in maize-harvesters.

Josiah Ells, of Pittsburgh, Pa., for improvement in revolving fire-arms.

James R. Stafford, of Brooklyn, N. Y., for improvement in distilling and condensing apparatus.

Arthur Harvie and Charles Guild, of Cincinnati, Ohio, for improvement in vinous-fermenting in close vessels.

Joseph C. Tiffany, of Coxsackie, N. Y., for improved ditching-plough.

George W. Glass, of Alleghany City, Pa., for improvement in cast-iron car-wheels.

Fred. Field, of Adrian, Mich., for improvement in travelling-bridges.

Wm. E. Milligan, of New-York, for improvement in railroad car-seats.

John P. Avery, of Stonington, Ct., for improved mode of securing stones in foundations.

Thos. W. Brown, of Boston, Mass., for improved file or bill-holders.

Chas. Buss, of Marlborough, N. Y., for improvement in fire-arms.

Reuben Burdine, of Washington, D. C., for improved rotary-pump.

Stephen and James A. Bazin, of Canton, Mass., for improvement in machinery for laying rope.

Henry Clark, of New-Orleans, La., for improvement in machines for feeding sheets of paper to printing-presses.

George H. Cotton, of Hampstead Road, England, for improvement in portable folding-chair bedsteads. Patented in England, Oct. 5, 1852.

Geo. C. Jones, of Alna, Me., and Peter King, of Whitefield, Me., for improved wedging-machine.

Geo. Little, of Utica, N. Y., for improved mode of operating the feeding-table of printing-presses.

W. Kuhlenschmidt and W. Hauff, of New-York, for improvement in apparatus for feeding paper to printing-machines.

Daniel R. Prindle, of East-Bethany, N. Y., for improved field-fence.

Fred. Shaum, of Baltimore, Md., for improvement in glass-furnaces.

John C. F. Salomon, of Washington, D. C., for improvement in brick-making.

Albert Spencer, of New-York, and August Loeschner, of Brooklyn, N. Y., for improvement in forming and hardening hat-bodies.

W. G. Stirling, of Bridgeport, Conn., for improvement in forming roofs.

Wm. Mt. Storm, of New-York, for improved bullet-moulds.

Varanes Snell, of North-Bridgewater, Mass., for improvement in machines for cutting and skiving boot-counters.

De Witt C. Smiley, of New-York, for improvement in oilers for machinery.

Wm. B. Thomas and Samuel Hickok, of Buffalo, N. Y., for improvement in railroad car-seats.

Simon Towle, of Pembroke, N. Y., for improved syringe eye-bath.

Isaac True, of Rochester, Ind., for improved reaction water-wheel.

C. D. Van Alien, of New-York, for improvement in invalid-bedstead.

Wm. F. Ketchum, of Buffalo, N. Y., assignor to Rufus L. Howard, of same place, for improvement in guard-fingers of harvesters.

Isaac M. Singer, of New-York, for improvement in sewing-machines.

Amos Young, of Georgetown, D. C., for improved method of discharging cargo from canal-boats.

Nicholas G. Norcross, of Lowell, Mass., for improvement in certain device for constructing strap iron-railing.

William Mt. Storm, of New-York, for improvement in charges for fire-arms.

Mahlon Loomis, of Cambridgeport, Mass., for improvement in plates for artificial teeth.

Mervin T. Landfeur, of Manchester, Conn., for improvement in reed-boxes for musical instruments.

Halvor Halvorson, of Boston, Mass., assignor to himself and John T. Heard, of same place, for improvement in process of distilling rosin-oil.

Halvor Halvorson, of Boston, Mass., assignor to himself and John T. Heard, of same place, for improvement in distilling-apparatus.

John W. Adams, of Thompsonville, Conn., for improvement in spinning cotton.

William E. Arnold, of Rochester, N. Y., for improvement in the couplings of endless chain horse-powers.

John Allender, of New-London, Ct., for improvement in operating catches in tool-holders.

Wm. Ballard, of New-York, for improvement in making ships'-knees.

Wm. H. Churchman, of Philadelphia, Pa., for improvement in hydraulic-heaters.

John Crabtree, of Philadelphia, Pa., for improvement in adjusting the packing of pistons in steam-engines.

Henry W. Farley, of East-Boston, Mass., for improved means of adjusting the valves of locomotive engines.

John Gallagher, of New-York, for improved cutter for metallic bars and rods.

Curtis Goddard, of Edinburgh, O., for improved machine for machine bed-pins.

Robert Hodgin, of Barnesville, O., for improvement in straw-cutters.

Archibald C. Ketchum, of New-York, for improvement in car-trucks with adjustable axles.

Conrad Liebrick, of Philadelphia, Pa., for improvement in trunk-lock hasps.

Washington F. Pagett, of Stone-Bridge, Va., for improvement in harrows.

G. M. Patten, of Bath, Me., for improved arrangement of spring-dies in machines for making clinch-rings.

Wm. B. and Geo. M. Ramsey, of South Strabane, Pa., for improvement in flexible harrows.

William Robinson, Jr., of Warsaw, N. Y., for improvement in machinery for making rope.

Sewall Short, of New-London, Ct., for improvement in violins.

Philander Shaw, of East Abington, Mass., for improvement in air-engines.

Le Grand C. St. John, of Buffalo, N. Y., for improved hydrodynamic-engine.

John M. Weare, of Saybrook, N. H., for milkers' protector.

Elbridge Webber, of Gardiner, Me., for improved rotary planing-knife.

Asa Weeks, of South-Boston, Mass., for improved expansive-bit.

Parley Williams, 2d, of Barre, Mass., for improved slotting-machine.

Seth Whalen, of West-Milton, N.Y., for improvement in hay-knives.