THE NEW-ENGLAND FARMERS' AND MECHANICS' JOURNAL.

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"*If the hand of industry is not directed by the head of science, it becomes in a great degree paralyzed and powerless.*"—FESSENDEN.

VOL. I.

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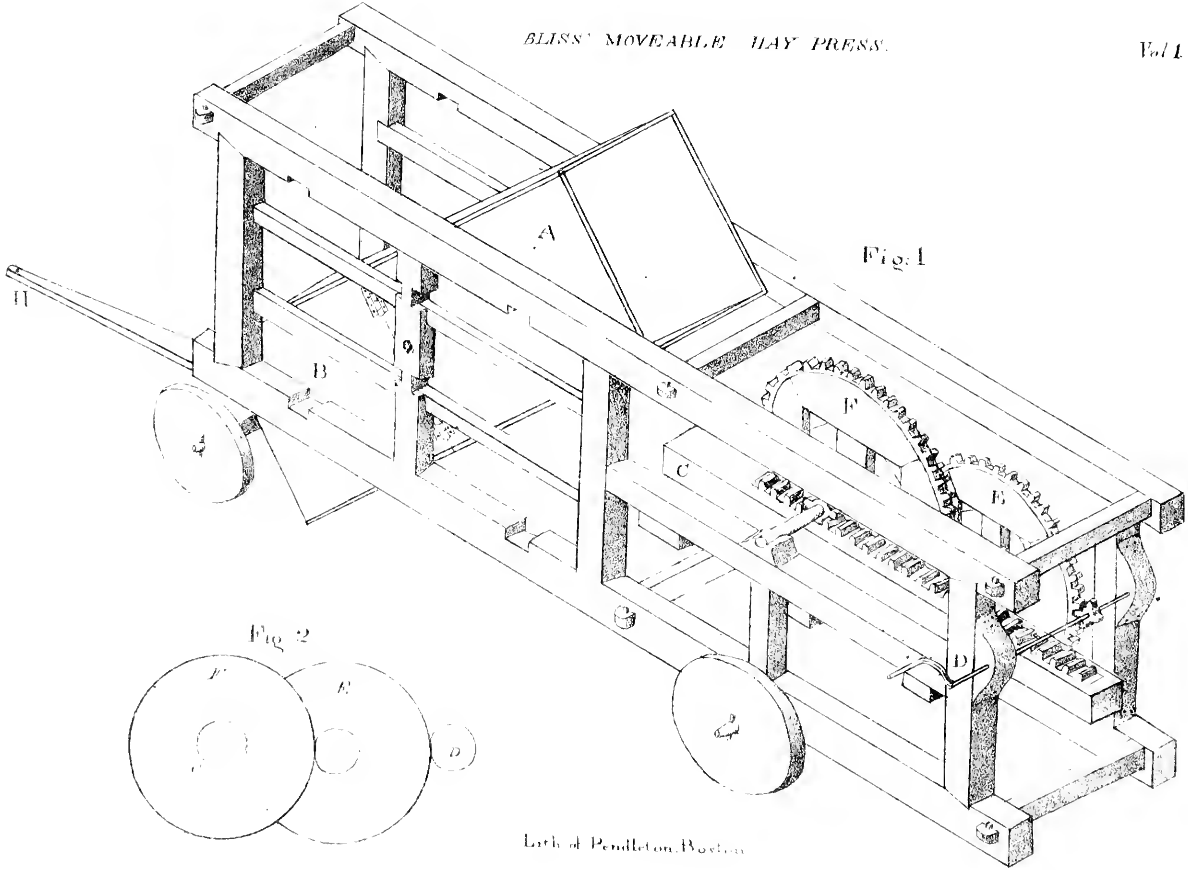

Fig. 1

Fig. 2

Lith. of Pendleton, Boston

THE

NEW-ENGLAND

FARMERS' AND MECHANICS' JOURNAL.

VOL. I. GARDINER, JANUARY, 1828. No. 1.

MECHANICS.

BLISS' MOVEABLE HAY PRESS.

WE have now in operation in this village two Hay Presses.—One of them is the Hydrostatic Press of immense power, the other is known by the name of "Whitney's Hay Press"—a very convenient machine, and although not so powerful, yet it is much cheaper in its construction and presses sufficiently hard for common purposes. Both of these are fixed, and all hay to be pressed must be carried to them. It has long been a desideratum to have a press which should be moveable, which could be carried into the meadow with ease, or from barn to barn, and thus save the labor of moving the hay (perhaps several miles) to the press.

This has been very ingeniously effected by Mr. MOSES B. BLISS of Pittston, Me. This improvement consists (in the words of the specification) in making the box to revolve on trunnions which project from near the centre of its two largest sides, so that it may be turned to an upright position for the convenience of filling and stowing, and then to a horizontal one for the pressure.

We had an opportunity not long since of seeing this machine in operation, and were much pleased with the ease and facility with which the hay is pressed. Two yokes of oxen are sufficient to move it to any distance.

It is taken into the barn floor and filled from the bays or mows, and requires one man to pitch the hay and another to stow it in the box; when thus filled, the box is brought down to a horizontal position and secured by bars, and the hay within these subjected to the pressure. The strength of two men is amply sufficient; even one might do it. The time employed in pressing is about five minutes. Two men can press two tons per day.

When the hay is sufficiently pressed, the two side doors are opened—the hay secured by hoops—the top door is then opened and the hay is pushed out in the form of a compact bale about 3 feet long and 2 wide, and weighing from 250 to 300 lbs. and sometimes more.

The machine is about 21 feet long and 8 feet high. The box is 8 feet by 3 1-2.

Plate 1, is an isometrical drawing of this machine.

A is the box which revolves on its trunnions, and is placed in a position to receive the hay; if necessary it can be placed perpendicularly.

B represents a notch in one of the beams, into which is slided a piece of scantling for supporting the box when brought to an horizontal position for pressing. There are four of these, two at bottom and two at top, as may be seen in the drawing. There are also two placed at the end, between the box and the posts to support it, when the piston is brought up against it.

C represents the piston rod; its rack working in the cogs on the axis of the wheel F.

E is the cog-wheel, which is acted upon by the smaller one, turned by the crank D.

The combination of powers is shown in Fig. 2.

The crank and wheel are seldom used, as it is found that the strength of two men, acting upon levers, attached to the axis of E, is amply sufficient, and a saving of time is thus effected.

We earnestly recommend this machine to the attention of the public. To the farmer who is in the habit of screwing his hay by hand, for a distant market, it presents peculiar conveniences. The cost of one of them complete, is about $250, and as they can be moved from place to place with all ease, one or two would be sufficient for a town. Should any person be desirous of purchasing one of them, or a patent right, or of making any further inquiries, he is referred to the inventor in Pittston, or to Calvin Wing, Machinist, of Gardiner.

DIGNITY OF MECHANIC ARTS.

If the dignity of things may be measured by their importance to mankind, there is nothing, perhaps, which can rank above the mechanic arts In fact, they may be called the lever, the fulcrum, and the power which move the world. They do not want the "*whereon to stand*" of Archimedes; they have a sufficient foundation in themselves.

What gives to civilized nations their superiority over the savage? It is chiefly, mechanic arts. By them the beautiful and convenient mansion is substituted for the rude and uncomfortable wigwam; and "scarlet and fine-twined linen" supply the wardrobe, in place of the skins of wild animals. They are the foundation of nearly all the improvements and the comforts of life—and further, we may say, of the glory and the grandeur of the world. By them the farmer ploughs the land, and by them the mariner ploughs the ocean; by them the monarch is adorned with his crown, and by them the peasant is clad in comfortable garments; by them the triumphl arch is raised to the hero, and by them the temple ascends to the Deity; by them the wealthy roll in chariots, and loll on couches; by them the sword is polished, and the axe is tempered; by them the table is spread, and the bed is decked, and the parlor is furnished. To them the poet owes the perpetuation of his fame, and the warrior the evergreen of his laurels; by them Homer sings and Cæsar triumphs, in all ages. Through them we are instructed by the wisdom of Plato, and charmed by the eloquence of Cicero; through them we admire the justice of Aristides, and the heroism of Leonidas.

And much of this owing to two single arts, that of printing and the manufacture of paper. By the former, learning has been rescued from the gloom of the dark ages; but without the latter, the benefits of printing would be circumscribed to very narrow bounds. It is by means of the press, chiefly, that so much of christendom owes its escape from the thraldom of superstition; and it is to the same means that we, Americans, owe our free and enlightened institutions. To these means, which originated in a few rude types carved on a block of wood, is owing the present wonderful diffusion of knowledge, which distinguishes this from all former ages. But whether a book be printed on paper, and sold for a single dollar, or laboriously written on parchment, and sold for a thousand, it is still to a mechanic art that the world is, and has been, indebted for the transmission and diffusion of light through the means of books—whether the rays of that light shine upon few persons or many.

But in speaking of the dignity of mechanic arts, we would not confine them to the mere hand that executes, without thinking of the head that plans; for, without the latter, but little more credit would be due to the person who exercises these arts, than to the automaton Turk who mechanically astonishes the world at the game of chess. To produce the great effects we have mentioned above, to do so much to enlighten, to beautify and improve the world; to labor for the glory and happiness of others, and yet be ignorant of the springs by which these important movements are carried on, would ill comport with the dignity of the mechanic. He would be ("if we may compare small things with great") like the sun in the heavens, which renders light and warmth and comfort to mankind, without itself being conscious wherefore.

There is a philosophy in mechanic arts. The mechanic who brings to his occupation an inventive, enlightened and inquiring mind, who is master of his craft in theory as well as practice, has more of real philosophy in him than twenty of those "minute philosophers," who spend their lives in puzzling the world with empty metaphysical speculations, and of whom Cicero speaks with so much deserved contempt. The man, who, like Franklin or Fulton, or Count Rumford, employs his inventive and studious mind to ameliorate the condition of his species, whatever his rank in life may be, is indeed the genuine philosopher. But how much of real practical philosophy may be found among the mechanics of this new world, to say nothing of the Watts, and Arkwrights, and Brindleys of the old! —"By their fruits shall ye know them."

Perkins, who crossed the ocean to secure the Bank of England against counterfeits, by his engraved plates, and who has since astonished the world by his discoveries and experiments, is a New-Englander and a mechanic. But visit the Patent Office at Washington, and examine the thousands of models, which have originated from the inventive minds of our native Americans, whose productions have been so often contemned by the writings of the "minute philosophers" across the Atlantic—the Volneys of the old world. Visit our manufacturing establishments, and witness the operation of our labor-saving machines, in a variety of the employments of life, and see the effect of inventive genius and practical philosophy in the mechanic arts.

But it is not expected, nor indeed is it desirable, that every mechanic should add his name to the list of inventors, for which our country, and especially New-England, is distinguished. Without this he may become useful, respectable, and even distinguished in his trade. But in order to attain this reputation, the attention of the head is requisite to understand, as well as the hand to labor.

To become an ingenious and enlightened mechanic, it is necessary that the youth who is destined for a trade, should bring to his employment a mind inquisitive, studious, busy, and inclined to mechanic pursuits. Such a mind, with ordinary attention to its cultivation, can scarcely fail of becoming, in a very considerable degree, enlightened. But to the common sources of information, a good many mechanics add a very laudable attention to books, to the periodical publications of the day, and to associations for mutual improvement. Mechanics' and Apprentices' Libraries are established in many of our large towns, and Mechanics' Societies are formed, which by inducing studious habits, interchange of ideas, and collision of sentiments, must tend to improve the minds of the members in a high degree. There is in fact, at the present time, a very large share of information, and solid practical science, among the mechanics of this country.

The life of the mechanic, it is true, is a life of labor, and while he wipes the sweat from his brow, he may perhaps murmur at his fate, and envy what he considers the easy lot of other professions. But where is the business which exempts a man from a life of labor? The life of merchants, of physicians, of judges, of the first officers under government, and even of the U. S. President himself, is a life of labor. But can these "honorable men" make a throstle or build a ship, or raise a spire to heaven? or exercise all, or any of the arts which add so much to the comfort and grandeur of the world? These the mechanic can do; and if he duly reflects on the importance of his labors, he can scarcely repine at his lot. [*Berkshire American.*

JONES, ON JAPANNING AND VARNISHING--No. I.

We copy the following article from the *Franklin Journal;* a valuable periodical work, published in Philadelphia, by Dr. T. P. Jones, under the patronage of the Franklin Institute of the State of Pennsylvania. The editor has, by collecting what is valuable on the subject from "the mass of rubbish," with which it was encumbered, rendered an important service to the mechanic. We publish it the more readily as a gentleman of this town informed us that he has tested the utility of the rules laid down, by a practical use of them.

The art of making, and of using, the different species of varnish, is one of high importance, not only on account of the exquisite beauty of an infinite number of articles upon which the japanner has exercised his skill, but also as it contributes to the durability of a variety of materials used in domestic economy, and in the arts, and enables us to employ others, which without its aid, would be altogether unfit for the uses to which they are now appropriated.

The recipes and processes generally given in works written upon this subject, are extremely defective. The common practice has been, to copy from book to book, the false or imperfect accounts which were at first published by persons who were without practical knowledge, and who had in many instances obtained them from those who were interested in keeping some material part, secret. In general, when the recipes are good, the directions are so brief, as to be altogether useless to those who are not already practised in the art; or at least, so incomplete, as to occasion many failures in the attempt to put them into practice. In the midst of the mass of rubbish which has been accumulated in the "*Thousand valuable Secrets*," "*Guides*," "*Instructers*," and a variety of other books, which have at various times issued from the press, there is a portion of valuable matter, which ought to be collected, and methodized. In many of the philosophical, and other journals, both foreign and domestic, much is contained, which from its isolated situation is of little general utility, being rarely accessible to the practical man. From these sources, it is intended to obtain whatever is worth preservation, and to present it in a form as clear, distinct and practical, as possible. Precise directions will be given for preparing, using and polishing, the different kinds of varnish. In accomplishing this, the editor is aware that he must sometimes enter into a minuteness of detail, which to the initiated may appear tiresome; but it must be recollected, that he does not expect to instruct persons of this class; as respects them his most ardent wish is to obtain their aid in the accomplishment of his purpose. In order to teach well, we must suppose the learner entirely ignorant of the subject in hand; and request those who are not so situated, to recollect the period when a similar course would have been welcome to themselves.

The editor has been in the habit of making, and of using a variety of varnishes, and can therefore draw upon his own resources to a considerable extent, but he is not dependant upon these alone, for original information. Mr. John Meer, a gentleman well known in this city, who has been, for more than half a century, in the habit of manufacturing and using almost every kind employed, both for coarse and fine purposes, has promised his aid in the prosecution of this undertaking. Whatever these numbers may contain, may be considered, therefore, as perfectly correct, being the result of actual experience.

The materials used in varnishes are numerous, but they all consist of some solid substance, dissolved by the aid of a liquid. Sometimes, though rarely, the two are found in nature, combined together, so as to furnish a native varnish; that most celebrated among the Chinese, and Japanese, is said to be of this description. The solids which enter into the composition of varnishes, are those generally known under the name of gums, and resins. There is, however, considerable confusion in the names given to these substances, several of them properly belonging to the class of resins, being denominated gums; thus we have gum copal, gum animi, and a variety of others, which are improperly so called. Their distinctive characters we shall presently examine.

The *menstruums*, or fluids, used to dissolve the solids, are not numerous. Water, alcohol, ether, some of the fixed, and of the volatile oils, constitute the list. The purity of these articles, is, in many instances, a point of considerable importance, and we shall, in the course of our investigations, pay particular attention to this part of our subject.

The term Japan is used to designate those varnishes, which give to articles an appearance similar to those which are imported from Japan, and other parts of India. The name of Japan varnish, is frequently appropriated, exclusively, to that species of oil varnish, which is used upon waiters, and many other articles, and which is dried by the heat of a stove, constructed for the purpose.

Gums are the inspissated juices of certain vegetables, before the gum is dried, or after being dried, if it be dissolved in water, the solution is called *mucilage*. The gums, properly so called, are soluble in water, whilst the resins are entirely insoluble in that fluid; gums are insoluble in alcohol, remaining unchanged in it for any length of time; and indeed they may be precipitated after having been dissolved in water, by pouring alcohol into the solution. The species of gum most extensively used, is gum arabic, or senegal; that which exudes from plum, peach, and other trees, possesses similar properties. Gum water may be considered as the most simple of the varnishes; it is sometimes used on pictures, and on painted toys, to give them a gloss, but as it is readily dissolved by water, it is of little value; sometimes it is employed before using spirit and oil varnishes, to prevent their sinking into the substance varnished; of this we shall speak more fully, when treating of varnishing upon paper. Some writers consider insolubility in water, as an essential characteristic of varnishes, and do not therefore view solutions of gum, as belonging to the number.

Gum tragacanth, also called gum dragon, is sometimes used, as will hereafter appear. This gum does not dissolve like the former, but when covered with water, it swells and becomes a soft pulp, which will mix with other mucilages, and dries hard and glossy, but will not resist water. Most plants contain a considerable portion of gum, and many a very large quantity.

The resins, like the gums, exude from certain trees, either spontaneously, or from incisions made for the purpose. They resemble tbe gums in external appearance, but differ from them essentially, in many of their properties. The resins are softened and melted by heat, they burn freely, and with a vivid flame, and generally with a fragrant smell. They are insoluble in water, but most of them dissolve readily in alcohol, and, probably, they are all soluble in this fluid, under proper precautions. The resins are precipitated from their solutions in alcohol, by water, a small portion of which, dropped into any spirit varnish, will immediately render it turbid, or milky. This fact should be remembered, as it will be found of importance in the process of varnishing. The resins are generally soluble in ether, and in essential oils; many varnishes are made by dissolving resins, in oil of turpentine; and other essential oils are occasionally employed to promote the solution of some of the most refractory of these substances. The fixed oils dissolve many of the resins. Linseed oil, is the one most commonly used for this purpose, forming what is called an oil varnish. Common rosin is the most familiar example of the resins. Copal, Mastich, Sanderac, and several others, are also in common use.

There are some substances found in the earth, which strongly resemble the resins in their general properties; of these the most important are amber and asphaltum; both of which are used in varnishes, and will be again noticed in their proper places.

The gum resins are principally used in medicine; they are, as their name indicates, mixtures of resins and gums, which exude together from the same tree. They are dissolved in common spirits, which is a mixture of alcohol and water, the former dissolving the resin, and the latter the gum; they are generally turbid when dissolved, soft and brittle when dried, and partially acted on by water; and, being, therefore, unfit to form the basis of varnishes, do not require from us any further notice.

Brilliancy, hardness, and toughness, are essential properties in varnish. These are posesssed in very different degrees by the different kinds. Some of the resins employed, possess one of these properties, and some another; from this cause, they are frequently used in a state of combination; a portion of hardness, and of toughness, is frequently sacrificed, to obtain brilliancy. Common rosin, which is the most brittle of all the resins, will communicate a high degree of brilliancy to some of the others; it ought, however, to be very sparingly employed, as it in other respects, deteriorates the varnish. It is very cheap, and easily dissolved, and, from these causes the manufacturer of varnishes, not unfrequently, uses it too freely, to the great injury of the consumer. The toughness of a varnish depends, not only on the kind of resin employed, but also on the solvent. The oil varnishes are the toughest, as the oils themselves, when dried, form very tough, and sometimes very good varnishes, without the addition of any resinous matter.

Varnishes differ greatly in the time required to dry them. Some of the resins retain the spirit in which they are dissolved, much more powerfully than others; the spirit varnishes, however, dry the most readily; some of them, in favorable weather, hardening almost as quickly as they can be laid on. The oil varnishes require a greater length of time, than those made with spirit, and the same kind differs greatly in different specimens. Copal, with linseed oil, will sometimes dry perfectly in an hour or two, whilst other portions will require many days, and even weeks, before they are perfectly hard; as this arises from a difference in the oil, it is a point of manifest importance, to understand the cause of these differences, so as to be able to produce, at all times, such an article as may be wanted. We have, in this paper, made those general remarks, which appeared to be necessary to a right understanding of the subject; the whole article will be of considerable extent, and excepting from some accidental cause, every succeeding number of the Journal will contain an essay, until a complete treatise has been furnished.

ON THE USE OF SOAPSTONE

TO DIMINISH THE FRICTION OF MACHINERY.

I have observed in the July number of the Franklin Journal, a short article copied from the *Edinburgh Journal*, in which reference is made to this use of soapstone. The fact is simply stated, that "it facilitates the action of screws, and from its unctuosity, may be employed with much advantage, for diminishing the friction of the parts of machines which are made of metal."

I understand that soapstone has been used for this purpose in the extensive manufactories at Lowell, for about two years, and with great profit and success. Besides answering the purpose to which it is applied, very much better than any other substance that can be procured, it saves a great deal of trouble and expense. It is first thoroughly pulverized and then mixed with oil, tallow, lard or tar, whichever may be adapted to the use for which it is designed. It is of course, important to procure that which is free from *grit;* and it can be purified in a good degree by mixing the powder with oil and diluting it after it has stood a few minutes. The heavier particles will form a sediment to be rejected. It is used on all kinds of machinery, where it is necessary to apply any unctuous substance to diminish friction; and it is said to be an excellent substitute for the usual compositions applied to carriage wheels.

Some idea of the value of soapstone in this use of it, may be formed from the following fact, communicated by D. Moody, Esq. the superintendent of the Tar Works on the Mill Dam, near this city:—Connected with the rolling machine is a horizontal balance-wheel weighing *fourteen tons*, which runs on a step of five inches diameter, and makes from seventy-five to a hundred and twenty-five revolutions in a minute. About a hundred tons of iron are rolled in this machine in a month; yet the wheel has sometimes been used from three to five weeks without inconvenience, before the soapstone has been renewed. The superintendent thinks however that it ought to be more frequently applied.

This use of soapstone was discovered at Lowell by an accident, the circumstances of which it is not necessary now to repeat. It is sufficient to say, that it is regarded by those who have used it as an invaluable discovery. I have been assured that it has never been known to fail of producing the desired result, when applied to the machinery which had begun to be heated even in those cases where nothing else could be found which would answer the purpose. Very respectfully, your friend, &c.

Boston, Aug. 6, 1827. EBENR. BAILEY.

[*Silliman's Journal.*

WHEEL CARRIAGES.

Gentlemen;—I avail myself of the opportunity afforded by the Mechanics' Magazine, of communicating what has lain upon my mind above fifty years, and that is to suggest the necessity of an improvement which might be made upon two-wheel carriages, particularly those drawn by one or more horses. I allude however principally to carts drawn by one horse. In going along a level road loaded, nothing need be said, but when going up or down a hill—particularly if the loading is high, how the poor horse suffers.

In going up, especially, the disadvantage he labors under is great, in consequence of the proper bearing upon his back being then taken off and thrown upon the back part of the axle-tree. Now to remedy this, I conceive that though the shafts must be as in the usual manner, fixed upon the axle, yet a method might be so contrived, by which the body could be moved backward and forward upon the shafts, so as to bring the proper bearing upon the horse's back, whether going up or down hill. Those of your readers who have been in Scotland, may have noticed that the carters there when they come to a bottom of a hill with a heavy load, are in the custom of getting upon the horse's back, *in order to lighten* its task, unless something equally heavy can be taken from the hinder part of the load and laid upon the shafts before. Absurd as this may at first sight appear, it enables the horse by restoring the proper bearing upon him, to go with greater ease, as I have myself repeatedly witnessed. Nay, so true is this, that when a cart has been dragged partly up the hill, and the horse has stuck fast unable to proceed, I have seen the carter mount on its back, when it immediately went forward, and reached the top of the eminence without halting. In hopes that you will insert this in your Magazine, and that I may live to see the evil remedied,

I am, &c. J. J.

[*London Mechanics' Magazine.*

[We have been informed, that a person in Turner, Me. once invented a method by which the difficulty above mentioned, was remedied; but not being able to make it a self-acting or regulating method, threw it by. Now it seems to us, that if it could be so fixed as to change the position of the load, by starting some fastening or turning a small crank, it would be a useful contrivance.—We should be happy to make known any thing of the kind which may be sent us. There are also a diversity of opinions respecting the comparative ease with which a horse travels in a four-wheeled vehicle or one with two—Can any person decide the question?]

SAVE YOUR OLD BONES.

[They are useful for many things, even after they have been boiled for soap-grease, and all the oil and fatty matter is extracted that the skill of man or woman aided by heat and potash can obtain. In the first place, when pulverized they make an excellent manure. In the second place, when charred or burnt in vessels closed from the air, they make what is sometimes called animal charcoal, and sometimes what is called *ivory black*,—substances, the particular uses of which we hope to have an opportunity of relating hereafter. At present we will inform you of the French method of making Bone Glue, which they consider as superior to the ordinary glue made from the skins of animals.]

"For the purpose of making this glue they use the refuse bone of the table-knife maker, and the skulls of oxen, from which the teeth have been extracted. These materials are soaked for about a week in water, rendered very sour by the addition of a little Spirit of Salt, (*Muriatic acid*,) in which they become quite flexible, and may be bent with ease. Being taken out of the acid, boiling water is poured upon the bones or rather the glue, to separate any grease, and also the acid that adheres to it. The pieces of glue are then wiped, washed in cold water, and dried in the shade. When this glue is to be used, it is boiled in water to a proper consistence.

"There is a finer kind of bone glue made in the same manner, from leg of mutton bones, which is used instead of isinglass by the French manufacturers. The teeth extracted from the ox cheek bones, are sold to the apothecaries, who use them for the making of Salts of Hartshorn; as they yield a large quantity of Carbonate of Ammonia, the scent of which resembles that of the true scent of Hartshorn, and is free from the fetidity of the salt of bones."

[*London Mech. Mag.*

MAINE CHARITABLE MECHANIC ASSOCIATION.

A friend handed us the other day a copy of the Constitution of the above named Association. We were not before aware of the existence of such an institution, but we are happy in finding that the Mechanics of our metropolis have manifested so noble a disposition as to pledge themselves to afford each other mutual support in time of need, and that they have united in the praise-worthy undertaking of giving to their apprentices every facility, not only in the acquisition of their respective trades, but also in the fundamental principles of economy, morality and general science.

There is an article providing for the establishment "of Professorships in Natural Philosophy, Chemistry and Mineralogy, as connected with the arts and manufactures;—also in Architecture and Mechanics, as soon as the Society shall think expedient," or, as we construe it, as soon as they shall find themselves in funds sufficient to enable them so to do. We hope the day is not far distant when this plan will go into operation. We wish them every success.—We cannot but feel a cordiality toward all those who are willing to exert themselves for the welfare and improvement of their fellow beings, and especially of the rising generation; and we earnestly hope that the apprentices will be stimulated by the example of their masters to excel in those trades and arts by which they expect to gain a subsistence, and upon which must depend in a greater or less degree, their future respectability and usefulness. A thorough knowledge of their plans and objects could not be obtained by merely looking over their Constitution, but we are informed that they have established a Library for the benefit of themselves and their apprentices.

We would suggest the giving of premiums to apprentices for well made models of machinery, or for superior workmanship of any kind; the premium to be paid in books or in tools. Would not this be an incentive to trials of skill among them and thereby be productive of much good? It would be the means of getting up a cabinet of models and designs, which would be highly valuable to the Society. It would rouse a spirit of industry and a desire to excel, and it would enable the apprentice to acquire a little property, which would be thrice more valuable to him on account of its being a token of the approbation of his superiors.

In reflecting upon the exertions which are now making for the benefit of the productive classes of men, one cannot help remarking the wide difference there is between the condition of the apprentice of the present day and those in the times of our grandfathers. Then he was made a servant boy. If he had time to learn to read the Psalter, work out the four fundamental rules of Cocker, and write his name, he had reason to be thankful for his advantages. In those days, a homespun jacket with pewter buttons and a pair of leather breeches, formed his freedom suit. The avenues of learning were guarded with jealousy from their unhallowed approach, and those who had been to college and acquired something of the rudiments of Mechanics and Philosophy were viewed by them with a reverence and an awe due to some superior being.

Now, every avenue of science is thrown open to them, and every facility and every encouragement given them to enter and store their minds with such knowledge as will make them learned and wise. They are looked upon as the bone and sinew of the republic,—as the hope of a mighty nation. We would earnestly and anxiously repeat our wish, that the apprentices who are blessed with such means of improvement should not let slip the golden opportunity which is presented to them, and we hope these institutions will increase and extend until every village and every hamlet in the United States shall boast of its Mechanic Association, and point to it as a fountain of benevolence and enterprise.

AGRICULTURE.

ECONOMY IN FODDER.

It may appear to many, somewhat useless to devote an article to this subject at the present time; a time when every barn is overflowing with hay and the market almost glutted with it. But it seems to us that farmers as well as others, should learn wisdom from the experience of the past. It is almost invariably the case that in years when hay is cut short and there is much alarm respecting the lack of fodder, that the Spring finds comparatively plenty to spare. On the other hand, during years of great plenty the reverse is too often the case. It needs no inspiration to divine the cause of this seeming inconsistency. In the first case, great economy is used, every thing is substituted which can be profitably, and not a straw is wasted—The reward of this care is a plenty of fodder during the winter. But when nature opens her hand more wide and bestows her bounties with greater liberality, there is too much inattention and carelessness in feeding cattle—and the result is a comparative scarcity at the end of the foddering season. Would it not be advisable, during seasons of great plenty, to use the same economy as in times of scarcity? Could not a large portion of surplus hay, straw, &c. be laid by for a time of need—for a scarce year, and thus save much of the sacrifice which farmers have hitherto been compelled to make at such times?

We think this would be good policy, and for this reason shall from time to time publish what we can collect from good sources relative to this subject.

ECONOMICAL METHOD OF KEEPING HORSES.

BY HENRY SULLY, M. D.

Having received innumerable letters from gentlemen who keep horses, requesting a description of my plan of feeding, I shall save much trouble both to others as well as myself, by laying my system before the public. Having pursued the plan above 17 years, I am enabled to appreciate its full value, and, being perfectly satisfied of its superior excellence, I hope to continue the same as long as I keep horses.

Most people who know me will allow, that horses in my employ enjoy no sinecure places, and few people can boast of their cattle being in better working condition or more capable of laborious undertakings, than mine.

The loft above my stable contains the machinery for cutting chaff and grinding corn. From this loft each horse has a tunnel of communication with the manger below, and a tub annexed to each tunnel in the loft for mixing the ingredients composing the provender.

There should be no rack in the stable, because this may tempt the groom to fill it with hay, and thus by overloading the horse's stomach, endanger his wind, to say little of its expense and waste, for it is a well known fact, that if a horse has his rack constantly replenished with hay, he consumes and spoils upwards of 30 lbs. per day.

The manger with which the tunnel communicates, should have cross-bars, of firm oak, placed at the distance of 10 or 12 inches from each other, to prevent the horse from wasting his provender in search of the grain it contains, and this space between the cross-bars, allows the horse plenty of room to take his food.

The chaff-cutter I make use of, is manufactured by Mr Wilmott, a very ingenious mechanic, who resides about five miles from Taunton, on the road to Wiveliscombe. He also provides corn-bruisers, of the best construction, and any person keeping three or four horses, will save the prime cost of his machinery the first year of its trial, and the horses themselves, thus fed, to use the language of horse keepers, will always be above their work.

When the provender is thoroughly mixed in the tub, previously weighing out each ingredient, the mixture should be given in small quantities at a time, many times in a day; and at night, enough is thrown into the tunnel to last till morning. This process will be found of very little trouble to the groom, who will only have to go into the loft six or eight times a day. As the component parts of the provender are weighed separately for each horse, we are certain he has his just proportion; and I have hereunto annexed my scale of feeding in four classes, for it sometimes happens that some of the ingredients cannot be procured, and at other times that it may be better to substitute others; but, whatever grain is given, it should always be bruised, or coarsely ground, and carefully weighed out; for by weight alone, is it possible to judge of the quantity of farinaceous substances, the horse consumes; it being well known that a peck of oats varies from seven to twelve pounds; consequently if the provender were mixed by measure there would be frequently an uncertainty, as to quantity. Wheat varies from 16 to 12; Barley from 13 to 10; Peas from 17 to 15; Beans* from 17 to 15 per peck. And as wheat, beans, peas, barley, and oats, are equally good, and of very trifling difference in price when their specific gravity is taken into consideration, I am equally indifferent which grain I use, but I should always prefer boiled or steamed potatoes, for hard working horses, to be a component ingredient, whenever they can be procured.

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* The English horse bean is probably here meant. Ed.

As I call all ground or bruised grain, of whatever description, *farina*, it will be so distinguished in the following

SCALE.

	Class 1.	Class 2.	Class 3.	Class 4.
Farina, consisting of bruised or ground peas, wheat, barley, or oats, -	5 lbs.	5 lbs.	10 lbs.	5 lbs.
Bran, fine or coarse pollard, - -	—	—	—	7 lbs.
Boiled or steamed potatoes, mashed in a tub with a wooden bruiser, -	5 lbs.	5 lbs.	—	—
Fresh grain, - - - - - -	6 lbs.	—	—	—
Hay cut into chaff, - - -	7 lbs.	8 lbs.	10 lbs.	8 lbs.
Straw, &c. in chaff, - - -	7 lbs.	10 lbs.	10 lbs.	8 lbs.
Malt dust, or ground oil cake, -	—	2 lbs.	—	2 lbs.
Salt, - - - - - - -	2 oz.	2 oz.	2 oz.	2 oz.

By the above Scale it will be seen, that each horse has his 30 lbs. of provender, in 24 hours, which, I maintain, is full as much as he can eat. The two ounces of salt will be found an excellent stimulus to the horse's stomach, and should, on no account, be omitted. When a horse returns from labor, perhaps the groom will see the propriety of feeding him from his tub more largely, in order that he may be the sooner satisfied and lie down to rest.

Whenever oat straw can be procured, it is generally preferred; and some like to have it cut into chaff without threshing out the oats; but this is a bad plan, for, in preparing a quantity of this chaff, unequal proportions of oats will be found in each lot, so that one horse will have too large a portion, whilst others have less than they ought, although the portions are accurately weighed.

The only certain method, then, is, to let the grain, of whatever description, be weighed separately from its straw, and the keeper of cattle will soon satisfy himself that his cattle are in want of nothing in the feeding line. Many people object to potatoes, and think them unfit for working horses; but, from many years' experience, I am enabled to recommend them as a constituent part of the 30 lbs. and am convinced, that it is as wholesome and nutritious a food, as can be procured for laboring horses, which are called upon sudden emergencies, to perform great tasks, as has been abundantly proved by Mr. Curwen, M. P., who kept above one hundred horses on potatoes and straw, and always found that their labors were conducted better on this than any other food.—See Curwen's Agricultural Hints, published in 1809.

HENRY SULLY.

Wiveliscombe, Somerset, Sept. 12, 1826.

[*London Mech. Mag.*

[It will be perceived that the above method of feeding horses, is well adapted to horses kept in Livery Stables which are let on short and severe journies; but we think the plan a very judicious one for those that are kept at steady work and are allowed to come into the stable only at noon and night. Although they could not be fed at short intervals, yet the ingredients of the provender or food might be proportioned in a similar manner as above directed.

The expense of this mode must vary with the price of the article; at present it is very low. Let us suppose that we have a horse that performs hard labor every day in the year, a stage horse for instance, and we are inclined to give him the provender laid down in Class 1.

He would require during the year, 38 bushels of Oats, supposing them to weigh 38 lbs. per bu. cost, say, $12,00
Of Wheat, weighing 64 lbs. per bu. 34 bu. cost, say, 34,00
Of Hay, 1 1-4 ton, cost, say, - - - 8,00
Wheat Straw, the same quantity, cost, - 5,00
Potatoes, weighing 64 lbs. per bu. 28 1-2 bu. 5,70

$64,70 per ann.

This will amount to a shilling a day, a very trifling recompense for a hard day's work. We know of many horses that consume this amount in grain, and then waste almost thirty pounds of hay besides. But we have noticed that horses thus fed, although fat and plump, cannot perform their duties with so much ease and apparent pleasure, as those fed in a manner similar to what is here recommended. If thirty pounds of provender will be sufficient for a horse that labors hard daily, twenty will suffice for one that works but seldom; and where there is plenty of pasturing during the summer, the cost of keeping a horse will be comparatively small, and instead of being one of the most expensive, he will be as cheaply kept as any animal on the farm.]

PRESERVATION OF POTATOES.

We select the following from vol. 3d, of the *New-England Farmer;* a work too well known to need our recommendation. It is hoped, that it may meet some eyes that have not seen it; and refresh the memories of some who we know have seen it—but, judging from the management of their potatoes, have forgotten it.

A variety of conflicting opinions have been and we believe still are entertained, relative to the topic of digging and preserving Potatoes. Formerly it was the fashion among farmers. to dig them early, while the tops were entirely green and the potatoes not ripe, nor indeed fully grown. They then took care to dry them in the sun till the bulbs were almost as green as the balls or apples, and nearly as strong as so many *quids* of tobacco. Potatoes treated in this way become poison for pigs, and very unwholesome for all other animals, including the great *rational* biped, whose sagacity is as apt to go astray in this as in other matters of importance to his welfare. It was probably this and other injudicious modes of cultivating, managing, and using this crop, that caused those violent prejudices against the plant, which prevailed for a long time among the bulk of mankind, after the potato was first introduced and recommended as an article worthy of the attention of the rural economist. Even in this enlightened age and nation, we have known farmers nearly spoil their crop of potatoes by mismanagement in digging and securing them. Some of those wise cultivators who know too much to be taught, either by the lessons of experience or the dictates of reason, let them lay after they are dug, for several days, perhaps weeks, in the field, as if on purpose to spoil them.

But, of late years, more correct systems relative to this and other branches of husbandry are introduced and becoming prevalent. Men who unite science, good sense, and experience, afford such lights that none but those whose mental optics are, as it were, hermetically sealed by obstinacy and prejudice, persevere in the use of bad means, to attain good ends.

The following paper from the Transactions of the Society of Arts in London, may be of use to those who wish to preserve potatoes in the best possible condition, either for sea stores, foreign consumption, or domestic use.

"The usual mode at present practised for endeavoring to preserve potatoes, is to leave them, after digging, exposed to the sun and air until they are dry. This exposure generally causes them to have a bitter taste; and it may be remarked, that potatoes are never so sweet to the palate, as when cooked immediately after digging. I find, that when potatoes are left in large heaps or pits in the ground, that a fermentation takes place which destroys the sweet flavor of the potatoes. In order to prevent that fermentation, and to preserve them from losing the original fine and pleasant flavor, my plan is, (and which experience proves to me to have the desired effect,) to have them packed in casks as they are digging from the ground, and to have the casks, when the potatoes are piled in them, filled up with sand or earth, taking care that it is done as speedily as possible, and that all vacant places in the cask are filled up by the earth or sand; the cask thus packed, holds as many potatoes as it would were no earth or sand used in the packing; and as the vacant spaces in the cask of potatoes are filled. the air is totally excluded and cannot act on the potatoes, and consequently no fermentation can take place.

"I sailed from New-York to St. Bartholomews, and brought with me two hundred barrels of potatoes, packed in the above manner. On my arrival at the island, I found, as I expected, that the potatoes had preserved all their original sweetness of flavor; in fact. as good as when first dug. having undergone no fermentation, nor in the slightest degree affected by the bilge or close air of the ship. Some barrels of the potatoes I sold there, and at the neighboring islands, for four dollars per bushel, and at the same time potatoes carried out in bulk, without packing, and others that were brought there packed in casks which had not been filled up with earth, sold only for a dollar per bushel, they being injured in the passage by the bilged air and fermentation, being bitter and bad, whilst mine were as perfectly sweet and dry as when first dug. What remained I shipped from St. Bartholomews to Jamaica, where they arrived in equally good condition, and sold at a higher price than they had brought at the former island; some of these casks of potatoes were put in a coal cellar by the purchaser at Jamaica, and on examining them when I was leaving the island, two months after, I found that they had in a very small degree, sprouted, but that all their original flavor was preserved.

"CHARLES WHITLAW."

In order to preserve potatoes in sand or soil, it is not necessary to pack them in casks or other vessels. They may be mixed with a due quantity of the earth of the field in which they have grown, and put into bins in cellars, or buried in holes dug in the ground. The earth should be in such quantity as to keep them from the air and from general contact with each other. Placed in this manner, they will not suffer from heat nor frost, if deposited in a cellar which freezes. If surrounded by earth they will receive little or no injury from frost. It is wrong to suppose, that the earth or sand in which they are embedded, should be perfectly dry. Some degree of moisture is necessary, in order to preserve the life of the root. If the vital or vegetative principle be destroyed, they will soon decay, by a sort of dry rot. They may, however, it is said, be cut into slices, and dried in an oven or kiln, and will then remain sweet and sound for years. We suppose that either the native juice of the potato should be expelled by heat, or the vegetative principle preserved by moisture, and a seclusion from the air.

ON FOREST TREES, ORCHARD TREES, &c.

Rensselaer School, Troy, April 30, 1827.

Effects of Light.—Clouds and rain have obscured the hemisphere during the last six days. In that time the leaves of all the forests, which are seen from this place, have greatly expanded. But they were all of a pallid hue, until this afternoon. Within the period of about six hours, they have all changed their color to a beautiful green. As the only efficient change which has taken place is, that we have a serene sky and a bright sun, we may say with confidence, that this change of color is produced by the action of the sun's rays.

Seven years ago next month, I had a still more favorable opportunity to observe this phenomenon, in company with the Hon. J. Lansing, late Chancellor of this State. While we were engaged in taking a geological survey of his manor of Blenheim, the leaves of the forest had expanded to almost the common size, in cloudy weather. I believe the sun had scarcely shone upon them in twenty days. Standing upon a hill, we observed that the dense forests on the opposite side of the Schoharie, were almost white. The sun now began to shine in full brightness. The color of the forests absolutely changed so fast, that we could perceive its progress. By the middle of the afternoon the whole of these extensive forests, many miles in length, presented their usual green summer dress.

Direction of the branches of trees.—A tree shoots out its branches like all other trees of the same species, external circumstances being similar. But there is one remarkable fact in the direction of branches, which I have not seen noticed in any publication.

All trees with spreading branches, accommodate the direction of the lower branches to the surface of the earth over which they extend. This may be seen in orchards growing on the sides of hills, and in all open forests. But the crowded situation of the wild woods of our country, prevents a sufficient extension of branches to exhibit this character.

This fact presents a curious subject for the investigation of the phytologist. The question presented is this: What influence can the earth have upon the branches on the upper side of the tree, which causes them to form a different angle with the body of the tree from the angle formed by the branches on the lower side, so that all the branches hold a parallel direction to the earth's surface?

Hollow Trees.—*The growth of trees is not influenced by any circumstance connected with their internal woody parts.*

Mr. Knight's central vessel hypothesis, and the authority of numerous able physiologists, seem to be at variance with this position. I shall not enter upon a discussion of the subject, but merely introduce a few facts.

The sugar maple, (*acer saccharinum*,) after being tapped and drained of its internal sap fifty years, and after the whole interior has become dead, grows as fast and presents an aspect as vigorous and blooming, as any sound tree of the same species and same age, which stands by its side. For the truth of this fact, I refer to all manufacturers of the maple sugar. I suggested this opinion more than twenty years ago, and frequently afterwards, when I was employed among the tenants of Messrs. Livingston, McEvers, Ludlow, Cutting, and others, between the spurs of Catskill mountain. Every manufacturer with whom I conversed, in this native residence of the sugar maple, confirmed my opinion.

The common apple tree (*pyrus malus*) grows thriftily and bears abundance of fruit, many years after its interior is so completely rotted away, as to leave but a very thin hollow cylinder in possession of the living principle.

We prefer solid trees in our forests and orchards; because they have more strength to withstand the force of winds, and because the unfavorable circumstance, which caused the interior to decay, may effect the total destruction of the tree. But as all depositions of matter, in any way affecting the growth of the tree, are made between the bark and wood, after the first year, in the form of a mucilage, called *cambium*, it seems that the internal woody part has no influence upon the external growth.

Yours, respectfully, AMOS EATON.

[*Silliman's Journal.*

HANCOCK AGRICULTURAL SOCIETY.

It gives us great pleasure to learn, that while all the other Agricultural Societies in this State are sleeping—it is feared, the sleep of death,—the industrious farmers of Hancock County are up and doing. The Castine *American* gives a minute account of their proceedings and festivities, on the 10th of October last. It seems they had not much gold or silver to bestow, and, of course, not many premiums were given. It is presumed, however, that the hilarity and joyous feeling which such occasions excite, was not the less on this account; and that the real objects which such societies ought to have in view, were much promoted, viz: The cultivation of an acquaintance with each other—-the diffusion of knowledge—the approbation of that which is good, and disapprobation of that which is not. All, undoubtedly, went home wiser than they came, for they had seen at one view the whole agricultural force of the county; each one had ascertained his relative strength, and could calculate more understandingly on the future management of his affairs.

It has been justly observed, that "of all classes in community, agriculturalists are most benefitted by associations. Living at some distance from each other, they have not frequent opportunities to interchange opinions, and consequently are less under the happy influence of emulation, than those of most other pursuits."

The Committee on Agriculture, awarded to Lemuel L. Osgood, of Bluehill, for the best Cheese exhibited, weighing 90 lbs., $4.

To Mrs. James, housekeeper to Leonard James, Esq., of Ellsworth, for the best Butter exhibited, $3.

The Committee on Ploughing, and Working Oxen, awarded to Elnathan Hinkley the first premium of $5.

To William Gregory, the second premium of $3.

They also awarded to Col. Wood, for the best yoke of Working Oxen, $5.

The Committee on Manufactures, none of the regular articles for premium being submitted to them, awarded a discretionary premium to Miss Holt, of Bluehill, for a handsome Hearth Rug, $1,50

To Mrs. Wood, of Ellsworth, and Miss Tenney, of Bluehill, for two very handsome Vandykes, each, $1,50.

To Miss Fisher, of Bluehill, for a neatly made Work Box, and a Gown handsomely wrought, $1.

To Miss Osgood, of Bluehill, for a Coverlet, and three Vest Patterns, $1,50.

To Miss Faulkner, of Bluehill, for a patch-work Bed Quilt of great neatness, $1.

To Miss Barret, of Surry, for two very superior Yarn Socks, $0,50.

To Major Ray, of Bluehill, for a Plough, and a Broad Axe, a Narrow Axe and Adze which could not be surpassed, $3.

The Committee on Stock, awarded to Reuben Dodge, Esq., for the best two-year old Heifer exhibited, $3.

To Samuel Parker, a discretionary premium, for a four-year old Bull, $2.

To Isaac Harden, a discretionary premium, for a two-year old Bull, $1.

ON THE HAW, OR THIRD EYE-LID OF THE HORSE; BONES OF HIS FEET, &c.

Loretto, Va. Oct. 31, 1827.

Dear Sir,—The following extracts from a very popular scientific work now publishing in England, and called "The Library of Useful Knowledge," will save, I hope, many a poor horse from much suffering and injury. With this view I take the liberty to offer them for publication in your very useful paper.

Yours, with regard,

James M. Garnett.

Speaking of the eye-lids of birds, the writer remarks: "A third eye-lid of the same kind is found in the horse, and called the *haw*; it is moistened with a pulpy substance, (or mucilage,) to take hold of the dust on the eye-ball and wipe it clean off, so that the eye is hardly ever seen with any thing upon it, though greatly exposed from its size and posture. The swift motion of the haw is given to it by a gristly, elastic substance, placed between the eye-ball and the socket, and striking obliquely, so as to drive out the haw with great velocity over the eye, and let it come back as quickly. Ignorant persons, when this haw is inflamed from cold and swells so as to appear, which it never does in a healthy state, often mistake it for an imperfection, and cut it off; so nearly does ignorance produce the same mischief as cruelty! They might as well cut off the pupil of the eye, taking it for a black spot."

The other extract relates to the horse's hoof, and is as follows: "The bones of the foot are not placed directly under the weight; if they were in an upright position, they would make a firm pillar, and every motion would cause a shock. They are placed slanting, or oblique, and tied together by an elastic binding on their lower surfaces, so as to form springs as exact as those which we make of leather or steel for carriages. Then the flatness of the hoof which stretches out on each side, and the frog coming down in the middle between the quarters, adds greatly to the elasticity of the machine. Ignorant of this, ill-informed farriers nail the shoe too far back, fixing the quarters, and causing permanent contraction—so that the contracted hoof loses its elasticity; every step is a shock: inflammation and lameness ensue."—[*Am. Farm.*

MISCELLANEOUS.

Inflammation of Gunpowder.—We were pleased with the caution used by a person in this neighborhood, in blasting rocks. He informed us that after the hole was drilled, he used no metallic substance whatever in charging for the blast. A small twig of ash or elder with the pith pushed out, formed a tube which connected the priming with the charge. In ramming, he used a wooden rod and a mallet. To show that this care is wise, and that it would prevent many of the horrible accidents which often occur in charging rocks in the common way, we publish the following from Silliman's Journal.

Powder Mills.—Although great care is taken to exclude from these manufactories all articles of iron, and to substitute copper and other metals, in the metallic parts of the machinery, which will not strike fire, yet it is well known that explosions, attended with disastrous consequences, are very frequent. Excited by an occurrence of this nature, *M. Aubert*, Colonel of artillery, was induced, in conjunction with Capt. *Tardy*, to resume some experiments which he had unsuccessfully tried, to ascertain, whether gunpowder would not explode by the shock of copper. The result of these renewals was, that powder would inflame by the stroke of copper upon copper, or upon the alloys of copper. This gave rise to further investigations, in presence of the committee of safety, and it was ascertained that gunpowder could be exploded by the stroke of *iron* upon *iron ; iron* upon *copper ; copper* upon *copper ; iron* upon *marble ;* and with suitable precautions even by *lead* upon *wood.* The experiments were successful both with English and French powder. The experiments most clearly show, that in all the manipulations of a powder manufactory, all violent shocks and percussions should be carefully avoided, since they may occasion the disengagement of sufficient heat to produce the inflammation of powder. [*Bul. d'Encouragement, Juin,* 1826.

Black Dye and Ink prepared with Logwood.—The following is a process for the preparation of a black dye, for which a patent was taken out at Vienna, by Mr. Honig. Logwood is to be boiled several times in water, and a little subcarbonate of potash to be added to the decoctions, the quantity being so moderated that it shall not change the color to blue ; the stuff to be dyed is then to be plunged into this bath. This stuff may be either animal or vegetable. When it is well impregnated with coloring matter, it is to be withdrawn, and, without being exposed to air, is to be introduced into a solution of green vitriol, and left there until it has obtained the desired black hue. In preparing the ink, the decoction of logwood is used in place of the infusion of galls.

[*Quarterly Journal.*

Magnetic Influence in the Solar Rays.—Mr. Christie has ascertained, that a magnetic needle comes to rest more quickly when vibrated and exposed to the rays of the sun, than when vibrated in the shade, and this entirely independent of any mere effect of change of temperature. When the needle was *shaded*, he could easily make the *fiftieth* vibration; when it was *exposed*, he could not distinguish beyond the *fortieth*. [*Quart. Journal.*

Cultivation of Plants in Moss.—Mr. Street has ascertained, that many plants thrive better if planted in common moss, than in garden mould. The mosses used are various species of *Hypnum*, collected with the decaying stalks and leaves which are found amongst them. They are pressed closely into the pot, and the plants are put into them as if into mould. [*Quart. Journ.*

Method of Making Transparent Soap.—Tallow is the basis of all soaps for the toilette, known under the name of Windsor, because olive oil forms a paste too difficult to melt, and having an odour too powerful for mixing with perfumes.

Tallow-soap dissolved with heat in alcohol, returns to its solid state on cooling. It is this fact which has led to the discovery of transparent soap. When well prepared, this soap should have the appearance of fine white sugar-candy. It may also be colored, and vegetable colors are for this purpose preferable to minerals. Any person can make the soap by putting into a thin glass phial half a brick of Windsor soap, filling the phial half full of alcohol, and placing it near the fire till the soap is dissolved. This mixture put to cool in a mould, gives the transparent soap.

[*Archives des Decouvertes et des inventions nouvelles.*

Blacking-Balls for Shoes.—Take mutton suet, 4 ounces; beeswax, 1 ounce; sweet oil, 1 ounce; sugar-candy and gum-arabic, 1 drachm each, in fine powder; melt these well together over a gentle fire, and add thereto about a spoonful of turpentine, and lampblack sufficient to give it a good black color. While hot enough to run, make it into a ball, by pouring the liquor into a tin mould; or let it stand till almost cold; or it may be moulded by the hand.

QUERY.

Mr. Editor,—Wishing to use some green stuff for Pannels, and having heard that if it were boiled in water for some time, it would prevent the shrinkage, &c. I should like to be informed if any one has tried the experiment, and if so, with what success.

A Joiner.

NOTICES.

NOTICE OF

"*Hale's Introduction to the Mechanical Principles of Carpentry.*"

An octavo volume, of about 180 pages, under the above title, has been just published, by Richardson & Lord, of Boston, and P. Sheldon, of Gardiner, Maine. The work is written by Mr. Benjamin Hale, Principal of Gardiner Lyceum. It is divided into two parts, the first treats of the *strength and stiffness of timber*, and the second of *statics applied to constructions of timber*. We have perused this volume with much satisfaction, and recommend it as calculated essentially to aid the operative carpenter in the prosecution of his business. It does not pretend to much originality, and had it done so, we should have thought it a very unfavorable symptom; much valuable matter has been published upon this subject, but it is usually contained in works which are inaccessible to the ordinary workman, on account of their cost; and which to most of them wear a repellent aspect, in consequence of the extensive use of algebraic formulæ: for however desirable it may be, and is, that the mechanic should be well acquainted with the arithmetic of signs, the time is not likely soon to arrive when this knowledge will be general. To the work before us, neither of these objections can be urged.

Mr. Hale has made free use of Tredgold, Robison, Barlow, and others, either copying them verbatim, or moulding them so as to suit his purpose, and has thus produced a work, which, whilst it is moderate in cost, is neat in its execution, and valuable from its matter. The subjects are illustrated by 82 figures, executed with remarkable neatness. We are informed in a note, that "The cuts in this book were made by Mr. L. T. Jackson, of Brunswick, Me. of *brass rule*, according to a method recently invented by him. These are the first specimens which have appeared in any publication, and this note is inserted, in justice to the author of an invention, which will probably be of considerable importance."

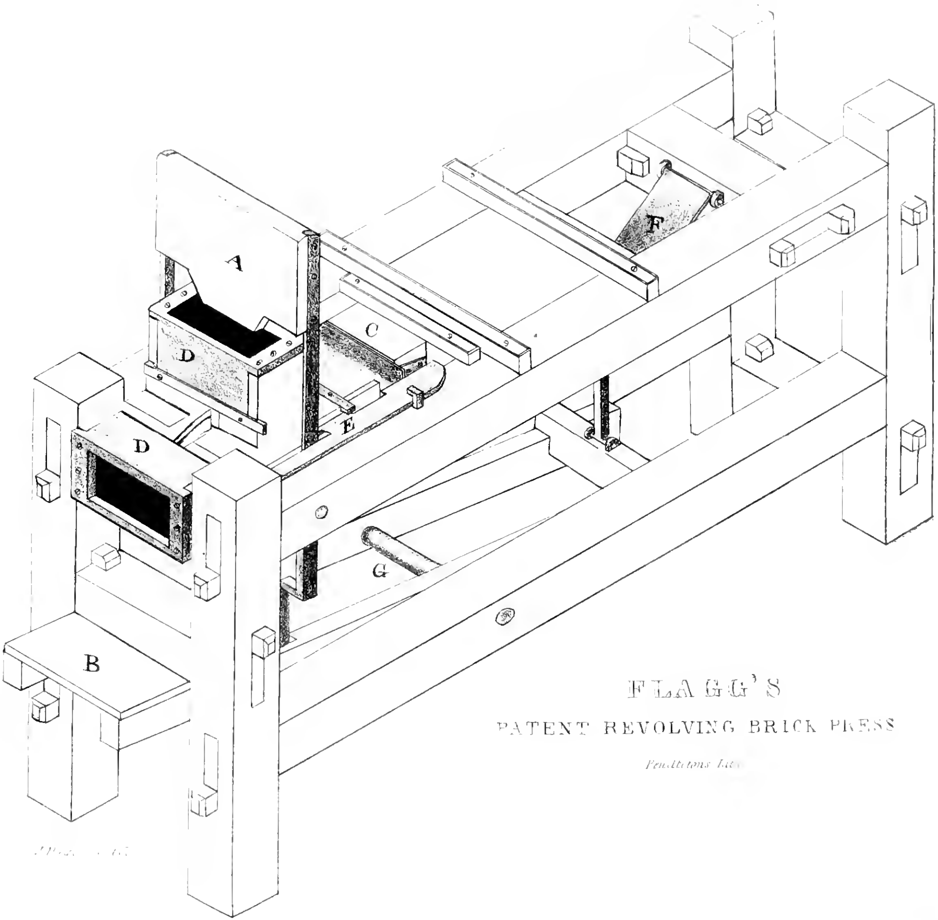
[*American Mech. Mag.*

GARDINER LYCEUM.

The attention of the public is respectfully invited to the Advertisement for Winter Classes in the Lyceum, the ensuing season.—Those Mechanics who are desirous of obtaining knowledge, which will be of daily practical use to them, and which can be obtained in few other institutions in the United States, would do well to embrace the opportunities now offered them. The expense, which has hitherto deterred many, cannot now be an objection. Those who are not able to pay for tuition, can have it gratis; and as it regards the board, it may be paid in whole or part by labor.

DENTON.

This celebrated Bull of the "Improved Durham Short Horn Breed," so well known among the breeders of fine stock in Massachusetts, has, by the politeness and generosity of his former owner, S. Williams, Esq., been sent to the Editor. He is now in Gardiner, where he may be seen and examined by all who wish. A further notice of him will be given in our next.



FLAGG'S

PATENT REVOLVING BRICK PRESS

Pendletons Lith.

THE

NEW-ENGLAND

FARMERS' AND MECHANICS' JOURNAL.

Vol. I. GARDINER, FEBRUARY, 1828. No. 2.

MECHANICS.

FLAGG'S PATENT BRICK PRESS.

We have seen this Press in operation, and think it vastly superior to one invented and used some years since by the same person.

There are a great variety of presses for the purpose of pressing bricks in use at the present day; each one has something to recommend it. Some are recommended for their simplicity—some for their power, &c. The one in question, perhaps combines as many of the essential requisites as any in use.

For the Farmers' and Mechanics' Journal.

Gardiner, Feb. 23, 1828.

Mr. Editor,—I have had, the last season, a Brick Press of my own invention in operation, which, for durability, cheapness, and facility in pressing, is considered by competent judges superior to any now in use. It is very simple in its construction. Is worked by the foot, and with more ease than any other foot press for this purpose. The power being obtained by a compound or perpetual lever, is immense. It may be regulated, however, by the operator, so as to give any pressure required.

It requires two boys to assist the Pressman; one to hand the bricks and the other to carry them away. The Press requires but one man to work it, who can press from six to eight thousands per day. He finds no inconvenience in waiting to have the bricks removed after they are pressed, for the machine discharges the brick first pressed while pressing the second. It is received on a thin piece of board made suitable for the purpose, so that the faces of the brick are not marred by the handling after being pressed, which is not the case with other presses, as far as I am acquainted with them. I could relate many more advantages if necessary; but as the Presses will be warranted to give entire satisfaction, as to their utility and durability, I think it unnecessary to give any further description at present. The cost of the Press, complete and warranted, is $100. Any orders directed to me will be promptly attended to. Yours, &c. David Flagg, Jr.

EXPLANATION OF THE PLATE.

Plate II. According to the specification, this improvement consists, in making the moulds D, D, D, revolve, being let into the extremities of four short arms. The Inventor now uses cast-iron arms and moulds, having them cast entire. A brick being put into the vertical mould D, it is turned until stopped by a trigger, (nailed across the arms when of wood, or cast on the arms when of iron,) which falls on the slide E, pushed along by a pin in the arm, as the mould turns to a horizontal position. Power is applied at the end B, of the compound lever, (the fulcrum of which is at G;) this gives the part F, a horizontal position, and thereby slides the piston C, on the brick, and presses it. It also pushes the slide E, back, by a cleet on the piston. Another brick being put into the succeeding mould and turned to a horizontal position, is pressed as the one preceding. At the same time, the piston A, pushes out the first brick, by pressing on the bottom of the opposite mould, the bottoms all being moveable, and the opposite ones connnected by iron bars.

NAVAL ARCHITECTURE.

It is somewhat strange, that, while so much has been said, written, and done, from time immemorial, upon Civil Architecture and its several branches, comparatively nothing has been written (in this country at least) upon Naval Architecture. Certainly it cannot be from want of experience in the art of constructing vessels. The many important improvements that have taken place in shipbuilding, evince that there is no want of skill, judgment, or experience, in the art; and yet, but little is written upon it,—nothing to perpetuate, and to hand down to posterity the essential and fundamental principles, upon which such structures depend. Nothing to warn others from experiments, and attempts which have proved abortive, or to guide to the attainment of particular objects. which, from years of experience, some can accomplish without difficulty. There are many who have grown grey in the business, —who can construct their own models,—can see the future ship in their "mind's eye," and foretell, or rather, form its character, as it progresses under their hands towards completion. There are others again, who will take the same model, and follow, apparently, every step with care and caution, and yet produce a thing totally unlike it, except in its general shape; sailing nothing like it, and requiring a very different management. It is a pity that valuable information on this subject, should either die with the possessor, or be taught only by oral instruction.

There is much that might be recorded, which would be of great use to many. Every one knows something that another does not. There is much to be told, that, although well known in one place, may not be in another. Some may have had experience in one kind of timber,—can tell when it should be cut and how managed, —its comparative durability, and in what places and for what purposes it will do best. Others may know the same of another kind. Some may have one mode of fastening, in particular cases, others, another. Some may lay down rules to obviate difficulties, which another knows not how to remedy. These are few and simple items of what may be told. It is evident, that this art like all others of a mechanical kind, depends on certain fixed, physical, or natural principles,—(whether they are known or not;) and it is to be regretted, that these principles have not been investigated and established with scientific accuracy.

It is a grand, a noble art. There is something extremely majestic in a stately ship.

"She walks upon the water, like a thing of life;"

And as she proudly careers through the waves, seems to proclaim the triumph of mind over the elements.

It has been customary for us to look, with humble deference, to England for instruction in the arts. as well as in the sciences, and whatever was found in an English book, considered the best authority. But in Ship-building, this can no longer be. The Americans have left the ship-wrights of the mother country far in the rear. The *London Quarterly Journal of Science* for September last, contains remarks upon this subject, in which the palm is yielded to our Naval Architects, in a spirit of candor and ingenuousness, quite unexpected. It displays a mind in the writer, elevated far above the idle malice, which seems to inspire some in that country, when they have aught to say of America. The following is extracted from the article alluded to. It contains hints which may be of use to us, as well as those for whom they were especially written.

OBSERVATIONS ON THE STATE OF NAVAL CONSTRUCTION IN ENGLAND.

It appears that there is at present a tendency to improvement in every branch of science; monopoly in intellect may now be said to be vanishing; and empiricism is obliged to seek dark corners, to escape the light which is penetrating into regions from which it had but very lately been excluded. The administration, too, encourages advance of knowledge; yet notwithstanding these favorable circumstances, there still exists, in some minds, an inaptitude of scientific perception, which induces unwillingness to acknowledge the advantage that results from the application of the exact sciences to the useful arts.

This neglect of scientific principles is nowhere more manifest than in the affairs of Naval Architecture, and it is not confined to the Royal Navy, but extends also to our mercantile shipping; and hence it is that our commercial marine is in some respects behind foreign nations, especially the Americans, in the formation of its ships; our merchantmen are, almost without exception, the most unsafe and slowest ships in the world. The ship-owners, therefore, would do well to consider this circumstance, and endeavor to devise means of introducing science into the merchant yards.—The establishment of the new University in the metropolis, affords an opportunity of doing it at a comparatively small expense, by the foundation of Lectures on the theory of Naval Architecture; and the support even of a separate institution in the vicinity of the merchant yards of this great port, for the education of ship surveyors, would soon be repaid by the improved character of our merchant shipping.

If the science of Naval Architecture depends on certain physico-mathematical laws, as no doubt it does, it is monstrous to imagine for a moment, that such laws can be developed by a flight of fancy, or that a man is born with an *intuitive optical* perception of the lines of least resistance, &c., or, in the jargon of the craniologists, that he has a naval-architectural bump on his skull; yet one would think that such was the case, when we see men, we cannot say philosophers, start up and loudly assert that they are in possession of the secret of construction; and they are believed, because their hypotheses are never submitted to the examination of those who are capable of detecting their fallacy.

The Experimental Squadrons have, with a multitude of perplexing results, elicited, it must be confessed, at least an interesting fact, viz: that there has been an establishment seventeen years in this country, in Portsmouth dock-yard, for the scientific education of naval architects, for the Royal Navy. From the plan of education, as laid down by the Commissioners of Naval Revision in 1810, it appears that, to a requisite knowledge of the *practice* of their profession, the gentlemen composing this body of naval constructors, unite a sound and competent one of its *theory*.

It can only be from such a source that we can look for the improvement of our men of war, and it is to be regretted that every means should not be taken to avail ourselves of it: but unhappily such is the force of prejudice that, unless some alteration should be adopted in this institution, it will be in vain to expect advantage from it.

The objection urged against this establishment, namely, that the scientific education it gives to its members, precludes them from the attainment of a due knowledge of the practical construction of our ships, is so absurd, that none but weak or jealous minds could ever have brought it forward. Shall it be laid down, in the present age, as an axiom, that a profound ignorance of the principles of his art is the one thing essential to the formation of what is generally meant by the term "practical man?" We contend that, having made, *in vain*, a long and most indulgent trial of a system without science, if we may use such an expression, we must extend to one in alliance with it, a like patronage, before we can be allowed to pronounce a fair and legitimate judgment upon its efficiency.

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But, to return to the Experimental Squadron: it is with regret that we must conclude, upon a careful consideration, that, although the experiments are carried on with so much vigor and interest, they are evidently founded on imaginative views, and that there cannot exist any thing like legitimate data where so many failures and anomalous results obtain. Who can read the account of the first Experimental Squadron, without immediately perceiving that the constructors of the contending vessels, however sanguine each might have been of the success of his particular fancy, met with nothing but the most perplexing results? We see sometimes one and sometimes the other vessel claim the palm of excellence, and finally leaving the subject as much in the dark as ever. This is the natural consequence of the non-application of inductive philosophy to the question before us, and the most important conclusion that can be gathered from the experiment is, that we have begun at the wrong end, and that it is high time to employ analysis instead of synthesis to effect the desired objects: for in the present state of the theory of naval construction in this country, there are yet no data existing to effect with precision and confidence, the synthetical composition of a ship.

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After so many years of trial with the present nearly invariable set of principal dimensions, during which period it may be said, that every possible contour of hull has been experimented on with them, we are inclined to think that almost all has been done that could be done under such restrictions, and that some great step must be made in one or other of the principal dimensions themselves, with correspondent alterations in the masting, before we can expect to see a decided and great improvement in the sailing of our ships. The depth is an element which has arrived at its limit from very apparent external causes; but the length and breadth remain to the skilful constructor without any such clogs to his endeavors; and he has only to accommodate their relation to each other in the manner most conducive to velocity, which in our opinion is the very capital object of naval construction, both in ships of war and of commerce. That it is so in the former, no one will, we apprehend, on due reflection deny; but there will be many who will assert that it cannot be obtained, in the latter, without a sacrifice of capacity, which will defeat the object of carrying large cargoes: to this we may reply, that if a vessel with an expense of one quarter the capacity can make *three* voyages instead of *two*, will not the merchant be still a considerable gainer in capacity, and still more so by a ready return of his capital?*

All observations on well-conducted experiments concur in proving that velocity is gained by increasing the length, to a much greater degree in relation to the breadth, than has ever yet been done in ships; and that the increase of the same element contributes to their weathering powers, is too obvious to need insisting upon: it is also generally advantageous, when not carried to an extent which would seriously retard the manœuvring of the ship. This limit has not yet by any means been determined; for it must be recollected, that, although the additional length increases the resistance to rotation about a vertical axis, yet the power of the sails to give rotation about the same is also increased, although not in so high a ratio. The power of the rudder to produce rotation is also greater in a long ship than in a short one, not only on account of the greater distance it is from the axis of rotation, but also on account of the greater velocity, and the more direct impulse of the water on it.

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We repeat that the very capital object of the science of Naval Construction is *velocity*, and we are decidedly of opinion that it is attainable in a much higher degree than at present, without compromising other necessary qualities, for which we have the concurrence of facts as far as they go.

The Americans, in the last war, took every possible advantage suggested by views similar to those we have been adverting to, in the construction of their large frigates. They had, it may be said, to create a martial navy, and they had to oppose it against fearful odds; but, free from the prejudices and errors so blindly cherished by their opponents, and which constantly oppose reform by always declaring the present practice to be the best, they did not retread the old path, but began at its last step, and boldly advanced on this principle into all the branches of the art. They built vessels upon the most enlarged dimensions, and of a superior weight of metal, and gave an increased ratio of length to the breadth. The result of such a procedure, justified the confidence of the American naval architects in only *one* maxim, founded upon the *scientific* observation of facts, and may give us a faint idea of what might be effected by a still more enlarged and mathematical

* Foreign nations, and more particularly the Americans, find their advantage in having swift merchant ships, and therefore our assertion is warranted by facts.

analysis. Our frigates were so inferior to theirs in every way, that they brought nothing but disasters upon us, excepting in the action between the Shannon and Chesapeake, and one or two others, where, assured by their previous successes, our gallant opponents threw away the advantages possessed by their ships, by coming to close quarters at once, and deciding the contest hand to hand.—Our ships of the line could never bring these frigates to action, and owing alone to their extraordinary sailing, did they evade and mock a large British fleet. We were finally obliged to build 60-gun frigates after their method, but when it was *too late* for the exigency of the period; and thus it has ever been our fate, for want of science in the constructors of our navy, to follow the steps of our enemies at a humble distance, and to be only then driven out of the old track by a terrible experience of its inefficiency.

Nor have the Americans stopped here :—Mr. Huskisson plainly tells us, that "America is, year after year, augmenting its military marine, by building ships of war of the largest class." According to Capt. Brenton, they have built a first-rate of 245 feet length on the gun deck, and 56 feet broad,* to carry 42-pounders on the lower deck, and 32-pounders on the other decks.

Our small class of 74-gun ships lately converted into frigates, carrying *fifty* 32-pounder guns, we are fearful can only produce disappointment if ever brought against the American frigates, (not by conversion, but by *construction*,) which carry *sixty-two* guns of the small calibre, and are 180 feet long on the gun deck.

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From what has been said, and the actual experiments now pending, it is apparent that the theoretic construction of ships is at a very low ebb in this country; yet a fine opportunity now presents itself. if we choose to avail ourselves of it, for rescuing the nation from this generally acknowledged odium. Let a proper use be made of the corps of Naval Architects we have, somehow or other. at last got. and let their exertions, under a degree of encouragement equal to that bestowed on the old ship-builders *in vain* for so long a period, be directed towards the improvement of their art. If they fail, they cannot claim the excuse of having their endeavors repressed; if they succeed, as no doubt they will, in advancing their profession to something beyond mere carpentry, we shall be enabled to bid adieu to the old and *ruinous* method of blundering, under the reign of which nothing but disappointment can ever be reasonably expected.

We have seen and do still see the immense advantages derived by our country, from the encouragement of those branches of science connected with its manufactures and agriculture; and if we wish to keep our present superiority, we must follow up vigorously this principle in all its universality. To the cavils of ignorance and bigotry against such a mode of proceeding, we would answer. in the words of one of the most enlightened members of the pre-

*These dimensions carry the ratio of the length to breadth above 4 1-2 to 1.

sent administration, "This country cannot stand still, whilst others are advancing in science, in industry, in every thing which contributes to increase the power of empires, and to multiply the means of comfort and enjoyment to civilized man."

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JONES, ON JAPANNING AND VARNISHING....No. 2.

In treating upon this subject, the spirit varnishes will claim our first attention, as they are used for a greater number of purposes, than either of the other species.

It is intended in these papers to preserve, in general, a systematic arrangement, but as it will sometimes happen that a recipe may present itself, or a process become known, after we have passed that point which it would have occupied in a perfect system, we shall not, on this account, refuse a place to any thing which is deemed useful.

On Alcohol.—The various kinds of spirituous liquors, derive their strength, their combustibility, and their intoxicating property, from the presence of one ingredient, which is common to them all, this ingredient is denominated *alcohol*. Proof spirit, whether known under the name of whiskey, gin, rum, or brandy, consists of about equal parts of alcohol, and of water; the peculiar flavor and odour of each being derived from the accidental presence of some portion of the article from which it has been distilled, and from which it may completely, although not easily, be separated by rectification. The liquid usually sold under the name of *spirits of wine*, is in general a highly rectified spirit, intermediate between proof spirit and alcohol; but not sufficiently concentrated for the purpose of making varnish. The name however will not serve as a guide, as the two are frequently used without discrimination, and the purchaser fails in his attempt to dissolve the resins, in sufficient quantity to make varnish, in consequence of the weakness of the liquid employed.

The goodness of the alcohol should first be ascertained, and if it contains any notable quantity of water, it must be rejected, or the water must be separated from it, which may be readily done by a method to be presently described. The most common way of testing the strength of the spirit, is to put a small quantity of gunpowder into a cup, and to pour a small portion of the spirit upon it, so as to moisten it; the spirit is then inflamed, and if when burnt out, it fires the powder, the spirit is accounted good; this however is a very imperfect test, as a weak spirit may fire the powder, if but a small portion is dropped on it, the quantity of water which it contains, not being sufficient to wet the powder throughout, whilst a stronger spirit, if applied in large quantity, may leave a sufficient portion of water to prevent the combustion.

The readiest practical method of determining whether alcohol will answer the purpose, is to fill a large vial with it, and then to drop into it a small lump of potash, or pearlash, which has been heated very hot over the fire, to expel its moisture, and which has not afterwards been suffered to become cold; the vial is then to be well shaken, and if the lump remains dry, or nearly so, the alcohol is good, but if any considerable portion of it is dissolved, it is unfit for use.

Should the alcohol not prove good, it may be rectified, by putting into the bottle in which it is contained, a considerable portion of potash, prepared, and warm as before directed; if there is much water present, the potash ought to be equal in weight to one-third of the alcohol; on shaking the bottle, the water will dissolve the potash, and this solution will fall to the bottom of the vessel, forming two distinct liquids, as separate from each other as oil and water; after this has stood for some time, the alcohol must be carefully poured off, and the same operation may be repeated. The watery solution, and the lumps of potash, may be put into an iron pot, and again dessiccated, when it will answer the same purpose, as well as at first.

The above process, will leave the alcohol of a reddish color, of which it may be deprived by distillation; but this color is of no consequence whatever in the making of ordinary varnishes, as it will not give a sensible tinge, excepting to the lightest kinds. When it is desired to deprive the alcohol of this color, and the means of distilling it are not at hand, it may be accomplished by putting into the spirit a small portion of calcined (or burnt) alum, the acid of which will combine with the potash, which will then fall to the bottom. Should the alcohol still retain any coloring matter, it may be rendered perfectly colorless, by filtration through fresh burnt, pulverized charcoal. The method of doing this, and also a simple apparatus, by which any one may accomplish its distillation, will hereafter be described, for the sake of those who live at distance from large towns, and are unable to purchase it in a state of purity.

There is another mode of trying the strength of alcohol, and that is by its *specific gravity*, or the weight of a certain bulk of it, compared with the same bulk of water; the greater its purity, the less it weighs, and when perfectly pure, its weight is but little more than four-fifths of that of water; suppose, therefore, you have a vial, which, when filled to a mark made on its neck, holds exactly five ounces of water, the same vial, filled with alcohol, to the same mark, ought to contain but a small fraction more than four ounces. The philosopher may require greater precision, but for the practical man the foregoing method is sufficiently correct, and may readily be employed. It is evident, that the size of the bottle is unimportant, provided the weight of the alcohol, which it will contain, is but little above four-fifths of the weight of its contents of water.

On Lac, or Lacca.—Lac is a resinous substance, imported from the East Indies, where it is found on several species of trees; being deposited on the twigs by an insect, the *coccus lacca*. Lac is brought to us in three states, known under the denominations of stick-lac, seed-lac, and shell-lac. The former consists of the resin attached to the twigs, the seed-lac is the substance separated from the wood, the shell-lac is in the form of thin lamina, or plates. Lac in its native state, contains a considerable quantity of coloring matter, of which it is nearly deprived, before it is exported, as it is employed in India, for giving a beautiful red, and some other tints, to cotton, and other goods.

In the application of Lac to the purpose of varnishing, we shall confine our observations to seed-lac, and shell-lac; and as the latter is the kind most extensively employed, we shall consider it first. The books inform us, that shell-lac consists of the seed-lac purified, fused, and run into thin plates. There is, however, sufficient reason to doubt the correctness of this statement, as the shell-lac is much cheaper than the seed-lac, is more fusible, much more easily dissolved in alcohol and forms a softer varnish; it is highly probable, therefore, that shell-lac contains a considerable portion of some cheaper resin, with which the lac is fused, at the time of its formation.

Shell-lac Varnish.—In making spirit varnishes, it will be found that the resin to be dissolved, may be from one-third to one-fourth of the weight of the alcohol employed; a complete solution of a larger quantity cannot be effected; and some of the resins used are much less soluble than this. The best shell-lac, is that which is most transparent, and which has the greatest brilliancy of surface. Its hardness is also a good test; of two portions, that which is least easily scratched with the point of a knife, may be considered as the best. To every pint of alcohol, from three to four ounces of shell-lac may be added; glass bottles are generally employed for containing the mixture, but vessels made of tin are much to be preferred, for very obvious reasons. The shell-lac ought not to be pulverized, but may be put into the spirits, in pieces as large as the vessel will admit. In warm weather it is not necessary to place it near a fire, as it will, if frequently shaken, dissolve in the course of a day. Frequent shaking is of importance in making this, and many other varnishes, as the resin will otherwise agglutinate into one mass, and will be afterwards dissolved with difficulty. In cold weather the bottle may be placed near a fire, so as to keep it slightly warm; if much heated, there will be a considerable loss of alcohol, by evaporation; there should be a small notch cut the whole length of the cork, to allow the escape of vapor, when placed near the fire, otherwise the cork may be blown out, and if too close to the fire, combustion may be produced. Those who make spirit varnish in the large way, use a barrel churn, into which the materials are put, and they are agitated until the whole of the resin is dissolved. This is an excellent mode, as there is no loss from evaporation, and the resin is prevented from agglutinating. Shell-lac varnish is never perfectly clear, as the resin contains some matters not soluble in alcohol; when the lac is dissolved without heat, the greater part of this remains at the bottom, but if made pretty warm, it is diffused in clouds through the whole mass, nor can it be separated by filtration; this, however, does not interfere with the goodness of the varnish, and may, probably, add to its toughness. Should the solution prove too thick, more alcohol may be added; this is best done in small quantities, as the varnish is used. Where hardness is not a point of importance, a small lump of common rosin is added to the shell-lac, as this substance increases the brilliancy of most of the varnishes; it ought, however, to be used with a sparing hand, as it renders every species brittle.

Shell-lac is of a yellowish brown color, and will not, therefore, answer for those articles which would be injured by this tint; it is otherwise the best of the common spirit varnishes, whilst it at the same time, is the cheapest. It answers well upon mahogany, and upon most colored articles; but when used upon those which are black, it must be made of that color, in a way to be hereafter described, or it will give an evident shade of brown.

When wood, or other porous materials, are to be varnished, they ought to be coated with some substance which will cause it to *bear out;* the pores may thus be completely filled, and much time and varnish saved. For mahogany, and some other woods, boiled linseed oil may be used, particularly if it is desirable to heighten the color. Thin size, made from common glue, that from isinglass, the glare of eggs, gum-water, or gum tragacanth, are occasionally employed; the object in view, being to prevent the absorption of the varnish by a coating of some substance not soluble in alcohol. When linseed oil is used, it ought to be rubbed on sparingly, then wiped carefully off, and a day or two should be allowed for it to harden, before the varnish is put on.

For ordinary work, the varnishing brush may be a *sash-tool* of a suitable size, as the varnish, if not too thick, will flow and spread itself evenly, although the hairs of the brush may not be fine.—When the varnish is used thin, and the articles to be varnished are of the finer kind, or the surface great, the flat, camel's hair brushes, are to be preferred. In general, three or four coats will be found necessary, and when wood is very porous, or the varnish is to be rubbed down, and polished, double the number may be required. In dry weather, the spirit evaporates so rapidly, that the coats may follow each other, at an interval of a few minutes only; but great care should be taken that the last be perfectly dry, before another is laid on. It frequently happens, that the varnish assumes an opaque white appearance, as it is laid on, losing all its brilliancy. This is occasioned by the moisture in the atmosphere, and indicates that a close room, and a fire, are necessary; and without these it will be useless to persevere. The transparency will, however, be restored by the next coat of varnish, if laid on in a place that is warm and dry. This frequently occurs, when, judging by appearance, we should think the day most suitable for varnishing.

It will be perceived, that many of the preceding remarks apply to spirit varnishes, in general, as they all possess certain properties in common, and require, therefore, a similar mode of treatment. The mode of polishing, and some other particulars, which will be treated in the next number, will partake of the same character, and will not need to be treated, when other varnishes are considered.

The following is Dr. HARE's method of bleaching Shell-lac:

It has been a great desideratum among artists, to render shell-lac colorless, as, with the exception of its dark brown hue, it possesses all the properties essential to a good spirit varnish, in a higher degree than either of the other resins. A premium of a gold medal, or thirty guineas, "For a varnish made from shell, or seed-lac, equally hard, and as fit for use in the arts, as that at present prepared from the above substances, but deprived of its coloring matter," has long been, and is still offered, by the Society, in London, for the encouragement of Arts, Manufactures, and Commerce. These ends are perfectly attained, by the process given by Dr. Hare, which leaves nothing to desire, excepting on the score of economy. Were the oxymuriate of potash, to be manufactured in the large way, the two processes, that of making the salt, and of bleaching the resin, might be very advantageously combined.

Method of bleaching Shell, or Seed-lac. By R. HARE, M. D.

Dissolve, in an iron kettle, one part of pearlash, in about eight parts of water, add one part of shell, or seed-lac, and heat the whole to ebullition. When the lac is dissolved, cool the solution, and impregnate it with chlorine, till the lac is all precipitated.

The precipitate is white, but its color deepens by washing and consolidation; dissolved in alcohol, lac, bleached by the process above-mentioned, yields a varnish, which is as free from color, as any copal varnish. R. H.

Chlorine, or oxymuriatic acid, may be formed, by mixing, intimately, eight parts of common salt, and three of the black oxide of manganese, in powder. This mixture is to be put into a retort; four parts of sulphuric acid, diluted with an equal weight of water, and afterwards allowed to cool, is to be poured upon the salt and manganese, when the gas will immediately be liberated, and the operation must be quickened, by a moderate heat. If the mixture be made, without the sulphuric acid, and this be added, in small portions, the heat generated by this means, will be sufficient to disengage the gas, without the aid of a lamp. A tube leading from the mouth of the retort, must be passed into the resinous solution, when the gas will be absorbed, and the lac precipitated.

For the Farmers' and Mechanics' Journal.

MR. EDITOR,

Sir,—In answer to "A Joiner," in your first number, I will state an experiment which I made one year since. I had about eighty Pannels, which were as green as they were when sawed from the log. I put them into a large kettle, and boiled them about two hours, and then stuck them over a fire in the shop where they were a good deal exposed to heat for some time. I did not use the pannels so soon as I expected to, but, I think it would have answered to use them in three or four weeks. It is my opinion that pannels boiled three hours and then exposed to the wind, may be used with safety, in ten or fifteen days.

Another advantage in boiling is, it takes out the gum or pitch and prevents the pannel from checking at the ends; and puts them in better order for painting, than when they are seasoned the usual way. It also changes the color of the sapwood, and brings it nearer to that of the heart wood. A Brother Chip.

Gardiner, Feb. 27, 1828.

AGRICULTURE.

HORSES.

We were preparing an article upon the varieties of this useful animal, (the Horse,) which now exist in the different parts of the world,—when the following from the *New-England Farmer*, came to hand. The writer seems to understand his topic, and we shall publish what he says, in preference to our own remarks. The Horse is a favorite animal with us, and we shall often introduce him to the notice of our readers, with the hope of turning attention to breeding, not only more, but better Horses, than are bred at the present day.

The northern parts of New-England are well calculated for grazing; and there is, perhaps, no stock, which remunerates the farmer better, for the trouble attendant upon the first three or four years of their lives. It certainly is not much more trouble to raise a horse, than it is a yoke of oxen. He will not eat so much in the same time, and if he be what a horse ought, he will frequently sell for double the price that the oxen will.

Vermont has heretofore been celebrated for her horses, but we have not heard so much respecting them of late years, as formerly. The same remark will apply to New-Hampshire. Old Massachusetts has roused up and furnished herself with genuine Sires from the purest blood of England. We refer to the Cleveland Bay—Sir Isaac, to Col. Jaques' Norfolk Trotter, Bellfounder and Mr. Williams' celebrated Roman.* These will soon turn the tables upon the other States, unless corresponding exertion is made, to keep up in the march. Connecticut can claim her share of credit, and Maine can——well afford room for a better breed. Not that we would indiscriminately condemn all the horses in the State.

* To these may be added the Dray Horse, Columbus.

There is many a generous steed to be found in Maine, which would furnish good material to improve upon. On the other hand, there are too many worthless *dobbins* among us, whose carcases ought to be *enriching* instead of *cumbering* the soil. Their number, we believe, is increasing, instead of diminishing. This arises, undoubtedly, from too little care in selecting the best stock to breed from. We doubt if there can be found a first-rate full blood or thorough-bred horse in the State. By thorough-bred, we mean, one that has descended from Sires and Dams of pure English blood; whose pedigree can be traced for many generations back, through Sires, &c.; whose excellence has been tested by the severest trials, and whose performances stand on record, for all to examine. We do not wish our farmers to breed race horses particularly. But we do wish them to adopt some system, in the thing;—to raise animals which shall have some fixed and definite character.

How is it that the Arabians have preserved for so many ages, the beauty, symmetry, speed and other excellencies of their Horses? By the most cautious and systematic mode of breeding. By continually selecting the best for the purpose. "The care taken by the Arabs,"--says Loudon,--"is most remarkable. None, but stallions of the finest form, and purest blood, are allowed access to their mares, which is never permitted but in presence of a professional witness or public officer, who attests the fact, records the name, and signs the pedigree of each."

How have the English established the fame of their different breeds of Horses? By first selecting such as would be suitable for the purposes which they desire, and then, keeping up their character by judicious crossings, with such as would improve, rather than degenerate.

In this way, Virginia has preserved the purity of the blood of her turf-horse, and rivalled old England herself in speed. Had the farmers of Maine taken more pains in selection, and avoided the injurious practice of breeding *in and in*, as it is termed, or putting those of the same family and nearest kin together, we should see a much more elegant and spirited breed of this noble animal than what we now do. There are a vast many colts raised in the State, but we know of but very few farmers who pursue what has been considered by those of other States, and countries, to be the most judicious method. There are a few who do; and they will eventually reap the reward of their care and labor, by the superior price which their stock will command.--We shall pursue this subject hereafter. It is a subject of much importance to the Agriculturist, and we hope to excite more of the right kind of attention to it than we imagine has yet been paid to it.

Nature originally formed to herself, there is reason to suppose two separate models of horse-flesh; though the different breeds of horses derived from accidental varieties and mixtures may be infinite. One she meant for daily drudgery in a northern climate; the other for speed, for violent occasional exertion, to gratify the pride and form one of the relaxations of luxury, and to live in the tropics. The two horses are still to be found distinct; but most horse-flesh is made up of their mixture.

The first is indigenous in the North of Europe. The basis of his color is almost invariably black; though in some few of his varieties, he is either roan, or gray with most of his dark hairs red. He is seen in Massachusetts perfectly pure in the Canadian; who has his fringe of hair starting directly from the knee; his shortness of breath; his willingness to draw; his sensibility to heat; and all the other attributes of the unadulterated cart-horse. The gray horse, sent here by Gen. Coffin, is a specimen of his English variety; but not of the largest size. The true Canadian is a valuable horse, has a foot endowed with very little sensibility, is very much inclined to carry flesh, and exceedingly well suited to a changeable climate; but he is unfit for fast work; and I question the fact from what I have seen, of his outworking the common Massachusetts horse at slow.

A remarkable degree of misinformation exists here as to the second; and, it may be well to give a very short description of him: In the countries where he has always been found, at least since the first dawn of history, he is about fourteen hands and an inch high, but pretty compact; the basis of his color scarcely ever black; but generally even if he is gray, some kind of red. He has a remarkably expressive eye, and very transparent; his nose nearly straight, and the nostril disengaged from the head; a most capacious chest; a wide and elevated loin; carries the dock of his tail pointed straight to the end when he is in action; and has a round, high, and hard hoof. His purity has always been most sedulously preserved by the Asiatic Arabs. His bones are of a much denser texture than that of the cart horse; his skeleton is heavier in proportion to his apparent size; and he can stand under a heavier weight. His most distinguishing characteristic, however, is the natural clearness of his wind; and breeds of horses vary in this particular, according to the proportion they possess of his blood: or, as it is technically called, of "blood." This with his muscular power, arises from the perfection of his organization; and he is often abused from the idea that he possesses a peculiar insensibility to fatigue, which none can thoroughly explain. His essence is speed. He is more inclined to save himself by flight from any thing he does not thoroughly understand; and is more irritable and variable in constitution. As he is probably indigenous in the sands of Arabia only, there appears no reason why his foot should have been made able to endure the concussion of a hard surface; and in some of his varieties, though the horn of it is generally excessively hard, the internal foot possesses extreme sensibility. He does not appear, under favorable circumstances, upon being transported to the climate of the cart-horse, to experience any diminution of his superiority to him, through any number of generations; though he is useless as he approaches that of the Arabian.

His most valuable variety, and that with which we are best acquainted, is the English thorough-bred horse; by which term is intended a horse, all of whose blood is to be traced to acknowledged racers, or to a very few celebrated individual horses, supposed to have been chiefly of Arabian blood, whose stock has in general proved so in England. Some of the pedigrees of this Anglo-Arabian have been regularly kept from the reign of James I.; but a very large part of him is derived from two individuals; one carried there about ninety years since, whose previous history is utterly unknown; the other, about one hundred and thirty years since, who was brought from the Desert of Palmyra. The blood of these two horses runs in the veins of the multitude of thorough-bred horses annually foaled in England, on the Continent, and in the United States; and, excepting the genuine cart-horse, there is scarcely a horse in England or the States entirely free from it.

The peculiar advantages and disadvantages of the thorough-bred horse, who is most corruptly called in Virginia, the *blooded horse*, for blood horse, are exceedingly necessary to be known to every breeder; as, though he is not so well adapted himself to any purpose but horse-racing, as a horse bred between him and one not thorough-bred, he is proved by the experience of a century in England, to be the only foundation of any reasonable expectation of breeding superior horse-flesh; allowed to be, and sought after from that cause by the Russians, the Germans and the French, who are all becoming great horse-breeders, and in most parts of the States, excepting in New-England. As a proof of this last fact, I can mention, that Henry earned between two and three thousand dollars to his owners, in the vicinity of the city of New-York, the last summer, as a breeder; and that he will probably this summer, earn much more.

He (the thorough-bred horse) is subject to infinite variety; but he is generally accompanied by the following peculiarities: In wind, in muscular power, and particularly in being able to perform feats, he far surpasses any other horse; even the Arabian in his unimproved state. A case in point has occurred in which two Cossack horses, picked from their immense studs, were beaten in a 30 mile race, over a hard road near St. Petersburg, by a broken down English race-horse, and he also beats the best horses that can be bought in Arabia, in their own climate at Calcutta. All his work is performed in much less time, when the pace appears to the eye to be the same; he can be used at an early age—he possesses greater longevity—he suffers less from the heat, than a low-bred horse, but there his advantages close. His ancestor was formed merely for galloping—leaving all meaner business to the donkey and the mule; which, in his ancestor's climate, are noble animals—and from this cause, as well as from the peculiar manner in which he has himself been bred and treated, he is attended by two great disadvantages. He has, in the first place, been bred from a succession of horses selected for their superior galloping from a race of gallopers.

Excellence in this pace, which is, however, nearly an accurate criterion of wind and muscular strength, is generally accompanied by a formation of the animal, inimical to excellence in any other; and a remarkable disinclination for exerting himself on any other than extraordinary occasions. To assist him in economising his powers, and to render them entirely subservient to the rapidity of his progression, he is formed, frequently, to move his feet so short a distance above the earth, that, particularly in a slow walk, he is continually liable to have it meet with some obstruction, when it is bent backwards from the fetlock joint, and he is about to throw his weight upon it; the muscles of the bended limb not being under his command, he must occasionally lose his balance; and if it is his fore foot, fall forwards; and, if it is his hind foot, catch backwards; and, in confirmation of the last observation, many superior gallopers appear actually unable to use their muscles properly, when not in a state of violent exertion; have a slipping, thoughtless manner of going at all other times; and will not brace their muscles. In the second place, he has been in general confined in the stable, and shod previously to his being two years old; which gives to his hoof a totally different shape, in growing, by preventing its lateral extension; takes away much of the means of resisting concussion which nature intended it to have, by preventing the expansion of the back part of it, when his weight is thrown upon it; and crowds the circulation of the sensible foot, by preventing the increase of size of the vascular parts after the excessive concussion to which the horse is daily subjected from that early age. Being also fed with the largest allowance of corn from before he is weaned, and the hoof deprived, through most of his life, of the dampness of the earth, his foot is exposed to all the evils, increased by happening together, arising from a plethoric habit, from contraction of the horn, and from mechanical violence; and, an Arabian foot not being originally intended to meet with very severe concussion, a degree of pre-disposition to disease in the foot is propagated to each generation, particularly to caries of the bones;—which (as the human teeth) are remarkably ready to discover an hereditary mis-organization. The thorough-bred horse has been long naturalized in the States; forms, at least, half of the Massachusetts mongrel, and is found as common, and in as high perfection as in England, in the low country of Virginia.

But the best horse, of any fixed breed, not thorough-bred, is the English Cleveland Bay;—of which the horse and mare sent here by Sir Isaac Coffin, were intended as a sample. The true Cleveland Bay, who is probably a lineal descendant of the horse used for tournaments in the Middle Ages, is extremely scarce in England, and confined to the county of York. Though a much finer horse, and not over large, he bears a general resemblance to the German horse of the Middle States; particularly, in his full crest, his Roman nose, and his deep bay color. He is in the very highest request, both in England and on the Continent; and stands at the head of all breeds between the blood horse and the cart-horse. He has formed no part of the Massachusetts horse; but there is still remaining in England, some remnant of a very celebrated draught horse. who unquestionably has; many of our ancestors having come from his country, and his peculiarities are often to be traced in our horse. He was supposed to have been carried from Norway, and was called the Suffolk Sorrel. He forms part of the modern trotting-horse of the bordering counties of Norfolk and Lincoln, of whom that most excellent horse Bellfounder is a genuine specimen.

The most valuable horse in himself, however, but who forms no breed, bred by the English, is their gentleman's hunter. He is often supposed here to be the offspring of a direct cross between the blood-horse and the cart-horse. This has, in some instances, been the case; but he is usually, now, either the thorough-bred horse himself, or got by him out of a well-bred mare; and it would be difficult to find one, of whom less than 3 parts in 4 could not be claimed by the Arabian. Some horses, not thorough-bred, or as they are called in England, cock-tails, are kept expressly as hunting stallions, but this is not common; the thorough-bred horse having the advantage of affording the greatest room for selection, and of having the peculiarities of his family so well known, as to give some grounds for a calculation concerning the fate of his stock. However, as he is sometimes kept entire, and as a tried good hunter must have shown himself able to perform the severest labor of which a horse is capable, and to possess, both, legs and constitution. I rather wonder none has ever been imported to this country as a stallion.—In my next, I will make some observations upon the Breeding of Horses.

PEACH TREES.

The following is from the pen of an able and successful Horticulturist on Long Island, N. York. Any thing, which will enable us to ward off the many evils to which this fine fruit is liable, must be valuable. It has been a common opinion here, that Peaches could not be raised in this State. The same opinion formerly prevailed respecting the Apple, but experience has proved its fallacy. From what we saw last summer, we are convinced, that peach trees can be made to flourish and bear well in this country. That their flavor will be so rich, and luscious, as those of more southern latitudes is not pretended. The Hon. B. VAUGHAN, of Hallowell, had several bushels ripen in his garden, the summer past--and we also saw a load, which were said to have been grown in the town of Jay, nearly fifty miles more northerly. The worst evil which we have to contend with, is the effect of frosts, early in the spring. Soon as the weather begins to grow warm and the snow thaws from around the roots, the sap starts,--during the night, it freezes and kills the branches. The best preventive of this, is, to keep the snow as long as possible about the roots and body of the tree.

Diseases to which Peach Trees are subject. By A. PARMENTIER, *Proprietor of the Horticultural Botanic Garden, Brooklyn, L. I. New-York.*

In this country the Peach Tree is attacked principally by worms that feed upon the roots, near the surface of the ground. Few remedies have been employed with success. It appears, however, as I have been informed by a farmer of New-Jersey, that the application of fish placed about the foot of the tree, drives away the worms. Last year I removed many worms from a peach tree to make the wounds which they had made to appear. I employed with great success, bruised sorrel applied as a plaster, tied upon the wounds. I have used bruised sorrel in Europe with equal success upon gummed parts of the plum tree and apricot. It was this use of it which first gave me the idea of applying it to the peach tree.

It is very advantageous to make in the summer, small heaps of earth about five or six inches high, around the foot of the trees. The insect goes upon them and deposits its eggs a little way under the ground in the tree. In the fall, on removing the earth, the eggs are left uncovered and perish by the frost.

After the worms, the yellows is the malady which causes the premature death of peach trees. I believe that the cause depends in a great measure, on a defect in setting out the trees; and it is this upon which I found my reasoning. I have observed in this country, that, for the most part in setting out trees, the earth is very rarely dug up more than two spades deep. The tree is put in, the roots are covered, and it is abandoned. If the tree is vigorous, the roots soon extend in the loose soil, until they reach the hard and impenetrable earth. On vegetating in the spring, the roots are forced towards the surface of the ground, where they become victims of insects. Finally, the tree deteriorates in its nature, and a premature death follows.

A hole of three feet deep and four broad, is not too large. Sods of about three inches in thickness, cut fine with the spade, should be put in the hole to the depth of two feet, and covered with about one inch of good earth. Then put in the tree and cover the roots with loose mellow earth or vegetable mould. Precaution should be taken against the sinking of the earth, which ought to be calculated at one inch for one foot. If the tree is planted too deep, it will vegetate poorly, and must perish at length, without producing but poor fruit. I shall never sell peach trees without giving these directions to those persons who have confidence in me.

As to the cloque, it is produced by the interruption of the sap in the cold nights of spring. It often appears that but one part of the plantation is attacked, and only those trees which are in a current of air. This disease is not very dangerous. It more frequently kills the fruit; and it is prudent to take them off, because the tree, suffering by the loss of a great part of the leaves, is under the necessity to recruit its strength. I have employed with success, the remedy which I make use of to kill the ants and other small insects, that take the substance from the leaves of the trees. If the trees are thus taken care of, they will be thrifty the following year.

[*N. Y. Farmer.*

FOOT ROT IN SHEEP.

This is a disease affecting (as its name denotes) the feet of Sheep. It appears to be endemical or affecting all, or nearly the whole of the flock at once. It consists in an extensive ulceration of the foot, beginning generally, between the claws of the hoof and extending into the sensible laminæ; which becoming carious—discharges an acrid and highly fœtid matter. Fungus flesh also appears in the latter stages of the disease. Various causes have been assigned for it, but none that are altogether satisfactory. By some, it is thought to be caused, or brought on, by feeding in low and damp situations. The animal pines away and seems to die of debility, but never loses its appetite. It will often continue to scramble upon its knees for food to the last.

This formidable disease was comparatively little known in this country before the introduction of the Saxony Sheep, and its ravages have since been principally confined to them. Various remedies have been proposed for it, and we have been politely favored with one, which seems to be as efficacious as any. It has appeared before in the *New-England Farmer,* and we are happy in being able to bring forward so respectable testimony in regard to its utility.

For the Farmers' and Mechanics' Journal.

Mr. Editor,

Sir,—I enclose you a Recipe for making a wash for the cure of the Foot Rot in Sheep. I have made use of it in the flock of Sheep that I have, which have been very much diseased with that complaint, and am strongly impressed with the belief that I shall effect a radical cure—after having tried almost every thing else but to little effect. If you should think it worth communicating to the public in your useful Journal, you are requested so to do. From your humble servant, RUFUS GAY.

Pittston, Feb. 6, 1828.

FOOT ROT IN SHEEP.

In the Report of the Merino flock of the Earl of Lismore, by the Rev. Thomas Radcliff, it is remarked, that the flock is almost wholly free from lameness, and that this is principally owing to *frequently paring the hoofs.* The drying wash used by the Shepherds, when needful, is thus composed: "Take blue vitriol, white vitriol, rock or roche alum, and verdigris, of each three ounces; rub them together in a mortar, and add one quart of scalding vinegar; stir it well and cover it down to cool; then add half a pint of spirits of turpentine and half a pint of spirits of wine or new rum, and cork it up in a clear stone bottle. It is a good wash for pinches and recent bruises and all incipient inflammations."

[*New Monthly Magazine, for* 1820.

NOTE. As the disease is chiefly under the hoof, it is of the first consequence to cut that away so as to expose the ulcers; and when washed clean, the liquid preparation should be applied. The feet of the sheep should be often examined, and the knife and liquid freely applied, until the disease is eradicated.

P. S. Sheep that are very lame should be kept by themselves in a dry place in the barn or shed, and well dressed every day for four or five days,—the others should be carefully dressed every second or third day until they are well,—paring away the hoofs as high as the feet are affected is absolutely necessary. In cases where the hoof is nearly or quite all cut off, they should be covered with strong rags, or boots made of strong cloth or tarred sheepskins, to tie above the hoof.

2d P S. The litter where the Sheep stand to feed at the rack, should be removed every second or third day, as it becomes impregnated with the infectious matter and impedes the cure of those that are lame, and communicates the distemper to others.

H. D.

The above precaution I received from Mr. JERVIS, of Vermont, who has had much experience in Sheep, and has a flock of Saxony Sheep purchased at the time I purchased mine. His remedy for the hoof distemper is, paring the hoof and washing in soap suds and then blue vitriol dissolved in spirits of turpentine and rum.

N. B. After all, the cutting away of the hoofs so as to lay the whole of the infected parts open to the dressing, is most essential.

MISCELLANEOUS.

NEW PROCESS FOR MAKING STEEL.

BY CHARLES MACKINTOSH, ESQ. GLASGOW.

There are few individuals of the present age who have done so much for the advancement of the useful arts, and for the promotion of the manufactures of his country, as the eminent individual whose new process we are about to describe. In the patent by which he has secured the privilege of this invention, he claims, as the principle of his process, the impregnation of iron at a high temperature with carbon in a gaseous form. The gas which he employs as the most economical and convenient for this purpose is, that evolved from coal under distillation. The iron is enclosed in a crucible, or melting pot, of the usual materials, and placed in the furnace, and when it is raised to a very high degree of temperature, a jet, or current of the gas, is thrown into the crucible through a suitable aperture and tube provided for this purpose. In the cover of the crucible, there is made another aperture to permit the escape of that part of the gas which is not absorbed by the iron.

[*Edinburgh Journal of Science.*

METHOD OF IMPROVING SOAP.

BY MR. WILLIAM POPE.

This process, for which a patent has been obtained, is as follows: A hundred weight of good soap is sliced into thin pieces, and mixed with seven pounds of marl of the purest kind, two ounces of potash, and a sufficient quantity of water to reduce the whole into a fluid state. The soap being thoroughly dissolved, the materials are stirred together, and when of the consistency of cream they are boiled, and then poured out into suitable moulds for making it into cakes. This process greatly improves the soap, by destroying the effects of the caustic alkali upon the skin, and it also renders it soft and smooth. [*Newton's Journal of the Arts.*

ON A FRENCH LUTING USED IN PROPAGATING FRUIT TREES, BY GRAFTING THEM.

The best luting wherewithal to cover the newly grafted scions, is composed of equal quantities of train oil and rosin, prepared in the following manner:—First, melt the rosin in an earthern vessel, and then pour in the oil; mix them well; to be applied when cold, with a painter's brush. The composition is used in the north-west part of France (Bretagne) with general success. It has this advantage, that it never cracks, nor admits rain or wind to the grafts, which is the usual cause of their failing. It is more expeditiously put on than the common clay covering, and looks much neater; but what renders it more useful is, that the grafts covered with the composition seldom fail. Scions laid under earth, or steeped in water for a few days, grow better than those taken fresh from the parent tree. [*New Monthly Magazine.*

PERCUSSION POWDER.

A powder inflammable by percussion has been used for some years past, especially in fowling-pieces. The following formulæ have been given for the preparation of this powder, the principal ingredient of which is chlorate of potash.

1.) 100 parts of chlorate of potash, (fulminating salt,) 12 parts of sulphur, and 10 parts of charcoal, are closely mixed. The grains are produced by forcing the soft paste through a sieve.

2.) 100 parts of chlorate of potash, 42 parts of saltpetre, 36 parts of sulphur, and 14 parts of lycopodium.

[*Schweigger's Journal, Band* xi. p. 66.

RAT CATCHING.

For premises infested with Rats, prepare from six to ten wooden traps, such as are commonly used for taking muskrats and rabbits in the country, place them where the rats run most frequently. Get a phial of oil of caraway, do. of oil of anniseed, and a very small quantity of the oil of rhodium—the latter is costly, and but little of it needed. Perfume the sides and top of the boxes with the caraway and anniseed, and with the end of your finger touched to the rhodium make a few dots on the bottom. Take stale bread and grate it, mix it up with some drops of the caraway, evenly, and place a single handful of it on the middle of the lower box-board, under the place where the pan or trap-platform is to be set—keep the boxes thus baited, fastened open for two nights—the two succeeding nights set the traps so they will not spring, and put the like baits on the pans. On the fifth night set the traps thus baited, *prepared for springing*. Sit with a dark lantern in the room or place where your traps are, and as soon as you hear a lid fall, take up the trap, cover its mouth with a bag, and empty the rat or rats into it—kill them by dashing the bag against a post or the floor; re-set the trap and continue until the "custom" ceases—Be careful not to suffer a rat that has been caught, to escape; if you do, you will get no more that night. By this process 300 rats were caught in London, in one house, and in one night, by two persons, during the revolutionary war. This is the old secret of the London and Liverpool rat-catchers, and is published for the benefit of those who prefer a little trouble, to a great annoyance.

[*Am. Farmer.*

QUERY.

Mr. Editor,—I have frequently heard, that a dye, similar to that used in dyeing English Flannel, yellow, may be obtained from onion skins. If any of your readers will send you the mode of preparing the dye from the onions and how it should be used, they will much oblige

A Housekeeper.

NOTICES.

NEW EDITION OF CLEAVELAND'S MINERALOGY.

Prof. Cleaveland, of Bowdoin College, is preparing a third edition of his valuable work on Mineralogy and Geology. This indicates a steady progress in the interesting science of which the book treats. The mineral riches of a country are of vast importance to its prosperity. To be of the greatest use, however, they must be thoroughly known; this can be effected but by a strict attention to the science which describes them, and a proper consideration of the particular items which serve to make up the whole. Prof. C. is desirous of obtaining all the localities not described in his last edition. A letter from him, says—

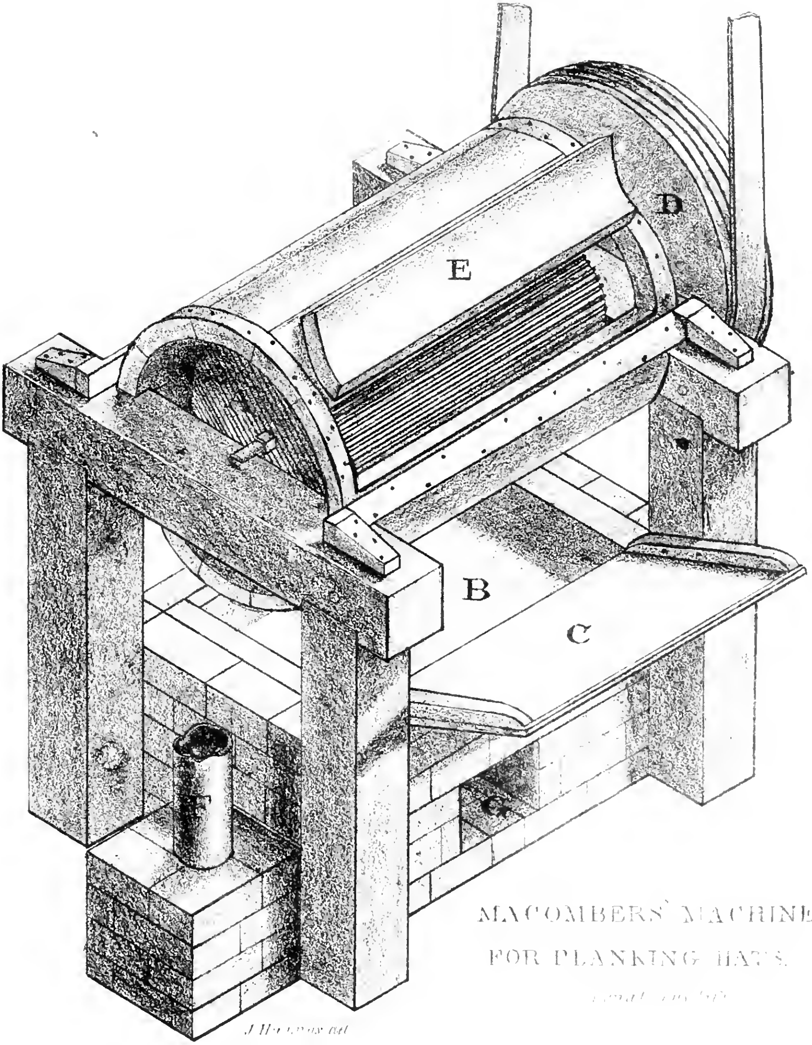
"I wish to connect with the account of the Locality some brief Geological notice, viz: whether the mineral occurs in veins, or in beds, or is disseminated—the associated minerals—and the *rock*, which contains them. In most cases, the form, structure, and prevailing color of the mineral may be mentioned.

"I also wish to obtain as accurate information, as possible, in regard to all minerals explored for *useful* or *ornamental* purposes, such as Nitre, Common Salt, Marble. Marl, Gypsum, Precious Stone s, Steatite, Roof Slate, Clays, Pigments, Anthracite, Graphite, Coal, Ores of the metals, Porphyry, &c., and also certain articles manufactured from minerals, such as Alum, Copperas. Chromate of Lead, &c. The *quantity* of the aforementioned substances *annually* obtained or manufactured, the *quality*, including the per cent. of metal yielded by ores, and the *price* are particularly requested.

"I am desirous, that the localities should be so described, that they may be found without difficulty. In addition to the name of the town, a few words, referring the locality to some point or object, *well known in that vicinity*, will be sufficient."

NEW WORK ON HORTICULTURE, AGRICULTURE, &c.

It gives us pleasure to understand, that a new work on Gardening, Agriculture, &c., is nearly ready for the press, by T. G. Fessenden, Esq., the able editor of the *New-England Farmer*. Mr. Fessenden has abundance of materials for such a work, and he receives the assistance and advice of some of the most able Horticulturists of the age. It will, no doubt, be an interesting and valuable manual, not only to the practical gardener, but to all, who have the least taste for those useful, delightful, and sinless employments.



MACOMBERS' MACHINE
FOR PLANKING HATS.

THE

NEW-ENGLAND

FARMERS' AND MECHANICS' JOURNAL.

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MECHANICS.

MACOMBER'S HAT PLANKING MACHINE.

WE have often thought, that the common method of planking Hats was a tedious and laborious operation. It is with pleasure, therefore, that we insert a drawing and description of a machine, invented by Mr. L. L. MACOMBER, of this town; whereby the hatter is enabled to perform this business, not only with more ease and despatch, but also, to make better felt than by the ordinary method.

It consists (PLATE III.) of a fluted cylinder, A, which is moved by a crank, or band-pulley, D, and which turns within a hollow cylinder somewhat larger, in order to give room for the felt to roll round between them. The exterior cylinder has an opening in the side, as shown at E, for putting in the hats, or felt, and taking them out. This cylinder is hung on a frame over a kettle, B, such as is commonly used by hatters. F, C, represents the inclined plane; G, the place for the fire which heats the water; the smoke of which passes off by means of a flue or funnel.

The following Certificates of Hat Manufacturers in the City of Boston and vicinity, will show the superior quality of Macomber's Patent Machine Hat Bodies.

We, the undersigned, having seen in operation Macomber's Machine for Planking Wool Hat Bodies, are of opinion, that the bodies are closed better, are smoother, will hold their stiffening, and finish better than those planked in the usual manner.

JESSE BROWN, *Pres't. Boston Hat Manf.*
ELISHA VOSE, *Treas. Boston Hat Manf.*
SAMUEL BARRY, *Watertown.*
C. L. EMERSON, *Newburyport.*
JAMES KENT, *West Springfield.*
MARTIN BATES, *Boston.*
GEORGE BASS, *do.*

We, the undersigned, having examined the Hat Bodies made by the above Machine, are of opinion, that they are better made than those manufactured in the common way.

BRADFORD LINCOLN, *Director of Boston Hat Manf.*
JOHN LONGLEY,
HENRY CLARK, *Finishing Agent of Boston Hat Manf.*

We, the undersigned, having made use of Macomber's Machine for Planking Wool Hat Bodies, do hereby certify, that the bodies so planked, are smoother, and closed better than they can be in the usual manner. The laborious part of the work is done by the Machine.

HIRAM MORTON, *Foreman of R. Bacon's Hat Factory, Medford.*
JOHN WHITE, *Methuen.*
HIRAM MERRILL, *Salem, N. H.*

JONES, ON JAPANNING AND VARNISHING....No. 3.

To rub down, or prepare the varnished surface, for polishing.

For ordinary purposes, shell-lac varnish does not require to be rubbed down and polished, but where it is wished to have the surface very even, these processes are necessary. For rubbing down, pumice-stone, in fine powder, is used. Four or five coats of varnish, at least, must be laid on, and allowed to become perfectly hard; a piece of woollen rag may then be made wet, and a portion of the powder put upon it; this is to be rubbed carefully, and equally over every part of the varnished surface, until it appears perfectly even. Great care is requisite to avoid rubbing through at some parts, before others are rendered smooth, particularly if there are sharp edges, or projecting mouldings. When this takes place, the whole process of varnishing must be repeated; a little practice, however, will enable any one to avoid this, provided the article varnished, has an even surface, and the number of coats have been sufficient to give the requisite thickness of resin. When the surface, to be polished, is flat, the cloth may, when used, be wrapped round a piece of cork or wood; and the same method may be adopted in rubbing down mouldings.

To polish the varnish.

When the surface is well prepared by the pumice-stone, it is very easily polished. This is effected by fine rotten-stone, used exactly in the same way with the pumice-stone, excepting that sweet oil is employed, instead of water. The oil may be removed from the surface by a fine rag, and some dry rotten-stone; and if a little is then rubbed on by the palm of the hand, this will give the highest possible polish to the surface.

To prepare the rotten-stone.

Rotten-stone is sometimes harsh and gritty; the best way of trying it, is to take a little between the teeth, when the least portion of grit may be discovered. Careful workmen always wash it before they venture to use it. This is effected by stirring the fine powder in a considerable quantity of water, then allowing it to remain at rest for a few seconds, and pouring the water into a glazed earthern vessel; the powder which then precipitates, will be perfectly fine and smooth; by washing the remainder, the whole of the finer parts may be separated from the grit.

The gloss upon shell-lac which has been polished, is less brilliant than that of the unpolished varnish; but this gloss may be given by a single coat of *seed-lac* varnish, which will abstract but little from the perfect surface given by polishing.

Black shell-lac varnish.

Shell-lac varnish may be rendered black, by mixing with it, either ivory, or lamp-black. The editor has frequently used, and always preferred, the latter. It should not be used as sold in the shops, being then greasy, as the workmen call it, and will neither mix or dry, well. Sometimes the lamp-black contains particles of plaster, from the walls of the chambers in which it is made; this, of course, should be rejected.

To prepare lamp-black for use.

Press a portion of it, into any earthern or metallic vessel, which may be made red hot in the fire; for small quantities, a tobacco pipe, a piece of a gun barrel, or any other metallic tube, will answer the purpose perfectly well. It is not necessary to close the vessel, but the powder should be well rammed in; place the whole in an open fire until it is red hot throughout; this may be known by the lamp-black ceasing to flame at the exposed parts; take it from the fire, and allow it to become quite cool before you remove it from the vessel, otherwise it will burn into ashes. Lamp-black, thus prepared, will mix readily with water, will dry well in paint or varnish, and will be improved in color.

To mix the color with the varnish.

Rub the lamp-black up with a little alcohol, spirits of turpentine, or weak varnish, taking care to make it perfectly smooth before putting it into the cup with the varnish. To give a good black color, the quantity of lamp-black must be considerable; this, it is true, will lessen the brilliancy of the varnish in some degree, but a thin coat of seed-lac, will diminish this fault. When only a small quantity of black varnish is wanted, it may be made by dissolving black sealing wax in alcohol. Sealing wax being composed principally of shell-lac. But little heat should be employed, or the black color will be precipitated.

Shell-lac varnish of various colors,

May be made by mixing strong body colors, in fine powder, with the varnish, levigating them in the same manner as recommended with the lamp black. None but full, deep colors will answer, as the color of the varnish will deteriorate all those which possess any transparency, or which are of a light shade.

Red shell-lac varnish,

Is best made from good Dutch sealing wax. This is the kind used to varnish glass, and wood, for electrical purposes. Three or four coats will make a perfect covering.

Of the brushes used in varnishing.

It has been already remarked that the painters' sash-tool, makes a very good varnish brush for common purposes; for large articles, however, the flat camel's hair brushes, made for the purpose, are to be preferred; they are to be obtained from half an inch, to four inches in width, at most of the drug stores; for smaller sizes, round brushes, with tin tubes, are to be preferred.

It is a common practice, when the same brush is always used with the same kind of varnish, to allow it to dry with the varnish on, after scraping the brush on the edge of the cup; in this case it must be allowed to stand in the varnish for a few minutes to soften before using. It is a much better practice, however, to wash the brushes clean in spirits of turpentine, or in alcohol. When washed in the latter, the alcohol need not be wasted, but may be poured into the varnish bottle. For colored varnishes, kept in small quantities, the brush may be left in the bottle; but in this case, the cork should be perforated so as to fit the handle, and the points of the hairs should dip into the varnish; it is then always ready for use. A common mustard bottle will, in general, answer the intended purpose.

Of the French polish, by means of shell-lac varnish.

There is a mode of using shell-lac varnish, which is sometimes denominated the French, and sometimes the German mode. To whomsoever it is due, it merits to be generally known, as the process is easy and economical, and the effect beautiful. It has been much employed by cabinet and musical instrument makers, but is yet not so extensively practised as it merits to be.

The varnish is to be prepared in the way already directed, and is used of a moderate thickness. The article to be polished must have a smooth even surface, such as is left by fine glass paper, usually called sand paper.

Mode of applying the varnish.

The varnish is applied by means of what is called a rubber; this is frequently made by rolling up a strip of thick woollen cloth, which has been torn off, so as to form a soft elastic edge; thick, wide list will answer perfectly well, although a greater width is more convenient to hold. This coil may be from one to three inches in diameter, according to the size of the work.

[From Gill's Technical Repository.]

" *On the manner of applying the varnish.*

" The varnish, put into a narrow-mouthed bottle, is to be applied to the middle of the flat face of the rubber, by laying the rubber upon the mouth of the bottle, and quickly shaking the varnish up once; as the rubber will thus imbibe just a sufficient quantity to varnish a considerable extent of surface. The rubber must then be enclosed in a soft linen cloth, doubled; the remainder of the cloth being gathered together at the back of the rubber, to form a handle to hold it by; and the face of the linen cloth must be moistened with a little raw linseed oil, (which may either be colored with alkanet-root, or not,) applied with the finger to the middle of it. The work to be varnished, should be placed opposite to the light, in order that the effect of the polishing may be better seen; and a surface of from one to eight feet square may be varnished at once.

"The rubber must be quickly and lightly rubbed on the surface of the article to be varnished, and the rubbing continued until the varnish becomes nearly dry; the coil of woollen cloth must be then again wetted with the varnish, but no more oil need be applied to the surface of the linen cloth, and the rubbing again continue till the varnish becomes nearly dry, as before; and again, a third coat must be applied in the same manner; then one with a little oil; which must be followed, as before, with two others without oil;—and thus proceed until the varnish has acquired some thickness, which will be after a few repetitions of the series; when a little alcohol may be applied to the inside of the linen cloth, before wetting the coil with the varnish; and then rub very quickly, lightly, and uniformly, over every part of the varnished surface, which will tend to make it even, and very much conduce to its polish. The linen cloth must next be wetted with a little alcohol and oil, without varnish; and the varnished surface being rubbed over, with the precautions last mentioned, until it is nearly dry, the effect of the operation will be seen; and, if it be found that it is not complete, the process must be continued, with the introduction of alcohol in its turn, as directed above, until the surface becomes uniformly smooth and beautifully polished.

"*On varnishing hollow and round works.*

"In this case, the woollen cloth is not to be used with its flat end, *but on its sides;* to which the varnish must be applied, as before directed, and be covered with two folds of the linen cloth, oiled or not, as before mentioned.

"*On varnishing recesses or carved work.*

"When this occurs in cabinet work, &c., and where the surfaces are not liable to wear, or are difficult to reach with the rubber, a spirit varnish, made with, or without lac, of the usual gum resins, and considerably thicker than that used in the above process, may be applied to those parts with a brush, or hair pencil, as is commonly done in other modes of varnishing.

"*On varnishing works in the lathe.*

"This process is exceedingly easy; and does not require much more skill than the mere application of a little oil to the surface of a soft linen cloth, and putting the lac-spirit-varnish upon it; then both together to be held upon the surface of the work, whilst turned round in the lathe, and rubbed along it, backwards and forwards, till the effect is produced."

The editor has frequently tried the *French polish*, but he has always used a kind of rubber differing from that above mentioned. It is made as follows :—a piece of thick woollen cloth, six or eight inches in diameter, is taken; upon one side of this a few teaspoonsfull of the varnish is poured; the edges are then collected together, so as to enclose the varnish in the cloth, and form a handle by which to hold it; this is then covered with a piece of oiled linen cloth, and the rubber is ready for use. When requisite, more varnish may be added. It will be found necessary, occasionally, to pour a little alcohol into the cloth, when the varnish becomes too thick to ooze through.

Some difficulties may at first be experienced in performing this process; but a very little practice will enable any handy person to surmount them, and to produce a beautiful polish without using successive coats of varnish, which require considerable time to dry, and which mode is otherwise attended with much more trouble than the plan here described. [*Am. Mech. Mag.*

REMARKS ON DYEING.

The Art of Dyeing depends wholly on chemical principles, and the Dyer, as far as the manipulation of his trade is concerned, is, in fact, so far a practical Chemist. "It consists," says Fyfe, "in fixing colors on cloths of different kinds, so that they shall not be destroyed by exposure to air, or by washing. The articles of which cloth is composed, have an attraction for coloring matter, but it varies in different instances. In some it is so powerful, that the color may be applied without any preparation, except merely scouring the cloth to free it from impurities, which is usually done with a weak solution of potassa. After this, it is soaked in the infusion of the dye-stuff, which adheres to it, imparting its color. and which cannot be removed by washing. In other cases, on the contrary, the attraction is so weak, that though the color can be imparted to the cloth, it is not fixed; it is easily destroyed by washing, or by exposure to air or sunshine; but when this is the case, it may be fixed by the use of a third substance, which has an attraction for both. Thus, if a piece of cloth be dyed by madder, it acquires a reddish color; but this is not fixed—it may in a great measure be removed by washing; but if it be previously soaked in a solution of alum, then dried, and afterwards put into the madder-vat, it is dyed, and the color is fixed. This is owing to the attraction of the earth of alum for the cloth, and also for the dye, by which they combine, and are thus kept in union with the cloth. This constitutes a difference in the process of dyeing, and has given rise to the division of dye-stuffs into two classes, the *substantive* and *adjective*; attaching to these words, the same meaning as in common language. A substantive color is therefore one that will act of *itself*; an adjective color requires *the addition of some other body*. Those substances used along with adjective dyes have been called *mordants*, from the idea that they *bite* in the color; they are chiefly alum, and some of the metallic salts, particularly those of tin, occasionally also those of mercury, lead, and iron. But these, besides fixing the dye, also change its color, and hence their use in procuring different colors from the same dye-stuff, as the remarks on the properties of coloring matters show, these being changed by the addition of the different agents mentioned.

"From what has now been said, it is evident that there are two modes of dyeing, either by substantive or adjective colors. When the attraction between the cloth and the color is strong, all that is necessary is, to soak it in the infusion of the dye-stuff, by which the color is imparted, and fixed. But when the attraction is weak, it must be first saturated with a mordant, and then with the coloring matter. Of course the mordant must vary according to the nature of the dye.

"There is still another method altogether different from those mentioned; it is not by using the dye already prepared, but by combining the cloth with substances which act on each other, and strike the color required; and in this way also the coloring matter becomes fixed. Thus, a piece of cloth can be dyed black, by soaking it in a mixture of infusion of nutgalls and green vitriol, the substances used in making ink, and which form a black color; but in this case, the color is not fixed. If, however, the cloth be previously immersed in the infusion, and after being dried, be put into the solution of green vitriol, the same black is produced, the chemical action taking place on the cloth, as when the solutions themselves were mixed, and the color is thus rendered fixed. In this way a great variety of colors may be produced. Many of these have been already described, when treating of the properties of the metals. In dyeing the compound colors, as green, this is generally done by giving to the cloth a blue color, and afterwards soaking it in a yellow infusion. Thus, by dyeing it with indigo, it becomes blue, and by putting it into an alum bath, and then into quercitron, the yellow of the latter and the blue together, form green.

"As mordants are used to fix color on cloth, it is evident, that if, instead of being applied to the whole, certain parts only are covered with it, the color, though communicated to the whole, will be fixed *only on those parts saturated with the mordant*; and that this is the case is easily shewn, by making some traces with the infusion of nutgalls on cloth, and allowing it to dry, and then putting it into a solution of green vitriol; the color, on the traces only, will be durable. Hence the mode of applying a pattern on a white or colored ground, and which is called *calico printing*, from its being usually done on calico.

"Two mordants are in general use by the calico printers, alumina and iron in union with acetic acid, or acid of vinegar. The attraction between acetic acid and alumina is so weak, that they cannot be made to combine directly; but they may be united, and the mordant formed, by decomposition, which is done by mixing sugar of lead, or the acetate, with alum, the acetic acid of the former combining with the alumina of the latter to form the acetate of alumina, while the lead is precipitated in union with the sulphuric acid of the alum; the mordant is therefore left in solution, so that, by filtration, it is obtained pure. The iron liquor is procured by putting iron filings into vinegar, or rather pyroligneous acid, by which it is slowly dissolved. The solutions thus formed, are made of the requisite consistence with starch, to which in general a little Brazil wood is added, to give it color, that the traces may be seen when applied to the cloth. The instrument by which this is done, is a block of wood, on which the pattern is cut. In some places, it is interlaid with the felt of hat, which takes up a great deal of the mordant when necessary; and for some of the nicer patterns, copper is sometimes used, by which the impression is more delicate. The block being covered with the mordant, is applied to the cloth, and struck with a mallet, or forced down by machinery, to cause it to leave on as much as possible, and by applying it repeatedly, the whole web is properly covered with it. It is then dried in a stove room, to fix it, and after being washed to remove the superfluous part, is put into the dye-vat, by which the color is imparted to the whole of it; but by boiling it in bran and water, and exposing it on the ground, only those parts previously covered with the mordant are colored, so that the pattern is dyed on it.

"By applying different mordants to the same piece of cloth, different colored patterns may be produced. Thus, if part of a piece of calico be covered with the aluminous mordant, another with the iron, a third with a mixture of these, and the rest left untouched, and afterwards put into a madder-vat; the first will become red, the second black, the third purple violet, chocolate, or lilac, according to the proportions, and that part uncovered will be reddish, but which, on keeping it in bran a little fermented, and then exposing it on the field, disappears, leaving the ground white.

"That different colors can be given in this way, is easily shewn by a simple experiment: Cover one part of a piece of cloth with a solution of prussiate of potassa, and another with infusion of logwood, and leave the rest uncovered. When dry, put it into a solution of green vitriol; the first will become blue, the second black, and the ground will be left white.

"Connected with the art of dyeing is that by which *bandannas* are made. For this purpose, a web is dyed Turkey red, and after being laid up in folds, is placed between metallic plates, in which are cut patterns, similar to that to be given to the cloth. Through the holes thus cut in the plates, a solution of the bleaching compound is allowed to flow, by which the color of that part of the cloth is discharged, and a white pattern is left on the red ground."

The bleaching compound, alluded to above, is made "by passing the gas through slaked lime kept in vessels, in which it is constantly agitated by machinery. After it ceases to be absorbed, the product is removed, put into vessels, and kept as much as possible excluded from air." [*Fyfe's Chemistry*.

As the art in question, depends upon the different attractions, which the substances acted upon, have for each other, it is evident, that the Dyer cannot be too cautious in procuring the best materials. It is, undoubtedly, often the case, that he fails to procure a good color, on account of the adulteration of some of the ingredients. It is, therefore, highly necessary, that he be sufficiently acquainted with Chemistry, to detect any impurities, and also know how to purify what he finds to be impure; for instance, alum, a substance which the Dyer cannot do without, is often contaminated with iron. The following method of detecting it, when present, will, therefore, be worth remembering:

Since the new Tariff has been established, alum has been made in this country. As some lots from each manufactory have been pure and good, whilst other lots, from the same factories, have been impure, and calculated to injure the dyer, I have considered it may be advantageous to the manufacturer, as well as to the dyer, to point out its occasional defects, and the mode of testing it, so as to ascertain its injurious impurity.

Alum is a mordant more generally used than any other, it being necessary to the production of every fine color excepting scarlet. It is a necessary condition to the production of fine colors, that alum should be free from every material which have a tendency to sadden the dye. Iron will do this to a greater degree than any other metallic substance, yet many lots of alum in this market are sufficiently impregnated with iron to destroy every fine color in which it may be used, and this has no doubt been the cause why many of our red flannel dyers have so frequently produced a dull brick color, from the same process, which at other times have obtained them brilliant reds. In dying of dark colors, such as greens, browns, dark drabs, olives, clarets, modenas, &c. &c., the presence of a small portion of iron will not be felt, but in all the finer colors the effect is highly destructive.

According to Vauquelin's analysis, alum should contain 30.52 sulphuric acid, 10.50 alumina, 10.40 potash, and 48.50 water of crystallization. Alum is made either from aluminous schistus, containing sufficient sulphur to acidify, by roasting or exposure, the alumina of the schistus, or from sulphuric acid and clay. When the schistus, or clay, contains iron, a portion of it will be found in the alum when crystallized. The manufacturer to get rid of the iron, should test the liquor before crystallizing, and precipitate it previous to submitting the alum liquor to that process. This precautionary measure would effectually prevent the existence of iron in alum, whether it existed previously in the clay, potash, urine, or vitriol, used in the manufacture.

Our dyers may discover when alum contains iron, by dissolving a small portion of it, and dropping in a few drops of a solution of pure prussiate of potash, which, when iron is present, will cause a blue precipitate, pale, when slightly impregnated, and denser as the iron is more abundant. As the prussiate of potash of commerce may contain iron, it will be necessary that our dyers should have a pure solution. which they can obtain by applying to Mr. William Partridge, 34, Cliff-street, New-York. HOPSON.

[*N. Y. Statesman.*

ON THE STAINING OF WOOD.

Dear Sir,—When I closed the letter which accompanies this, I forgot to mention a *stain*, as cabinet-makers would call it, for some sorts of wood used in the making of cabinet furniture. This *stain* consists simply of a decoction of walnut or hickory bark, with a small quantity of alum dissolved in it, in order to give permanency to the color. Wood, of a white color, receives from the application of this liquor, a beautiful yellow tinge, very little liable to fade. Indeed, so far as I have ascertained the fact by several experiments, the color does not appear to fade *at all;* and I have good reason to think, that it will abide until it is *worn off*. So far as I have tried the experiment. the color retains its proper state, when not defended at all from the action of the light and the air; when protected by varnish, it will. of course, be still less liable to change. I have in my house, an article of furniture stained in this manner, which has stood exposed to the near light of a window fifteen months, and the color appears at this time, if *any* change has taken place, even brighter than at first.

This stain is particularly adapted to several kinds of furniture which are commonly made of *maple*. It gives a beautiful and delicate tinge to the high posts of bedsteads, when made of that kind of maple which is called *curly* or *curled*. But to that kind of maple which is called *bird's-eye*, it gives the finest appearance of any. This species of wood is commonly prepared. by cabinet-makers, by scorching its surface over a quick fire, which does not, at the same time, smoke. The wood, after being thus scorched, is made smooth in the usual way, and varnished. The scorching produces a great variety of dark shades and specks on the surface; these have generally been considered to possess considerable beauty, and the wood, so prepared, has come into pretty extensive use in the making of particular sorts of cabinet furniture. When bird's-eye maple is thus prepared, except the varnishing, if it is then stained with the walnut dye, it receives much additional beauty. In the common mode of preparing that wood, the colors are *black*, of various shades and degrees of intenseness; and that kind of white, though somewhat tarnished, which is natural to maple. These colors are destitute of any other lustre than what the varnish mere-

AGRICULTURE.

HORSES.

We now publish the second part of the remarks on Horses, that were promised in the last number of the Journal. The writer "*calculated*" them for Massachusetts, but they will apply (generally speaking) "*to any of the adjoining States.*" He describes the form of the Mare, which should be employed for breeding. Some may feel disposed to differ with him, in this respect; indeed, there are scarcely two that think alike, respecting the form and "points" of a good Horse. Almost every one has some *whim* or *caprice* which biases his judgment, more or less; and very few,—comparatively speaking, look on him with that knowledge of the mechanism of his frame, that ought to guide one in choosing. The fact is, that a Horse is as "wonderfully," if not as "fearfully" wrought, as a man. Perhaps there is no other animal, in which the principles of many of the mechanical powers can be more easily and more strikingly demonstrated. None, in which the advantages and disadvantages, arising from slight variations, or alterations in length, position, or correspondence of the various parts, can be more clearly and forcibly illustrated. He is a compound of levers and pulleys, and he makes scarcely a movement, that is not in accordance with the fixed and unerring laws of mechanical science.

We would ask for no better object in nature, to prove the design—the wisdom, or even the very existence of a Supreme Intelligence. Without stopping, however, to moralize on this subject, we will pursue that with which we commenced. The writer very justly observes, that, "breeding from many of our Mares is a certain loss." There can be no very good reason assigned. why almost as much attention should not be given to the selection of a Mare for breeding, as well as to the selection of a Sire.

"Every one," an eminent writer observes, "exercises some degree of judgment, in regard to the stallion; but there are few breeders, comparatively, who hesitate to employ very ill-formed and worthless Mares, and often solely, because they are unfit for any thing else." A little reflection will convince any one of the absurdity of this plan. "The price of the leap, the keep of the Mare, and the care and keep of her progeny from the time they drop, to the time of sale, are the same," whether they be sold for more or less.

In England, they consider what kind of a Horse they wish to rear, and then employ such a breed as they wish the colt to be of. They have long since, laid aside the custom of putting one horse to every kind of work. They have distinct breeds for distinct purposes, and their character is so well fixed, that they can calculate, with tolerable certainty, the qualities of the future colt. Perhaps it would not be profitable for us to follow them in all of the several breeds; but, we do think it advisable to have two, or three, whose character shall be fixed, or which shall be, in the language of the English breeders, "*well bred*," rather than to follow on in the old course,—*hap hazard*, trusting altogether to luck and chance, respecting the qualities of the Horse about to be reared.

Sir,—In my last communication, for "relaxations of luxury," read "emulations," &c., a very different thing; in the eighth paragraph. as it is printed, for "last observation," read "last observation in the last sentence;" for "different," read "unnatural;" for "caries of the bones;—which are," read "caries of the bones of the foot; which appear to be;" there should have been no dashes: from "The peculiar" to "Country of Virginia," should be an integral paragraph; read "question of foot lameness" for "the management;" for "brought from the Desert," read "bought;" for the Suffolk sorrel's "country," read "County;" and at the commencement of that paragraph there should be no "But." I will now give you a few observations upon Breeding a Horse in Massachusetts, and will endeavor to express myself in the distinctest manner possible.

Where hay and pasture are so dear, a farmer can afford to breed from nothing but the right mare; or the horse will eat, three times in four, more money than he will ever be worth, before he sheds a tooth. In England, a mare is covered, with a design that she shall produce a particular horse; and it is not common for any horse but the thorough-bred one to be used for any purpose but that for which he is bred. He, if not gifted with superior speed, is hunted; ridden on the road; or galloped till his strength is consumed, in a stage coach. Breeding from many of our mares is a certain loss. The right one is a thick little mare, fourteen hands three inches high, with as much speed as is compatible with an adaptation for moderately heavy draught. Two things are indispensable. She must be perfectly sound in her feet; or unsound distinctly from accident, very improper treatment, or external disease, and she must have a wide chest. She may, comparatively, be spavined; ring-boned; or even blind; but I am so convinced of a predisposition to the disease which is the common cause of foot-lameness being frequently hereditary, that, if the cause of it were not evidently as above-mentioned, I would not take as a gift the finest colt, bred from a mare suffering from foot-lameness. What sort of foot is the most likely to remain uninjured by the severe concussion to which it is here necessarily exposed, it is difficult to say; but a flat, vulgar-looking one is decidedly my own preference. It generally possesses less sensibility and susceptibility of inflammation, and the horn is weaker and less able to contract than that of a foot of a more beautiful and original formation. There are many reasons why she should have a wide chest. If she has not, she will neither have a good belly for the young horse to grow in, constitution to nourish him before his foaling, nor milk enough for him after he is foaled; and she will be in danger of transmitting to him a figure, which he is more apt to take from his dam than his sire, and which it is very important in this climate he should not have. Many narrow-chested horses make it up in depth, and possess extraordinary powers in every way; but they are generally light in the flank, and high on the leg; hectic in their constitutions, and variable in their spirits: very superior walkers and trotters; but they will bear neither east winds nor daily labor. The mare's color is of little consequence: excepting that it should be recollected, that chesnuts, or, as we call them, sorrels, particularly light ones, who have always a good deal of white, are far more liable than other horses to the sympathetic diseases of the lungs and skin. The number of broken-winded chesnuts in Massachusetts, is four times that of any other one color. As I am acquainted with but three horses in Massachusetts fit to breed from, there is not much to be said about the sire. A very celebrated English horse is expected here in the spring; and I believe in Vermont there are two covering, of unexceptionable pedigrees. Cock of the Rock, is a good little bay horse—got by Eclipse's sire, Duroc; dam, own sister (called here *full sister*) to Eclipse's dam, by Messenger; grandam, bred by Lord Grosvenor, by Pot8o's, out of a Gimcrack mare. Trouble is also by Duroc; dam, by Hickory, out of Eclipse's dam.—A horse, here, is said to be got *out of*, for *by*, another horse; a most ridiculous corruption.

The next thing is to have the mare's gestation proceed under favorable circumstances, and to have her foal at the right time of the year. On this there is little to be said: a mare is perfectly fit for ordinary labor during most of her gestation, and is all the better for it; and the proper time for foaling, in this climate, is the first of June. Even in England, where the forwardness of a thorough-bred horse is a matter of extreme pecuniary importance; he being often matched, to run at two, before he is foaled, and all foaled in the same year carry the same weights; their most distinguished breeders, who have examined and scrutinized the subject, are of opinion, that a January colt will not be much forwarder than a June one; that the first will lose more by the exposure soon after his foaling, than he will have gained by having had more time to grow.

The third, and by far the most important thing of all, is the horse's treatment from the time he is foaled till he is full grown. One of the most celebrated sportsmen of modern times, has declared his opinion, that it is in the power of art to make a superior horse of any colt that nature has not deformed, and whoever is aware of the effects of different methods of rearing children, will not be disinclined to agree with him. The grand enemies of young animals, are moisture and bad food; and the younger, the more scrupulously should they be preserved from both. A horse should be fed better, and kept warm and dry more the first year of his life, than any other; and it has an advantage he will never lose. Many of our farmers have an idea that though insufficient nourishment will check the growth, the horse will still be a good one, though of small size; in England they assert, that his height will be the same, but that he will be weak and leggy. I have the opinion of one of the oldest Merino sheep breeders, that it is indispensable that the lambs should be kept warm and thriving, or they will not pay. A long coat is both the cause and effect of not thriving. If any one will examine long-coated and short-coated horses exposed to the same rain, he will find one saturated with water under the belly chest and throat; and not dry for some hours after it is done: that the water runs in streaks from the back of the other; that his belly, chest and throat are dry; and that he dries all over as soon as the rain is done. The different effect upon the insensible perspiration and the lungs are evident enough; and, if a colt wears a long coat, he should not be exposed to continued wet weather.

The thorough-bred horse is always allowed, in England, a full allowance of corn at all periods of his life, if well. All danger of his being injured by over-feeding is prevented by the attentive and experienced hands in which he is placed. He is carefully groomed at the earliest age; the advantage of this and clothing, no one is ever convinced of by any thing but experience, though he knows the benefit he himself derives from flannel and flesh brushes. Nothing of this, however, is necessary here, excepting that the horse should have a little corn, (oats in preference to any other kind of corn,) the first year. He must not, however, more than at any other age, be fed high on any kind of cold, or he is in danger of some local inflammation. He may have that of the lungs and die; or get well with his wind touched or his feet spoiled for life. The thickness of wind arising from thickening of the wind-pipe, is attributed in England, to improper treatment of the distemper. Man has various temperaments: the horse none but the sanguineous. All his diseases, that do not arise from contagion, assume an inflammatory form. If he has been allowed to suffer from severe colds, when young, he will be preternaturally liable to them through life. This can be explained on anatomical principles: it is an analogous fact, that the native of a warm climate has his health less affected by the first northern winter he is exposed to, than by any other; and that in Napoleon's Russian Campaign, the Italians and Spaniards suffered less than the Germans and the Poles.

The colt requires nothing but grass and hay after the first year. He should be perfectly broken in the winter before he is three years old; but must not be taken upon a frozen road. He is less in danger of being injured by being brought into work at that age, from the gentleness with which he will probably be used, than he often is from being presumed after five, to be fit for common labor without time being given him to be accustomed gradually to it. A horse taken from grass or the cow-yard, should eat no kind of corn till he has been a long time in work. He will puff in the houghs and heat in the feet, after walking five miles on the road; and if the fever attending his first attempts at labor, particularly if he is very young, is increased by full feed at the time, it will throw itself into his feet already heated by the unusual concussion, and do him permanent injury. He is especially in danger of this, if first used on the frozen roads in the beginning of the winter, when they are perfectly unelastic, and he is excited by the state of the atmosphere.

Spavins and ring-bones are sometimes thrown out by a colt; and their nature is not understood by our farmers generally. At the lower part of the front of the hough there are a number of joints, occupying together but a small space, and possessing but little motion. Upon any considerable inflammation, they are liable to secrete bony matter, which fills up their interstices; and generally projects in front or on the inside of the hough, and is evident to the eye. It appears suddenly, and soon hardens. As the separate bones then form one solid mass, it is obviously incurable. It is very common in oxen; butchers being frequently obliged to cut through with an axe, what was once a number of bones joined together. When it is soft it is absorbed by a blister. It may arise from the inflammation occasioned by a violent blow upon some part of the leg; and I have a colt spavined in both legs from a severe kicking. It is apt to keep a horse out of condition from its pain; but many of our first-rate work-horses are spavined. When I speak of spavin, I, of course, mean bone-spavin; bog and blood-spavins, as well as thorough-pins being nothing but wind-galls of the hough. A ring-bone is of the same nature as a spavin; and generally proceeds from inflammation of the pastern-joint. It has been ascribed, in some instances, to stamping off the flies; and I have had one arise apparently from that cause. So simple a reason, however, it would be difficult to make a farmer believe. It is not an invariable cause of lameness. Like a spavin it is incurable, excepting in particular states; not exactly corresponding, however. Curbs are common in thorough-bred colts; but are, comparatively, of trifling consequence, and always to be cured.

Any one, that does not acknowledge the assistance which nature may receive from art in a young animal, must have shut his eyes upon the vegetable world. Every domestic animal was intended to reap the advantages of civilization in his food and shelter as much as man; nor can he be in his highest perfection without them. For the very fullest development of a horse's powers, he must be kept continually in a high temperature. It is very well to laugh at the extent to which this appears to be carried: but the fact is not to be disputed. [N. *E. Farmer.*

AGRICULTURAL QUERIES.

We have received a Circular Letter from Prof. Cleaveland, of Bowdoin College, relative to the Agricultural interest of this State, followed by a long list of Queries, intended to elicit information on this interesting topic.

This is beginning at the root. It is in vain to attempt a change in any thing, or endeavor to remedy difficulties of any kind, until the actual state of the business is fully and clearly understood. We think that we cannot be justly accused of saying what is untrue, when we say, that the spirit of Agricultural improvement is at rather a low ebb in Maine. But why should it be? Why should our farmers be so far in the rear, of those of other States—following at a slow and humble pace, the improvements made by those, who, individually considered, are no better than themselves? Why is it, that there is such a lack of intercourse among them? No societies*—No cattle shows—No premiums! Has Heaven been more kind or beneficent to other States than to Maine? Are not her yeomanry as hardy,—as industrious,—and as intelligent, as those of other States? Are not her hills and her valleys as fertile? We believe—indeed, we know they are. Why then is there so much listlessness and apathy on the subject of her farming interests? Our brethren of Massachusetts set us better examples. They have their Annual Cattle Shows. They meet, and congratulate each other with cordial and heartfelt greetings. They cultivate an acquaintance with each other, and bestow mutual improvement by a kindly exchange of experience and observation. Each one hails the annual return of their "festival of Ceres," as a day of joyous satisfaction, and they hasten together, to compare their fatlings and best fruits,—to tell of the labors of the past year—to give and receive more knowledge, and to offer up to Deity, the most acceptable of all offerings, the effusions of grateful and contented hearts.

How is it in Maine? Our farmers, comparatively, are strangers to each other. No day of social meeting is found upon their calendar. No Societies (as we have before observed) for mutual information, or for the encouragement of improvements. No friendly contention, of who shall do best. No honorable competition to stimulate,—to increase, or keep up their energy and vigor. They

* The Hancock Agricultural Society, we believe, is the only one that is spirited enough to have Cattle Shows, and give premiums. Long life to them.

plod on the same dull pace, and follow the same dull routine—year after year—year after year, without one holiday,—without one meeting of general festivity and thanksgiving. No wonder things are at so low an ebb. No wonder that those children of our farmers, who have sprightliness and ambition, should be anxious to leave this monotonous employment, and engage in business which presents a better theatre for enterprise and activity. But we hope and trust, that this will not always be. We are aware, that there are those among us, of high and honorable standing, who assert, that "these societies and cattle fairs are of no use, that they present more *show* than *substance*." But, with all due deference, we as stoutly and decidedly assert, that we know better. There was once a State Agricultural Society in Maine. They had one Cattle Show, and although several years have elapsed since, the good effects of it are visible to this day. Why it was suffered to decline, or go down, we know not; but, we hope, that another, and a stronger, will, ere long, rise in its stead.

Correct answers, to Prof. C's. questions, will give us a just view of the present state of Agriculture among us, show where the weakest points are, and in what things improvement is the most needed.—The pages of the Journal are open to receive answers, and remarks, should it be more convenient to insert them there, than to send them to Prof. C. himself.

"Sir,—The Agricultural interests of Maine are peculiarly important to its citizens. The great capital of our State is *land*, which must be made productive by the skill and industry of the Farmer. Independent of the importance of our *crops*, the increase and quality of the most useful domestic animals greatly depend on the vegetable food, which the soil can be made to yield.

"The true principles of Agriculture can be established only by numerous experiments, carefully conducted and accurately observed. It must therefore be important to collect and compare the experiments and observations, which have been made by different individuals.

"Some of the improvements, recently made in Agriculture, have arisen from a judicious application of the principles of Chemistry; and a further increase of Agricultural knowledge will undoubtedly result from the application of similar principles by the practical Farmer.

"One important step PREPARATORY to further improvement, is to ascertain the *present state* of Agriculture in *all its branches*, in Maine.

"With this view the following questions are proposed. Most of them relate to such land, as has been for some considerable time under cultivation, and is sometimes called old land. A few Queries, in regard to the mode of changing wild into cultivated land, will be found among the Miscellaneous Questions at the end. Some repetitions of ideas may occur, in consequence of presenting the same subject under different points of view. The questions have been rendered minute, with the belief that the labor of answering them would thus be diminished.

"Permit me respectfully to request your answers, and those of your agricultural friends, to these Queries, or at least, to such of them, as have been the subject of your experiments and observations. Any important facts and observations, connected with Agriculture, although not direct answers to any of the following Queries, are also solicited.—It would perhaps be more useful and pleasant, if two or more individuals, resident in the same town, should unite in furnishing a joint answer.

"It is requested, that your answers may be communicated as early as December, 1828, or as soon after as may be convenient; and to avoid unnecessary expense, it is also requested, that they may be sent to the subscriber by *private conveyance*, or, if more convenient, to the care of Josiah W. Seaver, *South Berwick*, Judah Dana, *Fryeburg*, Wm. C. Whitney, *Hebron*, William Ladd, *Minot*, Stephen Longfellow, *Portland*, Eleazar Coburn, *Bloomfield*, Thomas Eastman, *Palermo*, Jedidiah Herrick, *Hampden*, Wm. Abbot, *Castine*, or Rufus K. Porter, *West Machias*.

"Yours respectfully, PARKER CLEAVELAND.

"*Bowdoin College, Dec.* 5, 1827."

QUERIES,

ADDRESSED TO THE FARMERS OF MAINE.

1. How many acres of cleared land do Farms in your town or vicinity generally contain; and what is the usual reserve of woodland for fuel, and to furnish timber for occasional purposes?

2. What proportions of the cleared land, in farms under good cultivation, are devoted to *pasturage*, *mowing*, and *tillage*, respectively?

3. *Rotation of Crops.* What is the usual rotation or succession of crops on the same piece of ground?
What order or succession of crops is found beneficial to the soil?
What crops, or succession of crops, are found peculiarly exhausting, or injurious to the soil?
What crops, if any, can be raised with advantage, for several years in succession, from the same piece of land, and under what circumstances?
Has the subject of rotation of crops received much attention?

4. Would not the same quantity of labor and manure, usually employed on tillage land, be more productive, if expended on a number of acres somewhat less?

5. *Soil.* What varieties of soil in your vicinity, in regard to sand, clay, loam, dryness, and moisture?
What is the most common variety, and its average depth?

Is the face of the country hilly or level?
Are stones scattered loosely in the soil, or do ledges of rocks appear? Are the ledges numerous?
Is any Limestone or marl known to exist near you?
Have you any soil *apparently* good, but which does not yield good crops?

6. *Ploughing.* What observations or experiments have you made on deep and shallow ploughing?
What depth do you plough in soils of middling quality?
Is summer ploughing ever employed to break up and turn in the sod, in order to prepare manure, and produce a fallow?
Does fall ploughing succeed well in all soils?
What are the effects of *deep* ploughing and hoeing on corn, potatoes, and other articles in rows, during a long continued *drought*, even when the killing of weeds or earthing of crops is out of the question?
What kinds of ploughs are most in use?

7. *Manures.* What observations and experiments have you made on the comparative effects of new and old dung on different crops, and in different soils?
What experiments on *ploughing in* green crops for manure?
What are the comparative advantages of ploughing in manure, and of putting it in hills or rows, in reference to different kinds of crops?
Are top dressings often employed, and with what success? Do you apply them in autumn or spring?
How much manure, estimating half a cord as a load, is collected from the barn-yard of a farm, specifying the number and kind of cattle kept, and what portion of time they are confined to the barn or yard?
Are manure heaps often protected by design from the rain and sun, unless in barn cellars?
Is much *compost* manure made, and how?
What experiments and results on lime, marl, leached ashes, and salt, as manures?
To what crops, and in what quantity, are ashes and lime applied?
To what soils and crops have you found *Gypsum* (or Plaster of Paris) best fitted? How are its effects, according as it is ploughed or hoed in, or used as a top dressing?
What are the comparative effects of gypsum on soils, according as they have, or have not, been recently manured with dung?
What circumstances of the weather are most favorable for applying gypsum? In what cases do you apply it to the seeds themselves rather than to the soil?
How are the effects of gypsum on clayey or rich soils?

[TO BE CONTINUED IN OUR NEXT.]

MISCELLANEOUS.

A mode of preparing Paper which shall resist Moisture.

BY M. ENGEL.

This process consists in plunging unsized paper once or twice into a clear solution of mastic in oil of turpentine, and drying it afterwards by a gentle heat. The paper thus prepared, without becoming transparent, has all the properties of writing paper, and may be used for that purpose. It is particularly recommended for passports, for the books of porters, and other laborers, and indeed is desirable for a great variety of purposes for which paper that is capable of absorbing damp, is very inconvenient. When laid by, it is perfectly secure from being injured by mouldiness or mildew, and is not likely to be destroyed by mice or insects.

The inventor states, that a solution of caoutchouc, would produce a still better effect, but he does not say in what way that elastic gum is to be dissolved or diluted for use, or dried afterwards. This mastic paper has been used by printers, who have discovered in it the above mentioned qualities. By adding a little verdigris to the solution, the paper may be made to assume a greenish tint, similar to the paper known in Paris under the name of "*Papier de Cassabon.*" [*Bulletin des Sciences, &c.*

New invented Apparatus for Expeditiously Drying Mildewed Grain.

This apparatus consists of two long concentric metal pipes, or tubes, winding in a spiral direction. The smaller pipe which is in the centre of the large pipe, forms a passage for the heated air, and the larger pipe receives the corn for drying, by means of a hopper attached to its upper end. The spiral shape of the larger, or conducting pipe, converts it into a long, inclined plane, in descending which, the grain is sufficiently heated to render it perfectly dry before it is discharged at bottom.

[*Annal mens de l'Industrie.*

For the Farmers' and Mechanics' Journal.

Mr. Editor,—Please to insert the following, for the consideration of your readers. Perhaps some of them can answer the Queries.

1. Is there any cheap and simple method of softening a grindstone or whetstone, when it is harder than desirable ?

2. What are the most obvious indications of Fossil Coal ?

Theory *vs.* Theory. The received theory is, that apple seeds seldom or never produce trees, which will bear exactly the same kind of apples as those from which the seeds planted, were taken.

I take the liberty to advance another theory, which is new to me, viz : that apple seeds will produce trees, which will invariably bear fruit of the same kind, as that from which the seeds were taken, provided the trees stand out of the reach of the farina or impregnating dust of other apple trees.

Are there any well authenticated facts that will illustrate or prove aught respecting this subject? I should be glad if some one who is conveniently situated for the purpose, would institute a course of experiments to confirm or confute the latter theory.

Union, Me. S. HILL.

NOTICES.

WARRIOR.

Two new Stallions have been brought into this vicinity within a short time. One of them by Mr. JOHNSON, of Hallowell, which we have not seen, and another, called the *Warrior*, belonging to G. WILLIAMSON, Esq. of Pittston. This Horse, we have had the pleasure of examining, and consider him, (the opinion of some others to the contrary notwithstanding,) a very fair horse. By a *fair* horse, we mean one that is well proportioned; one, whose conformation, when considered as a whole, indicates strength, speed, and *bottom*, or, in other words, capability of enduring hard labor and fatigue. We have seen *prettier* horses than he is, and we know of some that would better please the *eye* of those who judge of a Horse as they would of a Hog, by the quantity of flesh and fat that he carries. "Every one to his liking." We should prefer to examine a horse that was somewhat poor, as it regards fat, rather than one loaded with *blubber*, if an opinion were required. Warrior is a beautiful dapple grey, sixteen hands high, lofty carriage, and we are much mistaken, if he does not make, when he has arrived at maturity, a horse of powerful bone and muscle. So much as it regards himself: What he will do as it regards his *posterity*, can be better told five years hence.

We understand that a young Horse is to stand in Augusta this season, called "Young Bellfounder." Of him we know nothing except the name, and that we protest against. If he is not a son of Col. Jaques' Bellfounder, he has no business with it. If he is, it will lead to confusion.

A good assortment of Stallions were never more needed in any county than in this. There has been too much *mixing up* of one blood,—poor enough at the best. The acquisition of these "new comers" is, therefore, a good step in the cause of improvement; and we earnestly hope that it will begin a march, that will not soon end. Our farmers will now have an opportunity of some choice and chance for selection, and we hope they will exercise their judgment in such a manner, as to remedy the imperfections of the present breed, (if breed it may be called, which is no breed.) Too much care and patience cannot be bestowed upon this subject, for it must be remembered, that "excellence is of slow growth," and that it requires a slow and gradual, but powerful and unceasing exertion, to do away or remove the evils, which a few years of carelessness or negligence may have caused.

GARDEN AND OTHER SEEDS.

We would refer those who purchase their Garden Seeds, to the Advertisement of J. B. Russell & Co., under this head. The proprietors are deserving much credit, as well as patronage, for their enterprise and energy. Such an establishment was much needed in New-England. It is now pretty certain, that it is, occasionally, best to obtain seeds from a distance, and, if possible, from those who make it a business to raise them, and use due precaution to prevent their degenerating, or becoming *hybrids*, which they will do by an intermixture of the pollen, with different varieties, or species, of the same genus.

We would also refer those who raise Seeds, to the same Advertisement, believing that they would there find an opportunity to dispose of their surplus stock, provided, it can be warranted genuine. The ingenious Farmer, who may chance to visit the Metropolis, cannot spend an hour more profitably, or agreeably, than by also visiting Mr. Newell's collection of Agricultural implements. If he does not go away wiser than he went in, we will agree to pay him for the time spent.

MINERALS.

We have received from S. Hill, Esq. a good specimen of Soapstone, picked up in Union, Me. Should a quantity of it be found there, it might prove valuable.

We have also received, from the same place and source, specimens of Chlorite Slate. Specimens of other Minerals have been received from the same gentleman, which we have not had time to examine.

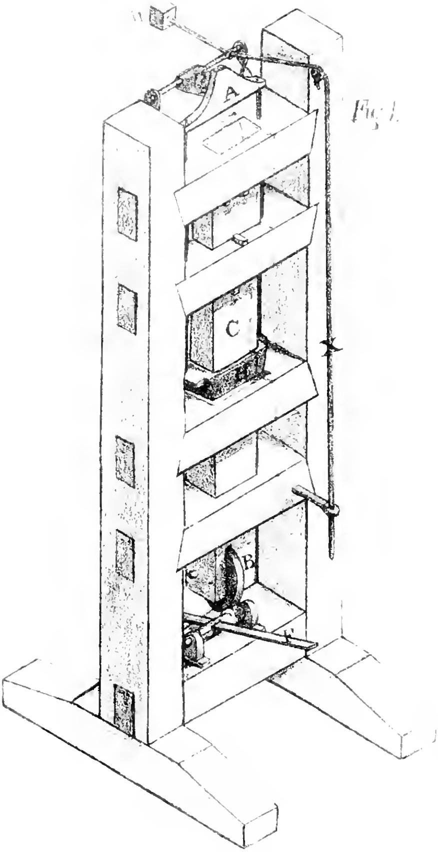


Fig. 1.

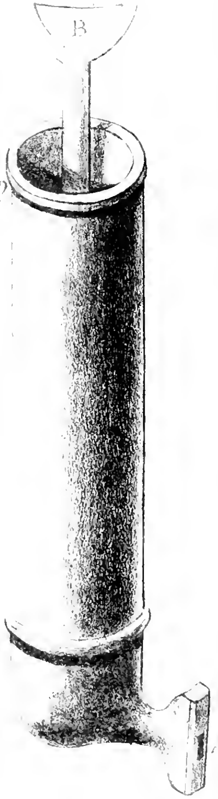


Fig. 2.

THE

NEW-ENGLAND

FARMERS' AND MECHANICS' JOURNAL.

Vol. I. GARDINER, APRIL, 1828. No. 4.

MECHANICS.

HOWE'S BRICK PRESS.

Plate IV. Fig. 1. A, is the top of the frame work, which moves the case or mould H, in which the Brick is contained while pressing. The case is attached to this, by means of two iron rods, which slide up and down in the frame of the machine, as represented in the drawing. On one side of A, is attached a semi-circle with cogs, which match into those of the pinion I. B, is a large piece of timber, or piston, which slides up and down, through holes in the cross-pieces, which are made to fit it and suffer it to pass through easily, and accurately; at the lower end is a friction roller. F, represents the lever, to which the power is applied, which raises B, by means of a kam-wheel. X, is the rod by which the pinion I, is raised. W, a weight attached to I, to assist its movement.

The method of pressing is this:—The piston B, is suffered to sink as low as the kam-wheel will permit it. By pushing up the rod X, the mould H, is slipped upward upon C, and leaves a space between B and C, sufficiently large to admit the brick. After the brick is placed, the rod X, is pulled down, which brings the mould H, over the brick. The foot is then placed upon F, which brings up the piston B, and thus presses the brick.

This machine is simple and cheap in its construction. The only objection that we see to it, is, the liability of the piston B, to press against the sides of the pieces, through which it slides, and thus cause too much friction. This will, however, perhaps be entirely obviated, by extreme care in placing the point of pressure exactly in the centre of the piston. The power is sufficiently great and can be augmented at pleasure. As it regards the number of bricks that can be pressed with it per day, we have not been informed. For this, the cost of the machine, and other particulars, we refer those who wish to inquire, to the Inventor, Mr. JOHN HOWE, of Alna, Me.

PITCH SYRINGE.

PLATE IV. FIG. 2. is a representation of *Flint's Syringe*, for paying or filling the seams of ships, or other vessels, with pitch,—a very simple, but very useful invention. It is made like a common syringe, excepting one extremity is curved, in such a manner, that the orifice A, is at right angles with the main body, or tube. B, represents the handle. The Syringe is made of brass, or composition, and sufficiently laige to hold a quart. It is filled with pitch in the same manner as any syringe would be, by placing the orifice A, into it, and a vacuum made by drawing up the handle B. The end at A, is about two inches long and one-fourth of an inch thick; but it may be removed, and others of different sizes put on, should a larger or smaller one be necessary. When filled, the end is placed in the seam to be pitched; pressure is applied to the handle , and at the same time, it is passed along the seam, until all the pitch is forced out. As the pitch is used hot, to prevent burning the hand, an exterior tube is fitted on, somewhat larger than the Syringe. For further particulars, apply to DANIEL FLINT, Nobleboro', Lincoln Co. Me.

JONES, ON JAPANNING AND VARNISHING....No. 4.

Improved mode of applying the varnish in the French polish.

To the information given in our last number, on the subject of the French polish, we add the following improvement, made by Mr. Samuel Nock, and published in the *Technical Repository:*

"This improvement consists in the substitution of a sponge, with a smooth surface, in place of the coil of list of woollen cloth, or drugget, commonly used.

"Mr. Nock finds the sponge to be far more convenient, for applying the varnish to the surfaces of gun-stocks, than the list, or drugget; as it has no loose hairs, like the latter articles, which are continually protruding through the linen cloths, in which they are enclosed, to the great injury of the process. He also finds, that he can fill the sponge at once with a considerable quantity of the varnish; and can bring it to the surface of the linen cloth, when required at any time, by squeezing the sponge; and he is thus enabled to continue the operation for a much longer time, without renewing the varnish.

"When the sponge becomes clogged with varnish, he moistens it with alcohol; and, putting a coarse linen cloth over it, employs it to prepare the gun-stocks for receiving the varnish; as, also, to remove any former varnish, oil, &c. He, however, always employs a fine linen cloth, in finishing his varnishing.

"He adds, that a Frenchman of his acquaintance, has informed him, that in France, they find the introduction of camphor to improve the varnish."

On Lacker for Brass, &c.

Although, as we have elsewhere observed, the term lackering, is applied to every kind of varnishing performed with lac, yet it is more commonly employed to indicate that process in varnishing, by which the color of brass is heightened, so as to appear more like gold, or by which a similar color is given to tin, or leaf silver. In our next number, we will describe the methods by which brass is cleaned, polished, and prepared for lackering; at present, our attention will be given to the mode of preparing and applying the lacker.

To make Gold Lacker.

Take seed-lac, and carefully pick out the impurities from the clear grains, and, if thought necessary, wash these in clear water, and afterwards dry it perfectly. About three ounces may then be put into a pint of well rectified alcohol; this mixture should be kept in a warm room, and frequently shaken, during two or three days. The whole of the lac will not dissolve, but a sufficient quantity will combine with the alcohol, for the purpose intended. It is best not to strain it through a cloth, but to allow it to stand until the impurities have subsided, and the varnish becomes transparent, when it should be carefully decanted into another bottle. This clearing will require three or four days, and sometimes more, according to the thickness of the varnish. When it is wished to preserve the brass nearly of its natural color, and merely to prevent its tarnishing, the lacker is used without any additional color; this, however, is rarely the case, coloring materials being usually added.

Various pigments have been used to tinge the lacker; they are all such as are soluble in alcohol, and the only colors employed, are yellow and red.

Yellows are produced by gamboge, or turmeric root, in powder; reds, by arnotta, or by dragon's blood, (*sanguis draconis*,) saffron is also sometimes used for the same purpose. A drachm of either of these, may be put into an ordinary vial, and a couple of ounces of alcohol poured on; this will dissolve a portion of the coloring matter, which when clear, may be mixed with the varnish. We have tried all the materials, and prefer the turmeric, and dragon's blood; a few drops of each of these may be put into the lacker;

using a larger portion of the turmeric, if a yellow color be preferred, and of the dragon's blood, if the red is to predominate. It is best not to color the varnish very highly at first, as it may then be altered according to the nature of the work.

Lacker for tin, or silver leaf.

The only difference in this lacker, and that intended for brass, is that it is more highly colored, as it is intended to give a gold color to a white metal. Many articles, commonly supposed to be gilt, are covered with silver leaf, and afterwards lackered, and when well done, the deception is perfect. When, what was called gilt leather, was in fashion, it was generally covered in this way.

Directions for using the Lacker.

The lacker properly colored, is to be poured into a tin or earthen cup; a common tea-cup, fixed on a block of wood, to cause it to stand firmly, will answer the purpose. It is convenient to have a wire fixed across the cup, just below the rim, in order to scrape the superfluous lacker from the brush. The brushes should be of the flat kind, excepting for small work; they are made of camel's hair, enclosed in tin, with cedar handles, and may be purchased at most of the druggists. The brass to be lackered, must be perfectly bright and clean; the room must be free from dust; a clean piece of linen rag must be at hand, to wipe the work before it is varnished; the sooner it is lackered after it is finished, the brighter it will be, as polished brass, exposed for an hour or two, will be sensibly tarnished. When it is not convenient to lacker soon after polishing, it is the practice of some workmen to pass the lacker-brush once over the article, cold, which prevents the contact of the air; the dull appearance which this produces, is removed in the subsequent operation.

The brass to be lackered, must be heated upon a stove, or in any other convenient way; the degree of heat must not be so great as to render it difficult to hold the work in the hand, nor should it be far below this. The brush is to be dipped in the varnish, and then scraped upon the wire, or upon the edge of the cup, to remove a considerable portion of its contents, otherwise it cannot be laid on evenly. The size of the brush may vary with the work, but one of more than an inch and a half will rarely be found convenient to use. In laying on the varnish, the brush should always be passed completely from one end of the work to the other, and never backwards and forwards, as in painting, otherwise the lackering will be irregular, and in streaks; nor must it be passed a second time over the same part, until the previous coat is dry; a few seconds, however, suffice for this, when the brass is properly heated. Two or three coats will answer for most work, nor are more than four or five ever requisite. Work that is thick, will retain heat enough to be finished at one operation; that which is thin, must be heated between every coat. If the varnish is too thick, it will always dry in streaks; a little alcohol is an evident remedy.

Work that is turned and polished in the lathe, may be so heated by the friction, as to be much more conveniently lackered, than when heated in any other way.

The foregoing directions apply only to smooth work, such as is either polished or burnished. Chased, or wrought work, such as leafing, &c. cannot be lackered with the kind of brush before described; one with fine, stiff hairs, called fitch-hair, is used, and this, instead of being passed over the article, is dabbed on, until the surface is regularly covered.

The most careful workmen do not return the lacker from the cup, into the bottle, but pour it into another, where it is allowed to accumulate, and to settle, when it will be as good as at first.

When the lackering is finished, the brush may be scraped upon the wire, and afterwards wiped by pressure between paper. This will be found better than washing it in alcohol, as by allowing it to dry with a little varnish in it, the hairs get a set, which prevents them from straggling, a point of much importance. A few minutes soaking in the lacker, will render it fit for use.

We have repeatedly performed the processes above described, and have now by us, articles which have been lackered nearly eighteen years, which have preserved their color, and appear equal to any similar work we have ever seen. [*Am. Mech. Mag.*

TANNING.

Tanning is one of those arts which depend on chemical principles, and may be considered as *Chemico-mechanical.* The basis of the whole art, rests upon the combination of astringent matter, with gelatinous, and changing it, from a substance, which is easily dissolved or soluble in water, to one that is insoluble.

Tanning is an ancient art. It has received many improvements of late years,—is still undergoing improvement, and yet it may be considered to be but little more than in its infancy. It presents a fine field for scientific ingenuity and research, and we hope, that, all engaged in the business, will strive to acquire theoretical, as well as practical knowledge, and occasionally venture an experiment, with a view of discovering some new principles, as well as to elucidate those that are old. We extract the following from *Fyfe's Chemistry*, with the hope of its being useful to some of the craft; who, although good tanners, may not perfectly understand the *rationale* of what they practise daily.

When part of an animal substance, particularly skin or cartilage, is boiled in water, after having been previously well washed, a fluid is obtained, which, when evaporated, and allowed to cool, congeals, forming a substance called *Gelatin* or *Jelly*. If this be heat ed it becomes liquid, the water is driven off, and it is thus procured in a state of purity.

When gelatin is put into cold water, it softens and swells, but is not dissolved ; it is not necessary to heat it, by which a solution is formed, differing in consistence according to its strength. By far the most important action of gelatin, is with the astringent matter of vegetables. When an infusion of nutgalls, oak bark, or willow bark, is added to the solution of gelatin, a powder is precipitated, or if the solution be strong, a tough matter is formed, which is a compound of the vegetable and animal principles, and which becomes hard on being kept. On this depends the art of *tanning*, or the making of leather, which is merely the union of the astringent matter in vegetables, with the gelatinous principle existing in the skins, by which they are gradually converted to a substance insoluble in water, and not liable to undergo decay.

The previous steps, in preparing skins for converting them into leather, consist in removing the hair, fat, and other impurities, after which they are subjected to different processes, according to their nature, and the kind of leather required, as *tanning*, or causing them to unite with astringent vegetable matter, *tawing*, or making them imbibe alum and other salts, with some animal substance, and *currying*, or soaking them in oil to make the leather soft, and impervious to water. These processes are often performed on the same skin, by which the leather is fitted for more purposes. The thick hides of which the soles of shoes are made, are merely tanned, while the white kid glove leather is tawed. That for the upper leather of boots and shoes, is both tanned and curried, and the fine Turkey leather is first tawed, and afterwards tanned.

When the skin is to be tanned, it is allowed to lie in water for a day or two, to remove any dirt, and to wash out the blood, after which it is laid on a round piece of stone or wood, called a *beam*, and deprived of the fat and flesh. It is then put into a pit with lime-water, and allowed to remain there for some days, by which the hair is loosened, and is easily removed, by placing it on the *beam*, and scraping it with a blunt knife. As the lime employed in this part of the process hardens the skin, it is necessary again to soften it. For this purpose, it is put in what is called the *mastering* pit, which contains water and dung, chiefly of pigeons or fowls, where it continues for some days, the time depending on the thickness of the hide. Great care must, however, be taken, not to allow it to remain too long, otherwise, owing to putrefaction, its texture is completely destroyed, so that it is torn by the slightest effort. After this, it is again cleaned on the beam.

When the skins are very thick, they are sometimes submitted to another process. After being deprived of the dirt and blood by washing, a number of them are heaped together in a warm place, so as to ca e a slight putrefaction, after which the hair is removed, in general without immersing them in the lime pit, as this would harden them too much, and render the leather liable to crack. They are then put into a vat, containing a sour fluid, generally prepared by allowing rye or barley to ferment in it, by which they are softened, and their pores are opened, so that they can more easily imbibe the tan-liquor in which they are afterwards to be immersed. This part of the process is called *raising*, as the hides are considerably swollen by it, and also requires particular attention, for if too long continued, the skin is destroyed by undergoing putrefaction.

Instead of this part of the operation, which is sometimes difficult to accomplish, owing to the state of the weather, the hides are plunged into a fluid composed of sulphuric acid and water, in the proportion of about a wine-pint of the former to fifty gallons of the latter, and allowed to remain there till sufficiently softened and thickened.

The next stage of the process is the tanning, which consists merely in soaking the hide in a solution of an astringent vegetable, and making this unite with the gelatin, by which it is rendered no longer liable to undergo putrefaction, insoluble in water, and in a great measure impervious to it. The astringent substance usually employed, is oak bark, procured from the trees which are cut in the spring, when the sap has risen into them. After being reduced to coarse powder, it is put into pits with water, by which a solution of the astringent matter is procured, called an *ooze*. In this the hides are immersed for several weeks, being frequently turned, to expose the whole of them to the infusion, and allow it to penetrate them. From this pit they are put into others, the liquor being successively stronger, till it is completely saturated. Should the hides be very thick, the last into which they are put contains some of the powder of the bark in alternate layers with them, by which, as the infusion becomes weaker by the substance combining with the gelatin, more of it is taken up, and it is thus always kept of proper strength. In this way the skins are allowed to remain, till the whole are converted into leather, which is known by cutting a small piece from them, and observing its appearance. If the process be completed, the cut edge is of a brownish color, but if the tan has not penetrated it thoroughly, there is a white streak in the centre; of course they must be left in it, till the whole assume the brown tinge. The time required for accomplishing this, depends on the thickness of the hide. Calves-skins take from two to four months, and the thick sole-leather hides, from fifteen to twenty. When this process is completed, the hides are removed, and laid again across the beam, where they are smoothed, and well beat, to make them more solid, and also more flexible, after which they are hung up on beams in the drying-house, a building into which the air is freely admitted, where they remain till dry.

A French Chemist of the name of Seguin, proposed what seemed to him an improvement in the mode of preparing leather, but which has not been adopted in this country. It consists in making quickly, solutions of the oak bark of different strengths, and passing the hides through them, beginning with the weakest, and ending with the strongest, by which the process is considerably shortened. It is said, however, that the leather thus prepared, is more liable to crack, than that manufactured in the usual method.

It may be here remarked, that oak bark contains a number of other substances, besides the astringent matter, and that, therefore, the quality of the leather depends in a great measure on the mode in which the infusions are made. One of the substances in the bark, is what is called *extract*, and which is soluble, but not so much so as the astringent matter. Skin has the power of absorbing this, by which the leather probably acquires its color and flexibility; if, therefore, the tan-liquor be so made, that it contains little of the extract, the leather prepared may absorb a great deal of the astringent matter, and thus become brittle, and more liable to crack. Hence probably the cause of that manufactured in the French way not being so durable as the other, for, by the method of forming the tanning fluid, much of the astringent, and little of the extractive matter is dissolved. Besides, when the process is carried on quickly, the outer part of the skin only is converted into leather, because, this being speedily tanned, prevents the fluid from penetrating any farther.

The great objects to be attended to, then, in tanning, are, to procure from the bark as much of the soluble matter as possible, and, could some means be devised by which the skins could be made to imbibe this quickly, a great deal of labor, time, and money, would be saved. On this is founded the patent process of Spilsbury, of forcing in the tan-liquor by pressure. For this purpose the skins, after being cleaned, are stretched on frames, which apply closely to each other, but so as to leave a little space between the hides. Pipes are connected with these, and the fluid allowed to flow into the compartments from a cistern placed above them, by which, owing to the pressure, it is forced into the hides. It is said, that in this way, skins which require a year according to the old mode, may be tanned in six weeks, and that some may be finished in a few days; it is doubtful, however, if the leather prepared is so durable, for, from the forcing in of the fluid, the skin does not appear to take it in uniformly, so as to tan completely the whole of it.

The *tawing* of skins, by which they are also converted into leather, is more speedily accomplished than tanning. The skins subjected to this process, are those of goats, sheep, lambs, and other thin hides, by which *glove leather*, and that usually called *morocco*, are prepared. When the leather is to be white, it is merely subjected to tawing, but when intended to be dyed, it also receives a slight tanning.

The process followed for preparing the skins, is nearly the same as that described. They are first freed of the dirt and blood by washing, and hung in a room heated by stoves, till they begin to putrefy, which is known by their emitting the odour of ammonia or hartshorn. During this a slimy matter collects on the surface, which is removed by placing them on a cylindrical piece of wood, and scraping them with a knife, and the hair is at the same time pulled off. They are next put into a pit of lime-water, and kept there for some weeks, according to their size, by which the putrefaction is stopped, and they become much thicker and harder; and after being deprived of the superfluous matter, by scraping them on the beam, they are placed in a mixture of bran and water, in which they remain for some weeks being occasionally scraped. By these processes, the whole of the lime and slimy matter is removed, and the skin is fit for tawing, in which state it is called a *pelt*.

Tawing consists in soaking the pelts in a warm solution of alum and common salt, by which they become thick and tough. They are then, after being washed, put into a vat with bran and water, and allowed to ferment for a short time, so as to remove a great deal of the alum and salt, after which they are stretched on frames, and kept in a heated room to dry.

By these means, a thin white leather is procured, which is made smooth and glossy, by soaking it in water, containing the white of eggs. It is then dried in a heated room, and the gloss given to it by smoothing it with a hot iron.

In the process of tawing, it is supposed that the skin imbibes something from the saline matter probably *alumine*, by which it is converted into leather; this combining with the substance of the skin, in the same way as the astringent matter does in tanning.

When the leather is to be dyed, as in preparing black morocco, after being tawed, it is soaked in a solution of *sumach*. It is then rubbed over with a solution of green vitriol, by which it becomes black, the same action taking place, as in the preparation of ink; and after this, it is polished by glazing it with a glass ball, or, if required to have the ribbed appearance of morocco, by using one of boxwood, round which a number of small grooves are cut, and by which the roughness is communicated to the leather.

Currying consists in soaking leather in some oily substance, by which it is made more impervious to water. For this purpose, the hides, after being tanned, are soaked in water, and then thinned by scraping them with a knife, after which they are rubbed with a polished stone, and well besmeared with oil, or oil and tallow. They are next hung in a room to allow the moisture to escape, and the oil to penetrate them thoroughly, being afterwards dried, either in sunshine or by exposure to heat.

Shamoy leather is merely sheep or doe's skin, prepared as already described, that is, tanned, and then subjected to the process of currying.

It is of the utmost consequence for tanners, and others using astringent matter, to be able to judge of the quantity of *tannin* in any article exposed for sale, particularly as it varies so much in different samples of the same substance, owing partly to the age of the vegetable, and to adulteration. Different methods have been recommended, but by far the best, is just that followed by tanners, but conducted in such a way as to be quickly finished. It is well known that skins will continue to imbibe the astringent principle for many months; but on a small scale, the whole tan may be removed from an ooze in a few hours. For this purpose, the astringent matter being ground to powder, 1000 grains are to be infused in water at about 100°, and after the whole of the tan seems dissolved, the fluid must be strained, and the insoluble matter, washed, till the water passes through tasteless. A certain quantity of this, say *one-tenth*, is to be placed in a bottle, along with some pieces of skin, previously washed with warm water, to dissolve the lime, employed in taking off the hair, and to remove the loose gelatin; the skin being dried by exposure to air, and weighed before being put into the bottle. Leaving them there for a few hours, turning them frequently, the whole of the tan will unite with the gelatin, and thus convert the skin into leather, so that, by drying it, and weighing, we find the quantity of tan that existed in the infusion, of course of 100 grains of the astringent matter.

The best skins for this purpose, are the fresh curriers' shavings from the strong hides, intended for harness, or ox-hides split very thin. They must, after being treated as above mentioned, and weighed, be put into tepid water, and *handled* for a few minutes, to open the pores, and allow them to imbibe the tan."

There are a great variety of vegetables, which abound in tannin; probably many, which have never been used for the purpose of tanning skins. An artificial tannin has been made by Mr. Hatchett, " by the action of heated diluted nitric acid on charcoal, and evaporation of the mixture to dryness. From 100 grains of charcoal, Mr. Hatchett obtained 120 grains of artificial tannin which like natural tannin, possessed the property of rendering skin insoluble in water.

" Both natural and artificial tannin form compounds with the alkalies and the alkaline earths; and these compounds are not decomposable by skin. The attempts that have been made to render oak bark more efficient as a tanning material by infusion in lime-water, are consequently founded on erroneous principles. Lime forms with tannin, a compound not soluble in water."

The quantity of tannin varies, in the same substance or bark, according to the time of year in which it is cut, and also according to the temperature in different seasons. " When the spring has been cold," says Davy, " the quantity is smallest. On an average, 4 or 5 lbs. of good oak bark are required to form 1 lb. of leather. The inner cortical layers in all barks, contain the largest quantity of tannin. Barks contain the greatest proportion of tannin at the time the buds begin to open—the smallest quantity in winter."

Some very good remarks upon tanning different kinds of leather, have appeared in the *Technical Repository*, which we shall copy in

AGRICULTURE.

PLANTING.

The time is now near at hand, when the provident and industrious farmer must commit the seed to the earth, in order to obtain a crop for future consumption. Many have a set time for this business;—some particular day of the month;—the particular phase of the moon;—the blossoming of some shrub, or the first appearance of some bird in Spring, is generally the monitor to warn the husbandman that seed time has come, and, if he would reap an abundant harvest, he must prepare for it now. The general appearance of the natural objects around us—vegetable, as well as animal, are pretty sure indications of the advance of the seasons. As it regards the changes of the moon, we are not yet *Lunatic* enough to observe, or be influenced by them, in our movements. We have made some experiments upon the subject of planting various kinds of seeds, with the view of ascertaining how early it will do to plant them in this climate; and also, how late in the season it will do. In the latter case, we have subjected ourselves to not a little ridicule by the "lookers on," and——. We have here, a mind to digress a little, and say a few words on Agricultural experiments. We have been guilty of trying a few. Have dared, in more than one instance, to step out of the beaten track of those around us, and stray a little for *amusement*,—not for *profit*. No small share of the amusement consisted in listening to the *sage* remarks that have been made upon us, and the *fun* that the *witty* and the *wise* have had at our expense. We have been honored with the title of *Book farmer—Fine farmer—Simpleton*—nay, one old man, (whose grey locks we should have felt disposed to respect, had not his tongue betrayed the *vacuum* which they covered.) openly, and loudly proclaimed us a *Fool!!* and all, forsooth, because we planted a few potatoes late in the summer,* in order to ascertain how large they would grow, between then and frost; and

* They were planted on the 25th and 26th of June, were the Chenango Potato, a sort somewhat earlier than the common Orange. Had it not been for a drought, which set in about the time the tubers were forming, they would have done well. As it was, they grew to a middling size, and cost, including expense of breaking up the ground, &c. 35 cents per bushel. The breaking up of the soil is considered by Political Economists, as fixed capital. The expense of that should, therefore, be deducted, which will bring the cost of the crop somewhat less. We have known potatoes—planted (in Maine) on the 4th of July, and yield a good crop. The success must depend, however, upon the season.

also, to ascertain whether, in unfavorable seasons, or under particular circumstances, late planting would not answer nearly, or quite as well, as standing in Grog-shops and at corners, berating Providence, and prophesying *no crops! no crops!*

We would here take the liberty of informing our captious brethren, that, as "one swallow makes no summer," so one experiment in Agriculture, does not always elucidate or establish one fact. Hence we intend to commit more breaches upon the common routine; and be guilty of further folly, in vexing the soil, in our own way, and time. We keep a *log-book*, wherein we carefully record our proceedings, and the various results of our labors, and we hope so to do, for sixty years to come. We would recommend the plan to all farmers.

Our first knowledge of practical farming we obtained by imitating others. That is, by doing as those did, who were placed over us and required to get as much labor out of the *boys* as they could, (not much at the most.) It was probably the same routine of operation practised by the veteran Pilgrims of the Mayflower, and which has been handed down from father to son and from generation to generation, even unto the present day. We are as well acquainted with it as we wish to be, for we had it fixed in our memories by—what was then tedious—experience. We say *tedious*, for we remember well the long and sultry days—and the many anxious looks at the distance between the sun and his "hiding place," verily believing that he stood still, as he did in the days of Joshua. We like the business far better now; and for this reason,—we can see some *meaning* to it. Then it was a task.—A business for the hands in which the head could discover neither "Rhyme or Reason." Our corn must be planted nearly at such a time. Why? Because the planting bush was out.* The rows must be just the distance of the hoe-handle apart. Why? Because it was just four feet. There must be just four kernels in a place, and a *pumkin* (pompion) seed, in every-other hill of every-other row,—whether the soil was barren or fertile. The soil in some places, must be manured. Why? Because it makes it *richer*. How? *Because it does.*

We ascribe no blame to any one for this want of explanation. We were kindly told all that they knew about it. It has been our

* Pyrus Arbutifolia of Willdenow—Choke berry—Swamp pear—Planting bush, so called, because the Indians considered it an indication that the season had so far advanced that there was no danger from frost.

good fortune since, to get a little more insight into the theory, and to receive more satisfactory explanations of what was before, a mystery to us. Although many things are yet behind the veil, many, which have baffled the skill of Philosophy and Science, yet what is known, is sufficient to reward every inquiring mind for the research, and to change the practical labor and fatigue of farming, into a rational and delightful employment. We will now proceed to our Planting, and first of Indian Corn. We would recommend to put this in as early as possible, after the earth is in a suitable situation to receive it, or as soon as there is no danger of the frosts killing the roots. It will bear more cold perhaps than most people think it will. Hear what JOHN LORAIN saith:

"It should, however, be remembered, that where the seasons are short, planting and sowing as early as frost will permit, is of the utmost consequence. The contrary practice has completely excluded many valuable plants which would have produced abundantly, if farmers had not considered it necessary to postpone planting and sowing, until the grounds were, agreeably to their opinions, sufficiently warm. This is a fatal error, especially as the ground is frequently warmer, and the soil better calculated to promote vegetation, in the more early part of spring, than it is at the remote periods they fix on for planting and sowing. After the plants have taken root, many kinds which are now considered very tender, are nothing like so susceptible of serious injury from frost as farmers and gardeners too generally suppose. If they should happen to be destroyed, they may often be resown or replanted, in time to stand on an equal footing with those planted or sown at the usual time. But this labor and expense may be generally avoided, by observing what degree of frost the plants will bear without material injury, and the time in the spring, when, in the common course of events, such frosts are not to be expected.

It is thought that the spring opens ten or fifteen days later here, than in the vicinity of Philadelphia, where I resided several years previously to my removal to this place early in June, 1812. Still I plant corn here, much earlier than it is planted there, to wit, from the 23d of April to the 1st of May, as the season may happen to suit. From the 10th to the 15th of May, was the common time of planting in the neighborhood from which I removed, but some planted much later even than this, as it too often happened that cold rains or other causes, determined them to wait until the ground was warmed.

When I planted my corn on the 1st day of May, 1814, a few clusters had been planted by a neighbor in his garden, on the 9th of April. These plants were in general cut off two or three times by frost, yet they maintained a superiority over the corn planted by me on the 1st of May, until the growth of the peas and beans planted quite too close to the maize, greatly injured it. As there had been a hog-pen in one end of my patch, it was very clearly seen that superiority of soil was not the cause of this marked difference.

When corn is planted very early, it is commonly severely affected by frost; so much so, that many of the plants are cut off by the ground. This is unquestionably an injury to which no judicious farmer would expose the plant, if the advantages obtained by very early planting, could be had by planting later. Still if the roots remain unhurt, they are of consequence established, and very soon repair the injury done above the soil, after the frost ceases to act on the plants. Of course they take the lead, and will maintain their superiority over later planted corn. The ears also fill and ripen much better in northerly climates from this practice.

The shooting and filling of them take place when the heat of the sun is much greater; and when less cloudy, cold. dripping weather prevails, and the crop is nothing like so liable to be injured by frost. The grounds are also sooner ready for crops sown in the fall. This mode of management will often enable the cultivator to grow the large and more productive corns, in climates where they have been abandoned, from observing that they did not ripen when planted at the usual time.

When I introduced the large yellow gourdseed corn, from seed procured from Huntingdon county. every farmer here ridiculed the idea of attempting to grow corn of this description. They considered the soil and climate hostile to the growth even of the smaller corns, and but little was planted. As they waited until the earth was warmed before they planted. the crops were frequently either destroyed, or greatly injured by frost.

I had, however, seen the effects of early planting, and knew that these men had been more or less conversant with it ever since they had been old enough to assist in the labor done on a farm. They were ignorant of the properties of maize, merely from not having sufficiently considered that a farmer ought to endeavor to become acquainted with the economy of the plants cultivated by him.

If they had thought of this, they might have seen that the corn planted by them, and every-body else, for growing early roasting and boiling ears, was generally put into the ground much sooner than that planted in fields. Also, that the corn planted for early use always succeeded, unless the roots were materially injured by frost; and that this seldom happened: as actual and long-continued practice in their gardens had taught them, that it was unsafe to plant for this purpose until material danger from frost had passed by. For although gentlemen who keep gardeners, and those who grow early corn for market, plant the very early varieties for green corn, farmers very often plant the same kind which is grown in their fields.

As it seldom occurs that the whole of the ears are pulled off when gree , practice, in his garden, might long since have taught the farmer, that early planted corn, in cold, backward climates, eared and filled much better than corn planted at the usual time:

also, that the causes of this were more sun, less cold, cloudy, falling weather, and frost, during the shooting and filling of the ears, and the hardening of the grain. The natural conclusions drawn from those facts, if they had been duly considered, must have been that the same good effects would occur in their fields if the same practice were pursued: also, that by early planting they would avoid that destruction of their crops which so often occurs in high latitudes, merely from planting quite too late.

Notwithstanding these very interesting facts have been as obvious ever since corn has been planted by Europeans and their descendants in this country, I do not recollect ever to have heard any thing said, or to have seen any thing written, on this subject.

Local causes alter climates so much, that the only sure criterion by which we may determine how soon corn or other seeds may be planted in many neighborhoods, is to observe when, in the general course of events, this may be done without risk of any material injury from frost. The ridge of quite a low mountain, or, indeed, the ridge of a high hill, will make a difference of several days in the proper time of planting or sowing in the valleys on the opposite sides of them; although these valleys be not more than two or three miles apart. Other causes, also, produce similar effects.

This shows the very great advantages which would be derived if intelligent farmers, in every neighborhood, would take notes on the weather, and its effects on vegetation.

Neither latitude, nor height, nor the influence of surrounding seas, can determine this subject sufficiently correct for agricultural purposes.

No kind of dependance can be placed on the Indian rule for planting or sowing. It may be of some use to them, whose observation is limited greatly by savage ignorance, but of none to us. We sometimes see the same vegetation which usually takes place in May, about the time corn is commonly planted, occur in February, or the fore part of March; when no rational cultivator would plant corn in any part of Pennsylvania where I have been.

The corn-plant is easily destroyed by frost in the fall, being then debilitated by age, or exerting all its powers to perfect its fruit. But when young, it is much hardier than is generally supposed. I have observed it for several days together coming up through the heat of the day, although the surface of the soil had been slightly frozen in the morning.

The spring after I removed to this place, Dr. Dewees, with Mr. Philips and myself, planted the yellow gourdseed corn on the 30th of April and the 1st of May. The season continued sufficiently mild to establish the roots of the plants, although many of their tops were severely affected by frost, and some of them cut off nearly level with the ground. The weather, after we had planted, was not quite so favorable, and continued to be such as farmers too generally consider unfit for planting maize.

Forty or fifty miles around us, (except two fields in this neighborhood, which the cultivators planted earlier than usual,) but little corn was made: a great many fields were of so little worth, that scarcely any grain was gathered from them. although the two first mentioned crops were considered excellent by all who saw them.

Farmers attributed this failure in their corn crops, to a continuation of wet, cool weather, through the spring and fore part of the summer, joined with a severe drought in the latter part of the season. But as the two luxuriant fields mentioned above were subjected to the same events, I can see no cause for this marked failure in the crops generally, except procrastinating planting until the earth was thought to be sufficiently warmed; which did not happen until it was too late to grow even the smaller corns with tolerable advantage, unless the latter part of the season had been very favorable.

No rain fell on my field from the 30th of July to the 1st of September; during which time moisture is particularly required in this climate, to fill the ears; yet I had never grown better ears before.

If the farmers had planted as early as I did, and cultivated their fields well, no question the same would have occurred in their corn crops; for the economy of this invaluable plant is well calculated to withstand the severest drought.

My field of corn, planted last spring, (1815,) with the same kind of seed, on the 24th and 25th of April, was doomed to withstand much severer frost than that just mentioned.

On the 15th and 16th of May the ground was frozen so hard that I peeled off the soil in cakes, to nearly, if not quite, three-quarters of an inch thick, and observed loose particles of congealed moisture still deeper than this.

Many of the plants were cut off by the ground, and yet I have never grown so large a crop of maize. It was still more remarkable, that some of the plants which were growing from seed, that by inattention was scarcely covered with soil, were not destroyed. It would appear that the earth screened the roots from the too powerful effects of the sun, and that a gradual thaw preserved them from injury."

Lorain was a *practical* farmer, lived, according to his own story, in a log-house, in the back-woods of Pennsylvania; and, strange as it may seem, was a "*book farmer*;" or, in other words, wrote a book—a practical book, and one which ought to be read by every farmer in New-England. Not that all his remarks will apply to every case, or farm; but there is much sound wisdom in it, which would be valuable to every one,—many maxims which ought to be remembered. Here is one: "The farmer's pride should rest in the display of luxuriant crops, obtained with the least possible expense, especially if he be very rich, as his example might go very far towards turning the tide of vanity into the proper channel."

RUTA BAGA AND MANGEL WURTZEL.

There is one kind of crop, which the generality of Farmers in the northern parts of New-England, do not sufficiently appreciate, viz: Root crops. Almost the only vegetable of this kind, grown among them, is the Potato, and not so many of these as there ought to be. They are more cheaply produced than any other kind, but they are not so valuable for cattle, (all things considered,) as the Ruta Baga, or Mangel Wurtzel, or, as it is sometimes called, "Scarcity." Cobbet has written a very interesting treatise on the culture and use of the former, (Ruta Baga,) which he extols above every other esculent root on earth. But next to Potatoes, the Mangel Wurtzel has been with us, most easily raised. They are full as hardy, and have but very few enemies to encounter, while the Ruta Baga is continually harassed, and not unfrequently destroyed by insects. Cobbet says, in his work, that the turnip fly does not exist in America. Perhaps the scourge which desolates the turnip fields in England does not, (not having seen a specimen, nor a description of them we cannot tell,) but there are flies enough, (or, as the Yankess call them, *bugs*.) that do. In the May of 1826, we planted a piece of ground with Ruta Baga; Mangel Wurtzel was also planted with them, alternating with the Ruta Baga. Every one remembers the intense drought which took place, and the myriads of Grasshoppers and he voracious insects which thronged the fields and gardens during that summer. In the hottest and dryest part of the season, when the "rain upon the land was powder and dust," and the grasshoppers—rivalling the 'clouds' of Egypt in numbers, devoured almost every thing that stood in their way, not even sparing the "*Board-fences*"—this plant (the Scarcity) flourished unhurt and almost untouched. At first it was thought the Ruta Baga saved them by affording the marauders a more agreeable meal. But they finally demolished the whole crop of them and still the Mangel remained uninjured. Those who cultivate those crops, can use their own judgment, as it regards the manner of procedure. There are two methods, however, which we shall notice, and which are most generally practised. One of them was introduced and practised by Cobbet while he resided on Long Island, N. Y., and the other is recommended by John Hare Powel, Esq. of Powelton, near Philadelphia. Cobbet's method is briefly as follows: After the ground is ploughed and well-harrowed, a trench or furrow is made by the plough, filled with manure, and covered by turning furrows over it, two on each side. This makes a ridge above the manure, upon which is planted the seed. It is then rolled with a light roller, to bring the earth more in contact with the seed. The ridges are about two or three feet apart, and he recommends to plant the seeds 10 inches from each other.—Powel's method and practice can best be shewn by an extract from his own communication to the President of the Pennsylvania Agricultural Society on the subject.

"My soil was not naturally strong; it has been gradually so much deepened, as to enable Wood's plough, No. 2, drawn by four oxen, to plough fourteen inches deep. Fresh barn-yard manure was equally spread upon the surface, and ploughed under in the early part of April, in quantities not larger than are generally used for potato crops in this county. Early in May the land was twice stirred with Beatson's scarifier--harrowed—rolled--after stirred—harrowed. and rolled again in the opposite direction. The holes for the seeds were made by a wheel containing pegs in its circumference, which penetrated the ground about an inch, leaving intervals of four inches; the rows were made two feet asunder; two capsules were dropped into each hole; the wheel of a common barrow, was passed over them; thus compressing the earth, and leaving a slight rut, for the retention of moisture.

A small cultivator, which I had contrived for the purpose, was drawn between the rows soon after the weeds appeared; a three-inch triangular hoe removed the alternate plants, leaving the others at distances, varying from 8 to 12 inches asunder. The cultivator was twice used before the 20th of July. The heavy rains of August made another hoeing necessary, and surcharged the ground so much with moisture, that all roots increased much less in that month, than during the same time, in the two last years.

The failure which attends the cultivation of most root crops in drills, proceeds from the neglect of weeds in their early stages. Four or five days of delay, frequently make the difference of fifteen days in the labor of making clean an acre of ground. The same weeds which a boy with a sharp shingle could remove at the commencement of one week, may, before the end of next, require the application of an implement drawn by a horse.

I ascribe my success, in great measure, to the use of *Wood's extraordinary Plough*, which enters the soil more deeply, and pulverizes it more perfectly than any other I have ever seen, with equal force in any country—to the use of cultivators, which complete the production of fine tilth--to the destruction of the weeds on their first appearance—to leaving the smallest space upon which a horse can walk between the rows, and above all to *planting the seeds of a proper kind upon a surface which is kept perfectly flat.*"

The expense of preparation for a Mangel Wurtzel crop, says Powel, is not so great as might be supposed. He states it to be

$30, but does not include the cost or worth of the manure.--Now we have tried both methods. We have raised *drills*, or ridges long and high, according to the minutiae laid down so particularly by Cobbet;* to the no small merriment of those who never heard, or saw any thing of the kind;† and we have marked out our drills on smooth ground, by a wheel with pegs in it, planted our seeds in the footsteps thereof, over which we trundled a wheelbarrow, as directed by Powel. The result is, we are convinced, that in nine cases out of ten, Powel's method is the best.

It is in the soil which was cultivated in the experiment, which to all intents and purposes is an argillaceous, or clayey soil. On good soils the yield of both kinds of root, is very abundant. Powel raised on one acre and fourteen perches of ground, 1631 bushels of Mangel Wurtzel, weighing 78,448 pounds.

There are many other instances of large crops on record. But in nearly all of them, I find there was one very *essential service* rendered the soil, viz: no small quantity of *excellent manure;* and yet the return in crop (in most instances) more than repaid all expenses. Indeed, it may be laid down as an Agricultural maxim—*Always put on to the soil a little more in substance than you take off.* Manure may be considered as the *raw material*, which nature and good cultivation manufactures into articles of tenfold value.

The Ruta Baga and Mangel Wurtzel should be planted by the first of May, if you would have them acquire a large size. For the table, they may be planted later. We have planted them on 20th of June; they grew sufficiently large for the table,--but this is too late, all things considered. The soil should be deeply ploughed and well pulverized, in order to allow the tap-root to descend freely and deeply into it.

There have been a great variety of machines invented for sowing the small seeds, most of which are very expensive and complicated. We would, however, recommend one very ingenious and very simple contrivance, invented by Mr. *James Williams.* A figure and description of it, may be found in the 8th vol. of the *American Farmer.* It is simply a tube of wood, or tin, about 3 feet 6 inches long, and may be one, two, or three inches diameter, as one may wish. In order to use it, you fill your right waistcoat pocket with

* See his "*Year in America.*"

† What are you making those sand *winrows* for? said a wag to us while engaged in the business.

the seed, take the tube in your hand, place one end on the spot in which you wish to drop the seed, and taking one, two, or more of them from your pocket, let them fall through the tube. By this mode you avoid all stooping, and however light may be the seed, or however strong the wind may blow, the seed is lodged where you wish it to be. These tubes may be made, by tacking together four pieces of *lath* or *clapboard*, each about two inches wide. The cost cannot exceed a four-pence half-penny. When it is desirable to plant the seeds any particular number of inches apart, a piece of thin stick, or shingle, may be tacked on the bottom of the tube, (as long as the distance required,) making a right angle with it,—placing the end of the stick on the place where the seed last dropped is, will bring the other end of the tube the requisite distance from it, and in this way, you can drop the seeds at any particular distance apart, that you wish.

But, say some farmers, what is the use of all this trouble? We raise corn, and wheat, and potatoes enough for our tables, and our cattle have plenty of good hay, and now and then a *nubbin** of corn. Ye do well, but we would have you do better. The comfort, and we may say *happiness* of our cattle should be carefully attended to. It is a duty which we owe to the Almighty, to make every creature whatever, over which we are placed, as comfortable as we conveniently can. In doing this, we should inquire into the appetites and natural habits, which the animal possesses, and should endeavor to let him live, according to these habits, as far as would be consistent with the domestic habits, which man has established in him. The natural food of cattle and horses, is green and succulent herbs, and we find that nature originally placed them in situations, where these could be always obtained. But man has removed them from these situations. He has brought them under his control, and made them dependent upon him for subsistence. He has taken them from the perrenial pastures of the tropics, and gradually habituated them to a colder climate, where, for almost half the year, they are compelled to live on dry fodder. It is true, they live, and even thrive on this. But is it natural to them? Ask the first ox that you meet. Place before him a lock of the best hay, and a plat of the best grass, and he will tell you, in language that cannot be misunderstood, which he prefers. Again, place before him the same grass and a quantity of succulent

* Yankee term for a small ear of Corn.

roots, such as Potatoes, Ruta Baga, Mangel Wurtzel, and he will, more than half the time, leave the grass, for the roots. It is impossible for us, in this country, to give our cattle grass in the winter; but we can give them that which they like as well, and oftentimes prefer—roots, and we are inexcusable if we do not do it. It is not denied, that they will live, and do well upon dry fodder.—So can a man live, and perhaps do well upon dry biscuit and water. But place before that man a quantity of fruit, or even a *roast potatoe*, and mark with what greedy pleasure he would devour it. Will any one say that the brute, who has been confined upon dry food, does not experience as much or more pleasure from a similar change? We think not. Such a change, therefore, adds to their pleasure—adds to their comfort—adds to their health; consequently adds to their value, and to the wealth of their owners. We can conceive no greater source of genuine delight, or better cause of self-congratulation to the farmer, than a full fold of thriving, healthy and happy cattle. There must be a feeling of exquisite satisfaction, in the breast of a benevolent man, when he reflects that he has done all in his power to relieve, and has relieved the wants of those that are dependent upon him. No matter whether it be a dog or a child; no matter whether it be a rational or an irrational being, it is all the same in effect, if not in degree.

With what intense pleasure must that farmer listen to the howling of the storm, as he sits by his fair blazing fire in the evenings of our cold winters, who knows that his cattle, his flocks, and his fatlings, are safely sheltered from its rage, who knows that they are full fed, and who daily receives their caresses, and marks their silent, but eloquent expressions of gratitude, whenever he goes among them. Those of you who have often experienced these feelings, and those of you who wish to experience them hereafter, are reminded that you must be up, and be doing. The genial and the merry month of May is at hand, and if you would have old winter find you with full barns, with full granaries, and overflowing bins, you must improve the time accordingly.

AGRICULTURAL QUERIES.

[CONTINUED.]

8. *Grasses.* What kinds of grasses are cultivated? How much seed do you sow upon an acre, stating the kind or kinds of seed?

In what proportion do you mingle clover and herds-grass, when sown together?
What success with red clover, when sown by itself? Does it succeed better with rye than with wheat, as is said by some?
What is the average quantity of hay upon an acre of upland, stating the kind or kinds of grass cut, and its age?
How much labor to an acre in mowing, making, and housing the hay, allowing for the weather and the state of the grass?
How long is land generally kept in grass, before breaking up for tillage?
Can land be preserved many years in good state for grass by manuring it, without ploughing?
What is the average quantity of hay on an acre of fresh meadow?
To what kind or kinds of grass is gypsum most beneficial?
What quantity of gypsum do you apply to an acre of grass, and at what time or times?
Do you repeat the application every year?
What per cent. increase of grass does gypsum give, when most successful?
What methods are pursued to obtain good grass seed?
What weeds infest the mowing ground?
Is salt often mingled with hay, when put into the barn, and how much to a ton?
Is chopped hay or straw ever employed for fodder?
What gsasses afford the best pasture?

9. *Wheat.* How many acres on a farm of average size are usually sown with wheat?
What soil is found to be most favorable?
How is the land prepared and manured, and what quantity of manure to the acre?
By what crop usually preceded?
What kind or variety of wheat is generally cultivated?
What observations on the comparative advantages of sowing winter and spring wheat, in those parts of the State where winter wheat is found to succeed?
What quantity do you sow upon an acre, and what is the average crop?
How many days' labor are expended in cultivating an acre of wheat, including the threshing?
Is a *roller* often employed after sowing wheat and other grain?
What do you consider the best process for preparing seed wheat to prevent smut?
Is it important whether the seed be old or new?
What observations have you made on mildew, rust, and smut, as connected with the kind of wheat, or character of the season?
What observations on gypsum, lime, and ashes, as manures for wheat?
When winter wheat is sown, ought the grass, which is designed to accompany it, to be sown at the same time, or in the following spring?

What is the quantity and value of wheat straw upon an acre? To what uses is the straw applied?
In ordinary seasons, what is the cost *per bushel* of cultivating wheat on old land, including in the estimate a fair charge for the value of the seed, manure, labor, &c.?

10. *Indian Corn.* How many acres on a farm of moderate size, are usually planted with corn, or, what proportion of tilled land is so planted?
What soil is most favorable to its growth?
How is the land prepared and manured?
What kind of manure is preferred, and what quantity to an acre?
When planted in hills, at what distances each way?
What quantity of seed to an acre, and what the average crop, when shelled?
How many times is it ploughed or hoed?
Is corn ever planted in drills or rows?
In what manner do you apply gypsum to corn, at what times, and in what quantities?
What are the comparative effects of gypsum and unleached ashes, when applied to hills of corn, after hoeing?
What rules do you observe in selecting seed-ears?
What kinds of corn are preferable, either for the quantity they yield, or for ripening early?
What remedies do you employ against worms, or, how do you prepare the seed for planting?
Are the suckers ever removed, at what time, and what the effect upon the crop?
Do you gather the ears only, or cut the stalk near the ground with the ears upon it?
What is the comparative value of equal weights of the stalks of corn and upland hay for fodder?
How many days' labor are expended on an acre, including the housing and husking?
What is the usual mode of shelling corn? What machines are employed? How many days' labor in shelling 100 bushels?
Have you any observations on the use of corn and cob meal for cattle or swine?
Is corn ever sown broadcast to be cut green for fodder?
In ordinary seasons, what is the cost *per bushel* of cultivating corn, including in the estimate a fair charge for the value of the seed, manure, labor, &c.?

[TO BE CONTINUED.]

MISCELLANEOUS.

For the Farmers' and Mechanics' Journal.

MR. EDITOR,—Your remarks upon the improvement of the breed of Horses, in this section of New-England, are well timed. There, perhaps, was never more need of some well-directed exertion in this business. Your notice of Mr. Williamson's *Warrior*, has induced me to call and see him, and although I could point out defects, or what appear to me to be defects, yet I think you have hardly done him justice. As you observe, I have seen *prettier* horses. The Quicksilver was a prettier horse, to my eye, as far as mere beauty was concerned, but he was not, on the whole, so noble in his appearance; nor did he move with so much strength and grace. I may be mistaken; every one, as you observe, has his whim or prejudice in the choice of a Horse. I am gratified to learn, that there are others which have recently been brought into this vicinity. I wish some one who has seen them, would give some notice of them; and I hope, that farmers will use a little discretion, and select those that are best adapted for their Mares. I mean those that will be most likely to correct their defects, in their offspring. Every Horse has his faults, or is defective in some points, and it should be the duty of breeders, to guard against these defects in their Colts, by carrying their Mares to Horses that will be most likely to correct, rather than increase them.

A FRIEND TO A GOOD HORSE.

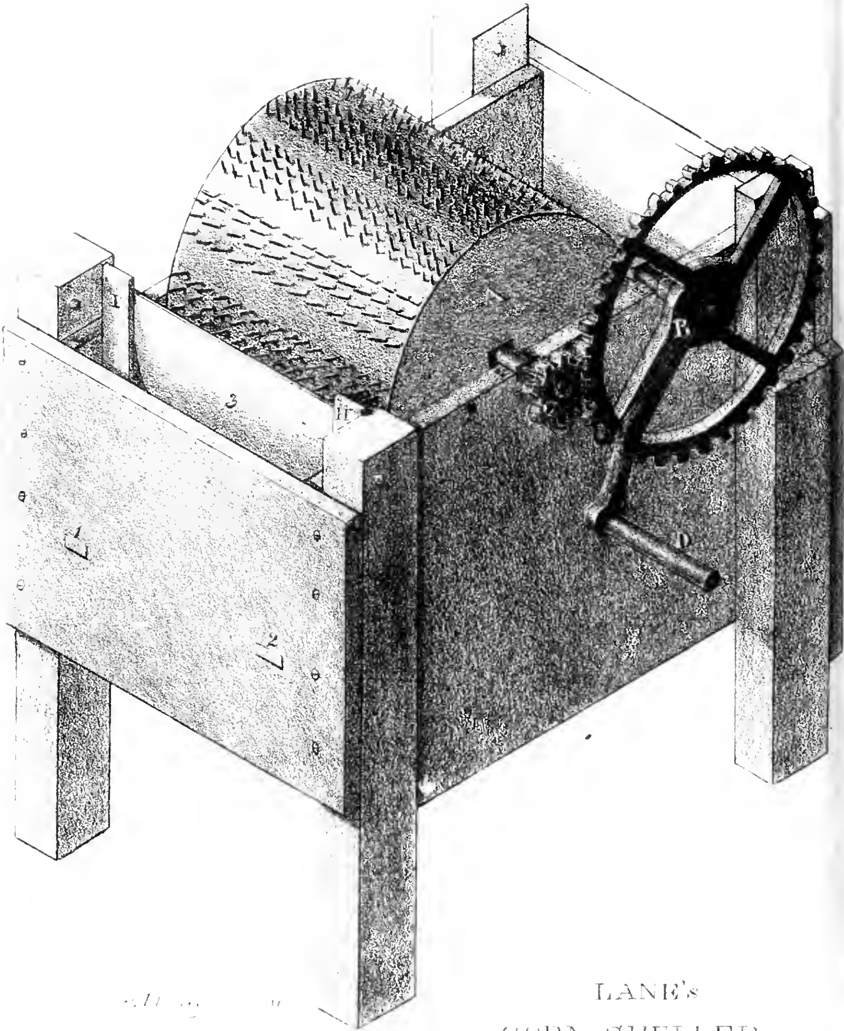
For the Farmers' and Mechanics' Journal.

QUERY. In what manner is Gypsum prepared for Plaister or Cement?

PUTTY. I have learned by observation and practice, that two parts of Whiting and one part of fine Plaister of Paris, makes a Putty much superior for setting glass than the Whiting alone; does not often crack; becomes hard much sooner, and is very strong; and am inclined to think, that, if it were as fine as Whiting, it would alone make as good Putty as any used. I have also found, that fine lime and linseed oil will make a putty or cement that hardens under water.

POTATOES. From an experiment, made last year upon a small scale, I have reason to believe that Potatoes might be growed to advantage upon the ground bark taken from the tan-pits, either in the yard, or laid upon rocks, clay beds, or on the grass, or anywhere else—sufficiently thick to preserve moisture. They will need no cultivation between planting and harvest. I would recommend to plant such pieces as will take about three to a hill, put them eight or ten inches apart in the row, and have the rows from 18 to 24 inches distant from each other. S. HILL.

Union, Me.



LANE's
CORN SHELLER.

THE

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MECHANICS.

LANE'S PATENT CORN-SHELLER.

PLATE V,—is a representation of a machine for shelling Indian Corn, invented by Mr. SAMUEL LANE, of Hallowell, Me. A machine, peculiarly useful and convenient to those farmers who grow large quantities of that article, and especially to the farmers' boys, who well know the trouble and time it takes to shell their *bushel*, in a winter's evening, by the aid of a *shovel*, a *bodkin*,* or *cob*.—This machine consists of a large cylinder filled with iron points or pins, that project an inch or two above the body of the cylinder. At a little distance from this, is placed a bed, or concave piece of wood, also filled with points, and which is fixed upon springs, in such a manner as to yield, or come closer, as the ear of corn is larger or smaller.

A is the Cylinder.

B, a large Cog or Spur-wheel, which is moved by the Winch D, and plays into the Pinion C, thereby causing the cylinder to revolve.

I, H, Springs, to which the Bed 3, is attached.

3, Plate, or Bedding, filled with pieces of iron plate, projecting towards the cylinder.

1, 2, Springs, which pass under the bedding.

The corn is put in between the piece 3, and the cylinder, is car-

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* Necessity is the mother of invention. Every urchin who is doomed to shell his share of corn, knows how to convert either of the above named instruments into a labor-saving machine, when he is desirous of finishing his task, that he may have the more time for play. Some of our best machines have originated from boys, who were eager to pursue their sports, and found *contrivance* better than *strength*.

ried under and discharged on the other side, in such a manner that the cob and the grain are completely separated.

This simple machine may be had of the Inventor for from 6 to 10 dollars. It has been thoroughly tried. Two boys have shelled eighteen bushels per hour by it. This however is probably working faster than they would wish to, all day. It is certainly worth the consideration of the farmer. A machine that costs but little and saves so much labor, should be extensively used. One might serve for a whole neighborhood; in this case the expense to individuals, would be very small and the advantages the same.

While we are upon this subject, perhaps it will not be amiss to make some remarks upon employing machinery in agricultural work.—We will acknowledge that there have been too many complicated and expensive machines palmed upon the public, and cried up as being of immense advantage to the farmer, on account of the time and the labor they would save, when in reality, they were time-wasting and labor-making inventions, rather than otherwise. Yet these failures ought not to prejudice the mind too deeply against inventions. The same failures have repeatedly happened, and are still occurring in manufactures, and yet they are indirectly useful, for they lead on to improvement, and point the way to more simple and successful schemes, by which the desired object is finally accomplished; and what is the reason that the same mode of procedure will not hold good in Agriculture? None. The same or similar reasoning which the manufacturer urges in regard to machinery, may with the same propriety be urged by the Farmer; viz: "Every invention that lessens the expense of farm-labor, enables the farmer to employ additional hands in carrying on other works, and, in all improved farms, these works are so numerous, that employment can never be wanting for laborers, as long as the means of paying them remain with the employers."

JONES, ON JAPANNING AND VARNISHING....No. 5.

White, or light colored Spirit Varnishes.

We have formerly remarked, that although the varnishes made from lac, are, in some respects, preferable to any of those made from the more colorless resins, yet, they cannot be applied, where a tinge of brown would be inadmissible. Pictures, maps, the lighter colored woods, inlayed work, japanned chairs, and other furniture, with ornamental painting and gilding, if finished with varnish, require such as is nearly colorless.

The resins principally employed, are mastic, sandarac, elemi. and animi. The two former can always be procured; the two latter are but little used, and therefore, only occasionally found in this country. Neither mastic or sandarac alone, makes a good varnish; sandarac is deficient in gloss; mastic in hardness and solidity; they therefore are best, employed together; the following proportions will answer well,—this is sometimes called,

Hard White Varnish.

Take Gum Sandarac	9	ounces,
Gum Mastic	3	do.
Alcohol	32	do.

Tingrey, in his "*Varnisher's Guide*," advises, in making varnishes of this description, to pulverise the resins, and, to add about one-third of their weight of pounded glass, when they are mixed with the alcohol; this prevents the particles of resin from agglutinating, and also, from adhering to the bottom of the vessel, which is apt to take place, if the ingredients are not shaken, or stirred very frequently; when this agglutination occurs, the dissolution becomes extremely difficult. Tingrey, also advises promoting the dissolution by means of a sand, or water bath. We have repeatedly made the sandarac and mastic varnish, and have always used the resins in the lump, breaking those pieces only, which are unusually large. We have never employed any higher degree of heat, than that of the sun, or a tolerably warm room, nor have we used the pounded glass; the only precaution found necessary, has been frequent shaking, and stirring with a stick; in this way, from 12 to 24 hours will be sufficient to complete the process; and that, without either risk or waste. In making varnish with alcohol, much of the spirit must evaporate, if heat be employed, as the vessel would burst, if not ventilated.

We shall hereafter describe the methods which have been adopted to effect the solution of copal, in alcohol, which in the ordinary mode of procedure, has but little action upon it. The following recipe we have not tried, and, if we had met with it in any common book, should unhesitatingly have condemned it. Tingrey, from whom it is taken, is very good authority, as he was not in the habit of trusting to others, but was a careful and accurate experimentor. Every chemist knows, that articles which are insoluble in a particular fluid, when alone, are sometimes rendered soluble by the presence of others, and this is probably an example of that kind.

Varnish of Copal, Sandarac, and Mastic.

Take pounded Copal, of an amber color, and which has been once liquified, according to a method to be hereafter described, 3 ounces,

Sandarac,	6	do.
Mastic,	3	do.
Clear Turpentine,	2 1-2	do.
Pounded White Glass,	4	do.
Alcohol,	32	do.

All the solid ingredients should be reduced to fine powder, excepting the glass, from which the finer particles should be separated by a sieve, and rejected; put the whole, the turpentine excepted, into a tin bottle, or matrass; which should then be placed in a vessel containing water, a little warm; this must afterwards be heated to ebullition, and so maintained for an hour or two; a stick of white wood must be used to stir the mixture, which must be done very frequently, as the heat will otherwise cause the resins to unite in a mass. When the solution appears to be nearly complete, add the turpentine, which must be melted, by immersing the vessel containing it, in boiling water. The heat must be continued for half an hour longer, when the varnish may be suffered to cool; during which process it must be constantly stirred.

Tingrey remarks, that the opinion generally entertained of the insolubility of copal, in spirit of wine, would have inspired him with some doubt, as regards its usefulness in this varnish, had he not experienced, that a much more durable varnish was produced, than could be obtained without the copal. It is probable, that the whole of this resin will not be dissolved, and that a smaller portion than that indicated, would answer every useful purpose.

A larger portion of copal may be dissolved, if three-eighths of an ounce of camphor be added to the ingredients; this quantity must not be exceeded, as it in some degree softens the varnish. We shall have occasion hereafter to speak more particularly of the employment of camphor, in facilitating the solution of copal in alcohol.

In digesting the ingredients, when making this and similar varnishes, a glass matrass is usually recommended, and, it is on some accounts to be preferred, more particularly as its transparency admits of the progress of the dissolution, being readily observed. The experienced manipulator may employ a vessel of this kind; but, in ordinary cases, the risk is great, and tin should be used. These varnishes may be filtered through cotton, or allowed to remain at rest, until the impurities subside, when they may be carefully decanted. We always prefer the latter method.

On cleaning and Polishing Brass, and preparing it for lackering.

In our last number, we described the mode of preparing, and using lacker, for brass; the beauty of the work depends, however, as much upon its being properly prepared, as upon its being well lackered; the mode of doing this, both upon old and new work, shall now be described.

To remove the lacker from old work.

Resinous substances are soluble in potash; and as the lacker upon brass is resinous, it may readily be removed, by means of ley, made from wood ashes. A portion of ashes and water may be put into a small iron pot, which must be made to boil; on dipping the work into the liquid, the lacker will be immediately removed, and if the surface of the brass be not corroded, it will require but little labor to prepare it for re-lackering. It ought not to remain longer in the ley, than is necessary to remove the lacker, otherwise the brass will become tarnished, and require considerable labor to polish it. When the articles are too large to dip into the ley, the lacker may be washed off. by means of a rag fastened on a stick. The strength of the ley will be greatly increased by putting some quick-lime into it.

After the removal of the lacker. the operations to be performed, will depend upon the nature of the work. and the degree in which the surface has been scratched, or corroded. The directions to be given for new work. will apply equally well to old. Wrought work, that is, such as is not finished with the file, or turned, but consists of foliage and other ornaments, will, if much soiled, require to be annealed, that is, heated to redness in the fire, and otherwise managed as new work.

On Finishing, Burnishing, or Polishing, Brass work.

Articles which are filed up, or turned, are in general either polished. or burnished, preparatory to their being lackered. Work which is well turned, requires but little polishing. For preparing and polishing brass, different articles are recommended and employed by different workmen; we have found that fine glass-paper covered with sweet oil, will give a perfectly smooth surface; which may then be polished with oil and rotten-stone, upon a woollen rag, and cleaned off with fine dry whiting, upon a piece of cotton or linen. The use of glass-paper and oil, was adopted by us many years since, and we believe was then new; it is adapted both to coarse and fine work, and has the advantage of producing the desired effect, with greater rapidity than any other method, with which we are acquainted. Glass-paper is frequently called sand-paper, and is often sold under that name; sand-paper was formerly much used, but is now almost unknown, the glass-paper being much superior to it, for all purposes. Emery-paper is sometimes used; for iron it is a very good article, but for brass, is not better than glass-paper, which is much cheaper; if not sufficiently fine, the glass-paper may be made so, by rubbing it with the pane of a hammer.

Work which is filed, may also be finished in the way above described. For flat work, the glass-paper is wrapped round a suitable piece of wood, and after being oiled, is used in the manner of a file. It may then be polished with oil and rotten-stone, upon a woollen or leather buff. The finest kind of work, after being smooth-filed, is rubbed with a piece of pumice-stone, afterwards with blue-stone, and then with charcoal; this leaves it with a perfectly fine surface, well prepared to receive a polish from oil and rotten-stone, with but little labor. There are several species of stone, in different parts of the Union, which may be substituted, both for the pumice-stone and the blue-stone. Instead of the latter, the Scotch stone, called *water of Ayr*, is often used: this exists in abundance, in the State of North Carolina. The best charcoal is that made from willow, but good pieces may generally be picked out from a heap; they, however, can be judged of, by trial only. The rubbing with charcoal is a slow business, and may, in general, be dispensed with.

When a bright polish is not desired, but the work is to appear with a fine surface, the *grain* may be laid with the glass-paper and oil; with oil and fine powdered pumice-stone, or with the finest washed emery and oil, upon a buff.

Burnishing on brass, is performed only on inferior kinds of work, or upon such parts as do not admit of being polished. A burnished surface is the most brilliant, but has much less *truth* than one which is well polished. For brass, steel burnishers are always used. (The general directions in the article on burnishing, extracted from the *Dictionnaire Technologique*, and published in our present number, may be referred to, upon this subject.) In burnishing small articles, the burnisher may be moistened by touching it with the tongue: weak beer is frequently used for larger work, instead of the soap-suds, used with silver, as mentioned in the paper just referred to. After burnishing, the articles are washed clean, and wiped perfectly dry, when they are fit for lackering.

On Finishing Wrought work.

Wrought work, after having the parts which are intended to be burnished, either scraped or filed, is to be annealed in a charcoal fire; a pickle is then made, by pouring aqua fortis (*nitrous acid*) into water, until it is intensely sour; into this pickle the articles are put, and suffered to remain until all the black scale is removed and the whole surface exhibits one clear, uniform red; they are then to be taken out, washed and dried, when they are ready for *dipping*, or *taking off*. Some clear aqua fortis is poured into a cup, and the article, if small, is dipped into it, and immediately removed; otherwise it is washed over by means of a piece of rag, tied on to the end of a stick; the acid immediately boils up, when it must be washed off, by being passed successively into two or three vessels containing water, as the smallest portion of acid will cause the surface to tarnish. A little practice will enable the operator to judge of the instant when the acid should be washed off, by the color which it assumes. The surface will now exhibit a clear and beautiful gold yellow, provided the brass and the acid are both of a proper quality. The parts which are to be burnished, undergo that operation, either by hand or in the lathe, according to the nature of the articles. The usual mode is to put them into small beer, from which the pieces are successively taken and burnished, when they are thrown into clean water, and dried in the saw-dust of some wood which is not resinous. Sometimes the work is scratch-brushed, before burnishing; this, however, removes that beautiful dead appearance, which is in general preferred, and leaves a general brightness upon the unburnished parts.

The scratch-brush is made of small brass wire, formed into bunches, which for large work are fixed around a chuck, and made to revolve in the lathe; beer is used in this operation, as in burnishing.

[*Am. Mech. Mag.*

ON BURNISHING.

To burnish an article, is to polish it, by removing the small eminences or roughnesses, upon its surface; and the instrument by which it is performed, is denominated a *Burnisher*. This mode of polishing is the most expeditious, and gives the greatest lustre to a polished body. It is made use of by gold and silversmiths, cutlers, locksmiths, and most of the workmen in gold, silver, copper, iron, or steel. It removes the marks left by the emery, putty of tin, or other polishing materials; and gives to the burnished articles, a black lustre, resembling that of looking-glass. The burnisher is an instrument, the form and construction of which is extremely variable, according to the respective trades; and, it must be even adapted to the various kinds of work, in the same art. We shall point out the principal ones. In general, as this tool is only intended to efface inequalities, whatever the burnisher is made of, is of little consequence to the article burnished, provided only, that it be of a harder substance than that article.

We shall first describe the art of burnishing silver articles, and afterwards point out the variety of modes in which the burnisher is used, in other arts.

When silver articles have received their last fashion from the silversmith's hands, that is to say, when they have been worked, soldered, repaired. or adjusted, they are sent to the burnisher, who has the care of finishing them. He must begin by cleaning off any kind of dirt which their surfaces had contracted whilst making, as that would entirely spoil the perfection of the burnishing. For this purpose, the workman takes pumice-stone powder, and, with a brush, made very wet in strong soap-suds, he rubs, rather hard, the various parts of his work, even those parts which are to remain dull; and which, nevertheless, receive a beautiful white appearance. He then wipes it with an old linen cloth, and proceeds to the burnishing.

The burnishers used for this purpose, are of two kinds; some of steel, others of hard stone. Steel burnishers are either curved or straight; rounded or pointed; and made so as to suit the projecting parts or the hollows of the piece.

Stone burnishers are made of blood-stone (*hæmatite*) cut, and either rounded with the grindstone, or rubbed, so that they present at the bottom, a very blunt edge, or sometimes a rounded surface. These are polished with emery, like steel burnishers, and are finished by being rubbed upon a leather, covered with *crocus martis*. The stone is mounted in a wooden handle, and firmly fixed by means of a copper ferrule, which encircles both the stone and the wood. The best blood-stones are those which contain the most iron, and which, when polished, present a steel color.

The operation of burnishing is very simple: it is only requisite to take hold of the tool very near to the ferrule or the stone, and lean very hard with it on those parts which are to be burnished, causing it to glide by a backward and forward movement, without taking it off the piece. When it is requisite that the hand should pass over a large surface at once, without losing its point of support on the work-bench, the workman, in taking hold of the burnisher, must be careful to place it just underneath his little finger. By this means, the work is done quicker, and the tool is more solidly fixed in the hand.

During the whole process, the tool must be continually moistened with black soap-suds. The water with which it is frequently wetted, causes it to glide more easily over the work, prevents it from heating, and facilitates its action. The black soap, containing more alkali than the common soap, acts with greater strength in cleansing off any greasiness, which might still remain on the surface; it also more readily detaches the spots, which would spoil the beauty of the burnishing.

In consequence of the friction, the burnisher soon loses its bite, and slips over the surface of the article as if it were oily. In order to restore its action, it must be rubbed from time to time, on the leather. The leather is fixed on a piece of hard wood, with shallow furrows along it. There are generally two *leathers*--one made of sole-leather, and the other of buff-leather. The first is impregnated with a little oil and *crocus martis*, and is particularly used for the blood-stone burnishers; the other has a little putty of tin, scattered in the furrows, and is intended exclusively for rubbing steel burnishers, as they are not so hard as the blood-stones.

Blood-stone being very hard, the workman uses it whenever he can, in preference to the steel burnisher. It is therefore only in small articles, and in difficult places, that the steel burnishers are used; as they, by their variety of form, are adapted to all kinds of work. But in general, the blood-stone greatly reduces the labor.

When the articles, on account of their minuteness, or from any other cause, cannot be conveniently held in the hand, they are fixed in a convenient frame on the bench: but under all circumstances, the workman must be very careful to manage the burnisher, so as to leave untouched those parts of the work which are intended to remain dull. When, in burnishing any article which is plated or lined with silver, he perceives any place where the layer of precious metal is removed, he restores it, by silvering these places with a composition supplied by the silverer, which he applies with a brush, rubbing the part well, and wiping it afterwards with an old linen cloth.

The burnishing being finished, it only remains to remove the soap-suds, which still adheres to the surface of the work: this is effected by rubbing it with a piece of old linen cloth, which preserves to it all its polish, and gives so great a lustre that the eye can scarcely bear to look upon it. But, when the workman has a great number of small pieces to finish, he prefers throwing them into soap-suds, and drying them afterwards with saw-dust, which is more expeditious.

The burnishers of articles which are not silver, follow nearly the same process as that above described. We shall briefly notice the variations to be observed in each case.

The burnishing of leaf-gold or silver, on wood, is performed with burnishers made of wolves' or dogs' teeth, or agates, mounted in iron or wooden handles. When they burnish gold, applied on other metals, they dip the blood-stone burnisher into vinegar; this kind being exclusively used for that purpose. But when they burnish leaf-gold, on prepared surfaces of wood, they are very careful to keep the stone, or tooth, perfectly dry. The burnisher used by leather-gilders, is a hard polished stone, mounted in a wooden handle; this is used to sleek or smooth the leather.

The ordinary engraver's burnisher, is a blade of steel, made thin at one end, to fit into a small handle, which serves to hold it by. The part in the middle of the blade, is rounded on the convex side, and is also a little curved. The rounded part must be well polished, and the tool very hard.

They use this burnisher to give the last polish to copper-plates, rubbing them well with it, and being very careful to use oil continually, to lubricate it. Other burnishers are nearly of the same form as those used by the gilders and silverers.

In clock-making, they burnish those pieces or parts, which, on account of their size or form, cannot be conveniently polished. The burnishers are of various forms and sizes; they are all made of cast-steel, very hard, and well polished: some are formed like the sage-leaf files; others, like common files: the first are used to burnish screws and pieces of brass; the others are used for flat pieces. The clock-makers have also very small ones of this kind, to burnish their pivots; they are called *pivot-burnishers.*

The burnishing of pewter articles, is done after the work has been turned, or finished off with a scraper: the burnishers are of different kinds, for burnishing articles either by hand or in the lathe; they are all of steel, and while in use are rubbed with putty-powder on leather, and moistened with soap-suds.

The burnishing of cutlery, is executed by means of hand or vice-burnishers; they are all made of fine steel, hardened, and well polished. The first kind have nothing particular in their construction; but the vice-burnishers are formed and mounted in a very different manner. On a long piece of wood, placed horizontally in the vice, is fixed another piece, as long, but bent in the form of a bow, the concavity of which is turned downwards. These two pieces are united at one of their extremities by a pin and a hook, which allows the upper piece to move freely around this point, as a centre. The burnisher is fixed in the middle of this bent piece, and it is made more or less projecting, by the greater or lesser length which is given to its base. The moveable piece of wood, at the extremity opposite to the hook, is furnished with a handle, which serves the workman as a lever. This position allows the burnisher to rest with greater force against the article to be burnished, which is placed on the fixed piece of wood. They give to the burnisher either the form of the face of a round-headed hammer, well polished, to burnish those pieces which are plain or convex; or the form of two cones, opposed at their summits, with their bases rounded, to burnish those pieces which are concave or ring-shaped.

The burnishing of the edges of books, is performed with a wolf's or dog's tooth, or a steel burnisher: for this purpose, they place the books in a screw-press, with boards on each side of them, and other boards distributed between each volume; they first rub the edges well with the tooth, to give them a lustre. After sprinkling or staining, and when the edges are become dry. they first burnish the front; then turning the press, they burnish the edges at the top and bottom of the volume.

They burnish the gilt edges in the same manner, after having applied the gold; but observe, in gilding, to lay the gold first upon the front. and allow it to dry; and, on no account, to commence burnishing till it is quite dry. [*Dict. Technologique.*

ON DYING WITH PRUSSIAN BLUE.

A NEW method of dying with Prussian Blue has been discovered by Prof. RAYMOND, of Lyons. By this process it is said, "that a brilliant and permanent color is produced; more bright, and equally deep, with those obtained from indigo, whilst it will also furnish a sky-blue, not attainable from that substance, which is likewise more costly.

To dye silk of a Raymond blue, it is to be cleansed in a large quantity of water, after the usual boiling with soap; it is then to be immersed in a solution of persulphate of iron, (that is, of that kind of copperas, which is of a dark green color,) the oxide of which will combine with the silk; the greater or less intensity of the shade of yellow which the silk acquires, will furnish the means of judging when a proper quantity of the ferruginous solution has been absorbed; after which it is to be rinsed with great care, to remove all the free acid; the silk is then to be immersed in a bath of prussiate of potash, acidulated by sulphuric acid. In a few minutes the dying will be completed; when this is effected, it must be rinsed in clear water, and brightened with purified urine, diluted with a large portion of water, into which is occasionally thrown a small portion of acetic acid, to guard against a too powerful action of the alkali.

The only difficulty which has yet been experienced in dying with Prussian blue, has been to obtain, at will, a regular gradation of shades, between the most intense blue and a perfect white. M. Raymond. Jun., has sent to the Society for the encouragement of Arts, [in France,] patterns of every shade obtainable from indigo; but it has not yet been proved that the process is applicable in the large way.

M. CHEVREUL has recently read to the Institute, a memoir upon a process remarkable for its simplicity, by which he has lately obtained a perfect gradation in the shades of color dyed by Prussian blue, which are at the same time, more permanent and more beautiful, than those from indigo. This chemist, after repeating the fruitless attempts of his predecessors, is convinced, that from indigo alone, it is impossible to obtain the various shades of pure blue, the materials employed with the indigo changing the color, so as to incline it, more or less, to a purplish or greenish hue.

The following is the method pursued by M. Chevreul, in graduating the shades from Prussian blue: He impregnates each of the different parcels of silk to be dyed, with different proportions of the oxide of iron, by immersing them in solutions, the strength of which has been previously regulated. For the deeper tones of color, he employs the acetate, and for the others, the muriate or sulphate; after having properly rinsed each of the parcels, they are dipped into distinct vessels, or baths of the prussiate of potash, the proportion of which has been made to correspond with the quantity of oxide of iron previously united to each portion of silk. By these precautions he obtains all the desired shades; those, however, which are light, are apt to have a greenish hue; but M. Chevruel found, that on washing them sufficiently in river water, the blue shade was obtained in perfect purity. When the washing did not completely produce this effect, a very weak solution of muriatic acid was found to remove the yellow matter which deteriorated the blue, and produced the tinge of green."

[*Am. Mech. Mag.*

PERPETUAL MOTION---DISCOVERED ONCE MORE.

Dr. Giraud, of Baltimore, announces that he has invented a Perpetual Motion Machine. The following is his description of it:

To Scientific Mechanics, and others.

The dead point is gained, and perpetual motion is discovered by J. J. Giraud, Physician, of the city of Baltimore. It cannot be denied. The thing itself is simple, and a trifling expense will convince the most incredulous.

Description of the Perpetual Machine.—A sunk spur-wheel of a certain diameter, with a round hole at its hub, is placed upon a short round tube, which acts as a journal and shaft, and does not pass the hub of the wheel. One end of this tube must be fixed solidly on a plummer-block, and the other part supports the sunk spur-wheel. A shaft of a certain length, passes through this tube by one of its sides, which is round; and the part which fills the space of the tube, of the thickness of the hub, must be smaller, for the purpose of leaving a certain space between the said shaft and the inside of the tube, so that they may not touch each other.

That part of the shaft which is outside and near the opening of the hub and the wheel is square, and receives a large pinion of a certain diameter. Between the large pinion and the sunk spur-wheel, there is a very small pinion which works with the two wheels. It is placed upon a long axle-tree, which is supported by the plummer-block, where the shaft of the sunk spur-wheel terminates, and the said plummer-block supports the other extremity of the axle of the pinion. On that axle a fly-wheel is placed. Another wheel of a very simple construction is placed on the shaft behind the sunk spur-wheel.

On the border of each of these wheels are placed two equal weights of a certain weight—the one opposite the other, and so fixed as to balance each other exactly.

The parts of the machine properly calculated and made according to the above direction, the action and re-action of the two wheels lend an equal power to both; and the fly-wheel, acting as an excitative of both the powers, propels the machine alone.

If, in the place of the wheel which is placed behind the sunk spur-wheel, we substitute a pedal water-wheel with weights proper to both, for the purpose of opposing a resistance to the column of water which the pedal embraces, it will require but a small power to turn it—and in the same way, *mutatis mutandis*, it may be applied to all mechanical operations.

AGRICULTURE.

HORSES.

[Continued from page 65.]

SIR,—I will now make a few remarks upon the treatment of a Horse kept for his work.

1. As to whether he should ever be turned out. It was once the received opinion of English sportsmen, that he should be periodically brought back to what some people considered his natural state, turned out to grass, deprived of his corn and his shelter from the weather. Hunters consequently, excepting those of a few sagacious individuals, were regularly turned to grass to shift for themselves in the summer. This system has been, of late years, attacked by a very powerful and classical writer, who asserts, that to perform the work of an English hunter, the horse's strength must be vastly increased upon nature by a long uninterrupted course of high keep in the stable, to turn him out, is not only to expose him to ruin from taking cold, but to throw away all his acquired strength. The continued summer-rest of a hunter, which a horse not exposed to the same exertions does not require, he says, can be taken in a small enclosure at home, the dampness of the earth can be supplied by standing in wet clay, some hours every day, and the grass, if he must have it, can be put into his crib. The ultra-stabulist has completely triumphed, and convinced the English nation, that where a horse is kept ten months of the year in a heated atmosphere, to sleep upon the damp ground, in a variable climate, the remaining two can do him no good whatever. In our cities, when a horse gets weak or lame, who is used to a hot, dry stable, perhaps to being clothed, with a plethoric system begging for diseases of the lungs and throat, incalculably less accustomed to the night air than the generality of men, he is sent into

the country to be turned out; particularly in the autumn, when the weather first changes to cold, and he is changing his coat! If any person will go into a large livery stable in Boston, in May, before the windows are taken out for the summer, when the doors are opened at daybreak, he will find, that though he cannot remain an instant in it himself, the horses have been quietly sleeping, sometimes two in a stall, their own breath and effluvia chiefly confined to their contracted stalls, their nostrils the farthest possible from the air, that they are most of them in good health, and some in high condition. After the efforts nature must have made to bear this, will she instantly retrace her steps? That she will, is defended and acted upon by persons who think they understand horse-flesh. To such persons, I would quote, if I had the book, the words of Vegetius, who wrote in the reign of Valentinian, when the world was interested in horse-flesh, and who calls turning horses out at all seasons a Hunnish practice. He wrote for the climate of Syria and Spain. The benefit to a horse of regular work and nourishing food increases his powers for years in succession. He appears to grow thicker. A particular kind of horse, who, to use such an expression, carries his work in his legs and his carcass, and not in any original goodness of his own, a stage-coach proprietor must frequently notice this fact in; and he is the most valuable horse he can get. I mean a horse, naturally of moderate powers of performance for a single day, but who has a deep carcass, with an insensible foot, and consequently has open to him a chance of receiving the highest degree of improvement to be derived from a succession of years of strong food and strong exercise.

2. As to how he should be confined in the stable. The universal practice in Massachusetts, as in most other places, is to tie him in a narrow stall with his fore feet higher than his hind ones. In some stables the declivity is very considerable. It is my opinion, that if there must be a declivity, it should be forwards. A horse worked every day on a fast trot over a hard road, as a coach-horse, suffers enough in his fore feet when he is sound. One of the first signs of incipient disease in them, or rather of the crowded state which precedes disease, is his throwing his weight as much as he can on his hind legs. I am inclined to doubt the fact of his preferring to stand up hill under such circumstances. One reason for such an opinion is, the manner in which his weight is thrown on his toes when he stands up hill, even if his heels are raised. Another great disadvantage of his standing so is, that he throws the whole weight of his forehand upon the same muscles and tendons he uses most in draught. It is certainly of importance, that if he must have an unnatural strain any where when he is not at work, it should not be where the strain must be when he is. It is a vast comfort to a horse to be kept in a box. He should be able to choose his own position, at least to sleep in, and relieve what muscles he wishes to. In a stall he must sleep, through life, with his head held in the air, and his legs under his body. His getting

cast in a box is not a common occurrence. Ten feet square will do well; if he cannot have a larger one. In a box he is freed from the torment of hearing walking and talking behind him.

3. As to how he should be fed. I have never yet met with a person having the charge of horses, who in my opinion attached sufficient importance to the impropriety of allowing a horse his usual allowance of corn when suffering from cold. Not only is the corn thrown away, but it must always do him some harm, and may do him a great deal. Many horses that suffer from a thickening of the windpipe, a disease for which we have here no name, many that are brokenwinded, many that are ruined in their feet, may have it ascribed to being fed in severe colds. The corn increases the disorder of the system by the difficulty with which it is digested, and when digested, it exaggerates what tendency may exist to local inflammation. Oats are the least dangerous corn, they being here so very light. There is another remark which I would make, which is,, that no horse should be fed higher than usual, when forced to any accidental violent exertion. He ought never to be forced to any which he has not been, in some degree, prepared for; and his ability to make it, should be looked for, from the previous preparation, not from any unusual means of supporting his strength. Oats appear to be the corn best suited to a horse's stomach; but he wants something better than ours for full work. There is to an experienced eye, a particular lightness and hollowness between the hip-joint and the stifle-joint, in worked horses that get nothing better than oats, which is not to be seen in those that get Indian corn. As I observed in my last communication, there is a great difference, generally, in the constitution of the round-chested, and the deep and narrow horse. The first has a much more comfortable one to deal with; the other is often stronger, faster, and better winded; but varies infinitely from day to day; feels the seasons more; is not so good a feeder; nor ought he to be; for his stomach is weaker and more readily oppressed.

4. As to how he should be worked. It is a common practice in Massachusetts to water horses just before they leave their stable. This is ridiculous; but a worse practice is to water them during their stage; which last is universal. They unquestionably may become accustomed to it, as to any thing else; but it injures many of them. If driven on again immediately, and thrown into new perspiration, it may possibly prevent the water from injuring them; but I entirely question the fact of its lessening the fatiguing effects of their work. I know that it is hard to tire a pedestrian that will drink but little; and that if he is to walk all day, every tumbler of water, drunk when hot, takes two or three miles from a pedestrian's day's work. It is also a common practice to drive horses through a stream of water when they are hot, to refresh them. The immediate effect, unquestionably, is to refesh them; but they soon feel an increased stiffness from it. It is the practice of some people to tie them up after they come in, in the strongest draught of air which can be found, (a damp brick-yard where the sun never

shines is still better,) and wash their legs with cold water. This is going for the whole. The universal manner in which coach-horses are driven in Massachusetts is reprehensible. They are started off at a pace much faster than they are expected to hold, and continually galloped for short distances, when the pace at which they are expected to perform their stage does not exceed six or seven miles in the hour. I do not believe that occasional galloping relieves the horses in slow coaches, where the hills do not render it necessary. I believe they should always be driven as nearly as possible at the same pace; and it certainly has a much more coachmanlike appearance.

No horse is worth breeding now, that will not be able to trot over a fair road his ten miles in the hour, with ease to himself; and to do this he must have much and good blood. At some future opportunity I will make a few remarks upon the question of foot-lameness. I should be very happy if any one else would give the result of his experience upon it, as there is a vast deal of such information afloat, which the public never gets the good of. I would ask any coach proprietor, most of whom have much experience of this kind forced upon them, if he has observed more horses to be lame in the near foot than the off one. It is my firm belief that there are, and there is a plausible reason for such an opinion.

I would here remark upon the corrupt use of the word *stud*,—A stud means in English a collection of horses. Stud-horse may do well enough; but when the language contains an old established term, such as stallion, which perfectly expresses the idea of a horse kept for the purpose of continuing his species, there is no necessity for our manufacturing a new one. [*N. E. Farm.*

AGRICULTURAL QUERIES.

[Continued from page 95.]

11. *Rye.* How many acres on a farm of average size are usually sown with rye?
What soil is most favorable?
How is the land prepared and manured, and what quantity of manure to the acre?
By what crop preceded, or accompanied?
What are the comparative advantages of sowing winter and spring rye?
At what time is winter rye sown?
What quantity of seed, both of winter and spring rye, do you sow upon an acre, and what is the average product of each?
Is it important whether the seed be old or new?
What observations have you made on Ergot, (or spurred rye,) and on its connexion with certain kinds of rye, or with certain seasons?
At what time is rye usually cut in reference to the state of the grain?
Is less attention paid to the cultivation of rye at present than formerly?

12. *Barley*. Is this cultivated on most farms?
What soil is most favorable, how prepared, and how manured?
What quantity of seed, and what the average product to an acre?
Is it found useful to cut barley a little before it is perfectly ripe?
To what uses is the grain applied, and to what the straw?

13. *Oats*. How many acres, or, what proportion of tilled land, on farms of average size, are sown with oats?
What soil is most favorable?
How is the land prepared, and manured?
What kind of seed is preferred?
How much is sown upon an acre, and what is the average crop?
Do oats succeed best on ground broken up the preceding fall?
Does grass succeed well on most soils, when sown with oats?
Are oats often cut green by choice for fodder?
When so cut, what is the average crop on an acre?

14. *Millet*. Have you cultivated millet?
If so, what observations have you made on the value of the grain and straw?

15. *Buckwheat*. How much seed is sown upon an acre, and what is the average product?
Is it cultivated for food?
Is it ever ploughed in as a green crop to fertilize the soil?
Is grass seed ever sown with buckwheat, and with what success?

16. *Flax*. What quantity of land on farms of average size is devoted to flax?
What soil is found most favorable?
How is it prepared, and manured?
What quantity of seed to an acre?
Is any benefit derived from a frequent change of seed?
What is the usual time of sowing flax seed?
What is the more common method of preparing and dressing the flax?
What is the average quantity of dressed flax, and of seed, from an acre?

17. *Hemp*. Have you cultivated hemp?
What is the appropriate soil, and the mode of preparing and manuring it?
How much seed to an acre?
How is the hemp prepared, and dressed?
What the average quantity of dressed hemp from an acre?
Is it not a profitable crop?

18. *Beans*. How are beans cultivated?
What kind of field beans yields the best crop?
Are they usually planted in drills?
What quantity of seed to an acre, and what the average crop?
Do beans ever suffer injury from rust?
To what use are the dried vines applied?

19. *Peas*. How are peas cultivated?
Are they sown broadcast, or in drills?
What quantity of seed to an acre, and what the average product?
Is the crop ever cut green, and made into fodder for sheep?

20. *Tares.* Have you cultivated tares? If so, what observations have you made on the mode of culture, and the value of the crop?

21. *Hops.* What soil is found favorable for hops? How is it prepared, and manured, and how are the hops cultivated? What number of pounds are obtained from an acre?

22. *Potatoes.* How many acres, or, what proportion of tilled land, on farms of average size, are generally planted with potatoes? What soils are preferable? What manure is usually employed, in what quantity, and how applied?
Do you plant them in *hills* or in *drills?*
What quantity of seed do you plant on an acre, and what the average product, stating whether in hills or drills, and at what distances planted in each case?
How often ploughed or hoed?
What rules do you observe in selecting potatoes for seed?
What experiments and their results on planting large and small whole potatoes, or the seed end, or the middle part of the potato, or the eyes only?
What quantity of seed do you put into a hill?
What sorts are considered best, on account of the quantity they yield, or of good flavor for the table, or for ripening early?
How do you apply gypsum, in what quantity, and with what success?
How many bushels of potatoes are equivalent in value to one bushel of corn?
How many days' labor in cultivating an acre of potatoes, including the digging and getting in of the crop?
What experiments have you made on improving potatoes by planting the *seed* contained in the balls or apples?
In ordinary seasons, what is the cost *per bushel* of cultivating potatoes, including in the estimate a fair charge for the value of the seed, manure, labor, &c.?

23. *Onions.* What soil and manure are best suited to this root? How is the seed sown, and what the mode of culture?
What quantity of seed to a square rod, and what the average product?

24. *Root Crops.* Are Turnips, Carrots, Mangel Wurtzel, Ruta Baga, (or Swedish Turnip,) cultivated in considerable quantities, as winter food for cattle?
What soil is preferred, how is it prepared and manured, and what is the particular mode of cultivation, in regard to each of the aforementioned roots?
What quantity of seed to an acre, and what the average crop, of each kind?
Are they given raw or cooked to the cattle? If cooked, in what manner?
All facts on the importance of these crops in wintering stock are requested.

25. *Fruit Trees.* Are most farms furnished with orchards, and to what extent on farms of average size?
Do they usually contain a good proportion of grafted fruit?
What is the usual method of grafting?
At what time, and in what manner, do you prune fruit trees?
At what distances from each other are apple trees usually planted?
Is the soil in orchards generally cultivated, or permitted to bear grass?
To what diseases do you find apple trees liable, and what remedies are employed?
What insects attack these trees, and what means are used to prevent or destroy them?
What observations on the time and mode of making the best cider?
Do most orchards, beside yielding a competent supply, furnish cider for the market?
Are Pear, Peach, and Plum trees cultivated with success? What kinds? To what diseases, and to what insects are these trees exposed?

26. *Bees.* Do bees receive attention, and succeed well?
What the average product in honey and wax from a hive?
How are the hives constructed, and in what manner is the honey taken?
How are the bees preserved in the winter?
How managed when swarming?
With what difficulties or obstacles is this branch of business attended?
From what insects do bees receive injury, and what is the best mode of preventing it?

[To be concluded in our next.]

FRUIT TREES.

What are you doing there, Madam? said I last summer, to an industrious and amiable young lady, who herself takes the care of her flower, fruit, and kitchen garden; for mercy sake! what are you doing there? Don't you see, answered she; I am scalding this peach tree. Do you wish to kill it? On the contrary, I wish to save it if I can; the root is worm-eaten; the leaves are curling and withering; it will be dead in a few days, if I do not apply an efficacious remedy. I have lost several fruit trees this summer by the worms; in vain have I tried all the means suggested, as to dig round, look for worms, use a wire to kill them through the apertures, put lime, ashes, &c., all in vain. Once the trees are attacked, they invariably die. This is the best tree of the garden; it produces the most excellent fruit. I am determined to try on it an experiment, which I have for a long time thought of, but from which I always have been discouraged by my friends saying that it will kill the tree; but the tree is already as if dead, and I think there is even prudence in the trial, since it leaves at least a possibility, a hope of saving it.

A great deal of conversation followed that experiment; some laughed, some found it absurd. I myself visited and examined with anxiety the tree every day. To our great surprise and satisfaction, after the fall of the faded leaves, the vegetation resumed all its activity, and a new set of beautiful, long, green leaves again covered the tree. Encouraged by this success, all the trees of the garden, sound or not, were scalded before the setting in of winter.

The brother of the young lady having taken confidence in the operation, and having himself an orchard of 150 fruit trees, apples, pears, plums, peaches, &c. &c., of which a few were also worm-eaten, took the resolution to have them all scalded before winter. An iron kettle was brought into the orchard, kept boiling, (water added from a neighboring brook in proportion as it was used,) and three or four quarts poured at the bottom of each tree, about one foot above the ground; care was taken to cause the water to follow the trunk and penetrate to the roots, by pouring it round the tree, and not too fast. This was done to each tree in the orchard with the greatest ease in less than half a day's labor. The same operation was performed again in the spring as soon as the frost was out of the ground. Not a single tree died. Those in bad order revived, and they are all covered with the most luxuriant blossoms.

This discovery, for it well deserves the name, will certainly rank among the most useful. I hasten to send it for your valuable paper; it should be reprinted in all the publications of this country, for it might save many thousand fruit trees this season from destruction, if known by gardeners and farmers.

In former times, a young lady who had become a benefactress of her own country, by her ingenuity and industry, would have received, as a reward, a crown of the finest flowers, with a basket of the best fruit; but in these dry modern times, let her, at least, receive our best thanks. D. C.

[*New-York Statesman.*

If any of our readers have ever tried the following method of propagating Fruit Trees, we should be pleased to hear with what success.

"The new method of raising fruit trees by planting the scions, is a great desideratum in the art of obtaining choice fruit. It has many advantages over grafting, because it is more expeditious, and requires no stalk or tree. They may be planted where they are required to stand; and the labor of a man for one day will be sufficient to plant out enough for a large orchard after the scions are obtained. The method of preparing is as follows:—Take the scions as for engrafting, and at any time after the first of February, and till the buds begin to grow considerably, and dip each end of the shoots in melted pitch or wax, rosin and tallow, and bury it in the ground, the buds uppermost, whilst the body lies in a horizontal position, and at a depth of two or three inches. We are informed that trees obtained in this way, will bear in three or four years from the time of planting."

For the Farmers' and Mechanics' Journal.

METHOD OF PLANTING SCIONS OF APPLE AND OTHER FRUIT TREES.

Take them fresh from the tree, and put a potato on the butt end, and set them in moist ground. The depth should be varied, according to the size and length of the scion. If it be one foot long, about three inches will do; if six feet, a foot and a half. Be careful, and get as many buds to go beneath the surface of the soil as you conveniently can. I have tried this method and seldom knew it to fail. I will relate one instance, which, I presume, will be sufficient. Some years since, while ploughing in an orchard, a branch was broken (by accident) from a favorite tree. Having heard of this method, I was induced to try it. I accordingly set it out in the manner above described. After the first year it grew as well as any tree in the orchard, and is now a valuable tree. I have since frequently tried the experiment with almost all kinds of fruit trees, and with good success. I have taken a branch that had some small twigs upon it near the bottom, set it in the ground, so as to cover the twigs, and after a short time have found the scion or shoot, supplied with roots from these twigs. The potato seems to not only keep the bottom moist, but probably supplies nutriment to it. Yours, &c. JOSEPH S. BARBER.

Gardiner, May 19, 1828.

For the Farmers' and Mechanics' Journal.

MR. EDITOR,—In Willich's Encyclopedia, second American edition, under the article "Bud," it is intimated, that leaf buds may be changed into flower buds, even after their formation. As buds are either leaves or blossoms in miniature or embryo, I do not believe it is in the power of man to convert the one into the other, but that flower buds may be produced by art instead of leaf buds, is capable of demonstration, from the following facts. In the spring of 1826, I cut around a limb of an apple tree in a bearing state, two rings, about one quarter of an inch apart, and from between them took out the bark clean to the wood. It being bearing year, every part of it bore full. In 1827, the limb which I ringed, or girdled, the year before, blossomed and bore so abundantly that it became necessary to support it to prevent its breaking. While on the other parts of the tree, (which were about seven-eighths of the whole,) after repeated and critical examinations not a blossom could be found; consequently bore no apples. From this and several other nearly similar experiments, I deduce the following conclusions: 1st, That the blossoms of 1827, were wholly in consequence of ringing or girdling the limb. 2d, That all healthy apple trees of sufficient age and size, may be made to blossom and bear fruit probably a year sooner than otherwise. A friend gives it as his opinion, (founded on experiment,) that simply passing the knife once round the limb entirely to the wood, has the same effect as passing it round in two places and taking out the bark between. If so, it is preferable. But I am inclined to think that it ought to be repeated in two or three months. Yours, &c. S. HILLS.

Union, May, 1828.

The above process is often resorted to by those who wish to ascertain the quality of fruit which a young tree will produce, when it is too young to bear fruit. The following, from *Thacher's Orchardist*, explains the theory, or cause of the effect:

"This barking, or girdling, must be made at the precise time when, in all nature, the buds are strongly swelling, or about breaking out into blossoms. In the same year a callus is formed at the edge of the ring, on both sides, and the connexion of the bark is again restored, without any detriment to the tree or the branch operated upon. By this simple operation, the following advantages will be obtained: 1. Every young tree, of which you do not know the sort, is compelled to show its fruit, and decide sooner whether it may remain in its present state, or requires to be grafted. 2. You may thereby, with certainty, get fruit of a good sort, and reject the more ordinary. The branches so operated upon, are hung full of fruit, while others that are not ringed, often have none or very little on them. This effect is explained from the theory of the motion of the sap. As this ascends in the wood and descends in the bark, the above operation will not prevent the sap rising into the upper part of the branch, but it will prevent its descending below this cut, by which means it will be retained in and distributed through the upper part of the branch in a greater portion than it could otherwise be, and the branch and fruit will both increase in size much more than those that are not thus treated. The twisting of a wire or tying a strong thread round a branch, has been often recommended as a means of making it bear fruit. In this case, as in ringing the bark, the descent of the sap in the bark must be impeded above the ligature, and more nutritive matter is consequently retained, and applied to the expanding parts. The wire or ligature may remain in the bark. Mr. Knight's theory, on the motion of sap in trees, is "that the sap is absorbed from the soil by the bark of the roots, and carried upward by the alburnum of the root, trunk and branches; that it passes through the central vessels into the succulent matter of the annual shoots, the leaf-stalk and leaf; and that it is returned to the bark through certain vessels of the leaf-stalk, and descending through the bark, contributes to the process of forming the wood." A writer in the *American Farmer*, says, he tried the experiment of ringing some apple, peach, pear, and quince trees on small limbs, say from an inch to an inch and a quarter in diameter. The result was, the apples, peaches and pears were double the size on those branches than on any other part of the trees: in the quinces there was no difference. One peach, the heath, measured, on a ringed limb, in circumference, 11 1-4 inches round, and 11 3-4 inches round the ends. and weighed 15 ounces. The limbs above the ring have grown much larger than below it. If the ring be made so wide that the bark cannot unite the same season, the branch will perish."

MANAGEMENT OF BEES.

It is the common practice to place the hives where the sun has the greatest influence,—such as beneath a south wall,—and to let them remain in the same situation during the winter. For the summer this is all right; but as the winter approaches, the hives should be placed where the sun never appears. It is not so much the degree of cold that injures the bees as the variations. Under a south wall the sun is sometimes powerful, even in the depth of winter; thus the bees are roused into action, and are ill prepared to meet the extreme cold of the night. Besides, when lying in a torpid state, which they do during the coldest weather, the bees do not require so much food; and I am led to believe that the cold is not so excessive during the night where the sun has not shone during the day; but even allowing the reverse, still I think as the degrees of cold are less variable, the north side of a house or wall is the preferable situation during the winter. Nor should the bees be removed into the sun until the trees have so far shot forth their buds that they may find a sufficient repast.

I think those hints may be useful to those who would wish to become practical apiarists. My knowledge of the matter is theoretical; but I have friends who follow the practice.

I am, Sir, your obedient servant, R. H.

[*London Mech. Mag.*

For the Farmers' and Mechanics' Journal.

Mr. Editor,—As Bacon is an article of domestic manufacture, and when good is generally esteemed, and as most persons have a rule of their own. or I should rather say, none at all; for the benefit of all, I send you one that I have followed several years with entire satisfaction, and only request brother Farmers to give it a fair trial.—For eight Hams, take 2 pounds of Salt and 5 ounces of Salt Petre, both finely powdered; mix the Salts with a pint of Molasses; with this composition rub them thoroughly; pack them closely in a tub five or six days; then take them up; rub on the remainder of the composition, if any be left; sprinkle them over with fine salt. In repacking, take care to turn them;—let them lie five or six days; then cover them with a brine that will bear an egg. Let them lie thus covered a month, and they are fit for smoking. It is thought by some, that corn-cobs for burning, give them the best flavor. If the Smoke-house is good, and proper attention paid to them, they will smoke abundantly in a few days, and need not be smoked from three to six months, as it is said Westphalia Hams are. RUMFORD.

MISCELLANEOUS.

Notice regarding Steatite, or Soap-stone, and its principal uses.

Steatite is, as is well known, a variety of the talc genus. Its color is white, green, or gray ; it is also sometimes, though rarely, red and yellow. Its specific gravity varies from 2.60, to 2.66. It is a compound of silica, alumina, magnesia, oxide of iron, and water, which vary according to the locality. It is very common in Cornwall and Germany. As it is fusible only at an exceedingly high temperature, and is easily wrought, excellent crucibles may be made of it, which are further hardened by fire, and which are only with great difficulty penetrated by litharge. It is also employed in making moulds for casting metals. In England it is used in the manufacture of porcelain. M. Vilcot, an artist of Liege, made several trials of it, with the view of finding out whether it might not be susceptible of being employed by the lapidaries. He prepared cameos of this substance, the color of which he brightened in the fire, and which he rendered so hard, by the elevation of the temperature, as to give sparks with steel. They were then colored, yellow, gray, or milk-white, by different solutions. He polished them upon the stone, and ended with making them assume all the lustre of agate. Some pieces even resembled onyx, in color ; but a serious inconvenience was, that the markings were easily altered by the fire, and could no longer be restored. Steatite has a great affinity for glass ; it is also employed in the manner of paste, reduced to a fine powder, and mixed with coloring matters, for painting upon this substance.

It also serves as a sympathetic crayon for writing upon glass ; the traces seem effaced, when a piece of woollen is passed over them, but they re-appear immediately, when moistened by the breath, and again disappear when the glass becomes dry. Steatite is not so easily effaced as chalk, and does not, like that substance, change its colors. Tailors and embroiderers also, prefer it to chalk, for marking silk. It possesses the property of uniting with oils and fat bodies, and enters into the composition of the greater number of balls which are employed for cleaning silks and woollen cloths ; it also forms the basis of some preparations of paint. It is employed also for giving lustre to marble, serpentine and gypseous stones. Mixed with oil, it is used to polish mirrors of metal and crystal. When leather, recently prepared, is sprinkled with steatite, to give it color, and afterwards when the whole is dry, it is rubbed several times with a piece of horn, the leather assumes a very beautiful polish. Steatite is also used in the preparation of glazed paper ; it is reduced to a very fine powder, and spread out upon the paper; or, it is better to mix it previously with the coloring matter. The glaze is then given to the paper with a hard brush. It facilitates the action of screws, and from its unctuosity, may be employed with much advantage, for diminishing the friction of the parts of machines which are made of metal. [*Edin. Journ.*

Use of Sugar as an antidote to Lead in cases of Poisoning.

The following fact has been stated by M. Reynard, to the Societe des Sciences of Lisle: During the campaign of Russia, several loaves of sugar had been enclosed in a chest containing some flasks of extract of lead. One of these flasks having been broken, the liquid escaped, and the sugar become impregnated with it. During the distresses of the campaign it was necessary to have recourse to this sugar; but far from producing the fatal results which were expected, the sugar formed a salutary article of nourishment to those who made use of it, and gave them a degree of vigor and activity which was of the greatest service in enabling them to support the fatigues of marching. Hence M. Reynard thinks that sugar might be adopted for preventing the effects of subacetate of lead, instead of the sulphates of soda and of magnesia, which are not always at hand. [*Lond. Mech. Mag.*

NOTICES.

NEW INVENTIONS.

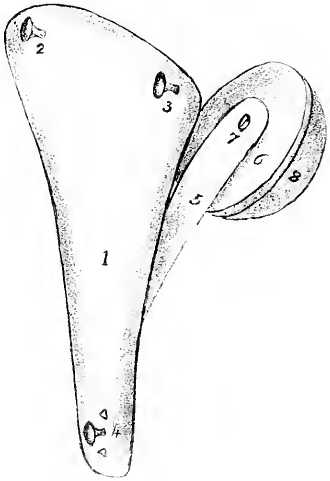
Messrs. PEARSON & HOWE, of Alna, Me. have taken out a patent for a newly invented *Machine for making Sugar Boxes.* The boards are cut, edged, and halved by machinery. It would also serve for making any kind of boxes or chests and trunks. They have one in successful operation in Alna.

Reaping and Thrashing Machine.

We have examined a Machine for reaping and thrashing grain by horse power; recently invented by Mr. SAMUEL LANE, of Hallowell, Me. It is simple in its construction, and promises to be a valuable acquisition to the class of labor-saving machinery. It might also be used for mowing as well as reaping where the ground is sufficiently smooth and level.--Drawings and descriptions of the above Machines will be given hereafter.

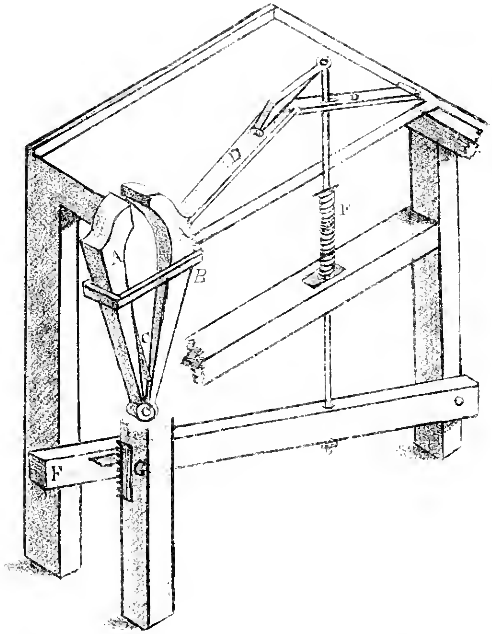
Pl. II.

Fig. 1.



HILLS' TRUSS.

Fig. 2



WINGS' PATENT VICE

THE

NEW-ENGLAND

FARMERS' AND MECHANICS' JOURNAL.

Vol. I. GARDINER, JUNE, 1828. No. 6.

MECHANICS.

HILLS' TRUSS.

Fig. 1, Plate 6,—is a representation of Hills' newly invented Truss, for those afflicted with Hernia.

1, is a Plate of tinned iron.

2, 3, 4, are Buttons to which is attached the strap.

5, is a steel Spring fastened to the Plate 1, by means of two small Screws at the lower end.

6, is a round Plate of thin tinned iron, which is attached to the spring 5, by means of a screw, and which also passes into and holds the Pad 8. This pad is made of stuffed leather, or ivory, or hard wood, turned smooth; the two latter materials are, on the whole, preferable. The Strap is so made, that it may be shifted, and the Truss removed from side to side, and put into various positions.

This Truss is simple and cheap in its construction, and we have no doubt will stand a fair competition with many other inventions for a similar purpose. The inventor is Mr. Samuel Hills, of Union, Me., who will supply those who may wish to procure them, and who will cheerfully answer any queries respecting them which may be proposed.

WING'S PATENT VICE.

Plate 6, Fig. 2.—is a view of a Vice, invented by Mr. Calvin Wing, of Gardiner, Me.

A, A, are the two sides, or cheek pieces, of the Vice.

B, an iron Clamp which surrounds them.

C, a Spring.

D, D, a Knuckle Joint, or Perpetual Lever.

E, a strong Spiral Spring.

F, a Lever.

G, a Rack.

The mode of using it is as follows: When any substance is to be held in the Vice, it is placed as usual between the Joint A, A. The foot is then placed upon F, and the pressure, acting upon the jointed lever, brings the side A, B, up to the other. A small plate of iron is attached to the side of the lever F, which catches in the rack G, and thus holds the Vice together as long as is necessary. As the lever hangs loosely upon its pivot, a side-motion disengages it from the rack. The spring E, raises the joint D, D, and the spring C, throws open the jaws.

The strength of the gripe is regulated by having the side A, B, made circular and notches cut in, which admits the end of the lever D, and which may be so moved as to make it longer or shorter, and the power be thus changed to a greater or smaller accordingly.

This Vice is cheaply and easily made; is powerful, and is superior to the other kind, in the ease and quickness by which any thing is fastened in it, or liberated from it—a slight movement of the foot being sufficient for that purpose. They are made wholesale and retail by the inventor.

JONES, ON JAPANNING AND VARNISHING....No. 6.

On the preparation and use of a Mastic Varnish, particularly suitable for Paintings in Oil.

TO THE EDITOR.

Sir,—Amateurs and collectors of paintings, are frequently at a loss for a varnish properly prepared, and suited, for the purpose of restoring and preserving the colors, in works of art. I submit the following observations on the preparation of a very good one, and the best mode of applying it to the surface of pictures painted in oil:

Experience has shown, that for this purpose, mastic varnish is, in general, preferable to any other, especially in the hands of inexperienced persons, and, with but few exceptions, even in those of the adept. This varnish is generally prepared by dissolving the mastic in spirits of turpentine, over a sand heat, in a well-glazed earthern, or in a copper vessel, occasionally shaking or stirring it about, until entirely dissolved, which will take place before it arrives at a boiling heat; after which, it is strained through a piece of calico, in preference to linen, as it is less apt to give off lint, which is very troublesome when it gets into the varnish: it is then put into a bottle, well corked, and placed for two or three weeks where the light of the sun can strike it, which will cause a large precipitation of mucilaginous matter, and render it as transparent as water. It is now to be decanted off into a clean bottle, and put by for use. This is the mode of preparing that commonly sold in the shops; but to insure a varnish that can be depended upon, the following observations must be attended to. Let all the mastic be bruised by a muller on a painter's grinding-stone, which will immediately detect the soft, or oily tears, which must be rejected; as when dissolved in the mass, they prevent the varnish from drying hard, leaving a greasy or tacky surface. The next point of importance, is to procure, if possible, turpentine which has been distilled a second time; but, where this is not to be had, the best kind sold in the shops must be taken; but it must be perfectly clear and colorless, otherwise, good varnish cannot be obtained; it must not be furnished through an oily measure, (which is but too commonly the practice,) but poured out of the carboy without shaking or disturbing it. If any doubts are entertained as to its purity, put about two spoonfuls into a common white saucer, and let it evaporate in the sun, which will be effected in two or three hours; and if it leave a greasy residuum, or a soft sticky mucus, it must be rejected; that only is good which entirely disappears. Thus prepared with good spirits of turpentine, and with mastic bruised and picked, the two ingredients may be put into a clean bottle, when the resin may be dissolved without heat, by half an hour's shaking in the hand; it must then be strained, and afterwards treated as before recommended.

The French sometimes prepare this gum in spirits of wine, (pure alcohol,) but it is subject to chill on the picture, and produces in time, a kind of white scale over it, which injures its lustre.

When it is prepared after the manner recommended, six ounces of pounded gum are mixed with fourteen ounces of pure spirit of turpentine, which may, if found too thick, be diluted with more turpentine. It should be laid on with a soft, flat, camel's hair brush, as it is called, but which however, is made of the hair obtained from the squirrel's tail. The varnish should always be laid on with as much despatch as possible, keeping it alive, as the artists term it, and floating after the brush. It may be proper to observe, that no kind of varnish should be applied to any painting, without first cleaning it; nor to a newly painted picture until it is perfectly hard, to effect which, requires five or six months. Before varnishing, be careful to remove all grease from the surface, by a coat of whiting (not lime) dissolved in water, and laid on so that it covers and entirely obscures the picture; this should be allowed to dry and to remain on for one or two hours, when it must be entirely removed by a sponge and some clean rain water; then perform the operation of varnishing in a still room, free from lint and dust.

It will sometimes happen, that a picture, where the surface is smooth, will look too bright and glaring, which is both disagreeable to the eye, and injurious to the effect of the picture: to remedy this defect, after the varnish is quite dry, say in ten or fifteen days, sponge the picture all over with pure rain water, for about one or two minutes; and having squeezed the sponge, and made the picture as dry as the sponge will leave it, pass, lightly, a clean silk handkerchief over it with great rapidity, until it become perfectly dry; when a clear, steady, lucid, appearance, will pervade the whole picture. Breathing occasionally on the picture to damp it, will assist the operation, while chafing it with the handkerchief.

Yours, very respectfully, JOSHUA SHAW.

Philadelphia, July 12th, 1827.

This is the last number that has appeared in the Franklin Journal. Should any others appear they shall be continued in this.

WHEEL CARRIAGES.

GENTLEMEN,—I have read with considerable interest the papers of E. Vialls and other correspondents, on the subject of the line of draught most proper for wheel-carriages. I remember to have heard the same subject extremely well treated by the late Mr. Walker, in the course of lectures which he used to deliver in different parts of England, on Experimental Philosophy; and if a few extracts from my notes of the same, can be of any service towards the elucidation of the matter, they are very much at the service of your readers. E. KNOX.

Bristol, Eng.

A horse, considered as a machine, is admirably constructed for draught or sustaining weight. His limbs form an assemblage of levers, which it would require a volume to point out. Attend, however, particularly to the formation of his shoulders: at the place where the neck rises from the chest of the horse, the shoulder-blades form the resting-place of his collar or harness into a slope or inclination, and as this slope or inclination forms an angle with a perpendicular to the horizon of about 14 or 15 degrees, it is clear the line of his draught should form the same angle with the horizon—Why? Because the horse will then pull perpendicularly to the shape of his shoulder, and all parts of the shoulder will be equally pressed by the collar.

The horse, besides, considered mechanically as a lever, has in this inclined draught a manifest advantage over all obstacles opposed to it in comparison with an horizontal draught; its power is in fact doubled.

We are entitled, therefore, to conclude, that single horse-carts are preferable to teams, and that four single-horse carts will draw more than when yoked to one cart. The reason—Because, in the latter case, three of the horses must draw horizontally, and therefore in a manner inconsistent with their mechanism.

Truth of this proved by practice--The small horses of the north of England draw larger weights than the largest waggon-horses of London, and go longer stages. The small horses of Ireland will draw as a common load 15 cwt., while our best waggon horses do not draw, on an average, more than 10 or 12 cwt.

In the case of our eight-horse waggons, at least, six out of the eight horses draw inconsistently with their mechanism, so that much exertion is misapplied: the horse's collar is also drawn against his throat, and his breathing interrupted.

In cart teams, where the horses are not marshalled, as in waggons, one horse is standing still while another is wasting his strength in pulling him forward. One horse leans one way out of the line of draught, whilst another is leaning a contrary way; their strength, in short, is scarcely ever united.

A horse, moreover, has the *momentum* of his draught increased by having a portion of the weight on his back. Hence, low wheels are not so disadvantageous as is generally supposed; for low wheels oblige the line draught to incline agreeably to the natural draught of the horse.

To prove that a horse should have something to lift in his draught, to give that draught its utmost momentum, Mr. W. mentioned that he had made the following experiments:—

He constructed a model of a four-wheeled carriage, whose weight was 32 ounces, the fore wheels 8 1-4 inches, and the hind wheels 10 1-2 inches. This was drawn on a horizontal board by a line over a pulley; an obstacle 1 1-2 inches high was placed before the fore-wheels, and the splinter-bar raised on the futchels, so as to be even with the top of the fore-wheel. The line of draught was then *horizontal*.

When things were so disposed, the weight necessary to draw the fore-wheels over the obstacle was 42 oz.

On lowering the splinter-bar, so as to make the line of draught to be from three-fourths the height or diameter of the wheel, the weight required was only 30 oz.

By lowering the splinter-bar still farther, so as to make the line of draught *from the axle*, the weight required was reduced to 24 ounces.

On changing the point of draught to a splinter-bar one inch below the axle of the fore-wheel, the weight was only 22 1-2 ounces.

It was hence to be seen, that the disadvantages of drawing from above the centre are as the sines of the respective arcs passing through the splinter-bar; and the advantage of drawing from below the centre, also as the sines of the respective arcs.

Now, as the splinter-bar, or point of draught, in most of our carriages, is placed about one-fourth the diameter of the fore-wheel above its centre, it is evident that a fortuitous pressure, equal to one-fifth of whatever weight lies upon it, is actually added to the natural weight by this unnatural situation of the point of draught.

Another course of experiments was made by Mr. Walker before several gentlemen, well versed in mechanics, on a waggon-like model, weighing about 156 lbs.; the fore-wheels four feet two inches in diameter, and the hind-wheels five feet six inches, with an obstruction placed against the two fore-wheels of 6 1-4 inches.

When the line of draught was perfectly horizontal, or even with the top of the fore-wheels, it required to draw it over the obstruction a weight of 60 lbs.

When the direction of the line of draught made an angle with the horizon of seven degrees, by lowering the point of draught six inches below the top of the wheel, the weight required was 48 lbs.

When the end of the line of draught was lowered, till the direction of it was at an angle of 11 degrees with the horizon, it got over the obstruction with 41 lbs.

When the end was lowered to the centre of the wheel, and the line of draught was at an angle of 15 degrees with the horizon, the obstacle was surmounted with 33 1-2 lbs.

When the end of the line of draught was lowered to 6 1-4 inches below the centre or axle, so that the angle with the horizon was 17 degrees, it was drawn over with 30 1-2 lbs.

When it was lowered to one foot and half an inch below the centre of the wheel, so that the angle was 18 degrees, it was drawn over with 29 lbs.

When it was lowered to 18 3-4 inches below the centre, (being only 6 1-4 inches above the road, and exactly level with the height of the obstruction,) the angle 23 degrees, the weight necessary to draw it over the obstruction was 27 lbs.

These experiments, though made upon so much larger a scale than the former, produced exactly a similar result.

A third experiment with a common chaise, when drawn by a splinter-bar as high as the top of the fore-wheels, proved that it required 80 lbs. to put it in motion; when drawn from the axle, it required only 51 lbs.

With another chaise, and the splinter-bar three-fourths of the height of the wheel, the draught over an inch obstruction, required 100 lbs.; but when drawn from the axle, only 61 lbs.

With another chaise, and the splinter-bar three-fourths of the height of the fore-wheel, the draught over an inch obstacle, required 119 lbs., but when drawn from the axle, only 93 lbs. So that in both cases there was one-fourth in favor of the draught from the axle.

With the same chaise, drawn up a hill rising one foot in six, with the splinter-bar one-fourth of the wheels' diameter from the top, it required 168 lbs. to draw it up. But when drawn up the same hill from the axle, it only required 129 lbs.; there was, therefore, the same advantage nearly in this mode of draught up-hill as on level ground. [*London Mech. Mag.*

TIMBER.

The durability of timber in all constructions, is a matter of great importance, and has led to many experiments in order to ascertain the most proper time of the year in which it should be felled. There are still various opinions respecting the proper season. If any of our readers have had any experience in these things and can state facts, we should be very much obliged to them for any communications on the subject. The following on "Felling and Seasoniug Oak Timber," is extracted from the *London Mecahnics' Magazine*.

Gentlemen,—As it must be acknowledged that every thing tending to improve the art of ship-building, either in the theory or practice, is of primary importance in a maratime country, I have ventured to send a few of my ideas on the subject of felling and seasoning oak timber: if they should not prove founded on a just view of the matter, they will, perhaps, elicit from some of your correspondents information that I have no doubt will prove valuable to many of your readers.

1st. Oak timber is generally felled for naval purposes about May, when the sap is rising in the tree; and this time is chosen on account of the bark stripping easier. This is very injudicious, however, as regards the timber; for the capillary tubes being full of moisture, the tree contains a greater quantity than would be the case if felled in the winter, which is the time I should recommend, and which, some years ago, was the practice. I believe that when winter-felled timber was used for naval purposes, very little, if any thing, was ever heard about the dry-rot. It is my opinion that winter-felled timber is of a better texture than spring felled, as the vessels are not distended; and the cold causes a contraction of the fibres, which in the Spring are dilated with the heat and sap. Now, my idea of one cause of the dry-rot is this,—that in in Spring-felled timber, the moisture it contains, when evaporated, leaves the secretion in the vessels, which, when it meets with a peculiar state of atmosphere, undergoes a fermentation, and causes ultimately a decomposition of the timber. Another thing which I think has tended much to hasten the decay of our ships, has been the indiscriminate use of foreign timber, particularly Quebec oak, which has been used in his Majesty's dock-yards for all purposes on board of ships where a straight timber was applicable. Now, it has struck me several times, whether by thus bringing timber of different species and countries (for they have likewise used oak from the Adriatic) in contact with each other, a chemical action may not arise from the difference in the juices of the timber, favorable to decomposition, or what we call the dry-rot. I think it probable some such action might take place; but I am not chemist enough to follow up experiments on this subject, nor have I either time or opportunity.

2d. The seasoning of oak timber appears to me to be egregiously wrong, and attended with great labor and waste of time; I shall in this instance more particulary allude to the King's yards, as being on a large scale, and presenting more cases in point. When oak timber is received at any of them, it is generally in a seeded state, (except what comes from the King's forests,) and is stacked in large quantities till wanted for use. Now, I cannot see any reason why the greatest part of it should not be converted into timbers, beams, &c. in the forest, which would not only be a saving in land and water-carriage, &c., but when the timbers were put in frame, they would be better seasoned than by the present method. There is also one thing I would wish to remark here, though not connected with the dry-rot, yet deserving of notice. That as many a piece of valuable compass timber is spoiled for particular purposes, by taking off so much in the siding of the piece, as will give the plane equal to the siding, with 1-8th added thereto: now if a convertor was on the spot, he might save many a piece of timber of this kind, by having it sided down to what he wants, and not to what the contract obliges the contractor to do. This plan of converting in the forests has been followed by the French; and it seems to be founded in reason, that there is no occasion for dragging about offal timber at a great expense of carriage, &c., and which offal wood might be sold in the forests when the season was over. If, in objection to this plan, it should be urged, that a mould loft cannot be carried to every forest, let all the straight work be cut there, the scantlings of which might be carried in the pocket. Were only this to be done, there would be a great saving, and the timber better seasoned. NAUTICUS.

Col. Pickering, in an essay on the "Felling of Trees for Timber," (published in the New-England Farmer, vol. i. p. 17,) says, "in the year 1800, divested of public employment, and about to commence husbandman, I made a visit to the late Joseph Cooper, of New-Jersey, one of the most intelligent farmers I ever knew, to converse with him on the subject of his vocation. Among other things he spoke of timber, and stated the following facts: His farm lying on the Delaware river, nearly opposite Philadelphia. was exposed to the ravages of the British army while occupying that city. Pressed for fuel, his fences first fell a prey to their necessities. In the month of May, 1778, they cut down a quantity of his white oak trees; but circumstances requiring their sudden evacuation of the city, his fallen timber was saved. The trees he split into posts and rails to carry on his fencing. It is now. said he, two-and-twenty years since the fences made of the May felled timber were put up, and they are yet sound; whereas those of trees felled in February, were rotten in about twelve years. He then pronounced confidently, *that the best time for felling timber trees, for durability, was when their sap was vigorously flowing*. He said also, that white oak and hickory trees felled at that season, would not be attacked by the worms, producing what is called 'powder post.' And added, that hoop-poles of oak and hickory, ought, for this reason, to be cut the same season." The writer then mentions several other instances, and authorities, in favor of of cutting timber, when durability is the object, at the time when the sap was flowing with the most freedom; and from the instances he has cited, it appears, that the only disadvantage attending the practice, is, that the timber thus cut, soon became so dry and hard as to render it difficult to hew it, or make any impression on it with edge tools.

In reference to a memoir of M. Buffon, before adverted to, the British Encyclopedia states, that, "by many experiments, particularly described in that essay, it appears, that the tree should not be felled till the third year after it has been stripped of its bark; that it then becomes perfectly dry, and the sap (alburnum or sap-wood) becomes almost as strong as the rest of the timber—and stronger than the heart of any other oak tree which has not been so stripped; and the whole of the timber stronger, heavier, and harder;—from which he thinks it fair to conclude that it is more durable."

Mr. Phinehas Stevens, of Andover, Mass., observes, (see N. E. Farmer, vol. ii. p. 370,) that, "the arguments adduced in favor of felling timber in June, are not conclusive. From thirty years' personal observation, I find it depends, in a great measure, on the quality of the timber. Some young growing timber, will perish sooner than that which is older and more ripe; and secondly, upon the use it is put to. We will suppose timber of the same quality wrought into two waggons, one of them, when used, is loaded with wet loading, the other with dry; it is obvious which will perish first. I trust I shall not be charged with egotism, by those who know me, when I say I have wrought more kinds of timber than most men have, and for more uses than any I know of; and it has been my endeavor to determine what time for felling, and what kind of timber is best for the use desired. And from the many observations I have made from both, I am satisfied and ready to say without hesitation, that September is the best time; although I believe, that if the bark of timber trees could be taken off in June, without felling the tree, or injury to the wood, and then let it stand till September, the timber would be stronger and more durable. I have seen this done to elm, walnut, and maple. All these are considered of the most perishable kinds that are made use of for timber. All of them proved to be more firm and lasting. I have seen white oak timber felled in February and March, the sap of the wood was perished in September on one side of the logs. I have seen wood cut in May and June, in which more than the sap of the wood was perished in one year. I have seen timber that was cut in September, that the sap was perfectly sound and bright two years afterwards. I have used white maple for hoops to buckets that was cut in September, that lasted twenty-one years in constant use, the first ten years for water, the remainder for feeding swine. I have one now that was hooped with maple that was blown down in the September gale, 1815, which is perfectly sound. I have one other that I put but one maple hoop on of the same kind, the others were of walnut cut in the winter; the latter i have had to replace three times, once with walnut, once with white ash, and once with red ash. The maple is perfectly sound now. Many reasons may be offered why September is the best time for the felling of timber, but one general reason must suffice for this time: The timber is more ripe in September than at any other time. I have thought that making these suggestions at this time, might induce some to try the experiment this season of removing the bark from trees designed for timber."

ANIMAL CHARCOAL.

Animal charcoal is prepared from the bones procured in large cities, and particularly at Paris, [France,] where the consumption of meat is very great. A great number of persons collect bones throughout large cities, among the refuse of other substances; and also the bones from kitchens, which are thrown into the streets. Shopkeepers, such as the dealers in marine stores for instance, buy them, and send them to the melters; who, after having extracted the fat or grease from the bones, sell them to the manufacturers of ivory-black and sal-ammoniac. These boiled bones require to be heated in close vessels; which operation is performed by two different processes. With the bones, broken to pieces, they fill large iron cylinders placed horizontally in a furnace; which are adapted, by means of a tube of three inches in diameter, with a long range of a refrigeratory apparatus.

The temperature is gradually raised, till the vessels become of a cherry-red heat; at which they are kept for thirty-six hours; when the charcoal is withdrawn from the cylinders, to be instantly enclosed in the extinguishing boxes. It is sufficient, then, to leave it to cool, and to reduce it into very fine powder. The greater part of the animal black is prepared in this manner.

The second process consists in carbonizing the bones in cast-iron pots, used in pairs, the one being inverted upon another; so that they assume nearly the form of a cylinder terminated by spherical ends. The joints are luted with loam. The cracks, caused by the contraction which the loam experiences in the fire, are sufficient for the escape of the vaporized water, the empyreumatic oil, and the gases resulting from the decomposition of the animal matters; such as, hydrogen, carbonic-acid, oxygen, and azote, either separate or combined, two and two, three and three, or in other varied mixtures, during the different periods of operation. The temperature of the whole soon becomes sufficiently elevated for the disengaged volatile products to be inflamed, and thus to assist the operation, by uniting with the fuel to produce heat. When the carbonization is complete, and all the volatile products are disengaged, the furnace is allowed to cool, so that a man may enter it: the brick-work door of the furnace is then broken down, and the cast-iron vessels are emptied: the bone charcoal they contained, is pounded, in the dry state, and is then ready for sale.

Animal Charcoal, in an impalpable powder, may be usefully applied as *a facing* to moulds for making iron or bronze castings: I have also used it with success in cementing delicate pieces of iron, to convert them into steel: it forms *ivory-black*, *bone-black*, &c.: it is spread upon land, as a manure; and assists in vegetation, even after being used in the refineries, &c. It is employed, not only in the preparation of sugar, but also to remove the color of various extracts, whether sirupy or saline. [*Dict. Technologique.*

On rendering Leather, Canvass, Linen, &c., Water-proof. By MM. FARRIMANN *and* THILLY.

To 100*lb.* of the best linseed oil are added 1 1-2*lb.* of acetate of lead, 1 1-4*lb.* of calcined umber, 1 1-2*lb.* of white lead, and 1 1-2*lb.* of very finely-powdered pumice-stone. These solid substances, well grounded and mixed together, must be boiled in the oil for ten hours, over a moderate fire, to prevent the oil from burning. This varnish should be of such a consistence, that, when mixed with a third part of its weight of pipe-clay, it should be as thick as treacle. It is left to settle eight days, and is then to be passed through a lawn seive. They then grind, in a solution of strong and clear glue, as much pipe-clay as amounts in weight to the tenth part of the oil employed, and mix to the consistence of ointment; adding the varnish by degrees, and stirring it well with a wooden spatula. This varnish must be repeatedly stirred, till it becomes perfectly fluid; and then the desired tint is given by adding a fourth part of the color, ground in oil.

The linen must be stretched upon a wooden frame; and the composition applied upon it, with a large spatula 3 inches broad and 9 inches long. The frame is then inverted, and the operation repeated upon the other side of the cloth: it is then left to dry for a week, and separated from the frame for use.

This cloth may be used for riding-hoods, covers for carriages, &c. &c.

For leather and skins, the same composition is used; but to give the surface a smooth and brilliant appearance, the following varnish is employed: viz. 5*lb.* of the oil varnish, and an equal weight of well-clarified resin, are boiled together, until the resin is dissolved; they then add 2*lb.* of oil of turpentine, having the color to be given to the varnish, ground with it, and passed through a lawn sieve: this is to be applied with a brush. When the varnish is thoroughly dry, it must be rubbed even with a pumice-stone and water, and be then washed clean. Two or three coats of varnish being then applied, and each coat suffered to dry for two or three days, is sufficient to produce a brilliancy equal to that of the Japan lacker. [*Bulletin d'Encouragement, &c.*

For the Farmers' and Mechanics' Journal.

ROCKING CHAIRS.

Mr. Editor,—Household furniture, as well as any other implement for use, ought to be so constructed as to combine economy with convenience and utility, thereby most effectually administering to our comfort. It is believed, however, that these ends are not so often attained to that degree that they might, by the application of a little common sense. I would particularly refer to the Rocking Chair, which is considered so essential to the comfort of almost every family, and is resorted to by the nurse and by the weary. For a short time, chiefly from change of posture, it affords relief, which soon (according to the weakness of the person) yields to a sense of weariness. This is frequently felt first at the pit of the stomach, then in the back, and the person is constrained to get up in order to *rest.* This is just what might be expected; for as they are generally made to counteract the pitch forward, the person is obliged to bear a considerable and continual weight upon his feet, and at the same time finds little or no support for his back, it will at once be seen that this is a fatiguing posture. Having noted the evil, I will proceed to point out the remedy.

Let the rockers project not more than an inch forward of the chair, and six or eight inches back, or so long that it cannot easily fall backward. Then let the rockers be so shaped that a person, of a size proportioned to the chair, sitting in it, and placing his feet on the rounds, with his back against the back of it in the most easy posture, will just balance it. Let the chair be so low that when the person's feet rest upon the floor, the forward part of the seat will not be felt much. By following these directions, the rocking chair will always be an easy, comfortable, and pleasant seat; and the improvement will well repay the expense of a new pair of rockers, or even a new chair. This has been proved long since by the experience of Yours, &c. Rumford.

REMARKS BY THE EDITOR.

We have two of the above named pieces of furniture, one as vile a thing to sit in as a man could well contrive, the other exactly the reverse. On trying them according to the above rule of balancing, we found the easy one would remain poised in the position stated by Rumford, the other came well near pitching the person out head-foremost. This rule should be known by every one, who attempts to make chairs of this description.

AGRICULTURE.

HORSES.

[Concluded from page 111.]

SIR,—In my first communication, for "are noble animals,—and" read "are noble animals: and"; a colon with no dash. The printer's accidentally cutting up an integral paragraph into three, has in some degree affected the sense of a large part of that communication: in my remarks upon the peculiar advantages and disadvantages of the thorough-bred horse, I did not intend to be understood that he never stumbled but in one way, or that he was liable to become unsound no where but in his feet; but that he was more apt than other horses to fall in a manner which I there described, more apt to catch behind, and rather more subject than other horses to foot-lameness: which last fact I ascribe to the peculiar manner in which this English variety of the Arabian, has for a succession of generations been treated. However, for coach-work, which is so much on the increase in Massachusetts, we should have horses capable of violent occasional exertion, and to breed them, let a man try what he pleases, he will always eventually look to blood. A single careless encroachment upon his powers, the coarse horse is, somehow or other, ever afterwards the weaker for. My observation that the true Cleveland Bay is confined to the County of York, is not entirely correct; he having been always to be found in the bordering County of Durham. It is going rather too far, to assert that all a horse's diseases not arising from contagion, assume an inflammatory form, but it is very near the truth. I will now make a few remarks upon the question of Foot-lameness.

The chronic lameness in one or both of their fore feet, and which never occurs in their hind ones, from which the superior orders of horses suffer more pain than from all other diseases put together, has given great occasion to inquiries and theories. It is rather remarkable, that most of the methods of accounting for it, have till of late years, gone upon the ground of the deviation from nature of the form of hoof, which universally takes place, in some degree or other, when the horse is shod, and kept in the stable; and none of them upon that of the joints within the hoof being injured by the concussion and strains, to which they are exposed in fast work; and the disposition of all inflammation near a joint to be transferred to it. The sporting and the veterinary world both decided, that it usually proceeded from something wrong about the hoof, with which the internal foot, had no part of it originally any concern. They now go the other way, and assert that contraction of the hoof is generally consequent to internal disease. Foot-lameness should be a subject of some interest to the public, for it dooms a very large proportion of our best horses to a life of comparative uselessness, and of excruciating misery.

1. They had a vague idea that it was connected with the horse's standing on litter in the stable. If this generally produced any

real evil to the horse, it would be from the unnatural heat in the foot, and the dryness and consequent contraction of the horn occasioned by the absence of the dampness of the earth, the heat of the litter, and the increased heat of the foot within. The greatest objection to this explanation is, that the contraction itself appears to be but slightly connected with the above causes, for the horse's hoofs, if he is kept shod, will contract nearly, or quite as fast, at grass as in the stable.

2. They then maintained that it probably arose from the frog's not receiving pressure, and that the very object of the frog was to prevent contraction by mechanical force. They shod the horse with a shoe lower at the heel than the toe, and with artificial frogs; broke down multitudes; found the hoof contract as much as before; and have at last, I believe, discarded the practice without reservation.

3. A distinguished master of the subject then ascribed it, and with vastly more appearance of reason, to shoeing the horse at all. It certainly would appear to be a tremendous trial of Nature's ability to accommodate herself to circumstances, to nail an iron ring round a living and elastic organ; and one, which as the wall of the hoof grows at the coronet, and is intended to be proportionably worn off by the earth, must be continually attempting to increase in size. Horses were never shod by the Greeks and Romans, with any thing but leather, or with shoes, which were tied on merely when the horse was at work: and nailing on shoes is still totally unknown in most parts of the world. The contraction arising from this fixed ring, though it may not ever be the immediately exciting cause of lameness, from the internal foot's in some degree adapting itself to its diminished area, I myself believe to be a great predisposer to it. That it cannot be the common cause, is evident from the fact that horses are never lame in their hind feet, be they ever so much contracted, and that the lameness itself is as often to be found in hoofs that are not perceptibly contracted at all, as in hoofs excessively contracted: which last fact I will demonstrate to any sceptical person, by examining the horses running in the coaches of any road in Massachusetts. I wonder that the very able defender of the theory of foot-lameness arising from the modern system of shoeing, instead of explaining it by the crowding of the sensible foot, did not perceive that its far most dangerous action was, from the contracted area of the back part of the foot, and the increased concavity of the sole's interfering with the action of the very joint, the injury of which is now considered the most frequent cause of this dreadful disease.

4. They were finally compelled to own that contraction could not be the common cause; (so many horses being struck with it, who had been never shod before, upon their being first put to work, might have been conclusive evidence to the contrary.) and have now generally supposed it to be a disease, which may afflict a horse that is kept standing upon the earth all his life, and who is never shod, provided he is exposed to sprains and concussion. At the back of the coffin-bone, there is a small bone placed horizon-

tally across the foot, excepting that it is in the form of a crescent, exactly resembling a very small shuttle. It is called the shuttle-bone, or from its resemblance to the shape of a boat, the navicular-bone. The outer side of the crescent lies backwards and downwards, and has a ridge in the centre of its surface. It is articulated both with coronet-bone and with the coffin-bone. Its especial office is to form an additional pulley for the back-sinew; which passed over its convex side, and is kept in its proper place upon it, by a groove corresponding to the ridge upon the bone. A bursa mucosa, or sac, containing and secreting the sinovia or joint oil, is interposed between the back-sinew and the bone; no way differing. I take it, in office or liability to disease from the bursæ mucosæ in other parts of the horse's frame. All the weight which the horse throws upon the leg is of course received by the coronet-bone, which, being articulated with the coffin-bone, which when the hoof is placed upon the ground, can have no motion but that allowed by the cartilages and the laminæ at its sides, sinks backwards and downwards, from its joint with the pasten-bone, directly upon the navicular bone. The navicular-bone being articulated with the coffin-bone, which is nearly motionless, receives what weight is not thrown upon the coffin-bone, rolls backwards and downwards also upon the back-sinew. The back-sinew being fast immediately almost below, and being perfectly inelastic, if the navicular-bone cannot roll upon it, the joint, if it may be called so, is destroyed. The weight is now transferred to the back-sinew, and is partly received by the muscles into which it is inserted above, and they share it with the elastic internal frog below the back-sinew, and the back part of the foot generally; all of which, if the horse has never been shod, is highly elastic. As this joint is the most perpendicularly opposed to the resistance of the earth of any joint in the horse's frame, and as all the elasticity of the back part of the foot, which Nature calculates upon, is neutralized by the iron, and in fact its area much diminished in general, disease of it would really seem to be very often expected in a shod horse, exposed to the concussion of fast work upon a hard road. That it seldom or never occurs in the hind feet is natural, when we consider that the weight thrown upon them is comparatively trifling, and that the resistance of the earth is not opposed to it perpendicularly, but in a very oblique direction. That foot-lameness generally arises immediately from concussion, is almost proved from its never occurring in the hind feet, which are also exposed to strains: and that it generally arises from disease of this joint is supported by the fact of this joint's being most exposed of any in the foot to concussion in the fore feet.

This joint, therefore, appears to be very much exposed to inflammation from direct injury, or if predisposed to it, it may appropriate to itself any general inflammation of the foot, from whatever cause. The first step of the disease is in the bursa mucosa, or sac, between the bone and the back-sinew; the second is a destruction of the smooth surface, and a caries of the bone; a consequent impediment to the roll of the bone upon the back-sinew;

and in extreme cases, I take it, an ossified union of them together. There can be no doubt, that in every state of the disease, the least motion of the foot, but particularly work upon the road, must occasion the horse a great degree of pain. As this chronic lameness in their fore feet is almost unknown in some breeds and in some families of horses, and is distressingly common in others, and as we well know, that in mankind, not only are hereditary taints very apt to show themselves in the joints generally, but we have almost as an established fact, that the generally carious teeth of civilized nations, is in fact to be ascribed to a superinduced frequency in their ancestors, I must continue to believe that this disease, or a strong predisposition to it, is very often hereditary.

The only approach to a relief of this disease, that has yet been discovered, is the operation of neurotomy; or completely destroying all nervous communication between the foot and the brain. This entirely, of course, destroys the sensation of the foot; and enables the horse to go with considerable freedom till the nerves re-unite; but it can have no effect upon the disease, but to facilitate its progress, by making the horse use his foot more roughly than he would otherwise have done, and I cannot conceive how it is possible that any cure ever should be discovered for it, after it has passed the first stage and affected the surface of the bone. However, I should like to see the opinion of gentlemen of infinitely longer experience in horse-flesh, and more intimate acquaintance with the principles of anatomy and the resources of the surgical art. Yours, &c. JOHN LANGDON ELWYN.

[*N. E. Farmer.*

AGRICULTURAL QUERIES.

[Concluded from page 114.]

27. *Oxen and Cows.* What number of each are usually kept on farms of average size?

At what age do oxen begin to work through the season?

How much hay is consumed by a steer before he is three years old, and what is the whole value of his pasturage during that period? What is the value of a calf 6 weeks old, and what of a steer 3 years old? What is the value of the milk, which the calf usually receives after it is 6 weeks old, until it is weaned?

What improved breeds of cows have been introduced?

What is the average quantity of milk a day from a good cow, during the summer season?

What quantity of butter, or of cheese, is usually obtained from a gallon of milk?

How much difference have you observed in the quantity of cream obtained from equal quantities of milk of different cows, though of the same age, and fed in the same pasture?

How much butter, or how much cheese, may be obtained in a year from one cow of average quality, supposing all the milk to be applied to one of these objects, or, how much butter and cheese are obtained from a cow of middling quality?

How much pasture in good state is allowed to one cow?
How much hay is necessary for the food of one cow, in average years, during the winter, or independent of pasturage?
How many sheep are equal to one cow in the expense of keeping through the year?
What is the *comparative annual income* of a cow and a sheep, both of middling quality?
What is about the number of cattle annually fatted in your town for the market? What food, beside grass, is given them, while fatting?
What is the average weight of an ox, fatted for the market?
What is the price of a cow in autumn, in years when an average crop of hay is cut?

28. *Sheep.* On farms of average size what number of sheep are usually kept?
What is the average number of lambs raised by any given number of ewes?
What is the number of Merino and what of common sheep in your town?
What is the average *weight of the fleece* of each kind?
What is the price of each kind of wool per lb.?
Does the quantity of the fleece vary much in different years?
What is the usual time of shearing sheep?
Taking all circumstances into view, what is the difference in *profit* between Merino and common sheep?
To what diseases are sheep subject? Is the evil from this source often very considerable?
What kinds or breeds of sheep are most liable to disease?
Are sheep in *certain pastures* ever subject to disease, while they remain healthy in other pastures in the same vicinity?
What food, beside grass and hay, is given to sheep?
What quantity of pasture is allowed to one sheep, or, what is the value of the pasturage of a sheep compared with that of a cow?
What is the value of the food of one sheep during that part of the year, when not at pasture, or, how many sheep will a ton of hay support during the winter?
What is the average weight of the flesh of a full-grown sheep, fit for the butcher?
Could not a larger number of sheep be supported without materially diminishing attention to other branches of agriculture, provided encouragement were offered in the price of wool?
What quantity of wool is annually manufactured in families for their own use in your town? And what quantity is annually sold to the merchant or manufacturer?

29. *Horses.* Are efforts extensively and steadily making to improve the breed of horses?
Are horses often employed in labor instead of oxen?
What quantity of hay is eaten by a horse during that part of the year, when pasturage cannot be obtained?

30. *Swine.* What breeds of swine are most extensively propagated?
With what food usually fed and fatted?

At what age killed, and what their average weight?
About what number of average size are fatted annually for the market in your town?
How many bushels of potatoes are equal to one bushel of corn for fattening hogs?

MISCELLANEOUS QUESTIONS.

31. In what manner are new lands prepared for cultivation?
What is the usual succession of crops for three or four years after clearing the land?
How many years are new or burnt lands cultivated, before the application of manure becomes necessary?

32. What quantity of sugar is annually obtained from a maple of average size?
What is the mode of collecting the sap, and preparing the sugar?
What effect has the loss of the sap upon the tree, and in what time does the effect begin to show itself?

33. What methods are pursued for draining swamps and low grounds, and preparing them for grass, or tillage?

34. What are the best methods pursued for destroying bushes, brakes, thistles, &c.?
What is the proper time for cutting them?

35. What is the best season for cutting timber, that it may be durable?

36. Are the older farms furnished with a supply of wood, and is the annual increase of that generally equal to the consumption?

37. What is the best method of recovering worn-out or exhausted soils to a good state, without expensive manures?

38. Are any efforts made to irrigate (or water) fields by damming, and changing the courses of springs or small streams?

39. Do you preserve good and improve your seeds and roots by exchange from different climates and soils, or by selecting from your own growth those seeds and roots, which are produced by the earliest and most flourishing plants?

40. Do you employ any valuable agricultural tools or implements not generally known?
What machines for threshing, shelling, winnowing, cutting straw, &c., are most in use and approved?

41. What is the price per acre of farms, of average quality, in your vicinity, and containing from 50 to 150 acres?

42. What are the principal articles, which your town furnishes for market; and in about what quantities, or to what probable amount.

HEMP.

There has been, and still is, much talking, writing and scolding, respecting the new Tariff. Many gloomy things have been predicted, and much shuffling and backbiting among the virulent of each party; each endeavoring to throw the real or imaginary odium on the other, and to escape themselves from the imputation of bad and imprudent legislation. It is indeed a "*queer*" tariff, but we are inclined to think will not be so ruinous in its consequences, as many would fain have us believe. If it bears hard upon any particular section of the United States, that section will probably be New-England. Yet she will hardly feel it—nay, it will be strange, if she does not ultimately turn it to better advantage than any of her sister States. We know not which to wonder at most—the folly of the idea, of its ruining New-England, or the folly of uttering such a thought, if conceived. What! crush New-England with such a paltry weapon as this! You could as well beat down her everlasting hills with a feather. Look at her resources—almost innumerable and exhaustless. She can live as long, as well, and as happy, without the productions of other climes as they can without hers. Her mountains are full of Iron: Her quarries are full of marble, coal and granite: Her forests are almost boundless: Her valleys are fertile and exuberant: Her sheep and cattle are without number, and her children hardy, industrious and frugal. But, say the complainers, it will stop much of the lumber-trade. We hope it will, and send some hundreds that are now destroying the forests, back to their farms where they belong. "It will stop, in a great measure, the importation of molasses"—True, and thereby check the distillation of it into N. E. Rum, that poison of the soul and body—that curse which has withered and blasted so many of the choice ones of the earth. These "evils," therefore, have their corresponding good. There are other things in which the tariff will be felt much more severely. The high duty on hemp, canvass and duck, will, for a time, be a matter of some inconvenience, and the only way to obviate it, is, to set about the business of cultivating Hemp, and manufacturing the articles from it that are needed. This may be made a profitable business. We are not aware that any considerable quantity was ever raised in this State; but there could not be a better region for it. It is a hardy plant, and will grow in almost all climates. It is grown in India, in Italy and in Russia. It may be cultivated throughout the whole extent of the United States. Our thrifty housewives will tell you, that it will flourish luxuriantly here, for it is their custom to scatter a handful of seed by the side of their Bee-houses, where it springs up and grows without care or attention, and continues to blossom and yield food for Bees until they retire into winter quarters. One sowing, for this purpose, is sufficient. It will spring up year after year like the common weeds, from the seeds which it sows itself. There could not be a better or more suitable and profitable crop for new lands. It yields from 600 to 1000 lbs. of clear hemp per acre, and when properly prepared, brings, in the market, if of middling quality, $200 per ton. The principal labor is in the dressing and preparing. It should be water-rotted: Every town furnishes convenience for doing this, and a little experience will soon enable one to regulate this part of the business understandingly.

There has been a prejudice against American Hemp which has prevented its use; but this prejudice arose from the improper manner of preparing it. It has been found that the fibre of American Hemp is better or stronger, than the Russian, when prepared like it. This has been proved by the experiments of the Navy Commissioners, who were directed by Congress to institute a course of experiments on the subject. They made the following Report:

Navy Commissioners' Office,
17th December, 1827.

Sir,—The Commissioners of the Navy duly received your letter enclosing a resolution of the House of Representatives, of the 2d of March last, requiring a report of the result of any experiments to ascertain the quality of American water-rotted hemp compared with Russian hemp; and, in reply, they have the honor to state, that all the experiments heretofore made of these different descriptions of hemp, have uniformly tended to establish the opinion, that the American hemp loses nothing in the comparison, whether we refer to its strength or its durability, when made up into cordage.

Experiments have been made of these hemps in their hatchelled state, before they were spun into yarns; and, in that state, the American hemp was found to be the strongest; and, after being made up into cordage, and tested on board of a ship under the command of one of the present Commissioners, its strength and durability were ascertained to be fully equal to cordage made of the best Russia hemp, similarly exposed. If there be a difference between the best American and the best Russia water-rotted hemp, when brought to our market, the Commissioners would unhesitatingly say it is in favor of the former. Admitting their staples, in their original state, to be equally good, the Russia hemp is certainly liable to greater injury from transportation; and that it does sustain more or less injury in its transportation from Russia to our ports, is believed to be an unquestionable fact.

At the instance of a gentleman from Pennsylvania, the Commissioners, in the year 1824, agreed to purchase two tons of American water-rotted hemp, with a view of having it made into cordage of various sizes, and tested on board of one of our national ships with the best Russia: under this agreement between 7 and 8 cwt. only was delivered. This hemp was pronounced by competent judges to be fully equal to the best Russia then in market, and the growers were accordingly paid the full price of the latter for it. It was then made into cordage and sent to Norfolk, to be used in the equipment of one of our national ships; but before it arrived the ship had sailed. A subsequent order was given to use it in reeving the main and main-top, fore and fore-topsail braces of a ship on one side; the other side of the ship to be fitted with cordage made of the best Russia hemp; and the experiment is now in progress: of the result no doubt is entertained by the Commissioners.

The Commissioners are sensible that, in the preceding remarks, they are only reiterating the opinion heretofore frequently expressed by them. They have never entertained a doubt of American *water*-rotted hemp being equal to Russia, but the great difficulty has been to procure a sufficient quantity of American *water*-rotted hemp to answer the demands of the Navy. The habit of dew-rotting has become so fixed, that it is apprehended a considerable time will elapse before the American community can be persuaded to change it, and resort to the preferable system of watter-rotting: indeed, a disposition has been manifested to experiment upon new theories, rather than adopt the system successfully practised and confirmed in other countries by long experience. Accordingly, we find that attempts have been made to prepare the hemp, by suffering it to remain twelve months in stack, and then exposing it to the action of dews; by breaking it with a machine in its natural state, without any previous rotting; by subjecting it to the operation of pyroligneous acid, after being dew-rotted.

The Commissioners have, from time to time, received hemp prepared in these various modes, and have directed experiments to be made of it. The results of such experiments. although not called for by the resolution, will not, it is presumed, be unacceptable, since their tendency is to establish the opinion entertained as to the properties of American hemp in its original state.

Cordage made of American hemp, stacked one year, and then dew-rotted, was fitted on one side of the Frigate Constellation as main, main-top, and fore-topsail braces, main clue-garnet, davits, and stern boat falls. The other side of the ship, in corresponding situations, was fitted with cordage of Russia hemp; and, after being thus worn for nearly a year, it was found, on examination, that the Russia rope, in every instance, after being much worn, looked better, and wore more equally and evenly than the American; that the yarns of the former were rather stronger, and the number of broken yarns not so great as in the American. But, although it thus appeared that the Russia rope was rather preferable, both as to strength and durability, yet, in the opinion of the commander, "the difference between them was not so great as to warrant a declaration that the proof was conclusive in favor of the Russia;" and he recommended further experiments as necessary to decide the question.

Of the same cordage, after being worn nearly two years on board the Constellation, her commander observes, "I have given a fair trial to the Kentucky hemp for rigging. If there is any preference, I would give it in favor of the Russia;" thus making it almost a matter of doubt whether cordage made of American hemp, stacked one year, and then exposed to dews, was not equal to cordage made of Russia hemp, when used as *rigging*.

In the year 1825, an experiment was made as to the relative strength of twelve yarns taken from a piece of cordage of Russia hemp, and the same number of yarns taken from cordage made of hemp broke by a machine, without having been either water or dew-rotted, and the following was the result:

	Russia.		*American.*
No. 1	sustained 97 lbs.	No. 1	sustained 97 lbs.
2	97	2	140
3	83	3	90
4	140	4	123
5	112	5	133
6	119	6	119
7	147	7	175
8	123	8	147
9	126 1-2	9	147
10	137	10	161
11	119	11	175
12	178	12	179
	1,478 1-2		1,686

Thus, the average weight sustained by the American yarns was 140, while that of the Russia yarns was only 123; proving, incontestibly, that the American was superior in point of strength, when newly made.

The same pieces of cordage (10 inch) were then directed to be immersed in water and mud, with a view to test their relative durability in that exposed state. After remaining thus immersed for nearly twelve months, they were taken up, examined, and tried; and the following was the result:

16 3-4 fathoms of the American rope were stretched until the outer yarns began to give way; remaining two and a half hours in that state, the purchase was increased until it parted, having stretched 3 fathoms 5 1-2 feet, lost 3-8ths of an inch in circumference, and sustained 5 tons, 3 qrs. 6 lbs.

The same length of the Russia rope similiarly tested, stretched 3 fathoms 3 1-2 feet, lost in circumference 5-8ths of an inch, and sustained 6 tons, 2 qrs. 12 lbs.

After these tests, the two remaining pieces of equal lengths were bent together, and hove until the American parted, sustaining 6 tons, 2 qrs. 4 lbs.

Two pieces of 12-inch cordage, hawser laid, one made of dew-rotted American hemp, prepared with pyroligneous acid, the other made of American hemp, broke by a machine, without any process of rotting, were tested on board the North Carolina, on her late cruise to the Mediterranean. They were found, *when new*, to be as strong or stronger than cordage made of Russia hemp usually is; but, after a lapse of eighteen months, they were found to have lost their strength in an extraordinary degree. Their appearance *then* indicated soundness; but, on unlaying the rope and drawing the yarns, it was found, after trying 20 yarns of each separately, that those of the dew-rotted hemp, prepared with pyroligneous acid, suspended, upon an average, only sixteen pounds, while those of the unrotted hemp sustained only eighteen pounds, although, when new, the yarns of either would have suspended at least 125 lbs.

From these facts, the conclusion appears irresistible, that American hemp requires only the same process of preparation practised in Russia, to render American cordage fully as good, for every species of service, as cordage made of Russia hemp. For the process practised in Russia, in the preparation of their hemp for market, the Commissioners would respectfully refer to the report which they had the honor to make on the 17th November, 1824.

I have the honor to be,
With great respect, sir,
Your obedient servant,
JOHN RODGERS.

Hon. SAM'L L. SOUTHARD, *Sec. of the Navy.*

[To be continued.]

CULTURE OF MELONS ON CLAYEY SOIL.

It has been found that if a hole be dug in a clayey soil, well-manured, and then filled up with fine sand, melons may be raised with comparatively less labor and care, and of better flavor than on the clay alone. The cause is probably owing to the sand's retaining the heat of the sun longer than the clay. With a view of ascertaining the fact, some sand was carted upon a stiff cold clay soil, and distributed as above. After it had been there a few days, the comparative heat of the two soils, was tested by a delicate thermometer. The experiment was tried at a quarter before 7 o'clock A. M. The thermometer stood in the shade at 58°. It was then buried one inch beneath the sand, in which the melons were planted, and suffered to remain two minutes. When taken out it was found to be 4° higher than when it was put in. It was buried the same depth, in the clay soil, about a foot from the sand, and suffered to remain the same length of time. On taking it out the mercury had sunk 4°. The thermometer was then laid, with its tube upon the surface of the sand, and suffered to remain the same time, as before. On taking it up, it was found to have risen 6°. It was then laid in a similar manner and for the same length of time, upon the surface of the clay, and on taking it up, it was found to have lost 5° of temperature. It may be well to state that there was a bright sun, shining at the time. The same experiments were tried at noon, and the difference of temperature was found to be 8°.

For the Farmers' and Mechanics' Journal.

TRANSMUTATION OF WHEAT.

MR. EDITOR,—It is a well known fact, that if a farmer sows wheat and rye together, the rye will gain on the wheat. The cause, according to the opinion of most people, is this. viz: that rye is a more fruitful grain than wheat. The writer has long been of the opinion, that it is not simply this, and of late has been convinced of the contrary by experiment. In the year of 1825, he had some wheat, and not knowing whether it were winter or summer wheat, in order to make it certain he took a few kernels of it and sowed it in his garden in the month of July. It proved to be winter wheat, and lived through the winter; but one half of it was rye. He then examined his wheat field, and fouud some of it that appeared to approach the form of rye in a small degree, having some appearance of very short barbs, though the wheat was bald. He then rubbed out the grain of one ear which resembled perfect wheat, and sowed it in his garden, which, strange to tell, was, next harvest, every spear rye! This was undoubtedly caused by the fecundation of the wheat by the rye pollen. Rye, being earlier and taller than wheat, has a greater opportunity of changing wheat than wheat has of changing rye, it being later and shorter.

However visionary this may seem to some, the results of the above experiment are facts. It is hoped that this will induce some of your scientific readers to put the thing beyond a doubt by a series of experiments on the subject. Should this be done, and the theory which I have advanced be established, farmers would find it for their interest to set apart a sufficient quantity of their wheat-field, for seed, and be careful to pull out every spear of rye before it blossomed that it might not scatter its pollen on the wheat, and we should then be able to buy a bushel of wheat, without its being at the same time half rye.

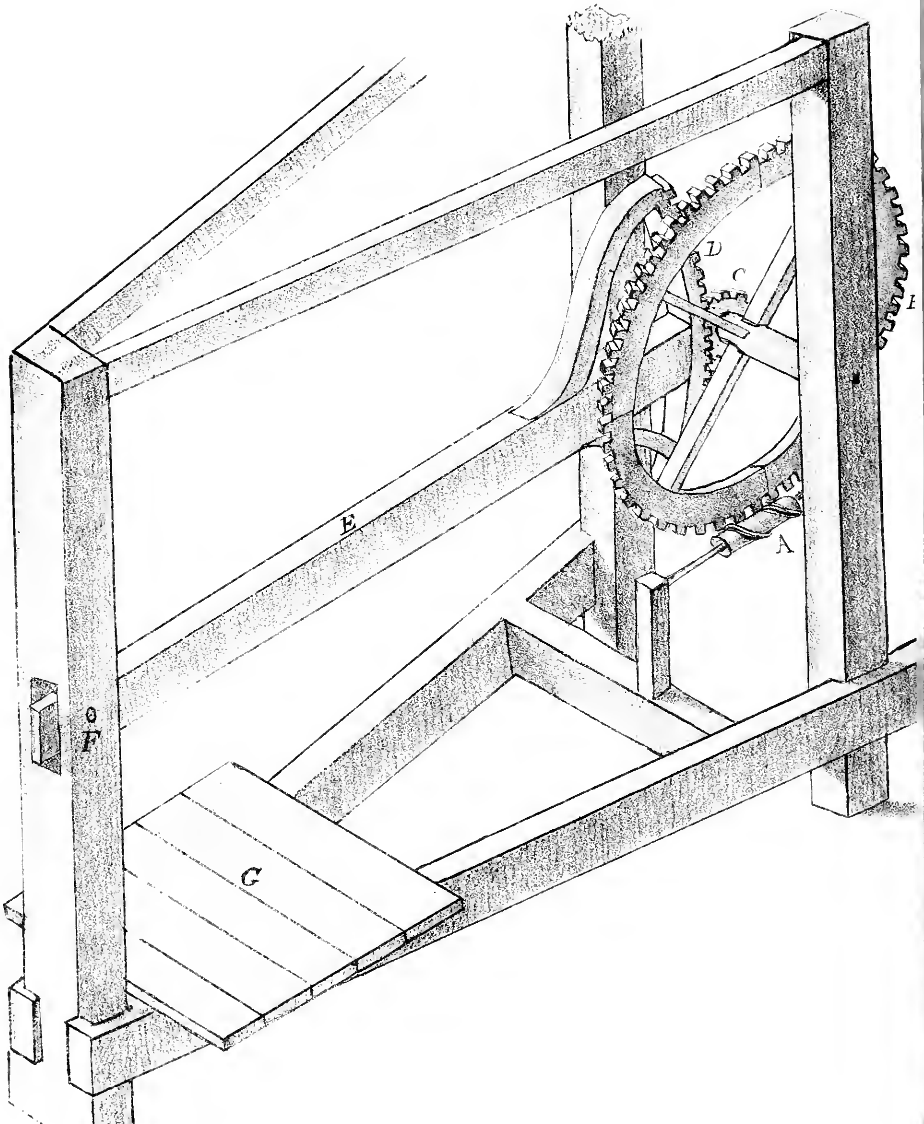
Yours, &c. S. CHANDLER.

Minot, June 6, 1828.

NOTICE.

WE have received a new Grammar of the English language, by WM. PIDGIN, A.M. teacher of a Grammar School in Buckfield, Me. "The parts of speech in the English language," says he, "are three; the Noun, the Verb, and the Conjunction."

What change, this system, together with *Nelandz Nu Orthografe*, may effect in Philology, we leave to those of a hundred years hence to tell.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THE

NEW-ENGLAND

FARMERS' AND MECHANICS' JOURNAL.

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MECHANICS.

CASWELL'S PRESS.

AMONG the many contrivances, for obtaining great pressure, we find a very simple one, invented by LEBBEUS CASWELL, of Harrison, Maine.—It is a combination of the screw, wheel and axis, and the lever; and is exhibited in PLATE 7.

A, is the endless screw, turned by a crank.

B, a large cog-wheel, which is turned by the screw.

C, a smaller cog-wheel on the same axis with B. This plays into the cogs which are on the semi-circle D, and which is attached to the lever E.

F, is the fulcrum of the lever.

G, a platform which may be moved to different parts of the lever.

This Press is powerful, but its scope is not very extensive. The nearer the fulcrum, the less distance does the lever move. Still it may be modified so as to regulate this, and it will undoubtedly be very useful for many purposes,—such as pressing cheese, cider, &c.

INTERNAL IMPROVEMENT.

Expeditious mode of conveying News, proposed.

THE anxiety which mankind feel, to hear whatever is new, especially when any important event is about to take place, has led them to adopt various plans for conveying information or news expeditiously from place to place. Couriers, Stages, Telegraphs, &c. are among the contrivances in most general use for despatching information. In turning over the leaves of a little work, called "*Philosophy in Sport*," we were reminded of a method of convey ing intelligence, which occurred to us years ago, when we used to amuse ourselves by whispering to our schoolmates, through the long wooden tubes, in a Pump-maker's yard. It then appeared possible to convey distinct words to a great distance through tubes of wood or metal, laid in the ground like an aqueduct. No chance ever occurred for trying the experiment. We once proposed it to a person who was repairing an aqueduct, but was heartily laughed at for a silly boy, and thus it ended. We are pleased to find, however, that the scheme is not altogether so visionary and pucrile as it at first seems to be. A Mr. DICK, of England, has tried some experiments upon this subject, and found that the human voice might be made intelligible twenty-five or thirty miles. The *Revue Encyclopedique*, on the strength of those experiments, recommends the manner to be put into general practice. Father KIRCHER relates in some of his works, that the laborers employed in the subterranean aqueducts of Rome, heard each other at the distance of several miles.

Some interesting experiments of BIOT, on the transmission of sound through a metallic tube, in some degree prove the feasibility of the plan. It was tried in order to ascertain the comparative capacity of air and solid bodies in transmitting sound.

"At the extremity of a cylindrical tube, upwards of 3000 feet in length, (over a half of a mile,) a ring of metal was placed of the same diameter as the aperture of the tube; and in the centre of this ring, in the mouth of the tube, was suspended a clock bell, and hammer. The hammer was made to strike the ring and the bell at the same instant, so that the sound of the ring would be transmitted to the remote end of the tube through the conducting power of the matter of the tube itself, while the sound of the bell would be conducted through the medium of the air enclosed within the tube. The air being transmitted by the metal of the tube, was first distinctly, and after a short interval had elapsed, the sound of the bell transmitted by the air in the tube, was heard. The result of several experiments was, that the metal of the tube conducted the sound with about ten and a half times the velocity with which it was conducted by the air; viz. 11,865 feet per second, and that the air conducted it 1142 feet in a second."

To put this project into practical operation, why could not tubes be placed under ground, out of harm's way, continuing any required distance, and opening into a small tight room? In this room should be placed some of those anxious mortals, who delight to listen to, and tell the news first—if they can. This person could hear what was said to him from the other extremity of the tube, and if another tube commenced at the other side of the room, he could apply his mouth to this and forward his communication with all the velocity of sound, viz: 1142 feet per second. We should thus have a grand national speaking-trumpet, and the executive could whisper in a trice to the most remote corner of the country, and give and receive intelligence to and from all their servants in almost as short a time, and as easily as if they were at their elbows.

FELLING TIMBER.

SINCE the publication of our last number, the following has come to hand from the *New-England Farmer:*

MR. FESSENDEN,—In vol. 2d of the New-England Farmer, were published a few facts respecting the most proper time for felling timber, that we intend to have the most durable, and yet have it exposed to the weather. At the time of writing those statements, I had one experiment going on, which had not come to a result. In September 10, 1822, I bought a maple log, and felled it for timber to work into a mill. After working what I wanted at that time, the remainder was left exposed to the weather. In June, 1823, I had another fallen, and left part of it exposed to the weather by the side of the other. In October, 1825, I examined both pieces, and found the one that was felled in June, was affected with white rot, all through the timber; but on examining that which was cut in September, I found the outside colored in about one-fourth of an inch; the remainder white, and as good for timber as it ever had been.

In 1827, in August, I was making an engine to a paper-mill, and had timber to work, which was felled in June, about the 10th. The bark was left on until we worked it, when to our surprise, the white sap-wood, in some places, had been rotten. This was the Quercus alba, (white oak.) From a consideration of the approaching scarcity of timber, in this part of the country, I have been led to communicate these remarks, not with a view of contradicting any person, for I think that a few degrees of latitude may make some considerable difference in the time when trees cease to extend their branches, and form their leaf and fruit buds for the next year, which is an indication that the sap is undergoing a change, and ceases to descend; a doctrine, which I shall attempt to demonstrate by some experiments I have made, which are conclusive to my mind. But this I must omit till another opportunity.

In this latitude, and to 1 deg. north—and nearly 1 to the south—the leaf and fruit buds are mostly formed in August, with here and there an exception; we find some formed in July, and some not until September. These last are not timber trees; and I think that in the latitude of Philadelphia, timber trees standing on a southern declivity, may be as mature in the last of June, as here in September; and what Mr. Cooper has said, [see New-England

Farmer, vol. vi. p. 366.] may be as correct there for June as what we have said for September here. But the fact that timber trees do cease to extend their branches in June, and form their buds on the banks of the Delaware, would be gratifying for me to learn. One other fact would be useful to ascertain—that is, whether there is the same acid in timber trees in June that there is in September. In this latitude, timber that is felled in September, will not suffer from red-rot; nor will the powder-post worm ever touch it. Take a young walnut, say one large enough for barrel-hoops, and give it any exposure you please (not placing it in the fire) and it will not lose its force in two years; nor will the powder-post be found upon it, whereas take it in June, and it will perish the first season.

I have subjoined a table, showing the comparative value of timber felled at the two seasons of the year above mentioned, in which I am correct, or nearly so:

Oak,	Sept. 10.0	June	4.5
Maple,	Sept. 10.0	June	2.4
Walnut,	Sept. 10.0	June	2.5
Elm,	Sept. 10.0	June	1.6
Ash,	Sept. 10.0	June	3.2

But by comparing the four last with white oak, provided they were all felled in September, they will stand nearly thus:

Oak,	10.0	Maple,	5.5
		Walnut,	6.2
		Elm,	4.5
		Ash,	5.6

PHINEAS STEVENS.

Andover, June 29, 1828.

On the Causes of Dry Rot in Public and Private Ships, and its Remedy. By JAS. BARRON, Esq., *of the United States Navy.*

A Pamphlet under the above title has just been published in Norfolk, by Commodore BARRON. The subject has been repeatedly noticed in this Journal, [*Franklin Journal*, edited by Thomas P. Jones, M. D.,] and from the great increase and extent of the evil proposed to be remedied, demands the utmost attention. We shall make a brief abstract of the former, and give to our readers the whole of the latter part of the pamphlet.

The dry rot is attributed to the influence of foul air extricated from the bilge water; and the remedy proposed is the free supply of wholesome air, by constructing the vessels in such a way that it may have free access to the timbers. The deleterious effect of foul air upon vegetable bodies, is viewed as analogous to its action upon animals.

"The most positive proofs (says the Commodore) of the destruction occasioned to timber by a foul atmosphere, are to be seen in every ship that is found in a decayed state; the best timber connected with the interior, being more or less injured, while that, even of an inferior quality, situated on the exterior, will be found to be comparatively sound.* A particular illustration of this truth is seen also in the excellent preservation in which the cabin furniture and joiners' work of ships, such as birth boards, &c. are found, arising from the free ventilation of those apartments, and their remoteness from the source of the noxious air generated by the bilge water. I would not be understood as ascribing this destructive agency directly to the bilge water itself, for it is well known that those parts of the timbers which are always covered with it, are seldom known to decay, while those immediately above it are most injuriously affected by the noxious air arising from it."

"Every ship or vessel acts, in some degree, as an hydraulic bellows, according to the quantity of water allowed to remain in her after the pumps have sucked; for as this water, by the motion of the vessel, rolls from side to side, the air above it, is by its motion, alternately forced out and drawn in between the timbers."

"It may not be irrelevant here to observe, that the tightness of ships is a fruitful cause of the destructive atmosphere of which I am speaking; for there is not an instance of the sudden decay of a ship that has proved leaky the first three or four years of her running, and this can only be accounted for by the continual use of her pumps, constantly admitting a quantity of pure water, and again removing it before it can become impregnated with the properties of the wood and the metallic substances, from which it derives its destructive qualities."

The ventilation is proposed to be accomplished by bellows constructed like the common smith's bellows, and to be worked by hand; all modes arising from the motion of the vessel having been found altogether uncertain. A pipe leads down from the valve on the under side of the bellows, and is, at the bottom, connected with another pipe passing fore and aft the vessel, and opening by means of short pipes into the spaces between the timbers, these short pipes being made to pass through the limber boards for that purpose.

The Commodore has found that the odour from a small quantity of any suitable substance deposited in the hold, may in a few seconds be perceived upon the deck, when the bellows are worked.

Of the Building of Ships.

"In the preceding pages I have intimated, that in order to the beneficial operation of the air-pumps or bellows, and to prevent the secretion of the destructive air, which the machine is intended to extract, ships should undergo a considerable change in their construction.

"I have submitted my ideas on this subject to several of our

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* "Eight years after the frigate United States was launched, I visited her, and found all the materials unconnected with the internal air, (that is, that air between the inside and outside plank,) as perfectly sound as they were when I first joined her in '98: I served on board of her for two years, and could readily identify the articles alluded to. At the time I speak of, the United States had undergone one thorough repair and was equally ready for the second."

most celebrated mechanics, all of whom concur with me in the opinion, that a change may be made in the manner of constructing our ships, without the least risk of impairing their strength; for, although there will be a much smaller quantity of materials employed than in those heretofore built, yet, from the combination of these materials, the ships will be stronger than when, as now, loaded with metals and timbers, which rot in a few years. This superabundance of metal and timber occasions ships to swim too deep, and in a great measure destroys the invaluable quality of buoyancy; while the unnecessary precaution of close ceiling ships, with a view of giving to them additional strength, is, I again urge, one of the principal causes of their rapid decay.*

"A very important advantage would accrue to the merchant service, from the proposed change in the construction of ships, whereby a free ventilation would be afforded to the *cargoes*, which, especially when in bulk, or composed of articles making close stowage, are liable to great damage from being over-heated. This evil is almost inseparable from a *tight* ship, which, as before observed, generates a foul air, destructive to every thing that comes in contact with it; and it has been distinctly ascertained, that less injury would be done to cargoes of grain, and other articles stowed in bulk, in leaky than in tight ships; the latter not being so susceptible of ventilation. A great benefit would also result to the *crews*, from the better state of preservation in which the *provisions* of ships would be kept, by this improvement in their ventilation.

"Formerly when ships were built in Virginia, (for the merchant service,) of the common oak of the country, and not so closely connected in their timbers or ceiling as at present, it was not uncommon to see them from sixteen to twenty years old before they had undergone any material repair; but, lamentable to relate, we now seldom see a ship, either public or private, that is not more or less rotten in from five to seven years after she is built. The question may then reasonably be asked, what nation can support a navy, if its ships are to be rebuilt in so short a time after their construction?

"Again, if the quantity of timber used in the construction of ships, both public and private, is, under any circumstances, necessary, how are we to account for the latter performing long voyages, through tempestuous oceans, loaded with heavy cargoes, without complaining either by straining or leaking; when, on examination, they are found to be as rotten as scarcely to exhibit one entire sound plank or timber; and, but for the superior quality of the live oak, of which our national ships are principally framed, they would be in the same situation? The fact above stated, of the competency of our private ships to sustain the strain of heavy cargoes, even in the decayed condition represented, certainly goes to

* "In the year 1805, Col. Lear informed me that he visited the frigate *Crescent*, in Algiers—she was then about seven years old, and built of the common oak of New-England. On examining her, he found that her ceiling had been taken out; and the minister of marine had informed him, that to this cause they attributed the duration of their ships."

prove, that more timber is employed in the construction of our public ships than is necessary for the purposes of strength alone; and regard to the valuable quality of buoyancy, should furnish a strong reason for not lumbering them with superfluous materials. It is an incontrovertible fact, that the merchant ships have encountered the heaviest gales while in the condition above stated, without exhibiting the slightest sign of weakness. Public ships, when so loaded with timber, float too deep in the water, either for comfort or fast sailing. The practice too of ceiling the decks over head, for ornament sake, is also ruinous to the beams and deck-plank itself, while it so much increases the weight in timber, of which I complain.

"All national vessels should be built with copper bolts, wherever they can be introduced, to be secured by *screw* taps on their inner ends, and removed or replaced at pleasure when a ship is repaired; and by no means should the present practice of cutting out plank and breaking off bolts be allowed; being a great waste of time, and often of valuable materials. If ships were built in the manner here recommended, the strakes of plank might be removed or replaced with convenience, without an additional hole being bored in the frame. It might probably become necessary, in this case, to use bolts one size larger in repairing, as driving out the bolts might somewhat enlarge the hole. I should recommend one bolt in each edge of the plank to pass through each timber composing the frame, thus,  and not to use tree-nails or spikes at all, in any part of a ship where they can be dispensed with. Thus constructed, ships can be completely ventilated, and when they require repairs, they may be taken asunder with perfect ease, and in a manner to expose every part of their frame to view, by which plan no defect can be concealed or rendered difficult to remove.

"Again, ships should be built in regular frames, coaged or dowelled together, and strongly bolted from the floors to the top timbers. These frames should be placed from eight to twelve inches apart, (according to the size of the ship;) the ceiling, as far up from the keelson, as one or two strakes above the floor heads, may be flush, and then chamfered pieces, (a term used by carpenters for horizontal pieces of plank,) perforated with many small, smooth holes, let in between the timber—covering the openings between the ceiling and outside plank, to admit the fresh air, as fast as the foul is pumped out by ventilators: the ceiling should then be partial up to the strake below the clamps of the lower gun-deck; using only three strakes of ceiling of from eight to twelve inches wide (according to the size of the ship) over each joining of the timbers. The ceiling should be of plank one-third thicker than that commonly used, and the frame let into it fully that third, thereby forming a kind of jog and chock work, on the principle of a square, supported from the point of each angle, thus, which renders the whole frame more secure than a general ceiling in the manner now practised. On each gun-deck a strake, or a small part of one, should be left out, and the openings furnished with shutters, hung by hinges, or metal slides, opposite each aperture between the frames, for the purpose of ventilation; to be closed in time of action, or during violent weather. On this plan, it is evident ships would be much lighter, contain less timber and other costly materials; would also be sufficiently strong, and show at the first glance, that they must be more healthy, as there would be scarcely a place in them where foul air could be secreted.

Of Store Rooms, &c.

"The whole system of bulk-heads and partitions for store rooms might also be changed for a more open and airy arrangement, all tending to remedy the evil complained of, by admitting a free and unobstructed current of air into every department of the ship, alike promotive of the health of the crews, the preservation of the ships, and of the valuable materials in charge of the store-keepers. Stanchions and shelves would answer all the purpose of dividing the different articles, and one *general store-keeper*, better qualified than those to whom such service has heretofore been assigned, would suffice to supervise the whole distribution of the stores.

On the Magazines of Ships.

"The magazine of every ship should be as distinct from the hull as convenience will permit. It should form a box, supported on all sides by stanchions, and made perfectly tight, so that in case of fire, it might be overflowed by water, introduced by a pipe passing through the sides of the ship into the box, without connexion with any other part of the ship's hold. An excellent idea has lately been suggested, for guarding against accidents, in conveying powder on board of ships, as well as against the awfully destructive effects of an explosion in the magazine. The plan is this: to have canisters of copper, with screw tops, made water tight, capable of containing from sixteen to twenty rounds of cartridges. Under such circumstances, should a fire occur on board, the magazine might be immediately filled with water, without detriment to the powder; and the ship might burn to the water's edge and fill, before an explosion would be likely to take place. Another highly important advantage of this plan, is, the increased effect given to the exertions of the crew, by removing all apprehension of her blowing up; the alarm from which, has on several occasions, proved destructive to that discipline, which otherwise might have been effectual in saving the ship.

Of the Pumps of Ships.

"I cannot but look back with astonishment at the listlessness that has prevailed in the nautical world, for such a length of time, in allowing so great a quantity of water to remain in a ship, after the pumps have sucked. This water, commonly called bilge-water, is also a principal cause of a ship's decay, and of the unhealthiness of the crews; notwithstanding which, it is yet the custom to allow, from six inches to two feet of this poisonous water to remain in a ship, under the idea that it would be dangerous to let the pumps have a closer connexion with the seams of the garboard strake, lest they should draw out the oakum from those seams so nearly connected with them. The best reason that could be assigned for not allowing the pumps to descend lower, or to the outer plank of the bottom, commonly called the skin, is, that ships are now built much stronger than heretofore, and of course, from the close connexion of the floor timbers, there is not room for the pumps to enter between them; consequently the depth of the floor timbers determines the quantity of bilge-water, allowed to remain in a ship. This inconvenience might be removed by having one or more *small* pumps placed farther aft, and let so close down to the inner part of the outward skin, as to take this water up within an inch of the bottom. I will suppose that the close connexion of the floor timbers—or a better reason than the one assigned, namely, that when further removed from any obstruction, the water naturally flows more freely to their heels or entrance—has been the cause of the pumps not being let down nearer to the bottom of the ship. But this reason can have no manner of influence, nor be properly urged as an objection to allowing one or two small pumps to go down within one inch of the bottom, only to be used in drawing this fœtid water entirely out of the ship, after those placed at a greater distance from the bottom have sucked, and thereby to extract the last drop of this poisonous cause of death and destruction."

Ships on the Stocks, under cover.

"One simple suggestion for their better preservation, may not be ill-timed:—The admission of the external atmosphere in its mildest stages, is, as before intimated, as advantageous to the preservation of timber, as it is generally found to be to that of the human system. Timber of the most superior quality, and in fact every species and quality of wood, exposed to unrestrained currents of the atmosphere, will be rent and split to pieces by the alternate expansion and contraction, thereby occasioned. The proofs of this, are numerous and of daily recurrence. I would therefore recommend, that all ships under cover, should be sheltered from the effects of changes in the atmosphere, by causing all the apertures in the ship houses to be as carefully closed as if occupied by families; and opened only when the air is pure and salubrious—for it is an undeniable truth, that timber, exposed to unrestrained currents of the atmosphere, and the vicissitudes of the weather, is rapidly rendered unfit for any useful purpose. Our household furniture affords conclusive evidence of this result; for however perishable its materials, it is seldom seen to be decayed or rent.

"If the foul air in the first instance, and an unrestrained current in the second, are not respectively the causes of the rapid destruction of timber, to what cause is it ascribable, that every species of wood, even of the most inferior kind, is found in a good state of preservation when totally excluded from the influence of either of these destructive agents?" [*Am. Mech. Mag.*

Observations and Inquiries respecting the alleged Decay of American Timber, in England and Ireland.

The subject to which the subjoined extract of a letter refers, is one of great curiosity, and of deep interest. The letter is from a person of the highest standing for talents and integrity; one whose name alone would bespeak attention to the inquiries made, apart from the importance of the trade dependant upon the productions of our forests.

The Editor had previously heard statements made respecting the rapid decay of certain kinds of American timber, which had been used for architectural purposes in England; these statements he had always considered as greatly exaggerated, if not altogether false; and he viewed, and still views this opinion as justified by the well-known fact, that at home, our pine, and other woods, are as durable as the deals from Norway, and the other species of timber imported into England from the north of Europe. The alarming manner in which that species of decay denominated the dry rot, appears to have increased in our own day, it was believed would aid in accounting for the complaints alluded to, although the timber of our own, might not be more susceptible of this disease, than that of other countries. We have inquired from gentlemen who have resided in Canada, respecting the durability of the timber of that section of our continent, but have not heard of any fact to lead to the conclusion that their woods used in building, decay more rapidly than those employed by us. Every builder in Philadelphia, we are assured, has seen girders, joists, rafters, and other timber, taken from houses which have been pulled down, after standing for nearly a century, which he would prefer to new wood from the mill, because it appeared equally sound, and was perfectly seasoned. The sap (alburnum) of the red deal, of Europe, and of the yellow pine of our country, is, we know, equally subject to the ravages of insects, when cut down at an improper season, and suffered to lie in the woods with the bark on, until they have made a lodgment in the timber.

Should the fact stated below, be eventually authenticated, we shall conclude, that the English have an insect which has an unfortunate fondness for American food; we hope, however, and believe, that the accounts given will be found to be incorrect; the truth must eventually be ascertained, and the earlier the better; we earnestly desire those who may possess any accurate information upon the subject to communicate it for publication. Is there any insect known which will perforate cork?

[*Am. Mech. Mag.*

Extract of a letter from a distinguished individual in Ireland, dated February 27, 1828.

"I have lately heard a curious fact respecting some American timber; I believe, Canadian pine; but of this I am not certain, as the words used by the person who told me the anecdote were general, viz: American timber.

"A person of our acquaintance had 36 dozen of wine in bottles, packed in Dublin in sawdust of American timber. The sawdust, when the wine was unpacked, was found swarming with an insect which had eaten through the corks of several of the bottles—the wine was spilled, and the bottles filled with the insects; all those of which the corks were yet safe, the person was obliged to have new-bottled. I mentioned this fact to Mr. ——, a great Dublin coach-maker, to whom I had occasion to write at the time, and to whom I thought it would be useful—he answered in these words:

"'I had heard before of the insect you refer to in the sawdust of American timber, and in the timber itself there is a much greater grievance. I understand there are whole streets in London lately built, in which this timber has been used, and rendered almost unfit for habitation by the *cimex* (I believe) *axanthia*, which actually swarms in the crevices of the joints, &c. and cannot be removed by any thing short of conflagration.'"

"I wish you would let me know if there be any complaint of any particular kind of timber in America as being infested with this insect. If the fact be as stated, the *kind of timber* should be distinctly described, for avoidance, else the general report will affect the credit of all American timber. Is there no remedy? Pray inquire, and make your answers more distinct than I have made my questions." E.

Plane Surfaces not separated by a Blast, in certain cases.

Wallingford, Vt. May 16, 1828.

TO PROF. SILLIMAN.

Dear Sir,—I beg leave to call your attention to a fact, for the explanation of which a gold medal and one hundred guineas were offered by the Royal Society.

The experiment is this: cut from a card two pieces about two inches in diameter, let one of them be perforated in the centre, and let a common quill be introduced into the perforation, with one end even with the surface of the card—let the other piece of card be made a little convex, and lay its centre over the end of the quill, with the concave side of the card down—the centre of the upper card should be from 1-8th to 1-4th of an inch above the end of the quill. On attempting to blow off the upper card, by blowing through the quill, it will be found impossible.

I prepared the pieces of card very carefully, according to direction, and to my astonishment, the upper card *could not be blown off.*

When the edges of the two pieces of card were made to fit each other very accurately, the upper card would be moved, and sometimes it would be thrown off, but when the edges of the card, were on two sides, sufficiently far apart to permit the current of air to escape, the loose card retained its position, when the current of air sent against it was strong, when it was inclined at every angle through 180°; but when very little inclined, if the current of air ceased, the upper card would immediately fall. The experiment succeeds equally well, whether the current of air be made by the mouth, or from a bellows. When the tube fitted the perforation of the card rather loosely, a comparatively light puff of air would throw both cards three or four feet in height. When, from the humidity of the breath, the upper surface of the perforated card had a little expanded, and the two opposite sides were somewhat depressed; these depressed sides were distinctly seen to rise and approach the upper card directly in proportion to the force of the current of air.

I have this moment discovered another fact with this simple apparatus, equally inexplicable with the former. Let the loose card be laid upon the hand, with the concave side up—blow forcibly through the tube, and at the same time bring the two cards towards each other—when within 3-8ths of an inch, if the current of air be strong, the loose card will suddenly rise, and adhere to the perforated card. If the card through which the tube passes, have several perforations made in it, the loose card is instantly thrown off by a slight puff of air. An explanation is requested by your ob't. serv't., NAT. IVES.

Explanation by Dr. Robert Hare.—The phenomenon above alluded to, is usually illustrated by means of two disks,* into the centre of one of which a tube is fastened, so that on blowing through the tube the current is arrested by the moveable disk. Under these circumstances the moveable disk is not removed, as would be naturally expected.

Supposing the diameter of the disks to be to that of the orifice as 8 to 1, the area of the former to the latter must be as 64 to 1. Hence if the disks were to be separated (their surfaces remaining parallel) with a velocity as great as that of the blast, a column of air must meanwhile be interposed, sixty-four times greater than that which would escape from the tube during the interim. Consequently if all the air necessary to preserve the equilibrium be supplied from the tube, the disks must be separated with a velocity as much less than that of the blast, as the column required between them is greater than that yielded by the tube; and yet the air cannot be supplied from any other source, unless a deficit of pressure be created between the disks unfavorable to their separation.

It follows then, that under the circumstances in question, the

* The word *disk* is used by experimental philosophers, to signify any plane surface bounded by a circle, whether it be merely a superficies, or have sensible thickness, as in the case of a wafer, or a piece of coin.

disks cannot be made to move asunder with a velocity greater than 1-64th of that of the blast. Of course all the momentum of the aerial particles which constitute the current through the tube, will be expended on the moveable disk, and the thin ring of air which exists around the orifice between the disks; and since the moveable disk can only move with 1-64th of the velocity of the blast, the ring of air in the interstice must experience nearly all the momentum of the jet; and must be driven outwards, the blast following it in various currents, radiating from the common centre of the tube and disks. The effect of such currents in producing an afflux of the adjoining portions of any fluid in which they may be excited, is well known, having been successfully illustrated by Venturi.—See Nicholson's Journal, quarto, vol. ii. p. 172.

Accordingly the afflux of the air towards the disks counteracts the small velocity which the blast would communicate, and thus prevents their separation, and may even cause them to approach each other, if previously situated a small distance apart.

This rationale commences with the assumption that the disks will remain nearly parallel. That there cannot be much deviation from parallelism must be evident, since any obliquity will make the opening greater on one side than on the other; and the jet proceeding with most force towards the widest opening, will increase the afflux of air upon the outer surface of the moveable disk in the part where the current is strongest, and thus correct the obliquity.

The phenomenon is advantageously exhibited, when the area of the tube is to that of the disk, as stated; but were any other ratio, which can be successfully employed, substituted, it would not alter the explanation. [*Silliman's Journal.*

The phenomenon, described above, and which has excited a good deal of curiosity, was first observed by M. Clement, of Paris. He found, that a "flat valve being placed over an orifice in a steam chest, and covering a considerable space around the orifice, when the steam was let on the valve, (instead of rising as was expected,) kept its place, and required a considerable additional force to lift it." Some consider Prof. Hare's theory incorrect, and have offered other explanations and experiments, to prove the fallacy of his, and the truth of their own opinions; they will probably be published in the next number of the Journal, that its readers may judge for themselves.

AGRICULTURE.

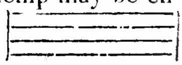
HEMP.

[Continued from page 143.]

In our last, was published the experiments of the Navy Commissioners, which prove that American water-rotted Hemp is preferable to the Russian. This fact being established, it becomes an additional incentive to cultivating it among ourselves. It would be the height of folly to purchase that of a foreign nation, which we can produce, not only as easily and plentifully, but better in quality than they can. The following is the method of raising the article in question, in Russia, transmitted by the Hon. J. Q. Adams, Minister to St. Petersburg, March, 1810:

In Russia, when the season is mild, the hemp seed is sown about the 1st June, old style. The richer the soil of the land employed for it, the better. A chetwirt of seed, (100 chetwirts are equal to 73 quarters, Winchester measure,) is sown on a piece of land of 80 fathoms (English feet) long, and 60 fathoms broad.

The land is first ploughed and harrowed, and, about 200 single horse loads of dung being spread upon it, it is left for six days, when it is again ploughed, and the seed sown and harrowed the same day. In about four months the seed becomes ripe, and the hemp is then pulled up with the roots; if it be allowed to remain too long in the ground, it is apt to become harsh. It is bound into heads or bunches of four handfuls each; these are hung upon sticks placed horizontally, thus, ×-0-0-0-0-0-0-×, and allowed to remain so for two days. It is then made into *cut* or *thrashed* hemp, as may be agreeable. The cut hemp is made by chopping off the heads containing the seed. These are put into the kiln, and, after remaining there for eighteen hours, the seed is beaten out.

If thrashed hemp is to be made, the heads or tops must not be cut off, but the bunches of hemp, placed entire in the kiln; and, if the weather be warm, it will be sufficiently dry in three days, when the seed must be thrashed out of the heads. In either case, three days after the seed is separated from it, the hemp must be put to steep or rot, either in a stream or a pond, and that the hemp may be entirely immersed, it is put under wooden frames  upon which stones are placed, or, where they are not to be had, earth is substituted, after the frames are covered with planks.

The clearer and purer the water, the better will be the color of the hemp. Where the water is warm, three weeks' steeping will be sufficient, but, if cold, as in rivers, springs, &c. five weeks or longer may be necessary. At the expiration of this period, a head of the hemp is taken out and dried; if, on beating and cleaning it, the husk comes off, the hemp may then be taken out of the water, but if the husk still adheres to it, it must be allowed to remain some time longer. This trial must be repeated from time to time, till the husk separates, when the hemp must be taken out of the water, and suspended to dry, as directed before, on its being taken off the ground.

The hemp is now made into the two sorts, distinguished by the names of *Spring* and *Winter* hemp; the former being dry and rather of a withered appearance, the latter more moist, and of a fine brownish green color, containing more of the vegetable oil, and, therefore, the most apt to heat, though, if not shipped at St. Petersburg or Riga, before September, there is not much risk of its heating any more on board the ships, especially on short voyages, as to England, and are the best fit for cables. If it be intended that the hemp should be early ready for the market, it is made into Winter hemp by the following process: On being taken out of the water, it is left suspended in the open air for about a fortnight, when it is put into the kiln for twenty-four hours, after which it is broken by means of a hand-mill, and the husk is then beaten off by striking the heads obliquely with iron and wooden instruments, of the shape of a large two-edged knife; lastly, to unravel it, it is drawn through a wooden comb, or card, with one row of wide wooden teeth, fixed perpendicularly.

The hemp is then laid up or suspended in sheds, and is fit to be sorted, bound into bundles, and loaded into the barks.

The hemp, to be prepared as Spring hemp, is allowed to remain suspended, and exposed to the weather the whole Winter, until it be dried by the sun in the Spring, when it is broken and cleaned in the same manner as the Winter hemp.

As the greatest part of the Summer elapses before it can be made fit for the market, none of this hemp reaches St. Petersburg until the following Spring, that is, two years after it was sown.

The hemp is sown in the same manner as linseed, rye, or wheat; land, of a sandy soil, may also be employed for it, but it must be strongly manured, otherwise it will be too short, and a flat country should always be preferred.

One chetwirt of seed commonly yields 25 loads (upwards 36 pounds English) of hemp, and twelve chetwirts of hemp seed.

[From the American Farmer, vol. 5.]

Hemp is a very hardy plant, resists drought and severe frost, is easier cultivated, less exhausting, and more profitable than many other crops, with which this does not interfere in its cultivation, (except the tobacco crop;) it is sown before, and gathered after, corn, and requires no attention when wheat is sown, harvested, or thrashed. It will grow, year after year, on the same ground, on which, if sufficiently rich, it is the surest crop. It is liable to no diseases, and injured by no insects.

The Soil.—The soil should be deep, clean, dry, rich, and mellow. The plant has a tap root, which descends to a considerable depth, and therefore the soil should be deep, and be thoroughly mellowed by deep and frequent ploughings. Fall ploughing, and two or three ploughings in the Spring, together with harrowing, so as to smooth the surface, (and thereby enable the seed to be sown even, and the hemp to spring up equally, and be cut close to the roots,) are preparatory steps to the putting in of the seed.

The Seed, when sown.—The seed (to the amount of two bushels per acre, on middling soil, and three on rich ground,) should be sown as early as possible, in the Spring, after the ground becomes dry and well prepared. Early sowing renders the coat heavier and stronger, enables the hemp to cover the ground early, so as to smother weeds, and before the sun becomes powerful, to shade the soil and preserve its moisture. The seed, after being cast as even as possible, should be harrowed in, to as equal a depth as may be, that it may all start together; and a heavy roller should then be passed over, or a brush drawn across, to smooth the surface, in order that the hemp may be cut close to the roots.

Ripening and Harvesting.—When the hemp becomes fit to be cut, the stalks of the blossom, or male hemp, turn yellow, become a good deal speckled, and drop most of their leaves, and. if the air is still, a cloud of dust arises from the blossom stalks, and hangs over the field. When sown early, it will be fit to cut about the first of August. The above appearance will become indicative of the proper time, and then it should be cut without delay: for, if suffered to stand longer, (as about one-half of the stalks blossom, and the other half bear seed,) the stalks of the male will wither and blacken, and the coat be of but little value; and the female hemp, which has stood to ripen the seed, requires a longer time to rot than the male, and, consequently, both would be thereby injured. *The best way to get seed would be to sow some thinly in a separate patch.* The mode of cutting is preferable to that of pulling. A man will cut half an acre per day; and a quarter, pulled, is said to be a day's work. By the former practice, the inconvenience of dust, and the dirt attached to the roots, will be avoided. Cut hemp will be worth ten dollars a ton more than the pulled. Knives, or hooks, for that purpose, may be obtained for about $1 25 each. When cut, spread the hemp a day or two, to dry it, then bind it, and put it up in shocks.

Wretting, (or Rotting.)—As soon as harvested, in order to prevent the rains from discoloring it, proceed, as early as convenient, to wret it, by placing it in *clean, pure water,* formed by a stream spring, or clear pond. If rotted shortly after cutting, about five days are generally required for the purpose. You will be able to judge, by taking out a handful and drying it, and if the stalk of sheaves will shake out, and separate easily from the bark, leaving it clean and entire, the process of wretting is completed. The bark, or lint of hemp, is connected with the stalk, by a substance which must be either wretted or dissolved, before they will separate; produce the separation, and the work is accomplished. Experience will be the best criterion. The water in which it is rotted should not run rapidly, as it would, in that case, wash away the coat. You may have three or four waggon loads of hemp, to the depth of three or four feet, sunk at a time, but it should be completely submerged, though not suffered to touch the bottom. If separate quantities are put in on several successive days, the days and quantities should be noted, for the purpose of ascertaining which becomes first wretted, and which should, therefore, be first taken up: for, if left in the water a day or two too long, the hemp will be materially injured.

Dressing and Securing.—When rotted, open and spread it, that it may dry soon. The process for breaking and swingling, is the same as that for flax. When it grows too long for dressing, (say from 8 to 10 feet,) it may be cut into two equal parts without any injury. Be very particular in keeping the long and short hemp separate, and not have the seed and butt ends put together: be also careful to dress it clean. When dressing it, put twelve handfuls in one head, laying them straight, the length of the hemp. The handfuls must not be tied, but bind the heads tight with a small band, about one foot from the butt end: it will then be ready to be put into such sized bales as may be suitable. Some bail it into a box, across the bottom of which four ropes are laid to tie the hemp when pressed into it. When packed, it should be perfectly dry, otherwise it will rot.

The following remarks from the '*Plough Boy*,' on the subject of water-rotting in preference to dew-rotting, coincide with the opinion of experienced cultivators: "If the crop is to be dew-rotted and got out by hand, its profits must be comparatively small, because it cannot be thus prepared to command the highest price in market, compete in quality with the Russia hemp, much less drive it from our markets. But, if the American hemp-planter be prepared with proper machinery to dress and prepare it, we ought not to doubt, much less to despair, of his ultimately arriving at a perfection in the production and dress of the article, to equal, if not excel, the best samples of Russia hemp."

[To be continued.]

PEACH AND PLUM TREES.

The following is copied from the *American Farmer*. We publish it for the information of our readers who already have peach trees, and for those who may have them hereafter. We are sanguine that peaches will hereafter be raised in this State, with comparative ease. The method recommended for preventing worms we have tried, and find it, in general, efficacious. There is another method which we would recommend, but have never had an opportunity of trying it—it is to lay on a covering of tar with a brush, or wind around the part of the body which is laid bare by the spade, *oakum*, well smeared with tar.

As it regards the method laid down for preventing the *curculio* in plums, &c. we do not think it a very good one; for this reason—unless the plums which are buried, decompose or putrefy very quickly, the curculio will hatch, or rather undergo a metamorphosis, and come out ready for another attack. We have *raised them*, by putting the plums into some dry sand in a box. It is true, that many of the plums, buried in the way recommended, would soon decay; but if two or three in a hundred did not, those insects that escaped, would soon *re-people* the trees with a new race.—A better mode of preventing the curculio in plums and apples,i s, to gather those that fall, boil them, and give them to the hogs.

PRESERVATION OF PEACH TREES.

Dayton, Ohio, June 24, 1828.

Mr. Skinner,—In yours of June 6th, I observe one or two short paragraphs upon the subject of the preservation of peach trees. If you esteem this luscious, and during its season incomparable fruit, as I do, you will not hesitate in rendering every aid towards its successful cultivation.

In addition to my orchard, I have about one hundred peach trees of different kinds, (and some one or two which are natives of our village, and of but few years, are equal to any,) not one which is at all injured by the worm, while many of my neighbors' are entirely destroyed. I can assure every one, that from my experience, no difficulty exists, and the produce amply remunerates for every trouble. One of your correspondents recommends lamp or fish oil, and then boiling water. Both are right, although I should say that boiling water was a very doubtful remedy, and would require to be often repeated. Not long since I saw a very fine peach tree in a perfect state of preservation. Although it had been several years bearing, (it was in a small garden, the reason of there being no more,) yet the worm had not injured it. Always anxious to learn every thing connected with agriculture, I inquired particularly with regard to its treatment, and was informed that the lady of the family had directed the suds of soap after washing, without regard to their being cold or boiling, to be thrown about the tree—and it had the desired effect.

The season is approaching when the insect commences its depredations. The season of its depredations may be fixed as commencing early in July, and ending in September. Its greatest ravages are during the month of August. It penetrates the surface, and commences its depredation by boring the tree and depositing its egg about one to three inches below the surface. I have read in works upon the subject, that the bark is there more tender, which I presume is an error, and that all bark of the root is equally soft, and that it is only the natural instinct which causes the insect to commence at that place. The egg, thus lodged in the wood of the tree, is there hatched and becomes a worm, which feeds upon the tender wood and bark, and effectually destroys the tree.

My method of prevention is this: Early in the month of July, with a hoe I clean away the earth from about my trees, in size and in shape like a common wash-bowl. The excavation being about three inches deep next the tree, and six or eight in diameter. I then fill up the hollow with common wood ashes, and raise an embankment about the tree, also about the size of a common wash-basin inverted; and have never yet known the insect to penetrate this embankment of ashes to the injury of my trees. I have never discovered any injury to result from the caustic nature of the ashes, and always take the precaution in the fall, say October, to remove the ashes and mix them with the surrounding earth, drawing up fresh earth to the tree to supply the place of the ashes. If any of your correspondents to whom this process is unknown, should be induced to try this experiment and should succeed, if they are as fond of a basket of fine Oldmixtons as I am, they will be obliged to me; if unsuccessful, I shall not have given them much trouble.

I have heard and read of various remedies for preventing the injury spoken of, but do not believe any of them will prove efficacious, except the application of some substance to the tree just below the surface, which will prevent the approach of the fly or insect. I have often thought, that lime in its powdered state, would be more efficacious than ashes; but as the ashes have never failed me I have never tried the experiment. I have known it recommended to remove the earth from the tree, so that the frosts might have full effect. This, however, will do no good, as the injury, or rather the seeds of it, are lodged in it before the frost commences, and are not injured or destroyed by it. I have known the earth removed, and tobacco, stems and other offal from the tobacconists appled with success. Ashes, however, are less trouble and more certain. In the summer I give my trees a thick coat of wash—a mixture of cow-dung, urine, soap-suds, ashes and lime. I do not know that it is of service in preventing the injury I speak of. but have often thought it did, preventing by its disagreeable nature the approach of the fly to any part of the tree. It is of essential service to the general health of the tree by destroying worms and insects, which are prevented from depositing their eggs in the bark. If you think the above worthy a place in your columns, it is at your service. H. B.

PLUMS.

Dayton, Ohio, June 24, 1828.

Mr. Skinner,—Our plums in this country are so entirely destroyed, year after year, that we have at last become indifferent about preserving our trees; and in case any of your correspondents are able to make known any efficient remedy, he cannot perform a more charitable and beneficent act. I have often seen my trees, to the number of twenty or thirty, loaded with fruit, promising a most abundant supply, and which were almost entirely destroyed. Just as our plums have their growth, they are perforated by the insect—the *curculio*, who is a sly depredator, and hardly ever seen, and almost immediately begin to fall off. I believe the finer stone more liable to injury than others, as the deposite is more easily and effectually made—but ours are entirely destroyed.

I have heard and read of many preventives, but none has ever succeeded with me. Some have recommended to hang up slips of paper on shingles, covered with a solution of some drug, such as camphor, or corrosive sublimate; but I have never found any effectual. The only remedy I ever found of any service, had but a partial effect. As it was of some service, I will communicate it. I dug a hole in the ground, away from the trees, three or four feet deep, and at stated times every day, had the plums as they fell carefully picked up and buried in the hole. If all would do this, I believe they would become scarce. This year I carefully removed the earth from about the trees, according to directions I somewhere read, and supplied its place with other earth from a distance. I am fearful, however, the insect will find me out. H. B.

ON THE CULTURE OF HOPS.

It is probably not known to every one, that the Hop is a native of Maine, and that it grows spontaneously in our forests. On the borders of small streams, that wind about the bases of the mountains in the North-west part, and on the fertile intervales in almost all sections, it is found, twining its luxuriant folds about the shrubs and small trees within its reach. It is cultivated a little, in some parts, but not to that extent that it might be with profit. It would undoubtedly yield a good profit, if it were raised for exportation, as the diseases and other enemies which assail it in Europe, would probably be less numerous in this region. Its consumption, or rather the consumption of the beer which it enters into, is increasing in New-England, and there will be a more steady demand for it as this beverage becomes more fashionable.

"When the hop," says Loudon, "was first used for preserving beer, or cultivated for that purpose, is unknown; but its culture was introduced into this country, (England,) from Flanders, in the reign of Henry VIII. Walter Blith, in his *English Improver Improved*, 1649, has a chapter upon hops. He observes, that 'Hops were then grown to be a national commodity: but that it was not many years since the famous city of London petitioned the Parliament of England against two anusancies, and these were Newcastle coals, in regard to their stench, &c. and hops, in regard they would spoyle the taste of drink, and endanger the people; and had the Parliament been no wiser than they, we had in a measure pined, and in a great measure starved, which is just answerable to the principles of those men who cry down all devices or ingenious discoveries, as projects, and thereby stifle and choak improvements.'"

[From the Transactions of the Agricultural Society of New-York.]

A rich, deep soil, rather inclining to moisture, is, on the whole, the best adapted to the cultivation of hops; but it is observable, that any soil (stiff clay only excepted) will suit the growing of hops when properly prepared; and in many parts of Great Britain they use the bog-ground, which is fit for little else. The ground on which hops are to be planted, should be made rich with that kind of manure best suited to the soil, and rendered fine and mellow by being ploughed deep and harrowed several times. The hills should be at the distance of six or eight feet from each other, according to the richness of the ground. On ground that is rich, the vines will run the most, the hills must therefore be farthest apart.

At the first opening of the spring, when the frosts are over, and vegetation begins, sets, or small pieces of the roots of hops, must be obtained from hops that are esteemed the best,* cut off from the main stalk or root, six or eight inches in length. Branches, or suckers, most healthy, and of the last year's growth, must be sought for. They may easily be known by their looking white. Two or three joints or buds should be left on each set. The sets should be put into the ground as soon as taken up, if possible; if not, they should be wrapped in a cloth, kept in a moist place, excluded from the air. A hole should then be made large and deep, and filled with rich mellow earth. The sprouts should be set in this earth, with the bud upwards, and the ground pressed close round them. If the buds have begun to open, the uppermost must be left just out of the ground; otherwise, cover it with the earth an inch. Two or three sets to a pole will be sufficient, and three poles to a hill will be found most productive. Place one of the poles towards the north, the other two at equal distances, about two feet apart. The sets are to be placed in the same manner as the poles, that they may the easier climb. The length of the poles may be from fourteen to eighteen feet, according as the soil is for richness. The poles should be placed inclining towards each other so as to meet at the top, where they may be tied. This is contrary to the European method, but will be found best in America. In this way they will strengthen and support each other, and form so great a defence against the violent gusts of wind to which our climate is frequently subject in the months of July and August, as to prevent their being blown down. They will likewise form a three-sided pyramid, which will have the greatest possible advantage from the sun. It is suggested by experience, that hops which grow near the ground are the best. Too long poles are not good, and care must be taken that the vines do not run beyond the poles; twisting off their tops will prevent it. The best kind of wood for poles

* Of the different kinds of hops, the long white is most esteemed. It yields the greatest quantity and is most beautiful. The beauty of hops consists in their being of a pale bright green color. Care must be taken to obtain all of one sort; but if different sorts are used, they must be kept separate in the field; for there is in different kinds of hops, a material difference in their time of ripening; and if intermixed, will occasion extra trouble in gathering.

are the alder, ash, birch, elm, chesnut and cedar. Their durableness is directly the reverse of the order in which they stand, and burning the end put into the ground, will be of service to preserve them. Hops should not be poled till the spring of the second year, and then not till they have been dressed. All that is necessary for the first year, is, to keep the hops free from weeds, and the ground light and mellow, by hoeing often, and ploughing, if the yard is large enough to require it. The vines when run to the length of four or five feet, should be twisted together to prevent their bearing the first year, for that would injure them. In the months of March or April of the second year, the hills must be opened, and all the sprouts, or suckers, cut off within an inch of the old root, but that must be left entire with the roots that run down;* then cover the hills with fine earth and manure. The hops must be kept free from weeds, and the ground mellow, by hoeing often through the season, and hills of earth gradually raised around the vines during the summer. The vines must be assisted in running on the poles with woollen yarn, suffering them to run with the sun.

By the last of August or first of September, the hops will ripen and be fit to gather. This may easily be known by their color changing, and having a fragrant smell; their seed grows brown and hard. As soon as ripe they must be gathered without delay, for a storm or frosts will injure them materially. The most expedient method of picking hops is to cut the vines three feet from the ground, pull up the poles, and lay them on crutches horizontally at a height that may be conveniently reached. Put under them a bin of equal length, and four may stand on each side to pick at a time. Fair weather must be taken to gather hops in if possible; and hops ought not to be gathered when the dew is on them, for dew is apt to make them mould. They should be dried as soon as possible after they are gathered; if not immediately, they must be spread on a floor to prevent their changing color. The best mode of drying them, is with a fire of charcoal, on a kiln covered with hair cloth, in the manner of a malt kiln. The fire must be kept steady and equal, and the hops stirred gently. Great attention is necessary in this part of the business, that the hops be uniformly and sufficiently dried: if too much dried, they will look brown as if they were burnt, and if too little dried, they will lose their color and flavor. They should be laid on the hair cloth about six inches thick, after it had been moderately warmed; then a steady fire kept up till the hops are nearly dry, lest the moisture or sweat, that the fire has raised, should fall back and change their color. After the hops have been in this situation about seven, eight or nine hours, and have got through sweating; and when struck with a

* Hops must be dressed every year as soon as the frost will permit. On this being well done, depends in a great measure the success of the crop. It is thought by many to be the best method to manure the hop-yard in the fall, and cover the hills entirely with manure; asserting, with other advantages, that this prevents the frosts during the winter, from injuring the hop. The truth of this may be determined by experiments in our climate and country.

stick, will leap up, then throw them into a heap; mix them well and spread them again, and let them remain till they are all equally dry. While they are in the sweat, it will be best not to move them for fear of burning them. Slacken the fire when the hops are to be turned, and increase it afterwards.—Hops are fully dried when their inner stalks break short, and their leaves crisp and fall off easily. They will crackle a little when the seeds are bursting, and then they must be taken from the kiln. Hops that are dried in the sun lose their rich flavor, and if under cover, they are apt to ferment and change with the weather, and lose their strength. Fire preserves the color and flavor of hops, by evaporating the water and retaining the oil of the hops.—After the hops are taken from the kiln, they should be laid in a heap to acquire a little moisture to fit them for bagging. It would be well to exclude them from the air by covering them with blankets. Three or four days will be sufficient for them to lie in that state.

When the hops are so moist that they may be pressed together without breaking, they are fit for bagging. Bags made of coarse linen cloth, eleven feet in length, and seven in circumference, which hold two hundred pounds weight, are most common in Europe; but any size that best suits may be made use of. To bag hops, a hole is made through a floor large enough for a man to pass with ease; the bag must be fastened to a hoop larger than the hole, that the floor may serve to support the bag, and for the convenience of handling the bags, some hops should be tied in each corner to serve as handles. The hops should be gradually thrown into the bag and trod down continually till the bag is filled. The mouth of the bag must then be sewed, and the hops are fit for market. The harder hops are packed, the longer and better they will keep; but they must be kept dry. In most parts of Great Britain where hops are cultivated, they estimate the charges of cultivating an acre of hops at forty-two dollars, for manuring and tilling, exclusive of poles and rent of land. Poles they estimate at sixteen dollars per year, but in this country they would not amount to half that sum. An acre is computed to require about three thousand poles, which will last from six to twelve years, according to the kind of wood used. [*N. E. Farmer.*

MISCELLANEOUS.

Effects of Galvanism in Cases of Drowning.

M. Leroy d'Etioles has addressed a letter to the Academie de Medecine, in reply to an assertion made by M. Thillaye, respecting the inutility of galvanism in cases of asphyxia. The former says, that when a short and fine needle is inserted in the sides of the body between the eighth and ninth ribs, so as to come into contact with the attachment of the diaphragm, and then the current of electricity from 25 or 30 pair of inch plates passed through them, that the diaphragm immediately contracts, and an inspiration is effected. Upon breaking the communication, and again completing it, a second inspiration is occasioned, and by continuing these means, a regular respiration may ultimately be occasioned. This power thus applied, has always succeeded with him in experiments on drowned animals.—*Bull. Univ.*, C. xi. 213.

Method of increasing the Odour of Roses.

For this purpose, according to the author of the method, a large onion is to be planted by the side of the rose-tree in such a manner that it shall touch the foot of the latter. The roses which will be produced will have an odour much stronger and more agreeable than such as have not been thus treated, and the water distilled from these roses is equally superior to that prepared by means of ordinary rose leaves.—*Œkonom. Neuigk.*;—*Bull. Univ.*

Caramanian, or Camblet Woolled Sheep.

A half-blood Buck of the Caramanian, or Camblet Woolled Sheep, has been received by the Editor, from New-Jersey. The sire of this was brought from Caramania, in Asia Minor. This breed of sheep are of a large size, their wool long and coarse, resembling the fleece of the Angora Goat, (exceping its color,) from which the best of the Camblets are manufactured.

It may appear to some of our readers, that we have taken up too much of our Mechanical department with the subject of timber, and Com. Barron's remarks upon Naval constructions. In all constructions or buildings, of any size or expense, it is of the utmost importance that the best materials and the best method should be adopted. We do not build for ourselves only, but for posterity also; or at least we ought to. This sentiment applies particularly to our Navy; and every person who pays a tax, is directly interested in it, as it is his money in part, which is expended. A 74 costs too much of the hard earnings of our mechanics and farmers, to be slightly put together. It should be so constructed, and of such materials, that it may not only be a wall of defence to us, but to our children and our childrens' children. Too much attention cannot be given to the subject.

For the Farmers' and Mechanics' Journal.

QUERIES.

What causes the slavering or salivation in Horses, and what will cure them?

What is the best method of destroying Canada Thistles?

Union, Me. S. H.

MACHINE
for making
SUGAR BOXES.

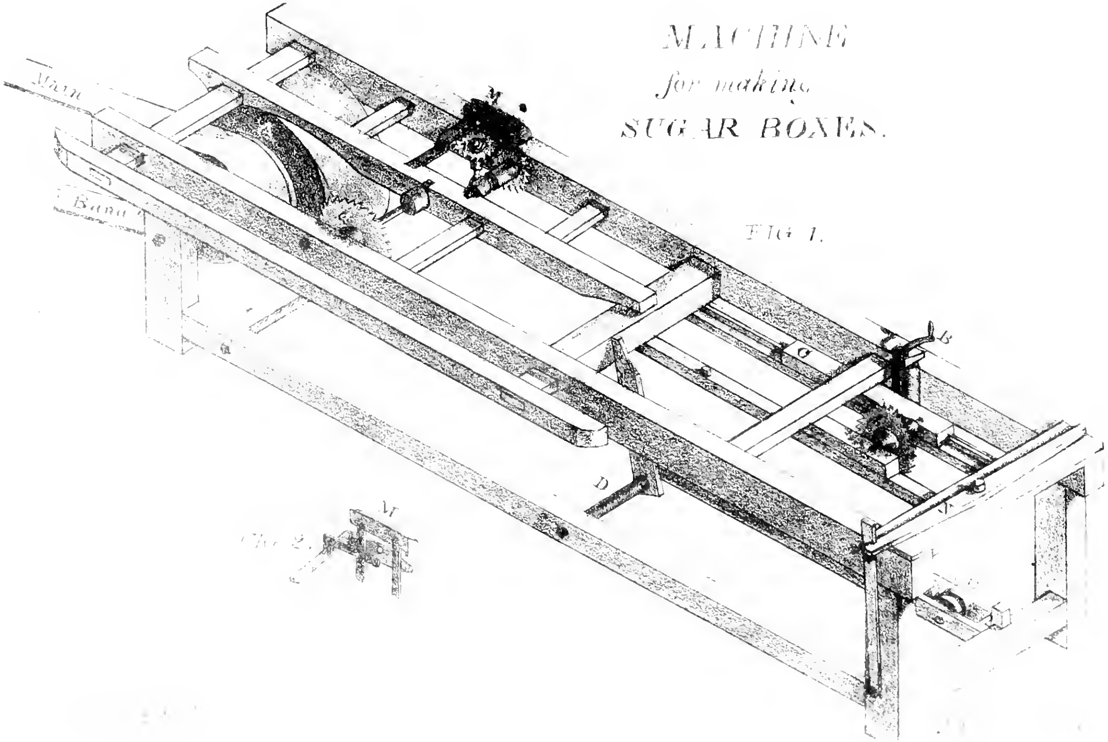


FIG. 1.

FIG. 2.

THE

NEW-ENGLAND

FARMERS' AND MECHANICS' JOURNAL.

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MECHANICS.

HOWE & PEARSON'S BOX MACHINE.

PLATE VIII. FIG. 1.

THIS machine consists of a large frame, in which are placed four Circular Saws, which are moved by water-steam, or any other power, usually employed for moving machinery.

The first saw, near B, is employed for cutting the boards the particular length required. The frame of this saw is so constructed, as to move backward and forward, on a horizontal carriage. This is effected by means of a rope, attached to the carriage, and passing around an upright cylinder, which is turned by hand, by means of the crank B.

When the saw is wanted to slide forward, the rope is uncoiled, by turning the crank—a lever with a pulley at the end, (shown at H,) sometimes called a jack-pulley—presses upon the hand which turns the saw, and keeps it upon the stretch. By turning the crank the other way, the rope is coiled upon the cylinder, and the saw is brought back to its original place; the jack-pulley rising at the same time by the drawing of the band upon it. Stops, or rests, are placed at such distance from the saw, as you wish to have the length of the board. These may be put in and out of place by means of a lever, attached to them, and extending across the machine to the side, where the person who turns the crank, stands. This lever is shown at N.

The second saw at *a*, is employed for edging or splitting the boards. There is nothing in this different from the common circular saw, excepting the gage carriage, into which the board is put.

when to be split or edged. This consists of a straight piece of wood or board, which is made to slide parallel to the saw; (the place for this to slide in, is shown in the Plate, by a piece framed on to the side.) On this piece of board, and at right angles with it, are fixed two other pieces of board, and at the same distance from each other, as the length of the board to be edged or split. These two pieces are graduated into feet and inches, by which the exact width of the board is obtained.

The third and fourth saws, (placed near M,) are used for halving the boards, in order to match them together; one of these is placed vertically, and the other horizontally. The horizontal saw projects a little by the other, and is nearly in contact with it. They thus cut at right angles to each other; and when a board is held edgewise to them, a square piece is cut out, equal in thickness, or diameter, to one-half of the thickness of the board to be cut. In order that the board, or stuff, to be halved, should be cut in the middle, the following apparatus has been invented; viz. a lever is framed into the side of the machine, parallel to the vertical saw, having its fulcrum (which is a pin, upon which it turns,) exactly in the middle. At one end of this, and at right angles with it, is affixed another plate of wood, or iron, which is moved back and forth, by moving the lever. On this last mentioned slide, and at right angles to it, is fixed a flat piece of wood, or iron, placed on its edge, and may be called a guide. When at rest, it is immediately over the vertical saw; but when the slide is pushed back by the lever, it recedes a little from the saw. Immediately over the lever is placed a similar guide, which is attached to one end of it by a pin. These two guides meet each other directly over the vertical saw. When a board is placed between them, it pushes the guide attached to the lever, to the left; this moving the lever, pushes the slide, and the guide attached to it, just as far to the right; and thus places the centre of the edge of the board, directly upon the vertical saw, and it is cut or halved in the middle.

The halving is sometimes performed by means of a circular plate, to which is attached chisels of the required width; but the saws are preferable.

FIG. 1.—A, is the drum, or main cylinder.
B, the crank which moves the cutting saw.
C, the carriage, by which the saw is moved backward and forward.

D, the rod, upon which one end of the lever in which the pulley H, is placed, turns.

M, the guides.

N, the arm, or lever, which guides the rest, against which the board to be cut, is placed.

Fig. 2.—The guides, separated from the machine. The guide M, is raised up from the lever, showing a small pin on the right end of it, which, when the guide is pressed down, shuts into the hole below and moves the lever by being pushed either way.

For further particulars reference is made to John Howe and Paul Pearson, the Inventors, Alna, Me.

EFFECTS OF FLY-WHEELS.

Sir,—Having, in the course of an extensive intercourse with operative mechanics, frequent occasion to observe that very incorrect notions are entertained with respect to the operation of Fly-Wheels, I have thought that an explanation of the manner of their operation might profitably occupy a space in your pages; and I have, therefore, (in the hope that you will agree with me in thinking it worthy of insertion,) abstracted from an excellent article on the subject, by Dr. Brewster, in his "*Appendix to Ferguson's Lectures*," as much as seems to me necessary to place the whole subject in a simple and clear light before your readers. B. D.

"A Fly, in mechanics, is a heavy wheel or cylinder, which moves rapidly upon its axis, and is applied to machines for the purpose of rendering uniform a desultory or reciprocating motion, arising either from the nature of the machinery, from an inequality in the resistance to be overcome, or from an irregular application of the impelling power. When the first mover is inanimate, as wind, water, and steam, an inequality of force obviously arises from a variation in the velocity of wind, from an increase of water occasioned by sudden rains, or from an augmentation or diminution of the steam in the boiler, produced by a variation in the heat of the furnace; and, accordingly, various methods have been adopted for regulating the action of these variable powers. The same inequality of force obtains when machines are moved by horses or men. Every animal exerts its greatest strength when first set to work. After pulling for some time, its strength will be impaired; and when the resistance is great, it will take frequent, though short relaxation, and then commence its labor with renovated vigor. These intervals of rest and vigorous exertion, must always produce a variation in the velocity of the machine, which ought particularly to be avoided, as being detrimental to the communicating parts as well as the performance of the machine, and injurious to the animal which is employed to drive it. But if a fly, consisting either of cross-bars, or a massy circular rim, be connected with the machinery, all these inconveniences will be removed. As every fly-wheel must revolve with great rapidity, the momentum of its circumference must be very considerable, and will consequently resist every attempt either to accelerate or retard its motion. When the machine, therefore, has been put in motion, the fly-wheel will be whirling with an uniform celerity, and with a force capable of continuing that celerity when there is any relaxation in the impelling power. After a short rest, the animal renews his efforts, but the machine is now moving with its former velocity, and these fresh efforts will have a tendency to increase the velocity; the fly, however, now acts as a resisting power, receives the greatest part of the superfluous motion, and causes the machinery to preserve its original celerity. In this way the fly secures to the engine an uniform motion, whether the animal takes occasional relaxation, or exerts his force with redoubled ardor.

"In machines built upon a large scale, there is no necessity for the interposition of a fly, as the *inertia* of the machinery supplies its place, and resists every change of motion that may be generated by an unequal admission of the corn.

"A variation in the velocity of engines arises also from the nature of the machinery. Let us suppose that the weight of 1000 pounds is to be raised from the bottom of a well fifty feet deep, by means of a bucket attached to an iron chain which winds round a barrel or cylinder; and that every foot in length of this chain weighs two pounds: it is evident that the resistance to be overcome in the first moment, is 1000 pounds, added to 50 pounds, the weight of the chain; and that this resistance diminishes gradually, as the chain coils round the cylinder, till it becomes only 1000 pounds, when the chain is completely wound up. The resistance, therefore, decreases from 1050 to 1000 pounds; and if the impelling power is inanimate, the velocity of the bucket will gradually increase; but if an animal is employed, it will generally proportion its action to the resisting load, and must therefore pull with a greater or less force, according as the bucket is near the bottom or top of the well. In this case, however, the assistance of a fly may be dispensed with, because the resistance diminishes uniformly, and may be rendered constant, by making the barrel conical, so that the chain may wind upon the part nearest the vertex at the commencement of the motion, the diameter of the barrel gradually increasing as the weight diminishes. In this way the variable resistance will be equalized much better than by the application of a fly-wheel; for the fly, having no power of its own, must necessarily waste the impelling power.

"When machinery is driven by a single stroke steam-engine, there is such an inequality in the impelling power, that, for two or three seconds, it does not act at all. During this interval of inactivity, the machinery would necessarily stop, were it not impelled by a massy fly-wheel of a great diameter, revolving with rapidity, till the moving power again resumes its energy.

"If the moving power is a man acting with a handle or winch, it is subject to great inequalities. The greatest force is exerted when the man pulls the handle upwards from the height of his knee, and he acts with the least force when the handle, being in a vertical position, is thrust from him in a horizonal direction. The force is again increased when the handle is pushed downwards by the man's weight, and it is diminished when the handle, being at its lowest point, is pulled towards him horizontally. But when a fly is properly connected with the machinery, these irregular exertions are equalized, the velocity becomes uniform, and the load is raised with an equable and steady motion.

"In many cases, where the impelling force is alternately augmented or diminished, the performance of the machine may be increased by rendering the resistance unequal, and accommodating it to the inequalities of the moving power, Dr. Robison observes, that 'there are some beautiful specimens of this kind of adjustment in the mechanism of animal bodies.'

"Besides the utility of fly-wheels as regulators of machinery, they have been employed for accumulating or collecting power. If motion is communicated to a fly-wheel by means of a small force, and if this force is continued till the wheel has acquired a great velocity, such a quantity of motion will be accumulated in its circumference as to overcome resistances, and produce effects which could never have been accomplished by the original force. So great is this accumulation of power, that a force equivalent to 20 pounds, applied for the space of 37 seconds to the circumference of a cylinder, 20 feet diameter, which weighs 4713 pounds, would, at the distance of one foot from the centre, give an impulse to a musket-ball equal to what it receives from a full charge of gunpowder. In the space of six minutes and ten seconds, the same effect would be produced, if the cylinder was driven by a man who constantly exerted a force of 20 pounds at a winch one foot long.

"This accumulation of power is finely exemplified in the sling. When the thong which contains the stone is swung round the head of the slinger, the force of the hand is continually accumulating in the revolving stone, till it is discharged with a degree of rapidity which it could never have received from the force of the hand alone. When a stone is projected from the hand itself, there is even then a certain degree of force accumulated, though the stone only moves through the arch of a circle. If we fix the stone in an opening at the extremity of a piece of wood two feet long, and discharge it in the usual way, there will be more force accumulated than with the hand alone, for the stone describes a larger arch in the same time, and must therefore be projected with greater force.

"When coins or medals are struck, a very considerable accumulation of power is necessary, and this is effected by means of a fly. The force is first accumulated in weights fixed in the end of the fly; this force is communicated to two levers, by which it is farther condensed; and from these levers it is transmitted to a screw, by which it suffers a second condensation. The stamp is then impressed on the coin or medal by means of this force, which was first accumulated by the fly, and afterwards augmented by the intervention of two mechanical powers.

"Notwithstanding the great advantages of fly-wheels, both as regulators of machines and collectors of power, their utility wholly depends upon the position which is assigned them, relative to the impelled and working points of the engine. For this purpose, no particular rules can be laid down, as their position depends altogether on the nature of the machinery. We may observe, however, in general, that when fly-wheels are employed to regulate machinery, they should be near the impelling power; and when used to accumulate force in the working point, they should not be far distant from it. In hand-mills for grinding corn, the fly is, for the most part, very injudiciously fixed on the axis to which the winch is attached; whereas it should always be fastened to the upper millstone, so as to revolve with the same rapidity. In the first position, indeed, it must equalize the varying efforts of the power which moves the winch; but when it is attached to the turning millstone, it not only does this, but contributes very effectually to the grinding of the corn.

"Dr. Desaguliers mentions an instance of a blundering engineer, who applied a fly-wheel to the slowest mover of the machine, instead of the swiftest. The machine was driven by four men, and when the fly was taken away, one man was sufficiently able to work it. The error of the workman arose from his conceiving, like many others, that the fly added power to the machine; but we presume that Dr. Desaguliers himself has been accessory to this general misconception of its nature, by denominating it a *mechanical power*. By the interposition of a fly, however, as the Doctor well knew, we gain no mechanical force; the impelling power, on the contrary, is wasted, and the fly itself even loses some of the force which it receives by the resistance of the air."

[*London Mech. Mag.*

On the difficulty of separating flat Disks by a current of air, or of steam, when their surfaces are in contact, or nearly so. By ASA SPENCER, *Mechanician.*

SIR,—Agreeably to my promise, I offer for insertion in your Journal, my theory respecting the adhesion of disks, which I shall be pleased to see published, should it meet your views.

Yours, &c. ASA SPENCER.

In the Journal of the Franklin Institute of last year, was published a communication by M. CLEMENT of the following purport:

A flat valve being placed over an orifice in a steam chest, and covered a considerable space around the orifice, when the steam was let on, the valve, instead of rising, as was expected, kept its place, and required a considerable additional force to lift it.

To this phenomenon I offered the following explanation to some of my scientific friends, who thought it satisfactory:

The extent of the valve, we will suppose to equal four square inches, its surface flat, and placed on the steam chest, where the surface is also flat. We will also suppose a space between the surfaces, sufficient to admit the atmosphere, it is evident that the top and bottom of the valve will be then equally pressed by it, and in that state the valve may be lifted with a force only sufficient to overcome its gravity.

Suppose an opening to be now made in the chest, under the centre of the valve, equal to one square inch, or one-fourth the size of the valve, the steam being then let into the chest with a power of 30 pounds to the inch, this rushes against, and communicates the same power to the one inch of the valve immediately over the aperture, which being only about half the force of the atmosphere on the whole four inches on the top of the valve, it cannot rise with any thing like the velocity with which the steam would move; its current, therefore, must necessarily be checked. Now currents of fluids on meeting immoveable obstacles, are not reflected back, like solids, but take a direction parallel to the surface against which they strike: currents of fluids also, whether elastic or nonelastic, exert no force, but in the direction in which they move; the latter is fully proved by forcing air, or water, through a cylindrical tube, if holes be made in the sides of the tube none of the fluid will escape.

It follows, then, that the steam on striking against the valve, as above mentioned, and thus arrested in its course, which was perpendicular to the valve, takes one parallel to it, and rushes out in all directions, in radii from the centre; of course, the atmosphere between the disks is driven out, leaving nothing between but steam, and that exerting no force on the valve except on the one inch in the centre, its course over the remaining surface is parallel to it, and its force is exerted only in that drection.

The state of the valve would then be as follows: pressed upwards by steam of 30 pounds to the inch, acting on the one inch only at the bottom, and pressed downward by the weight of the atmosphere of 15 pounds to the inch, acting on the whole four inches at top; making the downward, double that of the upward pressure.

The above will appear pretty evident, by the following experiment: take two thin flat plates of metal, tin-plate for example, about three inches diameter, in the centre of one insert a tube several inches long, and about 1-8th of an inch in diameter perpendicular to its planes; let both plates be pierced full of holes except near their centres; let these plates be placed with their surfaces parallel to each other, and about 1-16th of an inch apart, and attach the tube to a cock under a considerable head of water; when the water is let on it passes by the tube through the first plate, and on being checked by the second plate, passes out between them in a thin and even sheet, while none escapes through the holes. This happens when the force of water is at least equal to two atmospheres. This experiment has been repeatedly tried, and varied in different ways, with the same uniform result.

The preceding, and the problem of the cards, I consider as cases precisely similar; the same effect produced by the same causes. I, therefore, in a concise form, gave a similar explanation, which was published in the United States Gazette some weeks since.

I have since seen a solution of the latter problem by Prof. Hare, who attributes the effect to a different cause. He supposes that the blast coming out in various currents from the common centre of the tube and disks, causes an afflux of the surrounding air towards them, and as Mr. Perkins expresses it, (who explained the problem of the valve in the same way that Dr. Hare has that of the cards,) "impinges" on the whole outer surface of the disk, and counteracts the power of the blast, which acts only on a small part of the inner surface. To satisfy myself of the fallacy of this, I used means which I thought effectual to cut off all afflux of air towards the disk, which could have a tendency to keep them together, when I found the effect as prompt as before; which made me conclude, they were not kept together by any *flow* of air, but by the constant and steady *pressure* of the atmosphere which rested on them at the time the blast commenced, and continues unabated, while that on the inner surfaces is lessened by being met and opposed by the force of the blast, running out between the two inner surfaces of the cards.

I attempted to illustrate this by a tube six inches in length, and about the diameter of a large quill, at the end of which I fixed two strips of paper 3-4ths of an inch wide, and extending about three inches from the end of the tube; on blowing with force through the tube, the strips of paper were brought together by a very prompt and rapid movement. I observed the same effect, when this tube, with the strips of paper, was placed within another tube of 1 1-2 inch diameter and 10 or 12 inches long. [*Franklin Journal.*

Specification of the Patent granted to Charles Bagenall Fleetwood, *of Parliament-street, Dublin, Gent. for a Liquid, and Composition, for making Leather, and other articles, Water-proof.*—Dated February 28, 1824.

My new invented liquid and composition for making leather, and other articles, water-proof, consists of a certain compound of resinous, oleaginous, and elastic matters, the proportions of which, and the mode of mixing, I am about to describe. My process is as follows: I dissolve 10 lbs. of caoutchouc, or Indian Rubber, in 20 gallons of pure spirits of turpentine, by putting them both into a tin vessel capable of holding at least 35 gallons; 40 perhaps would be as well;—the caoutchouc should be cut into pieces, or slices, of about 1-16th part of an ounce weight, to hasten the solution. I then immerse the vessel into a boiler, previously filled with cold water, and apply the fire so as to produce the boiling of the water, occasionally supplying the waste. caused by evaporation. In this situation it remains until a perfect solution of the caoutchouc, in the spirits of turpentine, is effected; I then dissolve 150 lbs. weight of pure bee's-wax in 100 gallons of pure spirits of turpentine, adding thereto 20 lbs. of Burgundy-pitch, and 10 lbs. of gum-frankincense. The solution of these articles, I obtain by the same means as described for dissolving the caoutchouc. To these two matters or solutions, when mixed together, I add, after they are quite cold, 10 gallons of the best copal varnish. The whole of these materials are then to be put together in a large reservoir, where the compound may be diluted by adding 100 gallons of lime-water, pouring in five gallons at a time, and stirring it continually for six or eight hours; which agitation must be repeated whenever any of the composition is taken out of the reservoir, either to be bottled or casked. In order to color this composition, when it is required to be rendered black, 20 lbs. weight of the best lamp-black should be mixed up with 20 gallons of the purest turpentine spirits, (which 20 gallons should, under these circumstances, have been deducted from the previous mixture;) this, when properly blended, is to be added to the composition, but that should be done previous to the introduction of the lime-water. The composition, when thus prepared, is to be laid upon the leather by means of a painting-brush, and rubbed into the surface, which will render the leather, after the composition has become dry, impervious to water, and at the same time perfectly soft and pliable. Though I have thus minutely described the comparative proportions of each material, yet I do not mean to confine myself precisely to those respective quantities, nor to the precise mode adopted in mixing and preparing them, but have stated such proportions and such process as the best that I am acquainted with, and which I am, from considerable experience, induced to adopt, and recommend.

[*Repert. Pat. Invent.*

ETCHING AND CLEANING ALABASTER.

By HENRY MOORE, *of Green Hill, near Derby.*

Taking advantage of the well-known fact that gypsum, or alabaster, or sulphate of lime, (for these are only three names for the same thing,) is perfectly soluble in 500 parts of cold water, Mr. Moore has adopted the following process:

He covers the ornament, and all those parts that are not to be corroded, with a composition that will resist water. Wax, dissolved in spirits of turpentine, and mixed with white lead, may be used with a camel-hair pencil; or turpentine varnish, with a little animal oil and white lead, and will be found to work more freely than the wax. Spirits of turpentine must be used in pencilling with these compositions. The use of animal oil is to prevent the varnish from becoming very hard, which would render its removal, after corrosion, extremely difficult. The ornament, and other parts which are intended to be preserved, being completely covered with the composition, it is suffered to remain a few hours to dry. The article is then put into a vessel of rain water, in which it must remain forty-eight hours, or longer, according as the ornament may be required to have more or less relief. When the corrosion is completed, the varnish or wax must be removed with spirits of turpentine, which may be applied with a bit of sponge, and then be wiped off with soft rags.

The article, being made quite clean, is now rubbed over with a soft brush, dipped into finely-powdered plaster of Paris, and is applied in the dry state. This powder fills the pores of the corroded parts, giving a certain degree of opacity, similar to that which is left from the tools of the sculptor. It forms a good ground that contrasts well with the ornament, and makes it appear with greater advantage than if left merely in the corroded state.

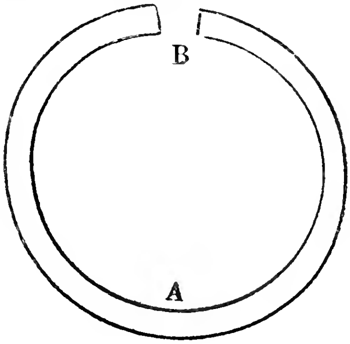
The alabaster of which the vase is made, was procured from a quarry at Chellaston, about four miles from Derby.

To clean Alabaster Sculptures.

Spots of grease are first to be removed with spirits of turpentine; the article is then immersed in water, where it is suffered to remain about ten minutes, or, perhaps, a little longer, if the thing be very dirty; it is then rubbed over with a painter's brush, suffered to dry, and then treated with plaster of Paris as above, when the article will be found perfectly clean, as if just from the hands of the sculptor.

A piece of sculpture that would take several days to clean by the usual way, with fish-skin and Dutch rushes, is, by this process, completed in half an hour. [*Journ. of Arts, &c.*

MOULD FOR MAKING CORES USED IN CASTINGS.



Sir,—In making some kinds of castings, it is highly important to secure apertures of uniform calibre through them; but this object is seldom obtained, owing to the difficulty of forming accurate cores. The above diagram represents a mould proposed by Mr. Isaiah Lukens, of Philadelphia, by which this difficulty may be effectually obviated. Should you think its publication likely to subserve the interests of the highly useful class of our citizens, who are engaged in the iron and brass foundry business, you will please give it a place in your Magazine.

A, represents the transverse section of a cylinder of wood whose calibre is accurately formed.

B, a longitudinal incision, quite through the cylinder.

The principle by which this mould is worked, depends on the elasticity of the wood. Previously to forming the core, the incision at B, is closed by pressure, and the mould is secured with twine; it is next filled with loam or sand, and then the twine being cut, it springs open, and may be readily removed without disturbing the core. CORE BOX.

Philadelphia, April 29th. [*Am. Mech. Mag.*

On various Compositions for Blacking and Polishing Leather.

Various compositions are used to give a sort of polish or varnish to leather, by being brushed over it. The blacking that has been most generally used for some years past, in France, was composed of the whites of eggs, beaten up with water; to which were added a little lamp-black, to color it; and some sugar, or gum, to render it shining. It was sufficient to spread this mixture over the leather with a brush, and allow it to dry.

This blacking is very beautiful, and easy to be made and used; but has its inconveniences: it is not very solid; heat causes it to scale off; and it is dissolved by the least quantity of water that touches it. Humidity alone is sufficient to cause it to come off, on the least friction. It is now but little used in large towns, as the following superior composition is substituted for it; viz:

Ivory Black	3500	grammes.*
Melasses	3500	
Sulphuric Acid	450	
Hydrochloric or Muriatic Acid	450	
Weak Acetic Acid	1700	
Gum Arabic	200	
Linseed or Olive Oil	200	
	10,200	

The sulphuric acid is diluted with six times its weight of water, which must be mixed with some precaution, adding it by degrees, that the temperature may not be too rapidly raised, or there is great risk of breaking the vessel. A mixture is then made of this diluted acid, with the dydrochloric acid and melasses, in a large earthern vessel. The ivory-black, previously mixed with a sufficient quantity of water, to make it of a moderately thick consistence, is then added by degrees to the acidulous liquid, stirring it all the while, not only for the purpose of disengaging the gas which is generated, but also to prevent the mixture from forming into a mass, or coagulating. When the mixture is well blended together, it is diluted with weak acetic acid, or common vinegar; and the gum, previously dissolved in four or five times its weight of water, is then added, with the oil. The whole is then again well stirred

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* The gramme is nearly equal to 15 1-2 English grains.

together; and, finally, a sufficient quantity of water is added, to increase its volume to 17 1-2 litres,* which will produce 70 bottles of blacking, of a quarter of a litre each. This blacking is sometimes scented with an essential oil, such as that of rosemary, &c.

The mixture must be constantly agitated, while putting into the bottles, in order that the heavier or lighter parts may not separate from each other. This blacking, when it is sent to any great distance, or remains long in the shops, is susceptible of entering into fermentation; and the great quantity of carbonic acid formed, during the conversion of the saccharine matter (the melasses) into alcohol, exerts a pressure in the bottles, and renders them liable to burst; or, when the cork is drawn, to occasion the effervescing liquid to fly out; to prevent which, it is sufficient to cause the corked bottles to be boiled in water for half an hour, in M. Appert's mode; but it is probable that the same end may be accomplished by mixing a small quantity of the sulphurous acid with the blacking. Whenever the blacking is to be used, it must also be shaken or stirred up, in order to mix those parts again, which are apt to separate on standing.

This composition is effected by the re-actions of the sulphurous and hydrochloric acids upon the *ivory-black;* also, by the hydrochlorate, the sulphate and the phosphate of lime formed, the carbon, and the other ingredients employed in its preparation; which sustain very little alteration from their mixture. This composition being spread upon the leather, and rubbed over, while it is wet, with a rather hard brush, makes it acquire a beautiful, brilliant, and black polish; it adheres closely to the leather, and is not removed by any slight friction, not even in damp weather. The hydrochloric or muriatic acid, which is employed in an equal quantity, or is about a third-part of all acids used in the composition, forms with the lime a soluble deliquescent salt, which enters and gives a softness to the leather, and does not produce that dull appearance which results from an excess of the sulphate of lime.

This article forms a very important branch of commerce in England; considerable quantities of it being exported; and, in the large manufactories, steam-engines are employed in its preparation.

Some years since, I pointed out a more economical mode of making a blacking, which is yet equally beautiful with the above: it consists in substituting for the melasses and gum, either the fecula of potatoes, or the potatoes themselves, saccharized by the action of the sulphuric acid; and for the *ivory-black*, animal or bone charcoal, ground in water. It is made in the following manner: supposing all the ingredients, except those substituted, to be used in exactly the same proportions as we have above given:

Either the fecula, or the potatoes, after being boiled and crushed, so as to be reduced to a gelatinous state, are to be mixed with tepid water (at about 45°;) and sulphuric acid, previously diluted with ten times its weight of water, is then poured on it by degrees, and the whole brought to a boiling heat in a leaden vessel; being

* The litre is nearly equal to 2 1-2 wine pints.

careful to keep the acid mixture and the fecula, or potatoes, well stirred together, and to make the additions in such small quantities, as to interrupt the ebullition as little as possible. Two or three minutes after the last addition has been made, the starch is completely saccharized; the vessel must then be taken off the fire; without which precaution the saccharine matter would very soon become scorched. The mixture is then allowed to cool gently, and during this time the hydrochloric acid is poured upon the animal charcoal by small portions at a time, and stirred with a wooden spatula; and this part of the process is finished, by mixing this charcoal in the saccharine liquid and acid, when the sulphuric acid acts with as much energy as in the former process.

This mixture is then boiled to a rather thick consistence, and is passed through a color-mill. The mill is previously washed, by throwing into the hopper the remainder of the acid liquid or vinegar, and then pure water; and these washings are put into the blacking; finally, the other ingredients are added, together with a sufficient quantity of water, to increase its volume to 17 litres and a half, as in the former process.

The blacking thus obtained is absolutely the same as the other: the fineness of the black, which enters into the composition, is even more equal.

We also find, in commerce, many other kinds of blacking, formed of resins, gum-lac, spirit of wine, (alcohol,) lamp-black, ivory-black, and other substances, in great number, and in various proportion; but they are very little used. P.

[*Dictionnaire Technologique.*

IMPROVED STEAM ENGINE.

Notwithstanding the very great improvements made in the process of generating and applying steam power to boats and other machinery, yet perfection in these principles appears not to have been attained, inasmuch as every year shows some advance in previous inventions and discoveries. From a communication in the New Orleans Argus, it appears that Mr. LAINHART, now of that city, formerly of Baltimore, has after four years of assiduous labor, succeeded in offering to the public a steam engine, which is thus described:

It consists of a generator placed over a grate, which receives four ounces of hot water from the boiler at each revolution of the paddles; this water is immediately converted into steam, passes into the cylinder, from thence into the condenser, and from thence again into the boiler. As the generator does not contain at most but six gallons of steam at once, and as it has a safety-valve, and is more than three inches thick, it is almost impossible that it could burst, and in case it should, no damage would result from it, on account of the small quantity of steam it contains, and as to the water in the boiler, it is only heated to 212 degrees of Farenheit, or 80 of Reaumur, which is that of boiling, besides it has a safety-valve.

The economy of this machine is very great; it can propel a boat of 25 tons, twelve hours with four bushels of charcoal. As to its speed it is astonishing; the wheels which act directly on the axle of the spar-wheels, make 190 revolutions in a minute! But what is more surprising is, that the machine, comprising fire-place, boilers, generator, in short, every thing, occupies the space only of six feet by 27 inches!

By way of encouragement, the Legislature of Louisiana passed a law, authorizing Mr. L. to raise a sum of money by lottery, for the purpose of fully testing his improvements, reserving to the State, the right of making use of engines on the principle for which he had a patent. [*Southern paper.*

AGRICULTURE.

HEMP.

[Concluded from page 161.]

We insert a few more remarks relative to the culture and management of Hemp, hoping that another year will find our industrious farmers actually engaged in the business of cultivating, and preparing this article for commerce. The profit, which cannot but arise from the article in question, will of itself be a sufficient stimulus to engage them in the undertaking; but as an additional incentive, we would refer them to the very liberal premium offered by the Trustees of the Lyceum, for the largest and best crop of hemp, raised and cured within the State, during the year 1829. You will find it noticed on the last page of the present number.

Extract of a letter from a manufacturer of Canvass, at Paterson, New Jersey, dated 9th August, 1824, *to the Hon. Secretary of the Navy.*

"I should have before replied to the letter which you did me the honor to address to me, under date of the 31st ultimo, but, being in a great measure unacquainted with the subject on which you required information, I have been since engaged in procuring as much as opportunity afforded me, and I have now the honor to communicate the result of my inquiries. I would here, however, observe, that, previous to the receipt of your letter, I had the honor to receive one from the President of the Board of Navy Commissioners, on the subject of the growth and manufacture of flax, which having answered, if it were necessary to your purpose, I could, and would, with pleasure, furnish a copy.

"It appears, from all I can learn, that hemp may be produced in any soil; in Russia, it is indigenous, found in all the south and middle parts, and even on the Uralian mountains, though the general opinion seems to be, that the greater crops are produced from that which is a deep black mould, formed from the decomposition of vegetable matter; until the texture is apparent, its situation should be low, with some small degree of moisture. This description of soil will produce hemp in greater abundance than any other, and every State in the Union possesses more or less thereof: this State, in particular, has a full share, together with the convenience of market for the sale, and a plentifulness of that description of manure which would best answer to restore the land to its former state.

"The land is prepared, by some, with three, by others with four ploughings, after it is manured; immediately after one crop is removed, 'tis usual in England to plough and harrow: the same thing is again gone through with early in the Spring, and, afterwards, just before the seed is sown; this makes its condition perfectly mellow, and renders it free from all kinds of weeds; in our country, if the ground be broken twice with the plough, and once harrowed, it seems to be considered sufficient; and in Russia, less pains still is taken, beside being more imperfectly done.

"The seed for hemp, as for flax, should be weighty, and of a bright color; good soils will admit of three bushels to the acre; not less than two should be used where one and a half bushels are now put in, as the hemp, the thicker it is sown, provided it is not overdone, will be finer in its fibre, and, consequently, spins a finer yarn, and lays much closer, besides that the twist will be more easily accomplished by the working hand or the machine, and it will be a much stronger yarn made from fine hemp than coarse, both being of the same diameter. The seed is sown in the broad-cast manner, as early as the climate will admit, and covered in with the harrow. Drilling is sometimes resorted to in England, under the impression that the early growth of the plant is promoted; but the broad-cast is preferred. The seed may be put in in April, the frosts being over even earlier, as the plants are more vigorous, and less affected by the different subsequent operations they have to undergo.

"There are few soils in this country that could not produce, or be made to produce, hemp, and repeated crops may be obtained, as advantageously to the ground, from the same piece of land, with proper attention, and as little exhaustion as almost any other vegetable production. It is asserted, that, in Suffolk, in England, it has been grown for 70 years in succession, on the same spot of ground, and, by continually manuring, the ground would be restored, and it may be grown forever.

"After it is sown, the management of the crop is attended with very little trouble; when it is properly ripe, it is pulled up by the roots, the mould well shaken off, and laid up in what are called *baits*. If the hemp be intended for a seed crop, it should be perfectly ripe; but if for manufacturers' use, it should be pulled earlier, as the coloring matter is then more easily extracted, and the hemp has less tow; besides, that it is generally believed the fibre is stronger. The next process which the plants undergo, is termed rotting—one method is denominated dew, the other water-rotting; and it is admitted on all sides, that the latter is to be greatly preferred. It affords much the finest, strongest, and longest staple hemp. The former process, however, is practised in our country almost universally: in fact, except on Connecticut river, I have heard of no other place where the other method is pursued; and there, water-rotting is but imperfectly managed, both as to economy and usefulness. To dew-rot the hemp, the stalks immediately after they are pulled, are spread on the ground, as thinly as possible, where they are left three or four weeks, occasionally turned; and, in this situation, they are subject to all the variableness of our climate, which is so fluctuating and uncertain, that hemp is materially injured before the farmer is aware of it, or could conveniently prevent it; the fibre is then generally weakened by being burnt up with the sun, or from too long exposure and excessive wet. Even in England, where the climate is much more favorable for this process, the greatest care and attention will scarcely prevent injury, and is never resorted to when the hemp is the object, as it is not uncommon to find, on examination, that the hemp is deteriorated in quality from too long exposure; in addition, also, the risk of damage. This is the most troublesome and longest process: for, in water-rotting, the hemp is more handled, after it is put into the water, until the process is completed; it is then taken out, tied into rather small bundles, placed upright between two ropes, extended parallel to each other, across a lot, and from this position it is protected from the effects of the rain, as also it is exposed to dry much sooner. The hemp, after it is pulled, is carried to a deep pond, or wooden tank of standing water; it is placed thereon, bundle upon bundle, cross-wise, and when the pond is filled, the whole should be completely immersed in the water by loading it with heavy pieces of timber; in four or five days. the process being finished, it is taken out and dried as soon as possible, in the manner explained before.

Another method of rotting has been suggested in France, and practised successfully:—the water is heated to a temperature of 72 to 75 degrees of Reaumur, dissolving in it a quantity of green soap, in the proportion of one to forty-eight of hemp; the quantity of water composed with the hemp should be as one to forty: the hemp is thrown in, and the vessel covered over, and in two or three hours, it appears, the hemp is fully steeped. If this process should be found to answer, it is by far the most convenient of any yet known, unless the application of steam prove as effectual, or more so, without the addition of soap.

"After the hemp is rotted, it is to be broken. A coarse and fine brake is sometimes used in England, but the rollers of the lint-mill are preferred, because of its being more expeditiously performed. In our country they use what is called a hemp-mill: which is a large heavy stone, formed like a sugar-loaf, with the small end cut off—such a form as is generally used for grinding white lead; a shaft is run through it, and it is made to revolve in a circle; when passing on a plane, the hemp becomes crushed, and broken by the stone, and is subsequently swingled: the rollers of the lint-mill are, however, thought to be better, and my own opinion is, that Mr. S. Swartwout's machine for breaking flax would answer better than any other mode which is now practised.

"The average crop, per acre, in America, England, and Russia, has been estimated as follows: America, 400 lbs.; England, 650 lbs.; Russia, 500 lbs. The present price of American dew-rotted, is $115 per ton, that of Russia $170 per ton.

"The cultivation of this plant would, no doubt, be of great national benefit, not, perhaps, arising immediately from the production of hemp, but the absolute necessity, almost, of being independent of this article from foreign countries in time of war, and the great value it is susceptible of attaining from the manufacture in our country. There is, perhaps, except in England, a greater quantity of hemp consumed in this than in any other country, in the manufacture of cordage, sail-cloth, cotton bagging, and in numerous qualities of ordinary cloths. The certainty of a market would, no doubt, very much tend to increase the cultivation; and a demand might be created by protecting the manufacturer to such an extent as to admit of his paying the farmer such a price for the raw material as would bring the gain and demand for the article to a par with any advantage he might obtain from any other article of vegetable production. The hemp manufactured into cordage is generally brought from abroad. I have written to a manufacturer on the subject, and when I obtain the information I have solicited and expect, it will be transmitted to you. In my mill I have spun, for cloth only, about two tons. Not having been properly prepared, I discontinued the use of it; however, the machinery I possess will spin hemp as well as flax, and hereafter I may be induced to turn my attention to it again. As far as I can learn, I am the only person in the United States, that will attempt to spin by machinery—I mean fine threads, capable of making duck.

"To prepare the hemp for spinning, it is hackled on three tools, to reduce it to the same fineness with flax, which is reduced on two tools, and in the process, we make use of oil to supply that elasticity which naturally it does not possess. All subsequent processes are the same as flax, the machinery being only altered in the draft from roller to roller, to conform to the length of the staple; it is also susceptible of being altered, that it may be made to spin the shortest tow, and longest hemp.

"I would, as it regards my own interest, prefer to make use of the American hemp, where it is as good as the foreign, or could I substitute it for the same purpose; but, as the reputation of a manufacturer depends on the quality of his goods, it is absolutely necessary the raw material should be of the best quality; and it is a fact, that neither the flax nor hemp of this country are of such a quality as to justify their general use for manufacturing purposes."

THE PLEASURES OF AGRICULTURE,

In free countries, are more, and in enslaved, fewer, than the pleasures of most other employments. The reason of it is, that agriculture both from its nature, and also as being generally the employment of a great portion of a nation, cannot be united with power, considered as an exclusive interest. It must of course be enslaved, wherever despotism exists, and its masters will enjoy more pleasures in that case, than it can ever reach. On the contrary, where power is not an exclusive, but a general interest, agriculture can employ its own energies for the attainment of its own happiness.

Under a free government it has before it, the inexhaustible sources of human pleasure, of fitting ideas to substances, and substances to ideas; and of a constant rotation of hope and fruition.

The novelty, frequency and exactness of accommodations between our ideas and operations, constitutes the most exquisite source of mental pleasure. Agriculture feeds it with endless supplies in the natures of soils, plants, climates, manures, instruments of culture and domestic animals. Their combinations are inexhaustible, the novelty of results is endless, discrimination and adaptation are never idle, and an unsatiated interest receives gratifications in quick succession.

Benevolence is so closely associated with this interest, that its exertion in numberless instances, is necessary to foster it. Liberality in supplying its laborers with the comforts of life, is the best sponsor for the prosperity of agriculture, and the practice of almost every moral virtue is amply remunerated in this world, whilst it is also the best surety for attaining the blessings of the next. Poetry, in allowing more virtue to agriculture, than to any other profession, has abandoned her privilege of fiction, and yielded to the natural moral effect of the absence of temptation. The same fact is commemorated by religion, upon an occasion of the most solemn, within the scope of the human imagination. At the awful day of judgment, the discrimination of the good from the wicked, is not made by the criterion of sects or of dogmas, but by one which constitutes the daily employment and the great end of agriculture. The judge upon this occasion, has by anticipation pronounced, that to feed the hungry, clothe the naked, and give drink to the thirsty, are the passports to future happiness; and the divine intelligence which selected an agricultural state as a paradise for its first favorites, has here again prescribed the agricultural virtues as the means for the admission of their posterity into heaven.

With the pleasures of religion, agriculture unites those of patriotism, and among the worthy competitors for pre-eminence in the practice of this cardinal virtue, a profound author assigns a high station to him who has made two blades of grass grow instead of one; an idea capable of a signal amplification, by a comparison between a system of agriculture which doubles the fertility of a country, and a successful war which doubles its territory. By the first, the territory itself is also substantially doubled, without wasting the lives, the wealth, or the liberty of the nation, which has thus subdued sterility, and drawn prosperity from a willing source. By the second, the blood pretended to be enriched, is spilt; the wealth pretended to be increased, is wasted; the liberty said to be secured, is immolated to the patriotism of a victorious army; and desolation in every form is made to stalk in the glittering garb of false glory, throughout some neighboring country. Moral law decides the preference with undeviating consistency, in assigning to the nation, which elects true patriotism, the recompense of truth, and to the electors of the false, the expiation of error. To the respective agents, the same law assigns the remorses of a conqueror, and the quiet conscience of the agriculturist.

The capacity of agriculture for affording luxuries to the body, is not less conspicuous than its capacity for affording luxuries to the mind; it being a science singularly possessing the double qualities of feeding with unbounded liberality, both the moral appetites of the one, and the physical wants of the other. It can even feed a morbid love for money, whilst it is habituating us to the practice of virtue; and whilst it provides for the wants of the philosopher, it affords him ample room for the most curious and yet useful researches. In short, by the exercise it gives both to the body and to the mind, it secures health and vigor to both; and by combining a thorough knowledge of the real affairs of life, with a necessity for investigating the arcana of nature, and the strongest invitations to the practice of morality, it becomes the best architect of a complete man.

If this eulogy should succeed in awakening the attention of men of science to a skilful practice of agriculture, they will become models for individuals, and guardians for national happiness. The discoveries of the learned will be practised by the ignorant; and a system which sheds happiness, plenty and virtue, all around, will be gradually substituted for one, which fosters vice, breeds want, and begets misery.

Politicians, (who ought to know the most, and generally know the least, of a science in which the United States are more deeply interested than in any other,) will appear, of more practical knowledge, or at least of better theoretical instruction; and the hopeless habit of confiding our greatest interest to people most ignorant of it, will be abandoned.

The errors of politicians ignorant of agriculture, or their projects designed to oppress it, can only rob it of its pleasures, and consign it to contempt and misery. This revolution of its natural state, is invariably effected by war, armies, heavy taxes, or exclusive privileges. In two cases alone, have nations ever gained any thing by war. Those of repelling invasion and emigrating into a more fruitful territory. In every other case, the industrious of all professions, suffer by war, the effects of which, in its modern form, are precisely the same to the victorious and the vanquished nation. The least evil to be apprehended from victorious armies, is a permanent system of heavy taxation, than which, nothing can more vitally wound or kill the pleasures of agriculture. Of the same stamp, are exclusive privileges in every form; and to pillage or steal under the sanction of the statute books, is no less fatal to the happiness of agriculture, than the hierarchial tyranny over the soul, under the pretended sanction of GOD, or the feudal tyranny over the body, under the equally fraudulent pretence of defending the nation. In a climate and soil, where good culture never fails to beget plenty, where bad cannot produce famine, begirt by nature against the risk of invasion, and favored by accident with the power of self-government, agriculture can only lose its happiness by the folly or fraud of statesmen, or by its own ignorance.

[*Taylor's Arator.*

HOW TO PROCURE ANIMALS OF EITHER SEX.

"M. GAROU DE BUZAREINGUES published, in 1825, some experiments relative to the reproduction of various domestic animals, more particularly of Sheep. In a late number of *Magendie's Journal*, he has resumed this subject, and has related the result of some experiments made with two separate flocks of sheep. In addition to these, there are many observations on the same subject applied to mares and cows; but the most important relate to sheep.

"A flock of sheep was divided into two equal portions, and a smaller or greater number of male or female lambs were to be produced, at the will of the proprietor, in each of these. The plan adopted in order to insure this result, was to employ very young rams in that division of the flock from which it was desired to obtain females; and strong and vigorous rams, of four or five years of age, in that from which males were to be procured. The first division was also recommended to have a more abundant supply of food, and more repose than usual, during the period of impregnation. The following table will show the effect of the first experiment:

	Sex of the Lambs.	
Age of the Mothers.	Males.	Females.
2 years, - -	14	26
3 years, - -	16	29
4 years, - -	5	21
5 years and upwards,	18	8
Total, -	53	84
At another farm:—		
2 years, - -	7	3
3 years, - -	15	14
4 years, - -	38	14
5 years and upwards,	25	24
Total, -	80	55

"Another experiment is thus related:—A flock of 106 sheep was divided into two sections of 42 each; one containing the strongest ewes, of four or five years of age; the second, consisting of the weakest, either less than four or more than five years old: the first section was intended to produce a greater number of females than the second; and after having been marked, and placed in a good pasturage, four rams, of about ten months old, were turned into them. The other section received two strong rams, each aged more than three years. The remainder of the flock, making up the number of 106, belonged to the shepherds; they are generally stronger and better nourished than the rest, and these, forming a third section, were placed under circumstances similar to the second.——The result of the lambing was thus:—

	Males.	Females.
First section, - -	15	25
Second section, - - - -	26	14
Third section, - -	10	12
There were four double births; two of which, in the first section, produced, -		4
The two others, belonging to the second and third sections, produced, - -	3	1

"It is to be remarked, that the lambs proceeding from the section in which the young rams were employed, were in all respects as fine as those begotten by the older and stronger rams.

"In connexion with this part of the subject, we find, in another part of the communication, a remark of some importance. In 1825, twenty ewes, which had not borne for two years, received the rams clandestinely, in the beginning of winter; they were almost all of them remarkably fat; they produced sixteen females and four males. Among the number of these ewes, were two old ones, which had been put up to fatten in 1824, but could not be sold because they were not in sufficiently good condition: these gave one male and one female.

"M. Garou next carries his inquiries to the reproductive power in the mare and cow. Respecting the first of these, he observes, that, wishing to obtain more female than male colts, he fed his brood mares on fresh food; that he chose for propagation only such as had not been foaled or even nourished by the mother the preceding year; and he did not give them the stallion until they gave evident signs of being in heat. Five mares, so chosen, produced five female colts; and, by following the same method, out of thirteen colts foaled that year, eleven were females; and one of the two males was the product of an old mare. He remarks, that some mares of a remarkably vigorous appetite, always bring forth females; whilst those of delicate health have constantly produced males. The same remarks apply to the cow."

[*London Med. and Phys. Journ.*

TO PREVENT THE DESTRUCTION OF BEES, BY THE BEE-MILLER.

Devan's Ferry, Bertie Co., N. C. July 8, 1828.

JOHN S. SKINNER, ESQ.

Sir,—Understanding that you are the publisher of a paper exclusively devoted to domestic industry and intelligence, and through which every subject upon domestic economy can be, and is readily communicated to the public; I take the liberty, through the advice of a friend, of making known to you, for publication, (should you think proper to publish the same,) my method of preventing the destruction of that useful insect, the Bee, by what is usually called the Bee-miller, or Bee-worm.

I have, sir, for many years, been the raiser of bees, and was at one time much troubled with the bee-worm; but, upon examination, I found, they always bred between the bench upon which the hive sat, and the bottom edges of the hive. I first adopted the method of having the bottom edges at the hive, brought to so small a point or edge, as to afford them no shelter; but now, during the warm season, I raise the hive by placing small sticks around under the hive, so as to raise it, say about half an inch from the bench, which I take out during winter or the cold months.

And I can say, sir, that for many years I have seen nothing of the bee-worm, and that my stock of bees have increased as fast as I can or could wish. Yours, &c. MILEY HAMILTON.

[*American Farmer.*

MISCELLANEOUS.

WE insert the following QUERIES from the *American Farmer.* Many of our subscribers are well acquainted with the business of manufacturing Pot and Pearl ashes; and we should be much obliged to any of them for communications on the subject.

A Southern Planter, utterly ignorant of the process for manufacturing *Potash*, will be grateful for any information relative to it. He possesses beach wood in abundance, which he is instructed produces a greater quantity of alkali than most forest trees. Not being acquainted with the requisites that would warrant an engagement in the business, however simple they may be when understood, he is induced to solicit the necessary information for the accomplishment of the object in view; and, however apprehensive he may be, that the minute inquiries will require more courtesy than he ought to expect, yet as they may benefit others as well as himself, he will, without further preliminaries, proceed to state them:

What season ought the wood to be cut?

What length, when split, and what size?

Is it most productive burnt green or dry?

Is there any particular form for stacking or piling it?

What is the best manner of collecting and securing the ashes? and what the means employed?

What the number, size and form of the kettles and other necessaries required, for a definite number of laborers—say ten?

If the kettles be set in furnaces, what the proper arrangement for them?

Give the whole process of boiling, setting, &c. The requisite buildings, &c.

Lastly—Can the manufacture of potash from the beach wood, be profitably and unremitedly pursued, where there is no want of the materials within a square mile? C. E.

An Erroneous Judgment respecting Apparent Stains of Blood.

A murder having been committed in France, and a rusty sabre and knife found in the possession of a person accused of the murder, they were pronounced by a medical man, to be actually spotted with blood, and certainly used in the commission of the murder, notwithstanding the spots resembled rust rather than blood.

Mr. Vauquelin was therefore desired to examine these spots chemically, to determine their nature. For this purpose he scraped off from the sabre some of the red matter, and put it into a small glass tube closed at one end, and stopped the other with a strip of litmus paper, which had been previously turned red by an acid. The tube and red powder were then heated by a lamp, a yellow steam was produced, which restored the reddened paper to its original blue.

The same experiment was made with the powder scraped from the knife, and the same effects were produced. As this alteration of the color showed the presence of volatile alkali in the red spots, and this alkali is well known to be present in all animal matters, the suspicions previously raised, were considerably strengthened; but Mr. Vauquelin was not thoroughly satisfied.

The experiment was therefore made with rust scraped from a piece of iron found by accident in the Judge's closet, which gave the same result as the other rust; and thus destroyed the suspicions that the unguarded assertion of the medical man had occasioned.

These experiments prove that when rust is formed in houses, it is capable of absorbing and even retaining the volatile alkaline vapors usually floating in the air in inhabited rooms. Rust also appears to absorb animal vapors, for in the experiments some traces of a brown oil were observed on the surface of the glass tube.

Mr. Laugier has examined some rust found in his own laboratory, and not only confirmed the observations of Mr. Vauquelin, but also detected the presence of sulphuric acid in the rust.

[*Lond. Mech. Journ.*

Recovery from Drowning.

M. Bourgeois had occasion accidentally to give assistance in a case, where, after a person had been 20 minutes under water, he was taken out, and by a very common but serious mistake, carried with his head downwards. The usual means were tried unremittingly, but unsuccessfully, for a whole hour, but at the end of that time, a little blood flowed from a vein that had been opened, and a ligature being placed on the arm, ten ounces of blood were withdrawn: the circulation and respiration were then gradually reestablished, horrible convulsions, and a frightful state of tetanus coming on at the same time; copious bleeding was again effected, after which a propensity to sleep came on; a third bleeding the following morning was followed by the recovery of the patient. Hence M. Bourgeois concludes that the means of recovering a drowned person, should never be abandoned, until the decomposition of the body has commenced. [*Bull. Univ.*, C. xi. 213.

Mode of preserving wooden buildings from the effects of Fire, invented by Dr. Fuchs, *Prof. of Mineralogy, in Munich.*

The following is the process: 10 parts of potash or soda; 15 parts of quartz (sand,) and one part charcoal. are melted together. This mass, dissolved in water, and either alone or mixed with earthy matters, applied to wood, completely preserves it from the action of fire. [*Ed. Phil. Journ.*

Pine Apples.

A great improvement may be made in keeping pine apples by twisting off their crowns, which are generally suffered to remain and live upon the fruit till they have sucked out all the goodness. It will be very easy for fruiterers to keep a few crowns by them in water, which can be pegged or stuck on with dough, for show, when the fruit is served up, or artificial ones may be made. A pine apple will keep for a long time when its crown is removed, and will also be greatly improved in flavor, for the more aqueous parts of the fruit gradually evaporate, and leave it much more saccharine and vinous in its flavor; which natural process is totally destroyed by the vegetation of the crown, just upon the same principle that an onion or carrot loses its flavor when it begins to sprout in the spring.

Extract of a letter to M. de Ferussac, Berlin, Feb. 27, 1827.

There is here at the present time, a mule, from a stag and a mare. The authorities have attested the phenomena, and the structure of the beast is singular enough; the fore part is a horse and the hinder part a deer, but all the feet are those of the horse. The same stag has covered a second mare, and the result is in anticipation. The King has purchased the mule for the Island of *Pfaneninsel*, where there is a menagerie. [*Bull. Univ., March*, 1827.

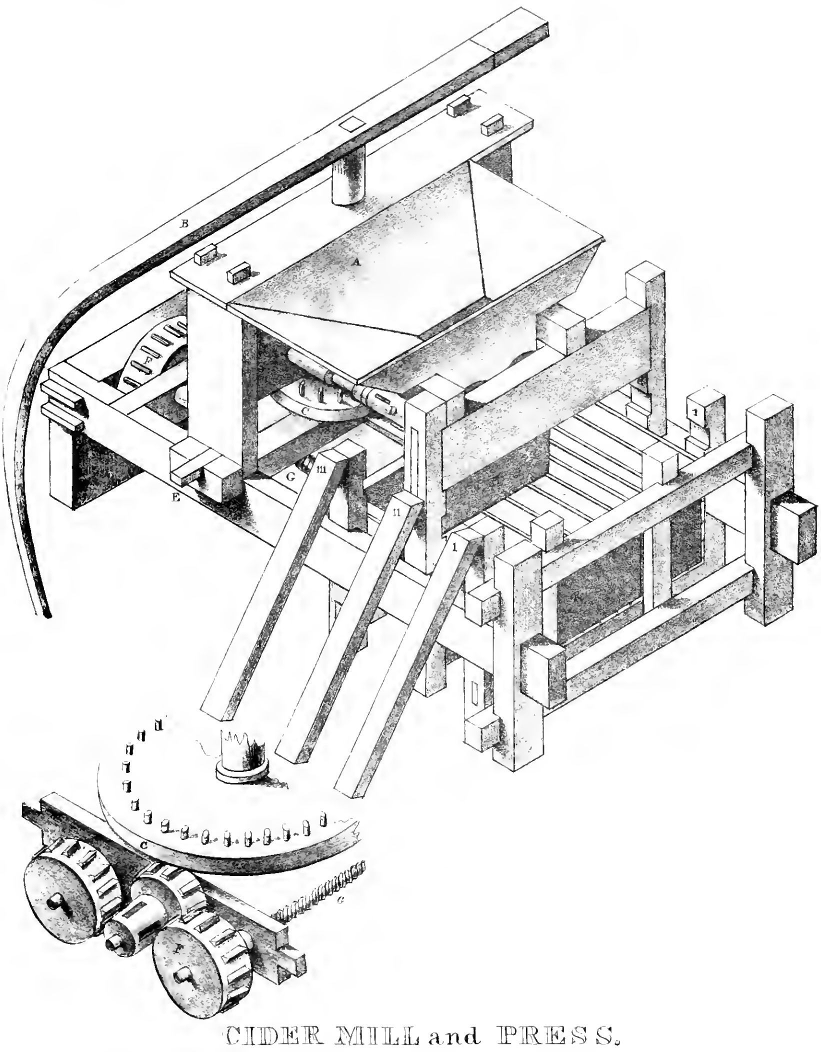
NOTICES.

PARKER'S BRICK PRESS.

Another Press, for pressing bricks, has been recently invented and put into operation by Dr. James Parker, of this town. It combines in a remarkable manner, the three essentials to every machine—*strength*, *simplicity*, and *cheapness*; and will be a valuable acquisition to the Brick-maker, notwithstanding the many Brick Presses now in operation.

PREMIUM FOR HEMP.

We are authorized to state, that the Trustees of the Gardiner Lyceum are about offering a premium of *Fifty Dollars*, for the largest, and best crop of water-rotted Hemp, to be raised and prepared in this State, during the next year. We have not received their offer in time to insert in this number.



CIDER MILL and PRESS.

THE

NEW-ENGLAND

FARMERS' AND MECHANICS' JOURNAL.

Vol. I. GARDINER, SEPTEMBER, 1828. No. 9.

MECHANICS.

CHURCHILL'S CIDER MILL AND PRESS.

Plate IX,—is a representation of an improved Cider Press, invented by Mr. J. Churchill, of Buckfield, Me. The apples are put into a hopper and ground by horse power in the usual way. After they are ground, the pomace falls down into a vat below and is suffered to lie as long as necessary. The Nuts are carried or moved by means of a large Cog-wheel lying horizontally, and having cogs on its upper and under surface. The cogs on the upper side, play into one of the nuts which moves them while grinding the fruit. After this is accomplished, a key is removed from under the large wheel, which causes it to drop down a few inches, leaving the nuts, and fitting the under cogs into the head of a couple of screws, which lie beneath in a horizontal position. A piston, or follower, is attached to these screws, and when the cog-wheel is put in motion, it is brought home, carrying the pomace before it and pressing the juice from it. The whole Machine sits in a large Vat which retains the liquor until drawn off. The advantages of this improvement are, lessening of the labor in pressing and managing the pomace. In the first place, it falls exactly where it is wanted, after leaving the nuts, and it is not necessary to shovel it into another reservoir. Second, no straw need be added, which sometimes by being musty or dirty, injures the cider very much,—and third, the labor of turning the screws by hand is dispensed with, as they may be turned either way, by horse power. A slight examination will convince any one that a vast saving is also obtained with regard to time, as much more can be performed in the same number of hours than by the old process.

References.

FIG. 1.—A, the Hopper.

B, the Sweep, to which the horse is attached.

C, the Spur, or Cog-wheel.

D, the Nuts, or Mashes.

E, the Key, which keeps the cog-wheel when grinding, and which is removed when the pomace is to be pressed.

F, the Spur-wheel, attached to the screws, and is moved by the larger one.

G, the Screws.

H, the Follower, or Piston.

I, II, III, Side-pieces to the vats.

K, the end of the Vat.

FIG. 2,—is a representation of the Cog-wheel and Screws.

ON THE CONSTRUCTION OF FIRE-PLACES.

BY N. ARNOTT, M. D.

DURING my attendance lately in some cases of pulmonary disease, while considering how best to attain the important objects of uniformity of temperature, and the prevention of draughts or currents of air in the apartments to which the patients chiefly confined themselves, a simple means occurred to me, which, on trial, perfectly succeeded. It is an addition easily made to any fire-place; and as its uses are important to the health and comfort of all the inhabitants of cold climates, I am happy to suggest it to the public.

It is simply a glazed metal frame-work, or window, placed before the fire, and coming in contact with the chimney-piece and hearth all round, so as perfectly to cut off communication between the room and the fire-place; and the fire is fed with air brought by a tube from without.

Completely to understand the effect of it, it may be remarked, that of the heat produced by the combustion of fuel in a common fire-place, a part radiates into the room as the light does, and the remainder ascends the chimney with the smoke. That which finds its way into the room, contrary to common apprehension, is probably not more than a fourth part of the whole heat produced; but even less than this would be sufficient to preserve in the room the desired temperature, could it be all retained. The great current of air, however, in the chimney, carries this heat again quickly with it, (for it is the warm air of the room passing away,) and a chimney of the ordinary proportion, and with the ordinary velocity of the smoke, will allow the whole air of the apartment to pass out by it in less than half an hour.

The glazed frame then, described above, will prevent, it is evident, the heat when once received into the room, from again escaping from it, as it now does, with the air ascending in the chimney; and although the glass is some obstacle to the radiation of the heat from the fire in the first instance, the disadvantage is much more than compensated by its retaining agency afterwards.

One of our rooms, as now constructed and heated, may be compared to a vessel of water of similar shape, with a hole near its bottom, through which the water is constantly running off, while an attempt is making, at the same time, to warm its contents by heat radiating inwards, from the hole and around it. The hottest water would always get out first, being nearest the opening from whence the heat came; and to keep the vessel full, this would be replaced by fresh cold water, entering by one or more openings in the circumference. It would require a powerful heat indeed, to raise much the temperature of such a vessel; and it is evident, that no degree of heat so admitted, could warm the contents uniformly.

It may be supposed that I have under-rated the proportion of caloric which radiates from a fire into the room, compared with that which ascends the chimney, in calling the former only a fourth part of the whole produced; but the following considerations, without new experiment, may probably be accounted decisive of the question:—Mr. Leslie, in his experiments on heat, found that a metallic vessel of water, of medium temperature, suspended in the air, lost about half its caloric by radiation, and half by contact with the air. At a higher temperature, however, on account of the increased velocity of the air, caused by its greater expansion, or in an artificial current of air, without higher temperature. it lost much more by contact than by radiation. Now, in a fire are found the two circumstances of extreme heat and great velocity, and to these is added a third, of much greater importance than either, viz: the surface of contact being exceedingly increased by the air passing between the pieces of coal. while the surface of radiation, viz: the external surface, remains the same.

It is a thing not sufficiently adverted to in the management of our fires, that the heat given into the room, is proportioned rather to the extent of burning surface presented towards the room, than to the depth of the fire, the intensity of the heat backwards, and the quantity of the fuel consumed. I have been trying experiments, with a view to ascertain the proportions exactly; of which, however, I have not as yet had time to prepare an account for publication; but as the general result, I may state, that a tile, or sheet of iron. laid on the back part of the fire, so as to cover it closely, and to prevent combustion, except in front, rather increases than diminishes the radiation of heat towards the apartment, and much less fuel is consumed.

In constructing the glass frame proposed, a part must be made to open, to allow the putting on of coal, and stirring of the fire. The air, to feed the fire, may come from an opening in the external wall, by a tube concealed behind the wainscot. In the case where it was first tried, a useless chimney happened to pass by the side of the fire-place, and a brick taken from between them, gave admittance to the air. In whatever way the object be accomplished, we should have it in our power to admit more or less air, so as to regulate the combustion at will, as in the common furnace. The room may be ventilated by a small opening near the ceiling. either into the chimney or into the stair-case, to be made to open and close too, to the degree required. The heated air tubes now commonly connected with fire-places, are peculiarly adapted to this plan, and with it, produce the greatest possible saving of fuel; and the method of supplying coal to the fire from below it, or in any other way that secures the combustion of the inflammable gases contained in the coal, which I hope may soon become general, has the same utility here as in other cases.

The advantages of the plan may be shortly enumerated as follows :—

1. The nearly perfect uniformity of temperature in the air throughout the room, rendering it a matter of indifference in what part the company sits.

2. The total prevention of draughts or currents of air, which are inevitable in our rooms, as now warmed, because the fire must be supplied with air from the doors or windows. It is almost needless to mention, that a great proportion of the winter diseases of this climate are occasioned by these currents, acting partially on our heated bodies.

3. The saving of fuel. Less than half the usual quantity will generally be found to keep the apartment in the most comfortable state.

4. The raising the temperature of the air of the house generally. For were all the chimnies thus closed with respect to the apartments. although fires were lighted but in a few, any degree of heat once generated in the house, would be long retained.

5. It completely prevents smoke or dust; a circumstance which alone renders it extremely valuable in many cases; and with it there is no danger of fire.

In these particulars are comprehended all the advantages of the close stoves of Continental Europe, so superior to ours in economy, and in the degree and uniformity of the temperature produced, with what many will call a very great additional one, that of seeing the fire; and it avoids their disadvantage, of giving a burnt or sulphury odour to the air of the apartment. It should not be forgotten. that at a very moderate expense, the change described may be made on all common fire-places.

[*Journal of Science and the Arts.*

DR. BLACK'S SENSIBLE BALANCE.

The following description of a very delicate, and, to many it may be, very useful Balance, is taken from a letter written by Dr.

Black, to James Smithson, Esq., and inserted in the *Annals of Philosophy*, N. S. x. 52.

"The apparatus I use for weighing small globules of metals, or the like, is as follows: A thin piece of fir-wood, not thicker than a shilling, and a foot long, 3-10ths of an inch broad at the middle, and 1 1-2 tenths at each end, is divided by transverse lines into 20 parts, i. e. ten parts on each side of the middle. These are the principal divisions, and each of them is subdivided into halves and quarters. Across the middle is fixed one of the smallest needles I could procure, to serve as an axis, and it is fixed in its place by means of a little sealing-wax. The numerations of the divisions is from the middle to each end of the beam. The fulcrum is a bit of plate-brass, the middle of which lies flat on my table when I use the balance, and the two ends are bent up to a right angle, so as to stand upright. These two ends are ground at the same time on a flat hone, that the extreme surfaces of them may be in the same plane; and their distance is such that the needle, when laid across them, rests on them at a small distance from the sides of the beam. They rise above the surface of the table only one and a half or two-tenths of an inch, so that the beam is very limited in its play.

"The weights I use are one globule of gold, which weighs one grain, and two or three others which weigh one-tenth of a grain each; and also a number of small rings of fine brass wire, made in the manner first mentioned by Mr. Lewis, by appending a weight to the wire, and coiling it with the tension of that weight round a thicker brass wire in a close spiral, after which the extremity of the spiral being tied hard with waxed thread, I put the covered wire in a vice, and applying a sharp knife, which is struck with a hammer, I cut through a great number of the coils at one stroke, and find them as exactly equal to one another as can be desired. Those I use happen to be the one-thirtieth part of a grain each, or 300 of them weigh ten grains; but I have others much lighter.

"You will perceive that by means of these weights, placed on different parts of the beam, I can learn the weight of any little mass, from one grain, or a little more, to the 1-1200th of a grain. For if the thing to be weighed weighs one grain, it will, when placed on one extremity of the beam, counterpoise the large gold weight at the other extremity. If it weighs half a grain, it will counterpoise the heavy gold weight at five; if it weighs 6-10ths of a grain, you must place the heavy gold weight at five, and one of lighter ones at the extremity to counterpoise it; and if it weighs only 1, or 2, or 3, or 4-100ths of a grain, it will be counterpoised by one of the small gold weights placed at the first, or second, or third, or fourth division. If, on the contrary, it weigh one grain and a fraction, it will be counterpoised by the heavy gold weight at the extremity, and one or more of the lighter ones placed in some other part of the beam.

"This beam has served me hitherto for every purpose: but had I occasion for a more delicate one, I could make it easily by taking a much thinner and lighter slip of wood, and grinding the needle to give it an edge. It would also be easy to make it carry small scales of paper for particular purposes."

Mr. Smithson observes, that the rings, or small weights, mentioned above, have the defect of their weight being entirely accidental, and consequently most times very inconvenient fractions of grains, and recommends instead that the weight of a certain length of wire be ascertained, and then the length of it taken, which corresponds to the weight wanted; when fine wire is used, a set of small weights may thus be made with great accuracy and ease. This is a process, the value of which is well known to the philosophical instrument maker. [*Jour. of Science and Arts.*

On rendering Fish Oil and Linseed Oil drying; and on making cheap Oil Paints. By Mr. T. VANHERMAN.

Having applied a great portion of my time, for several years past, to discover a method of preparing a cheap and durable composition for the defence and preservation of all work exposed to the inclemency of the weather, I have now the satisfaction of laying before the Society for the Encouragement of Arts, &c., specimens of some of the colors ready prepared for use, which will, I flatter myself, be found superior to all others for cheapness and durability, equal to any in beauty, and not be subject to blister or peel off from the heat of the sun.

The vehicle made use of for the said paints, is fish-oil, the preparation of which is so simple, that, when known, gentlemen who have large concerns to paint, may have this composition of any color manufactured, and laid on by their laborers.

I have sent a bottle of the prepared oil, also a number of patterns of paints, of various colors. The highest price of any does not exceed three-pence per pound, and many of them are so low as two-pence, in a state fit for use. I have likewise sent a pot of white-lead, which has been ground with prepared fish-oil; and which, when thinned with linseed-oil, surpasses any white hitherto made use of for resisting all weathers, and retaining its whiteness. I hope my humble endeavors will merit the approbation of the Society, before whom I will, at any time they shall please to appoint, make the various experiments they may require.

Relying on your encouragement, I am, Gentlemen, with due respect, your most obedient humble servant,

THOMAS VANHERMAN.

To refine one Ton of Cod, Whale, or Seal Oil, for Painting, the following ingredients are used.

One ton of fish-oil, or 252 galls.	12 lbs. white copperas,†
32 galls. of vinegar,	12 galls. of linseed-oil,
12 lbs. of litharge,*	2 galls. of spirit of turpentine.

* The vitreous oxide of lead. † Sulphate of zinc.

To prepare the Vinegar for the Oil.

Into a cask which will contain about forty gallons, put 32 gallons of good common vinegar; add to this 12 pounds of litharge, and 12 pounds of white copperas in powder; bung up the vessel, and shake and roll it well twice a day for a week, when it will be fit to put into a ton of whale, cod, or seal oil; (but the Southern whale oil is to be preferred, on account of its good color, and having little or no smell;) shake and mix all together, when it may settle until the next day; then pour off the clear, which will be about seven-eighths of the whole. To this clear part add twelve gallons of linseed-oil, and two gallons of spirit of turpentine; shake them well together, and after the whole has settled two or three days, it will be fit to grind white-lead and all fine colors in; and when ground, they cannot be distinguished from those ground in linseed-oil, unless by the superiority of their colors.

If the oil is wanted only for coarse purposes, the linseed-oil and spirit of turpentine may be added at the same time that the prepared vinegar is put in; and after being well shaken up, it is fit for immediate use, without being suffered to settle.

The vinegar is used to dissolve the litharge, and the copperas accelerates the solution and increases the drying quality.

The residue, or bottom, when settled, by the addition of half its quantity of fresh lime-water, forms an excellent oil for mixing with all the coarse paints for preserving outside work.

NOTE.—All colors, ground in the above oil, and used for inside work, must be thinned with linseed-oil and spirit of turpentine.

☞ The oil mixed with lime-water, I call *incorporated oil.*

The method of preparing various Impenetrable Paints.

FIRST—*Subdued Green.*

Fresh lime-water, 6 galls.	Wet blue, 20 lbs.
Road-dust, finely sifted, 112 lbs.	Residue of the oil, 3 galls.
Whiting, 112 lbs.	Yellow-ochre, in powder, 24 lbs.
Blue-black, 30 lbs.	

This composition will weigh 368 pounds, which is scarcely one penny per pound. To render the above paint fit for use, to every eight pounds add one quart of the incorporated oil, and one quart of linseed-oil; and it will be found to be a paint with every requisite quality of beauty, durability, and cheapness; and, in this state of preparation, does not exceed two-pence half-penny per pound; whereas the coal-tar paint of the same color, is six-pence per pound.

The method of mixing the Ingredients for the Subdued Green.

First, pour six gallons of lime-water into a large tub, then throw in 112 pounds of whiting; stir it round well with a stirrer; let it settle for about an hour, and stir it again. Now you may put in the 112 pounds of road-dust, mix it well; then add the blue-black, after which, the yellow-ochre; and when all is tolerably blended, take it out of the tub, and put it on a large board or platform, and with a laborer's shovel, mix and work it about as they do mortar. Now add the wet blue, which must be previously ground in the incorporated oil, (as it will not grind or mix with any other oil,) When this is added to the mass, you may begin to thin it with the incorporated oil, in the proportion of one quart to every eight pounds; and then with the linseed-oil, in the same proportion; and it is ready to be put into casks for use.

Lead Color.

Whiting, 112 lbs.	Road-dust, 56 lbs.
Blue black, 5 lbs.	Lime-water, 5 galls.
Lead, ground in oil, 28 lbs.	Residue of the oil, 2 1-2 galls.
Weight 256 lbs.	

To the above add two gallons of the incorporated oil, and two gallons of linseed-oil to thin it for use, and it will not exceed the price of 1 3-4*d.* per pound.

Note.—The lime-water, whiting, road-dust. and blue-black, must be first mixed together; then add the ground lead, first blending it with two gallons and a half of the prepared fish-oil; after which thin the whole, with the two gallons of linseed-oil, and two gallons of incorporated oil, and it will be fit for use. For garden-doors, and other work liable to be in constant use, a little spirit of turpentine may be added to the paint whilst laying on, which will have the desired effect.

Bright Green.

112 lbs. yellow-ochre, in powder,	6 gallons lime-water,
168 do. road-dust,	4 do. fish-oil, prepared,
112 do. wet blue,	7 1-2 do. incorporated oil,
10 do. blue-black,	7 1-2 do. linseed-oil.
Weight 592 lbs.	

This excellent bright-green paint does not exceed three-pence farthing per pound, ready to lay on; and the inventor challenges any color-man or painter to produce a green, equal to it, for eighteen-pence per pound.

After painting, the color left in the pot may be covered with water, to prevent it from skinning; and the brushes, as usual, should be cleaned with a painter's knife, and be kept under water.

A brighter green may be formed by omitting the blue-black; and

A lighter green may be made by the addition of ten pounds of ground white-lead.

A variety of greens may be obtained by varying the proportions of the blue and yellow.

Observe, that the wet blue must be ground with the incorporated oil, preparatory to its being mixed with the mass.

Stone Color.

Lime-water, 4 galls.	Prepared fish-oil, 2 gallons.
Whiting, 112 lbs.	Incorporated oil, 3 1-2 do.
White-lead, ground, 28 lbs.	Linseed-oil, 3 1-2 do.
Road-dust, 56 lbs.	
Weight 293 lbs.	

The above stone color, fit for use, is not two-pence per pound.

Brown Red.

Lime-water, 8 galls.	Four gallons of fish-oil,
Spanish brown, 112 lbs.	Four do. incorporated oil,
Road-dust, 224 lbs.	Four do. linseed-oil.
Weight 501 lbs.	

This most excellent paint is scarcely three half-pence per pound. The Spanish brown must be in powder.

A good chocolate color is made by the addition of blue-black in powder, or lamp-black, till the color is to your mind; and

A light brown may be formed by adding ground white-lead.

Note.—By ground-lead is meant white-lead ground in oil.

Yellow is prepared with yellow-ochre in powder, in the same proportion as the Spanish brown.

Black is also prepared in the same proportion, using lamp-black, or blue-black.

To Whiten Linseed Oil.

Take any quantity of linseed-oil, and, to every gallon, add two ounces of litharge; shake it up every day for fourteen days; then let it settle a day or two; pour off the clear into shallow pans, such as dripping pans, for instance, first putting half a pint of spirit of turpentine to each gallon: place it in the sun, and, in three days, it will be as white as nut-oil.

This oil, before it is bleached, and without the spirit of turpentine, is far superior to the best boiled oil; there is no waste, and it has no offensive smell.

Note.—From experiments made, it appears that fine sand will not answer the purposes of road-dust in painting; and that this dry dust, collected in high-ways much travelled by horses and carriages, and afterwards finely sifted, is the article recommended, as possessing the properties required.

I here subjoin a receipt for a constant white, for the inside painting of houses; which paint, though not divested of smell in the operation, will become dry in four hours, and all smell be gone in that time.

A Constant White Paint.

To one gallon of spirit of turpentine, add two pounds of frankincense; let it simmer over a clear fire until dissolved; strain it, and bottle it for use. To one gallon of my bleached linseed-oil, add one quart of the above, shake them well together, and bottle them also. Let any quantity of white-lead be ground with spirit of turpentine very fine, then add a sufficient portion of the last mixture to it, until you find it fit for laying on. If in working, it grows thick, it must be thinned with spirit of turpentine. It is a flat or dead white.

☞ Certificates of the superior excellence of the above paints accompany the original paper.

[*Transactions of the Society for the Encouragement of Arts, &c.*

ON THE PREPARATION OF CATGUT, FOR VARIOUS USES.

[Perhaps every one does not know that the very useful article known and sold by the name of *Catgut*, is generally manufactured from the intestines of Sheep. Some kinds are made from the intestines of horses and other animals, but those of sheep are mostly used for the common kinds.]

Catgut for Rackets or Battledoors.

The intestines of sheep, after they have been steeped in alkaline lye, are cut slantwise, if they are in short lengths, and sewed together; carefully placing the slants in a direction contrary to each other, that the seams may not render the cords of an unequal size. This being done, and the intestines formed into one piece, it must be soaked in ox-blood, to give it the proper color, and then be stretched on a proper frame; after which, one, two, three, or four of the intestines, according to the required size of the cord, are fixed to a piece of tape, and the other ends are turned twice round a peg. This done, the workman takes the tape, applies it to a hook on a spindle, and gives a few turns of the handle. As the cord shortens by twisting, it must be well stretched; and when this is effected, the workman squeezes the cord between his finger and thumb throughout its whole length, to remove all its humidity, and produce an equal thickness in every part of it. One or two hours after, he twists it again, and rubs it with a horse-hair cord, wetted.

Thinner cords are made of only one intestine.

Catgut for Whip-handles.

Sheep's intestines, prepared with potash, are used for this purpose. The workman cuts them slantwise, and sews them together, observing always to keep them of an equal size. They are then stretched, and twisted at each end: it is very rare that this sort of cord is made of two intestines. They are then bleached, by the fumes of burning sulphur, once or twice; and sometimes colored; as they readily receive any dye. Common ink is used for a black color; and red ink for a rose color, which is sometimes rendered lighter by a little sulphuric acid. A green color is given by a composition sold for that purpose, by color-men, to the manufacturers of catgut.

Catgut for Hatters' Bows.

These are made of sheep's intestines, of the longest and largest kind, after being prepared with potash, by twisting together from four to twelve of them, according to the size required. They are usually made from 15 to 25 feet long. During the twisting, the cord is placed in a long box, from 18 to 20 inches in breadth, and a few inches high, in order to keep it clean, and prevent it from trailing on the ground. The box is called the *refresher*.

This kind of cord must be void of seams and knots; to accomplish which, the workman attaches the intestines to a piece of tape, hangs them on a peg, and draws the whole of them straight, to fit their other ends to another peg: in doing which, if he finds the intestines too short, he makes a hole in their ends, and threads into them short pieces, till the whole is long enough to reach the other peg, placed at a given distance from the first. These ends are then affixed to a piece of tape, and fastened to the peg. This done, he applies them to the twisting-wheel, rubbing the cord well between his finger and thumb throughout its whole length, at every turn of the wheel, in order to make it of an equal size. When about half-dry, they are exposed twice to the fumes of sulphur; after each time, the cord must be well stretched and moistened with plenty of the solution of potash, at the same rubbing with the hair-rubber. It is then left to dry, and afterward cut, and coiled up for sale.

Catgut for Clock-makers.

This kind must be very fine; and of course requires the smallest intestines, well prepared with potash. Sometimes they are made by cutting, with a particular kind of knife, the intestine into two strips. The knife, which is fixed to a table, has two edges, in opposite directions; and above them, a ball of lead, which is introduced into one end of the intestine; and by drawing the latter continually over the ball, the projecting blades cut it into two strips, which the workman holds, one in each hand; drawing them regularly, till it be cut quite through.

Watch and Clock-makers also use catgut of various sizes, consisting of more than one intestine, and made like the musical-instrument cords; which we shall next describe.

[To be concluded in our next.]

HARD AND SOFT SOLDERS FOR COPPER AND BRASS.

Solders for Copper.—There are two kinds of these solders; the one for *hard*, the other for *soft* soldering. The *hard solder* is made with eight parts of copper and one of zinc, the copper being first melted in a crucible, during which operation, the zinc is also heated. When the copper is melted, the zinc is thrown hot into it: the crucible is then covered, and the whole well shaken together. In about two minutes, the metal is poured out, through the twigs of a birch-broom placed over a proper vessel filled with water. The metal is, by this process, divided into small grains; after which, it is well washed, and kept for use. This solder is very fusible, and at the same time malleable.

An alloy, composed of three parts of copper and one of zinc, also makes a good solder.

In general, the solder is harder or softer, in proportion to the quantity of copper employed. The more copper is used, the harder is the solder, but less fusible. The highest degree of hardness is produced when ten parts of copper are united with one part zinc; but this is also the least fusible. Solders of different degrees of fusibility are often required, particularly in cases where several pieces are to be soldered one to the other. The *least fusible* solder is employed in the first place; and the other degrees in proportion to the number of pieces to be soldered. By adopting this precaution, the first soldered pieces are not affected by the degree of heat necessary for joining the other pieces.

Soft solder is a mixture of two parts of tin and one of lead, poured into ingot-moulds. It is used with a hot iron, as the plumbers and tinmen use it.

SOLDERS FOR BRASS.—Two kinds of these solders are also employed; the *hard* and the *soft*. The hard is made in the same manner as that for copper, but of brass and zinc; and the proportions may be varied from 16 parts of brass and one of zinc, to two parts of brass and one of zinc.

The *soft solder* is made of six parts of brass, one of zinc, and one of tin. The brass is first melted; the tin is then added: and, lastly, the zinc; which last metal should be first well heated. The whole is then agitated, and divided into grains, by the process above explained.

It is always necessary, before soldering, to clean the surfaces well, which are to be soldered, either with a file, a scraper, &c.

[*Dictionnaire Technologique.*

To make a Silvering Powder, to put a coat of Silver on Copper, when worn off.

Take of the dry muriate of silver, such as is procured when you clear nitric acid from the muriatic acid; or make it by dissolving any small piece of common silver coin, such as a quarter dollar, in nitric acid, and then adding to the solution common salt. By so doing, the common salt is decomposed, the acid thereof unites to the silver, and the alkali thereof to the nitric acid. Of this muriate of silver dried in the shade, take by measure one part; of cream of tartar, three parts; of common salt, three parts; of common whiting, three parts. Mix all together, and when you want to renew the silver on copper, in places where it is worn off, rub a little of this mixture by means of a moist rag on the abraded place; the silver will take the place of the copper; and it can be washed and cleaned. But it will not bear much rubbing or scrubbing. It is, however, a very convenient and useful receipt, particularly for articles of plated ware, which can have the silvering renewed at a very trifling expense.

The rationale of this process is very complicated: the supertartrite of potash, or the cream of tartar, and the muriate of silver decompose each other: a tartrite of lime is formed; the excess of acid is neutralized by the whiting forming a tartrite of lime, which with the common salt, serves to clean the surface of the copper: the tartrite of silver at the moment of its formation is decomposed by the copper or brass, and the silver is precipitated in a metallic state on the copper: it will admit of being polished with the palm of the hand, but is too thin to bear burnishing.

Another Method.—Wash well the surface of the copper or brass, with water acidulated with muriatic acid, and having a little common salt and cream of tartar dissolved in it. Then wash it with pure water, and rub the surface bright with leather.

Dissolve some silver in aquafortis; dilute it when dissolved with an equal quantity of pure water: add to it a small plate or rod of copper, which will precipitate the silver in a metallic state and in a fine powder. Pour off the solution of copper: wash the precipitate with water. Take of the washed precipitate 20 grains; grind it with two drachms of cream tartar, two drachms of common salt, and half a drachm of alum. With a clean rag, rub the surface of the polished copper or brass with this moistened mixture, and when the white color appears, wash it, and polish it with the fleshy part of the thumb.

This process is analogous to the method of whitening brass-wire to make brass pins; the wire is boiled in a solution of tartar with a little common salt, in which solution you put filings of pure tin.

All these methods of silvering may be protected by varnish of mastic or sandarach.

Another Way.—Clean the surface of your copper or brass with crocus martis, tin putty, or finely sifted rotten-stone. Heat the metal quickly, and while hot, cover the surface with silver-leaf; press it hard to the surface of the copper or brass, and when cold enough, burnish it. You may repeat this.

To Plate Copper with Silver.

Upon one side of a flat polished ingot of copper, sift thinly some finely powdered glass of borax through fine muslin. Place on it a plate of silver of nearly equal surface; bind it down tight with iron wire: hammer it so that the surfaces shall be in contact. Expose it to a low red heat which will melt the borax. Then pass the plated ingot while warm, through a roller. It will now be joined to the copper, and can be rolled out with it. Good plating should have a twentieth of its weight of silver on it.

[*Cooper's Chemical Amusement.*

ARTIFICIAL SLATES.

A species of artificial slates have been used in Russia, which are said to be very valuable, as being lighter than common slates, impervious to water, incombustible, and made of any required form or size. They have been analyzed by M. Giorgi, who finds them to consist of bolar earth, chalk, or carbonate of lime, strong glue, paper pulp, and linseed-oil. The earthy materials are to be pounded and sifted, and the glue dissolved in water; the paper is the common paper pulp, which, after being steeped in water, has been pressed, or it may be bookbinders' or stationers' shavings boiled in water and pressed. The linseed-oil is to be raw. The paper pulp is to be mixed in a mortar, with the dissolving glue, the earthy materials then added and beaten up, and the oil added during the beating, as fast as it is absorbed. The mixture is then spread with a trowel on a plank, on which a sheet of paper has been laid, and surrounded by a ledge, to determine the thickness of the layer, and is then turned out on a plank strewed with sand, to dry. When dry, they are passed through a rolling-mill, then pressed, and finally finished by a coat of drying oil.

The following are some of the various proportions recommended:—

2 parts paper pulp, 1 glue, 1 chalk, 2 bole earth, 1 linseed-oil; this forms a thin, hard, and very smooth sheet.

3 parts paper pulp, 4 glue, 4 white bole earth, and 4 chalk; produce an uniform sheet, as hard as iron.

1 part paper pulp, 1 glue, 3 white bole earth, 1 linseed-oil; a beautiful elastic sheet.

When these plates or slates were steeped in water for four months, they were found not to alter at all in weight; and when exposed to a violent heat for five minutes, they were hardly altered in form, and were converted into black and very hard plates.

[*Lond. Mech. Mag.*

AGRICULTURE.

CIDER.

"Any body can make cider," said a man, who calls himself a farmer, to us one day. That is true, if by cider is meant the juice that can be squeezed out of any apples, in any manner. Any body can make cider, as the person alluded to makes it. We will give you the process in full. Build your Press and Mill, wholly exposed on every side, except a shed at the top, merely to keep off the direct rays of the sun, and rain, or, if wholly covered, be sure and convert it into a hen-roost, and lying-in hospital, for sick sheep and cows, excepting during the season when you are actually at work there. Pick up every thing that has fallen from the trees, since last May,—green, rotten, withered, and worm-eaten; let nothing be lost. The hogs *wont* eat them—but they can be ground up, and made into cider! After you have done this, clear out the tenants of the cider-house, brush off a few of the cobwebs,—splash over the press, &c. a few pailsfull of water, sufficient to loosen the dirt and let it trickle into the crevices, and there remain. "Every little makes a mickle" in cider, as well as in every thing else. Then shovel in your materials, whip up Dobbin, grind, press and bung it up into musty barrels, that have never had a refreshing drop of water, inside, since they were made. It may be all done in half a day,—and that's cider,—if the *rotten* juice of *rotten* apples may be called cider. We were once cheated with a barrel of such stuff;

and we kept it on hand to treat the vender with; but he never troubled our liberality much on that score. It was a "villainous compound," possessing various and curious properties. It was bitter, emetic and cathartic withal; and would have probably made a good substitute for Chambers' medicine. We are happy, however, in the belief, that there are but few, hereabouts, who manage their cider as the good man who thought any body and every body could make it. It is an art which every body does not understand. It requires a vast deal of care, caution and experience. It is an art which, besides requiring skill in the manipulation, involves many important laws of Chemical Philosophy, which ought to be known by those who would understand the whole matter.

We copy the following, by J. Buel, Esq. from the *New-England Farmer*. Those who have never seen it, will acquire much information from it—those who have, will be reminded of some valuable facts.

We would first remark, however, that one very important thing is too frequently disregarded, even by the best manufacturers of cider, viz: proper attention to the Cask. We believe that casks, which have once become musty, can hardly be purified by any soaking, scalding or rinsing. The best way to manage them would be to take out one end, and scrape and charr, if it can be conveniently done, the whole inside. We have known this done with manifest advantage.

ON THE MANUFACTURE OF CIDER.

The quality of Cider depends on several contingencies; among which I will enumerate—

1. The species of fruit employed.
2. Soil and aspect of the orchard.
3. Condition of the fruit when ground.
4. The process of grinding, &c.
5. Management of the vinous fermentation; and
6. The precautions which are taken to prevent the acetous fermentation.

I intend to offer remarks upon each of these divisions. And,

1. *The Fruit.* Apples differ not only in their flavor, color, and time of ripening, but in the proportions of their constituent parts. The most material of these constituent parts are acid, sugar, astringency, vegetable extract and water. The properties of good dessert and cider apples, are seldom united, though they are not incompatible with each other. Table apples are esteemed on account of their bland and aromatic flavor, crisp and juicy pulp, and for the property of keeping long, or ripening late. The characteristics of a good cider apple are, a red skin; yellow and often tough and

fibrous pulp, astringency, dryness, and ripeness at the cider-making season. "When the rind and pulp are green, the cider will always be thin, weak, and colorless; and when these are deeply tinged with yellow, it will, however manufactured, or in whatever soil it may have grown, almost always possess color, with either strength or richness."—(*Knight.*) The apple, like the grape, must attain a state of perfection, or perfect maturity, before its juices develope all their excellence; and as many of our best eating apples do not acquire this maturity until winter or spring, this affords a satisfactory reason why winter fruit is seldom or never good cider fruit. In a dry apple, the essential elements of cider are generally more concentrated, or are accompanied with a less proportion of water, than in a juicy one; of course the liquor of the former is stronger than that of the latter. Of our best cider apples, ten or twelve bushels of fruit are required for a barrel of juice; while of the ordinary juicy kinds, eight bushels generally suffice.

The only artificial criterion employed to ascertain the quality of an apple for cider, is the specific gravity of its *must*, or unfermented juice; or, its weight, compared with that of water. This, says Knight, indicates, with very considerable accuracy, the strength of the future cider. Its weight, and consequent value, is supposed to be increased in the ratio of the increase of the saccharine matter. In making wine of domestic fruit, say of the currant or gooseberry, for example, we use sugar till the unfermented liquor attains a certain specific gravity; or until the saccharine matter of the fruit, and that artificially supplied, bears a certain proportion to the water. This insures to the liquor strength, or body, as the sugar is converted into spirit by the fermentive process.

Very little has been done to acquire a correct knowledge of the relative value of our native apples for cider. Coxe has described and figured one hundred varieties of this fruit, of which about thirty are recommended for cider. Of these thirty kinds, I selected the following for my nursery, as not only being best for cider, but as generally combining the desired qualities of table fruit also; viz: the Haglœ and Virginia Crabs; Harrison, Campfield, Stire, yellow Newton, and Newark Pippins; Priestley, Graniwinkle, Winesap, Carthouse and Cooper's Russetting. We have, undoubtedly, among our indigenous fruit, many kinds of excellent cider apples hitherto unnoticed; and it is very desirable that their properties should be tested, and the result of the investigation made public.

In Great Britain, more attention has been given to this subject. The specific gravity of the juice of old cider varieties, has not only been ascertained by scientific men, and their relative value fixed, but new varieties have been obtained by artificial crossing, surpassing, in richness of juice, any before cultivated. Loudon has given a table of 38 cider apples, in his Encyclopedia of Agriculture. Of these, the following are only known to be in our nurseries, viz: *Redstreak, Wine, Stire, Haglœ Crab; *Maiden's Blush, *Count Pendu, *Downton and Grange Pippins; Foxley, Siberian Harvey, yellow Siberian and *Minshul's Crab. Those with an asterisk are also excellent dessert apples. The seven last named, five of which are new varieties by Knight, I have obtained from Europe, and propagated in my nursery. None of the old English cider varieties exceed, in the specific gravity of their juice, 1.079, water being 1,000. Six of Knight's new varieties are over 1,079, and one is 1,091. Knight is of opinion, that with proper varieties of fruit, the defects of almost every soil and aspect might be corrected, and that fine ciders might be made in any part of England. In France and Italy, small berried grapes of a harsh flavor, are preferred for wine making, (*Loudon*,) and it will be found that the cider apples recommended by Loudon and Coxe are under a medium size, and several of them austere and harsh.

2. *Soil and Aspect.* The apple, like the grape, is known to take much of its character from the soil on which it grows. The best cider orchards in England are on a stratum of red marle which stretches across the island. The soil of Herefordshire, highly reputed for its ciders, is an argillaceous, or clay marle; and Knight says, the strongest and most highly flavored cider which has been obtained from the apple, was produced from fruit growing on a shallow loam, on limestone basis. All the writers upon the subject seem to agree, that calcareous earth should form a component part of the soil of a cider orchard. It appears to have the effect of mitigating the harshness of rough and austere fruits, and of neutralizing the juices of those which are too acid. Coxe says, the soil which grows good wheat and clover, is best for a cider orchard. My own observation would induce me also to prefer a dry and somewhat loose soil, in which the roots, destined to furnish food for the tree and fruit, may penetrate freely, and range extensively, in search of nutriment. The juices of plants and fruits are always more concentrated when growing on a dry, than on a wet soil. Mint, or other aromatic herbs, is much stronger in the specific virtues of the plant, when grown on a dry soil, and greater in volume, when grown on a wet one. The maple yields the sweetest sap, though less in quantity, on a dry soil. Apples may grow large on a moist alluvion; but the fruit will neither be so abundant, nor so rich, as on a dry soil. The thriftiest trees produce the most wood buds; those less thrifty, the most fruit buds. The best aspect for an orchard, is one somewhat elevated or undulating, protected from prevailing cold winds, and facing the south, south-east or east. Ciders brought to the Albany market, from the hilly towns of Columbia and Saratoga, on the transition formation, possess the most spirit, best flavor, and resist longest the acetous fermentation.

3. *Condition of the Fruit.* Fruit should be used when it has attained its perfect state of maturity, and before it begins to decay, because it then yields the greatest proportion of saccharine matter. The most certain indication of ripeness, says Crocker, is the fragrance of the smell and the spontaneous dropping from the trees. Each kind of the apple should be manufactured separately, or those kinds only mixed which ripen at one time, and which experience shall show, are not prejudicial to each other. Who would ever

think of making a superior wine from an indiscriminate mixture of a dozen kinds of grapes? And yet we seem to expect good cider from an indiscriminate mixture of a dozen kinds of apples. It may be urged, that the evil is irremediable, because our orchards, containing these dozen varieties, have been furnished to our hands; and that neither the quantity nor quality of any one kind of fruit renders it an object to manufacture it separately. Is it not time, then, to set about correcting the evil, by selecting only the best kinds for new plantations? A farmer should make cider to sell, and it is material to him whether he obtains two or ten dollars the barrel. Our manufactories, our towns and cities, and the demand for exportation, will always ensure a market and price for good ciders. Mr. Wynkoop, of Lancaster, Pa., has 400 trees, of the Virginia crab, on less than five acres of ground; and when his orchard was twenty-two years old, he stated to the President of the Pennsylvania Agricultural Society, that it produced him every other year forty hogsheads of cider, of 112 gallons each; which he sold at 2*s.* 6*d.* the gallon, or about $1500 in the gross. And yet this apple is not a first-rate cider apple. It is deficient in sugar, but abounds in astringency, rather a keeping than an enriching quality. What farmer can apply his land to better profit? Wines differ as much in their quality and price as ciders. Fruit, soil and skill make the difference in both; and upon the proper selection and expense of those, depend the quality of the liquor, and the consequent profits of the cultivator. Upon this branch of the subject I will only add, that the apples should ripen upon the tree, be gathered when dry, in a cleanly manner, spread in an airy, convenient situation, if practicable, for a time, to induce an evaporation of aqueous matter, which will increase the strength and flavor of the liquor, and be separated from rotten fruit and every kind of filth, before they are ground.

4. *Grinding, &c.* The apples should be reduced, by the mill, as nearly as possible to an uniform mass, in which the rinds and seeds are scarcely discoverable; and the pomace should be exposed to the air from twelve to twenty-four hours, according to the temperature, before it is pressed. The juices of the rind of fruit, as may be instanced in the orange and lemon, are highly concentrated; and those of the rind of the apple have a material influence, with the aromatic bitter of the seeds, upon the flavor and strength of the liquor.

On partially macerating the pulp of an apple, and subjecting it to immediate pressure, the juice which escapes will be found to be thin, nearly colorless, and devoid of flavor. If the maceration is perfect, so as to crush the seeds and break down the rind, the strength, color and flavor of the *must* will be improved: and if the macerated pulp is exposed for a few hours to the atmosphere, and then subjected to pressure, these desirable properties in the liquor will be found to be still further augmented. "By the chemical action of the roller," says Knight, "the various fluids which occupy the different vessels and cells of the fruit, are mingled with the juices of the rinds and seeds, and with the macerated substance of the vessels and cells themselves. In such a mixture it seems probable that new elective attractions will be exerted, and compounds formed, which did not exist previously to the fruit being placed under the roller; and hence the most correct analysis of the expressed juices will convey but a very imperfect degree of knowledge of the component parts of the different fluids, as they existed in their state of separation, within the fruit." "I have often extracted," he continues, "by means of a small hand press, the juice of a single apple, without having previously bruised it to pieces; and I have always found the juice thus obtained, to be pale and thin, and extremely defective in richness, though the apple possessed great merit as a cider fruit. I have then returned the expressed juice to the pulp, which I have exposed, during a few hours, to the air and light; and the juice has then become deeply tinged and very rich. In the former state it apparently contained but a very small portion of sugar; in the latter it certainly contained a great quantity; much of which I believe to have been generated subsequently to the juice having been subjected to the action of the press; though it may be difficult to explain satisfactorily the means by which it could have been produced." Knight ascertained, by a subsequent experiment, that by exposing the reduced pulp to the operation of the atmosphere, for a few hours, the specific gravity of the juice increased from 1,064 to 1,073; and from the experiment being repeated in a closed vessel with atmospheric air, he ascertained the accession to be oxygen, which, according to Lavoisier, constitutes 64 per cent. of sugar. For fine cider, he recommends, that the fruit be ground and pressed imperfectly, and that the pulp be then exposed twenty-four hours to the air, being spread, and once or twice turned, to facilitate the absorption of oxygen; that it be then ground again, and the expressed juice be added to it before repressing. In straining the *must*, too much care cannot be taken to exclude the pulp, as the presence is apt to render the fermentation too violent, and drive it into the acetous stage. A hair sieve, filled partly with straw, answers the purpose well. The mill which most effectually reduces the pulp, is to be preferred. It has been remarked with much force, that cider mills should, like school houses, be limited to one in a district. In this way it would be an object with the owner to render his implements complete, and to conduct the process with care and skill. And as the value of the cider depends so much upon its being well made, it is believed the owners of fruit, as well as the purchasers of the cider, would be benefitted by such an arrangement.

[To be concluded in our next.]

INFLUENCE OF THE MOON.

That the different phases of the moon have some connexion with changes in the atmosphere, is an opinion so universal and popular, as to be, on that account alone, entitled to attention. No observation is more general; and on no occasion, perhaps, is the almanack so frequently consulted, as in forming conjectures upon the state of the weather. The common remark, however, goes no further than that changes from wet to dry, and from dry to wet, generally happen at the changes of the moon. When to this result of universal experience we add the philosophical reasons for the existence of tides in the aerial ocean, we cannot doubt that such a connexion exists. The subject, however, is involved in much obscurity. Mr. Howard is the only one who has treated it with the consideration which it deserves. In his book may be found much information upon it, the result of laborious investigation. It would be foreign to my purpose to enter at large upon this interesting ground, but the previous investigation suggests one particular view of it, which it may be useful shortly to state.

The action of the moon upon the aerial columns over which it passes, may be regarded as diminishing the force of gravity. This action must be greater in proportion as the moon approaches the earth; in proportion as it coincides with the analogous action of the sun; and in proportion as its passage over the meridian comes near to the perpendicular direction. The result of this diminution of gravity must be a general decrease of density; and its effect upon the lateral currents, an acceleration of the incoming, and a decrease of the outgoing streams. The loss of weight will thus be compensated, and the excess of elasticity hence derived, will lengthen the column. The final adjustment will, therefore, be assimilated to that which arises from an equal expansion by heat. Now the effect of the atmospheric tide has hitherto been sought for, and measured upon the surface of the earth, at the base of the column; and much conjecture and disappointment have ensued from not finding the effect as great, or as regular, as had been anticipated. But, if this view of the subject be correct, the total weight of the perpendicular column would not be affected so much as that of its horizontal sections; and the amount of the lunar influence should be sought in the variations of the differences of density between some high elevation and the level of the sea. The mean of a series of experiments carefully conducted with this view, when the moon is upon the meridian and at the horizon, would possibly exhibit the amount of the daily tides; their weekly increase and diminution; the influence of the moon's apogee and perigee; and that of its north and south declination. It has, however, I think, been proved that the influence is still felt at the surface of the earth; and the barometer, upon an average, stands lower at new and full moon, than at the quarters. This also would naturally be expected, when it is considered that the attraction of the moon is an action upon the power of gravity, and acts instantaneously in the perpendicular direction; while the compensating effects upon the lateral currents is gradual.

Is it not possible that some of the remaining discrepencies of barometrical mensurations may be traced to this influence?

[*Daniell's Meteorological Essays and Observations.*

PRESERVATION OF APPLES.

Some kinds of Apples are so very mellow and juicy naturally, that it is very difficult to keep them sound any length of time.

The cause of their rotting, is owing to the spontaneous decomposition of their juices. This is accelerated by warmth or heat,—indeed, heat and moisture, are the two principal agents in the decomposition of all substances. Hence dry apples, or those that are naturally not very juicy, keep sound the longest. Darwin recommends the keeping of fruit in ice-houses—by freezing them down, and when wanted for use, thawed gradually by immersion in cold water. We should think this method might be used with success, with some of the more delicate and tender pears which are very liable to decay. Some recommend laying them on shelves in a dry airy place; but it would take a very large place to preserve any considerable quantity of fruit in this way. Others, recommend packing them away in dry straw; and others, with much more success, deposite them in bins or barrels, of oats, wheat or other grain. Others, again, put them into very dry sand. We should think, however, that saw-dust or pulverized charcoal would be preferable. The fruit ought to be picked carefully from the tree, and not shook with violence enough to bruise and break the texture. It should be wiped as dry as possible, and if saw-dust is used, it should be kiln-dried and the fruit should be laid carefully into it in such a manner that each apple should be completely surrounded or enveloped in it, and care should also be taken, that too much should not be put into one vessel, lest the pressure injure those at the bottom. Perhaps charcoal, being an antiseptic, would do better. We have known Grapes preserved a long time, however, in the dried saw-dust.

☞ As it is now the season for digging and securing Potatoes, we would refer our readers to an article on the mode of preserving them, in our first number.

MISCELLANEOUS.

CATTLE SCENTING RAIN.

Liable to long and parching droughts, the author of "*Letters from Buenos Ayres, Chili,*" &c., notices the well-known instinct of cattle in scenting water at a wonderful distance, where it was displayed on the approach of a rain, in a similar manner as if a river or spring had been found:

"The negroes were sent in different directions to see how far the scorched grass extended, and were at a considerable distance when the Father Provincial cried out, "Look at the oxen, they smell water;" we all eagerly turned to the poor panting animals, and saw them stretch out their necks and raise their heads towards the west, and snuff the air in a manner as if they would be certain of obtaining drink could they but raise themselves in the air. At that moment not a cloud nor a single breath of air was to be seen or felt; but in a few moments, the cattle began to move about as if mad, or possessed by some invisible spirit, snuffing the air with most violent eagerness, and gathering closer and closer to each other; and before we could form any rational conjecture as to what could occasion their simultaneous motion, the most tremendous storm came on of thunder, and lighting, and rain, I ever witnessed in my life. The rain fell in perpendicular streams as if all the fountains of heaven were suddenly broke loose; so that in the space of very few moments, torrents of water rolled around us, and the cattle easily drank their fill at the spot on which they stood."

On a Method of Cleaning Silk, Woollen, and Cotton Goods.

BY MRS. ANNE MORRIS.

Take raw potatoes, in the state they are taken out of the earth; wash them well; then rub them on a grater, over a vessel of clean water, to a fine pulp; pass the liquid through a coarse sieve, into another tub of clear water; let the mixture stand, till the fine white particles of the potatoes (the *fæcula*) are precipitated: then pour the *mucilaginous potato-liquor* from the fæcula, and preserve this liquor for use.

The article to be cleaned, should be laid upon a linen cloth, on a table; and, having provided a clean sponge, dip it into the potato-liquor, and apply the sponge thus wet, upon the article to be cleaned, and rub it well upon it, repeatedly, with fresh portions of the potato-liquor, till the dirt is perfectly loosened: then wash the article in clean water several times, to remove the loose dirt: it may afterwards be smoothed and dried.

Two middle-sized potatoes will be sufficient for a pint of water.

The white fæcula, which separates in making the mucilaginous liquor, will answer the purpose of *tapioca;* will make a useful nourishing food, with soup or milk; or serve to make starch and hair-powder.

The coarse pulp, which does not pass the sieve, is of great use in cleaning worsted or woollen curtains, tapestry, carpets, or other coarse goods.

The mucilaginous liquor of the potatoes, will clean all sorts of silk, cotton, or woollen goods, without hurting the texture of the articles, or spoiling their colors.

It is also useful in cleaning oil-paintings, or furniture that is soiled.

Dirty painted wainscots may be cleaned, by wetting a sponge in the liquor, then dipping it into a little fine clean sand, and afterwards rubbing the wainscot therewith.

[*Transactions of the Society for the Encouragement of Arts, &c.*

RECIPE FOR PICKLING BEEF,

which from experience we can recommend.

Soak the beef 24 hours in fresh water; 1-2 lb. Saltpetre; 1 lb. Brown Sugar; 1 qt. W. I. Molasses; 8 galls. water; Salt enough to make the brine bear an egg lightly; Skim the brine.

[*Am. Farmer.*

For the Farmers' and Mechanics' Journal.

REMEDY FOR RHEUMATISM, &c.

Mr. Editor,—I have, for many years, been in the constant practice of applying a plaster of common Shoemaker's Wax, for the Sciatica, or Hip Gout. Rheumatic lameness, &c., and in all strains, whether old or new, I have never in one instance failed of finding relief, and effecting a cure in a much shorter time than could reasonably be expected. A neighbor of mine, from Nova Scotia, I found had adopted the same plan, and with equal success.

Rumford.

NOTICES.

A NEW VARIETY OF BARN-DOOR FOWL;

THE SINGING COCK.

It has been our good luck, (says the Editor of the *American Farmer*,) through the agency of naval officers, our consuls abroad, and merchants and other liberal citizens at home, to have been instrumental in introducing a great variety of vegetables, grains, fruits, fowls and animals, which had never before been reared in America. Another is added to the list of dung-hill fowls by the kind attention of our consul at Rio, W. H. D. C. Wright, Esq., who has been for fourteen months discharging the duties of Chargé d'Affairs at that place, during a somewhat critical state of our relation with that government. The fowl which has been sent us by Mr. Wright, may be regarded, we suppose, rather as a *curiosity*, than as an useful addition to our stock of poultry. It is called in Brazils, the "Canta Galla," or singing-cock, from its crow being spun out, as in the new style of singing, until you begin to fear the fine lady will spin out all the breath she has in her body, leaving not enough to recover upon. Mr. Rebello, the liberal distributer of the "Rebello Premiums," at our Cattle Shows, was the first to mention to us the existence of the "Canta Galla."

"*Rio de Janeiro, July 14th*, 1828.

"Dear Sir,—I could not obtain any of the musical cocks here; I sent to a friend at St. Paul's and he sent only cocks. I send two;

the black is a fine crower. I have sent for others, male and female, which I will send you when I receive them. The two now sent, Capt. Williams of the Margaretta, will deliver.

"W. H. D. C. Wright."

AN IMPORTED COW.

The ship Alexander has just brought for Col. Powell, of Philadelphia, an extraordinary improved Durham short-horned Cow, which produced in England, as appears by certificate, *thirty quarts* of milk per day in June last, and affords from the milk of seven days, 19 1-2 lbs. averdupois, of Butter, and had continued to give milk until the birth of her calf. Col. Powell has done more for the improvement of Neat Stock in the United States, than any man living. If we had a few more such men in different parts of the Union, we should soon rival Old England in the good qualities of our cattle.

LITHOGRAPHY.

There are now, two establishments of this beautiful art in Boston, viz: that of Pendleton's, and the Sennefelder Press, owned by Messrs. Annin & Smith, the well known Engravers. Specimens from both Presses, may be found among our Plates. Three years ago, and it would have been almost an impossibility, to get a Plate executed in Lithography, this side of the Atlantic. Much credit is due the proprietors of these Presses, for their enterprise, in introducing such an able handmaid to the Arts among us.

The ease and facility with which plates, or drawings, are struck off, illustrating ideas in the different departments of knowledge, which cannot be conveyed by words, renders this one of the most useful of the Arts; for, by multiplying the avenues to Science, and making the steps less difficult, we increase the number of her votaries, and diffuse more generally and equally, the good resulting from a knowledge of her principles. To the Farmer and the Naturalist, this Art is particularly useful, as plants, animals, &c. can be represented nearly as well, and vastly more cheap, than by engraving.—We hope to give you a specimen of the Art, as it regards animals, in some of our future numbers. A fine specimen from the Sennefelder Press, designed by Swett, may be seen at our Publishers.

THE

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MECHANICS.

PARKER'S BRICK PRESS.

PLATE X,—is a representation of PARKER'S BRICK PRESS, noticed in our eighth number. As bricks are more and more used as materials for building in this country, an increased attention to the art of making them is excited. Much has already been done in this art, but much still remains to be done. At first, bricks were faced by a slow and tedious operation. The idea of pressing them then occurred, and the ingenuity of many individuals, was, and still continues to be at work, in improving the modes or machinery for doing this. The pressing of bricks, is, perhaps one of the greatest improvements that has been made lately in the art. They are much more strong, durable, compact, and handsome, than those made in the old way; and when the machinery for moulding and pressing them, comes into more general use, they will probably be as cheap and in greater demand than the common. It is now thought that pressed bricks are not needed, except for the fronts of buildings. The extra expense of them, is an objection to using them in all situations; but that does not prove that they are not as useful in other parts of a building as well as in those which are exposed to view. Wherever strength is wanted, (and in all buildings of any magnitude it is of the first importance,) pressed bricks are preferable, because they contain more clay in the same space, and are consequently more dense, or solid and strong.

The improvement represented in the Plate, consists in a Bench A. A. of strong hard-wood plank; a Mould for the brick B. made of cast-iron and cast in one or two pieces; a Piston, of iron, C. which is attached to the Rack E. which is moved by the Pinion Lever F. G.; a Knuckle-joint, or perpetual lever H. which is put in motion by the Lever I.; a Slide L. which is elevated or depressed by the Lever M. In order to press a brick, the piston is drawn back, as is represented in Fig. 1. The brick is put into the space at S. The piston is brought forward by bringing down the pinion lever G.—this permits the end of the perpetual lever, which before rested on the end of the rack, to fall into the socket at K. The foot is then placed upon the lever I. which, together with the power applied to G. gives an immense pressure. When the foot is removed the weight of the Ball at N. brings up the lever, which, also, by an apparatus described below, elevates the end of the knuckle-joint.

The foot is immediately placed upon the lever M. which raises the slide L. and the brick is pushed forward by bringing the lever G. still further down, and the brick is left on a boarn at P. The foot is then removed from M. The slide L. falls by its own weight —the piston is brought back by means of the pinion lever F. G. and the machine is ready for another brick.

Fig. 2, represents the apparatus for raising the knuckle-joint. N. is the Ball, at the end of the lever I. O. a flat Chain, passing over a Pulley R. which is fastened to a Wire T. which is also fastened to one end of the angular lever U. When the ball falls, it pulls the end of the lever U. towards it, and the other extremity moves the contrary way, and by striking against the arm of the perpetual lever H. raises it in such a manner, that it slides over the end of thre rack E. and *vice versa.*

The particular improvements which are claimed, aside from the general combination of powers, are,

1. The mould is made to flair, or. in other words, it is somewhat wider at the mouth, where the piston stands in the drawing, than at the place where the brick is, when the pressure is given.

2. The detatching or lifting the lever, or knuckle-joint H. and the apparatus therefor.

3. The mode of moving the brick from the mould, after being pressed.

4. A greater length. both of perpetual lever and the finger lever, which passes over the knuckle—it being extended any required length.

BRICK MAKING.

The following article is from the *Edinburgh Encyclopedia.* It contains some facts which are not generally known by brick-makers, and some historical information interesting to every one.

The art of brick making consists chiefly in the preparing and tempering of the clay, and in the burning of the bricks; and as the quality of the ware depends very much upon the right performance of these operations, we shall present our readers with a short sketch of the general process of this manufacture. The earth proper for making bricks is of a clayey loam, neither abounding too much in argillaceous matter, which causes it to shrink in the drying, nor in sand, which renders the ware heavy and brittle. As the earth, before it is wrought, is generally brittle and full of extraneous matter, it should be dug two or three years before it is used, that, by being exposed to the action of the atmosphere, it may be sufficiently mellowed and pulverised, and thus facilitate the operation of tempering. At any rate, it should always have one winter's frost; but the longer it lies exposed, and the more it is turned over and wrought with the spade, the better will be the bricks.

The tempering of the clay is performed by the treading of men or oxen, and in some places by means of a clay-mill. If the operation be performed by treading, which is the common way, the earth is thrown into shallow pits, where it is wrought and incorporated together until it is formed into a homogeneous paste, which is facilitated by adding now and then small quantities of water; but the less water that is used, the substance of the clay will be more tough and gluey, and consequently the bricks will be smoother and more solid. This operation is the most laborious part of the process; but it is of essential importance, and therefore ought to be done well; for it is to the negligence of the manufacturers in this respect, that we are to attribute the bad quality of our modern bricks, which are often light and spongy, and full of cracks. Whereas, if the clay be properly tempered, they are hard, ponderous, and durable; much stronger and better fitted for every kind of building, than those made in the common way. This will appear very evident from the following experiment of M. Gallon. Having taken a quantity of brick-earth tempered in the usual way, he let it remain exposed to the air for seven hours, and then caused it to be moistened and beaten for the space of half an hour: the next morning the operation was repeated; and in the afternoon the clay was again beaten for fifteen minutes more; making the whole additional labor an hour and a quarter. The bricks made of this earth, being dried in the air for thirteen days, and burned along with the rest without any particular precautions, were found to be not only heavier than common bricks, but also very different in strength; for on placing their centre on a sharp edge, and loading both the ends, Mr. Gallon found, that while it took a weight of 65 lb. at each end to break them, other bricks were broken by the weight of only 35 lb. The improvement in the quality of the article thus far exceeds the additional labor; and none would hesitate to give an additional price, since both the value and the comfort of our dwellings depend so much on the quality of the materials of which they are constructed.

The next part of the process is the moulding of the bricks. This is a very simple operation, and requires very little skill, unless it be to make the greatest number in the shortest time; and the day's labor of a handy workman, emoloyed from five in the morning until eight at night, is calculated at about 5000. The clay is brought to the moulder's bench in lumps somewhat larger than will fit the mould. The moulder having dipt his mould into dry sand, works the clay into it, and with a flat smooth stick strikes off the superfluous earth. The bricks are then carried to the hack, and there ranged with great regularity one above the other, a little diagonally, in order to give a free passage to the air. The hacks are usually made eight bricks high; and wide enough for two bricks to be placed edgewise across, with a passage between the heads of each brick. In fine weather, a few days are sufficient to make them dry enough to be shifted; which is done by turning them, and resetting them more open; and in six or eight days more they are ready for the fire.

Mr. Goldham observes, that bricks will have double the strength if, after one burning, they be steeped in water and burned afresh. "The excellency of bricks," says Mr. Malcolm, in his *Compendium of Modern Husbandry*, "consists chiefly in the first and last operations—in the tempering of the clay, and in the burning of the bricks; and as every man who has occasion to use bricks, whether on his own estate, or on that of his landlord, cannot but be sensible of the great value of a perfectly dry house; and as it is impossible a house can be dry if bricks are used which are insufficiently burnt, he will do well to consider whether it will be more advantageous to him in the end, to make use of the very best hard sound bricks, be the color of them what they may, and be the cost of them what they will. Such bricks are easily known by their sound, and by their striking fire with steel." For a more minute account of the various processes of brick-making, we must refer our readers to that author, from whom much of the preceding information has been extracted.

Bricks are made in various forms; but those which are made for sale, and are in common use for building, are required, by act of Parliament, to be not less than 8 1-2 inches long, 2 1-2 thick, and 4 inches wide. There are also square bricks, for pavement or facing walls; and cutting bricks, which are used for arches over doors and windows, being rubbed to a centre, and guaged to a height. Various improvements, however, have of late been made in the moulding of bricks; and as the use of this article is daily becoming more prevalent, they are now formed so as to suit almost every purpose in building. Among these improvements, the patent bricks of Mr. Cartwright deserve particular attention. These bricks are formed with a groove down the middle, a little more than half the width of the side of the brick, leaving two shoulders, each of which will be nearly equal to one half of the groove. When these bricks are laid in courses, the shoulders of the first course fit into the grooves of the second, and the shoulders of the second fall into the grooves of the first, thus forming an indented line of nearly equal divisions. The grooves, however, ought to be somewhat wider than the two adjoining shoulders, to allow for mortar, &c. The construction of these bricks is perfectly simple; but the principle will be preserved, in whatever form of indenture they will be made to lock into, or cramp each other. Brick walls, constructed upon this principle, require no bond timber; one universal bond connecting the whole building, which can neither crack nor bulge out without breaking through the bricks themselves. This invention is also particularly useful in the construction of arches; and when employed for this purpose, the shoulders of the bricks and the sides of the grooves should be radii of the circle, of which the intended arch is a segment. It is, however, recommended, that if the arch be particularly flat, or applied in situations which do not admit of end walls, to have the shoulders dovetailed, to prevent the arch from cracking across, or giving way edgewise. In forming an arch, the bricks must be coursed across the centre, and a grooved side of the bricks must face the workmen. The bricks may be either laid in mortar, or dry, and the interstices afterwards filled up by pouring in lime-putty, Paris plaster, or any other convenient material. The obvious advantages of arches constructed upon this principle, are, that the same centre, which, whatever be the breadth of the arch, may be in no case many feet wide, may be regularly shifted as the work proceeds; and as they have no lateral pressure, they require no abutments to prevent their expanding at the foot, nor any weight upon the crown to prevent their springing up. They may be laid upon a common perpendicular wall, and if used in the construction of common buildings, they will not only preclude the necessity, and save the expense of timber, but will also afford an absolute security against the possibility of fire.

A new invention in the formation of bricks, by M. Legressier, has lately been announced in the *Archives des Decouvertes et des Inventions Nouvelles*, Pendant l'annee 1809. The principle, however, is merely that of Mr. Cartwright's, followed out to a greater extent than has perhaps ever been done in this country. M. Legressier proposes, that the bricks should be formed in seven different moulds, according as they are to be placed in the middle or on the exterior of the walls; in the bottom or on the top; in the arches or in the corners; and by the proper disposition of these bricks in the building, every pressure, either longitudinally or laterally, is resisted, in proportion to the strength of the indentures by which they are locked together.

Besides the place bricks, and grey and red stocks, which are used in common buildings, there are marle facing bricks, cutting bricks, fire bricks, and floating-bricks. The first of these are of a fine yellow color, hard and well burnt; they are made in the neighborhood of London, and are used in the outside of buildings. The cutting bricks are made of the finest kind of marle; and, as we have already observed, are employed in the construction of arches over windows and doors. Fire bricks, sometimes called Windsor bricks, because an excellent kind of them are made at Hedgesley, a village near Windsor. They contain a large proportion of sand, and will stand the utmost fury of fire, and are consequently used for coating furnaces, and lining the ovens of glass-houses. Clay for fire bricks is got at most great collieries, but particularly at Stourbridge, which produces the best clay for this purpose in England. Floating bricks are a very ancient invention: they are so light as to swim in water; and Pliny tells us, that they were made at Marseilles, at Colento in Spain, and at Pitane in Asia. This invention, however, was completely lost, until M. Fabbroni published a discovery of a method to imitate the floating bricks of the ancients. According to Posidonius, these bricks were made of a kind of argillaceous earth, which was employed to clean silver plate. But as it could not be our tripoli, which is too heavy to float in water, M. Fabbroni tried several experiments with mineral agaric, guhr, lac-lunæ, and fossil meal, which last was found to be the very substance of which he was in search. This earth is abundant in Tuscany, and is found near Casteldelpiano, in the territories of Sienna. According to the analysis of M. Fabbroni, it consists of 55 parts of siliceous earth, 15 of magnesia, 14 of water, 12 of argil, 3 of lime, and 1 of iron. It exhales an argillaceous odour, and when sprinkled with water, throws out a light whitish smoke. It is infusible in the fire, and though it loses about an eighth part of its weight, its bulk is scarcely diminished. Bricks composed of this substance, either baked or unbaked, float in water; and a twentieth part of argil may be added to their composition without taking away their property of swimming. These bricks resist water, unite perfectly with lime, are subject to no alteration from heat or cold, and the baked differ from the unbaked only in the sonorous quality which they have acquired from the fire. Their strength is little inferior to that of common bricks, but much greater in proportion to their weight; for M. Fabbroni found, that a floating brick, measuring 7 inches in length, 4 1-2 in breadth, and one inch eight lines in thickness, weighed only 14 1-2 ounces; whereas, a common brick weighed 5 pounds 6 3-4 ounces. The use of these bricks may be very important in the construction of powder magazines and reverberating furnaces; as they are such bad conductors of heat, that one end may be made red hot, while the other is held in the hand. They may also be employed for buildings that require to be light; such as cooking places in ships, and floating batteries, the parapets of which would be proof against red hot bullets. The turrets which were raised on the ships of the ancients, says M. Fabbroni, were perhaps formed of these bricks; and perhaps they were employed in the celebrated ship, sent by

Hiero to Ptolemy, which carried so many buildings, consisting of porticoes, baths, halls, &c., arranged in mosaic, and ornamented with agates and jasper.

Bricks appear to be of the highest antiquity; and, as we learn from sacred history, the making of them was one of the oppressions to which the children of Israel were subjected during their servitude in Egypt. The bricks of the ancients, however, so far differed from ours, that they were mixed with chopped straw in order to bind the clay together, and instead of being burned were commonly dried in the sun. Vitruvius recommended, that they should be exposed in the air for two years before they were used, as they could not be sufficiently dry in less time; and by the laws of Utica, no bricks were allowed to be used, unless they had lain to dry for five years. From Dr. Pocock's description of a pyramid in Egypt, constructed of unburnt bricks, it appears that the Egyptian bricks were nearly of the same shape as our common bricks, but rather larger. Some of those he measured were 13 1-2 inches long, 6 1-2 broad, and 4 inches thick; and others 15 inches long, 7 broad, and 4 3-1 thick. The bricks used by the Romans were in general square; and M. Quatremere de Quincy observes, that in his researches among the antique buildings of Rome, he found them of three different sizes. The least were 7 1-2 inches square, and 1-2 thick; others 16 1-2 inches square, and from 18 to 20 lines in thickness; and the larger ones 22 inches square, by 21 or 22 lines thick. Among the celebrated buildings of antiquity, constructed of bricks, were the tower of Babel, and the famous walls of Babylon, reckoned by the Greeks among the wonders of the world; the walls of Athens, the house of Crœsus at Sardis, and the walls of the tomb of Mausolus. The paintings, which were brought from Lacedæmon to Rome, to ornament the Comitium in the edileship of Varro and Murena, were cut from walls of brick; and the Temple of Peace, the Pantheon, and all the Thermæ, were composed of this material. The Babylonian bricks, which are in the possession of the East India company, and upon which Dr. Hayes has lately favored the public with a dissertation, are inscribed with various figures and characters, and are supposed by some to be a part of that brick work, upon which Pliny tells us that the Babylonians wrote the observations which they made of the stars for seven hundred and twenty years.

ON THE PREPARATION OF CATGUT, FOR VARIOUS USES.

[Concluded from page 203.]

Catgut for Musical Instruments.

Of all the cords from intestines, this kind is the most difficult to make, and requires the greatest care and ability of the workmen. It is acknowledged that for many years they have been made as well in France as in Italy, with the exception of the treble-strings for violins, which our manufacturers have not been able to imitate.

but on a very limited scale. This is either owing to the difference in quality of the intestines, or some other unknown cause. Whatever it be, we are still tributary to Naples for this article; and every exertion ought to be made to free us from this necessity. Experiments, made with skill, will no doubt succeed; and the Society for the Encouragement of National Industry, by calling the attention of artists to this subject, will have the glory of contributing to the perfection of an art, of which little is at present known.

The cleaning and scraping of the intestines for this purpose, to free them from the fat, must be done with much more care than is requisite for other cords; and, when they have undergone that process, they must be steeped in an alkaline lye, prepared as follows:—

An earthern pan, holding six quarts, is filled with water, and three pounds of potash are added to it; which must be well stirred, and suffered to subside. In a similar vessel, full of water, placed by the side of it, are put five pounds of pearlash; leaving that also to settle. If it be wished to make use of this solution within a short time, it will be necessary to add to it a little alum-water, which will clarify it quickly.

The scraped intestines are now put into earthen pans, so as about to half-fill them. The pans are then filled up with the solution of potash, with as much water added as to double the quantity of fluid. This liquid is changed twice a day, increasing its strength each time, by adding more of the soluion of pearlash, and diminishing progressively the quantity of water; so that the last solutions be the strongest. The intestines gradually become whiter, and begin to swell. After having suffered them to macerate from three to five days, or more, according to the state of the atmosphere, the operation proceeds as follows:—

Every time that the alkaline solution is changed, the pans are placed upon the box called the *refresher*, placed on a table, or on tressels, in a slanting direction, so as to facilitate the running off of the water. This box must be large enough to hold the frame on which the cords are to be stretched. The intestines are scraped with the edge of a copper cube, held in the left hand. The forefinger of the left hand is placed near to the edge of the copper cube; whilst, with the right hand, each intestine is drawn over the edge of the disk or cube, and between the fore-finger.

When they have all been treated in this manner, and placed in a fresh pan, a stronger alkaline solution is poured on to them than that from which they were last taken, as we have before mentioned. This operation is necessary for cleansing the intestine of its greasy quality, and bringing the cords to perfection.

As soon as it is perceived that the intestines begin to swell, and some little bubbles appear on their surface, (for in this state they rise in the water,) it is necessary to twist them *immediately*, or they will begin to shrivel; which sometimes happens, particularly in summer, and occasions the loss of the intestines, and also the time spent over them. In hot weather, the intestines are, indeed, most easily cleaned from fat; but then the workman must be more than ordinarily attentive; and the different lyes for the washings must be made stronger with alkali, and applied more quickly. In winter, all goes on in better order, and the operation is more certain. The manufacturers of this article generally place their workshops in cool places, where there is a little dampness.

The intestines being now ready to be twisted, they are taken out of the alkaline solution. Some manufacturers plunge them again into fresh water, and wash them well therein; but, although they become, by this method, of a better color, and take the sulphur better, they run the risk of being weakened.

To twist and finish the cords, a machine is used—a kind of frame, two feet high, and five feet long; on one end of which are placed a number of pegs; and in the opposite end are bored, with a large auger, a number of holes, inclined in such a way, that when pegs are placed in them, to attach the cords to, they may not be liable to slip and come out. The intestines are now selected according to their size; and two or three of them are taken, and the ends twisted round one of the pegs first placed; and the other ends are carried to the opposite ones, and attached to them. Two turns of the intestines around the peg are sufficient to prevent their slipping. When fixed to the pegs, they must not be drawn tight; as they would be subject to snap during the twisting, if sufficient play were not given to them for that operation.

If any of the intestines should be found too short to reach the opposite side of the frame, they must be lengthened, by pieces cut off any others which may be too long; and care must be taken to make the ligature near the last-placed peg, to preserve the cord of an equal size in its whole length; as otherwise it would be false in its tone.

The frame being filled up in the manner we have described, two or three of the pegs, bearing one end of the intestines, are fixed to spindles, if the machine contains several, and turned round several times; passing the finger and thumb of the left hand frequently from one end of the cord to the other, beginning at the spindle. When all the cords have undergone this operation, and the pegs are all replaced, the whole frame is placed in the sulphuring closet, with several others; as it would not be worth while to sulphur one at a time.

The sulphuring closet is placed in a damp place, surrounded as much with water as possible. An earthern vessel, containing the sulphur, is placed in it, with the frames; the sulphur is then set on fire, and the closet well closed in every part, to confine the fumes. When the cords have remained a sufficient time—which, of course, varies in some measure, according to circumstances—the frames are taken out, and placed on the *refresher*, and rubbed with a horse-hair cloth. This done, they are again placed in the frame, twisted anew, and returned to the sulphuring closet, to undergo the same process as before. If the state of the atmosphere require it, the whole of these processes must be twice or thrice repeated; and they are then left to dry.

When the cord is sufficiently dry, it is known by its not running up when a peg is taken out, and remaining stiff and straight, instead of flagging. If dry enough, they are well oiled with good olive-oil, and coiled up into rings for sale. They become better by being kept some time.

To make the fourth strings for violins, or any other sized cords, intended to be covered with metal-wire, the process is so well known, that it need not be here described.

The whole success of these operations depends principally on the ability and experience of the workmen in managing the different washings, stretchings and twistings, and in a judicious use of the sulphur. When the cord is too much sulphured, it readily snaps; and, on the contrary, when it is not enough so, it stretches too much, and never keeps in tune. [*Dict. Technologique.*

On the Application of Larch Bark to answer all the purposes of Oak Bark, in Tanning Leather. By THOMAS WHITE, Esq., *of Woodlands, Durham.*

[The Larch here recommended, is the European species, but if the American species, *Larix Americana*, is not the same, its properties cannot be very different. This tree is abundant in Maine, New Hampshire and Vermont, and is well known by the names of *Hackmetack* or *Cypress*. In New Jersey, it is known by the name of Tamarack, and in the Canadas it is called *Epinette Rouge*. We believe it has been used in some parts of the United States, for tanning; but its properties are not generally known. If it be really as valuable for tanning as the writer says, it should certainly be saved for that purpose as well as the Hemlock bark.]

[From Transactions of the Society for the Encouragement of Arts, &c.]

Woodlands, August 13th, 1811.

SIR,—In the year 1786, my deceased father did himself the honor of laying before the Society of Arts, &c., his remarks on the improvement of this place; and in a second letter, in 1796, he wrote some further observations; since which time, the plantations, as well as the place in general, have made great progress in beauty and improvement, which induces me to trouble you with a few ideas, that I flatter myself will be of importance to the country at large, as well as of private benefit to persons in possession of woods, which you will oblige me by laying before the Society.

As the trees have now advanced, as I have before observed, to a considerable size, we have been busy for some years, in weeding them out to a timber distance; in doing which, lately, and whilst taking off the bark of some larch trees that were wanted for building purposes, our agent observed the nails of his fingers to be stained, which induced him to think, that the bark of this tree might be useful in tanning leather; a thought that struck the active mind of my father many years ago, when he was desirous of trying its virtues in this necessary and useful business, but was prevailed upon to give up the project, on being told that a tree containing turpentine would not answer the purpose; his adviser thinking the larch was a species of the fir tribe, instead of the cedar. In consequence of this renovated idea, I was determined to have the most impartial trial made of the bark of the oak, and that of the larch, and in order to show the latter no favor, I procured some of the best oak bark in the country, such as can rarely be purchased, and took that of the larch from a small young tree. I next purchased two calf-skins, of the same value, weight, and quality; and put as much of the fine oak bark to one skin, as was applied of the larch bark to the other, both remaining in the pits the same time. During the operation, as we repeatedly weighed a certain measure of larch liquor against the oak, the latter always required an additional quantity to make the scales equal; which accounts for the skin tanned by larch, being above one pound and a quarter heavier than the other, which it was, when dried and ready for the currier. the increase being gradually perceptible during the whole business. Which of the two skins proved the best, I leave to the Society to determine; but I flatter myself, that, exclusive of the additional weight of that produced from larch, the color of it is preferable for gloves, saddles, boots, &c.

As I am proceeding with some other experiments, one of them will, I hope, prove which of the two infusions that the skins were tanned in, will afford the greatest weight of leather, in order to produce a fair test of the intrinsic value of both trees, when applied to tanning; the result of which I shall do myself the honor of laying before the Society at a future period.

It must be observed, that the bark of oak and birch (the two kinds used to any extent) can only be taken off the trees for a very few weeks; whereas larch bark may be collected at any period during three parts of the year; and, I believe, with almost as good effect even in winter; and, as the bark is stript off this tree with very little trouble, the expense of doing it is much less than the oak. It is unnecessary for me to inform the Society, that as oak is daily decreasing in this country, so as to require a great annual importation, the larch tree (which I believe there is little doubt of being the cedar of Lebanon) is in a fair way to be as celebrated hereafter, as it was in former times. * * * *

I am, Sir, your most obedient Humble Servant,

THOMAS WHITE.

To C. TAYLOR, *M. D. Sec.*

Woodlands, 26th June, 1812.

SIR,—I am sorry that I have not been able to send before, two pieces of leather, of a strong quality, tanned with larch bark; and which, though perfectly useful for most purposes, would have continued to great advantage some time longer in the tan-pit, for making soles of shoes.

With the specimens, I send a pair of gloves, and a remnant of leather, converted into shoes, both tanned with larch bark, by a person at Hexham; who told me that glovers would use nothing else, could they get a sufficient supply.

In addition to the equality that larch bark is upon with oak, in regard to its tanning as great weight of leather of every description; it has the advantage of being *quicker* in its operation, and from its light color, of being *preferable*, as mentioned before, for gloves, book-binding, &c.

It must be observed, that nothing has been introduced into the tan-pit, to make the leather firmer, but bark.

I am, Sir, your most obedient servant,

THOMAS WHITE.

To C. TAYLOR, *M. D. Sec.*

Durham, April 17th, 1813.

I, Thomas Farbridge, Tanner, of Woodlands, in the county of Durham, do verify, on oath, before one of his Majesty's Justices of the Peace, that on or about the 21st of June, 1811, I put a calf-skin, weighing, when green, 12lbs., into a tan-pit, to which, at different times, I applied 43 1-4lbs. of larch bark; and on the said 21st of June, I put another green calf-skin, of the weight of 12lbs. also, into another pit, and in the same manner applied, at different times, 42lbs. of oak bark; and on one and the same day drew both these skins, when tanned; which, when dried, produced as follows: viz. The larch skin 6 1-4lbs., and the oak 5 1-2lbs.; both skins undergoing exactly the same process, and the former having neither oak bark, nor any other substance of tanning quality, put into the tan-pit, but larch bark. And although the larch liquor had 1 1-4lbs. more bark than the other, it was infinitely stronger; for, after the two skins were tanned, I put three sheep-skins into each of the pits; and, although I drew the three from the larch liquor about twenty-one days before those put into the oak bark, they were in a better state; and, at the end of the second tanning, the larch liquor was the strongest; as I have ever found it to be after every experiment, where the weight of leather was equal.

I moreover declare, that the skin which is on the point of going to London, the one-half marked oak, and the other larch, was tanned, after being equally divided, the one part with 43lbs. of larch bark, and the other with an equal weight of oak bark, being put into the tan-pits on the same day, about the 21st of May last, and drawn together about a month ago; and that nothing of a tanning quality was put into the larch-pit, but larch bark alone, and the process exactly the same in regard to each half, as in the first experiment.

I moreover declare, that the specimen of hide leather sent to London in November last, as well as the hide now to be sent, although tanned in a pit with a number of others, underwent exactly the same process, without any bark or mixture but pure larch bark: and although no comparison was made betwixt it and oak, I am certain it would have required as much bark of the latter, to have produced leather of equal good quality and weight.

THOMAS FARBRIDGE.

Sworn before me, at the place and date above written,

EDWARD DAVISON.

AGRICULTURE.

ON THE MANUFACTURE OF CIDER.

[Concluded from page 211.]

5. *Vinous Fermentation.* This is commonly called *working.* It commences at the temperature of 59° Fah. and cannot be conducted in safety when the heat is over 75°, for a high temperature induces a too rapid fermentation, by which much of the spirit passes off with the disengaged carbonic acid gas, and the acetous or vinegar fermentation begins at 77°. This will show the importance of conducting the vinous fermentation under a proper temperature, which is from 50 to 70° Fah. To show the chemical effect of the vinous fermentation, it will be proper to repeat that the unfermented juice, or *must,* of the apple, consists of saccharine matter or sugar, vegetable mucilage or extract, astringency or tannin; malic, and a small matter of gallic acid, the principle of flavor, tinging or coloring matter, and water. The sugar becomes the basis, or spirit, of the fermented liquor; the spirit, after vinous fermentation, and the tannin, or astringent matter, preserve it from the acetous fermentation, if the vegetable mucilage, or yeast, is separated when it has performed its office. This vegetable mucilage acts upon the saccharine matter in a manner analogous to yeast upon the wort of the brewer—it causes fermentation, and converts sugar into spirits—by its giving off carbonic acid gas, and imbibing hydrogen; the liquor becomes clear, and part of the mucilage rises to the surface with the disengaged air, in the form of froth, and the residue is precipitated, with the heavier impurities, to the bottom, in the form of sediment or lees. This is the critical period. The liquor may now be drawn off clear. If left longer, the feculent matter, or froth, by parting with the gas, which renders it buoyant, soon settles and mixes with the liquor, renders it turbid, and as soon as the temperature attains a proper height, causes a new fermentation. This will explain the reason why ciders become harsh and sour on the approach of warm weather in the spring. The elementary principles of sugar, ardent spirits and vinegar, it has been ascertained by the experiments of Lavoisier, are the same; and these substances only differ in the proportion of their component parts, and in the modes of their chemical union. Sugar consists of hydrogen, oxygen and carbon. An increased proportion of hydrogen enters into the composition of ardent spirits, and of oxygen into vinegar. The same agent, vegetable mucilage, which converts

the sugar of the apple into spirits, will convert the spirits into vinegar, under a proper temperature, and aided by the oxygen of the atmosphere. The process of making vinegar is greatly accelerated by exposing cider or wine to the atmosphere, the oxygen of which it imbibes, and which is termed by chemists the great acidifying principle. Here again we see the propriety of professional cider manufacturers, who might be provided with cellars where the temperature could be regulated, and who would carefully rack off the liquor at the completion of the vinous fermentation.

The vinous fermentation commences and terminates at different periods, according to the condition and quality of the fruit, and the state of the weather. The juice of unripe fruit, if the weather be warm, will begin to ferment in a few hours after it passes from the press; and seldom stops at the vinous stage. The juice of ripe fruit, when the temperature is lower, does not begin to ferment under a week or fortnight, or longer, often continues slowly through the winter, and when made from some of the finer cider apples, is not completed under six or nine months. Indeed, in some cases the liquor does not become clear under a year, and the sugar is not wholly decomposed under two years: for the whole of the sugar is seldom decomposed during the first sensible fermentation.—Knight considers cider at two years old as in the best state for bottling. For until the sugar is decomposed, fermentation insensibly goes on, and the strength of the liquor increases. The like insensible process goes on in wines, and when it is completed, the wines are said to be ripe, and are in their highest state of perfection. (*See M'Culloch.*) Temperature being the same, I think it may be assumed as a rule, that fermentation will be rapid and short, in an inverse ratio to the proportion which the saccharine matter bears to the mucilage and water; and that the vinous liquor will be rich, high flavored and durable, in the proportion as the sugar and astringency preponderate in the *must*.

6. *Precautions to prevent Acetous Fermentation.* These are, supposing the previous contingencies to have been favorable, a careful separation of the vinous liquor from the froth and lees—a cool temperature—racking and fining—and artificial means to destroy the fermenting quality of the remaining mucilage.

I have already suggested the importance of drawing off the liquor from the scum and sediment—at the termination of the vinous fermentation. This period may be known by the cracking of the froth in an open cask, or, if in a close one, by the application of the nose or ear to the bung-hole. If the fermentation has not ceased, a hissing will be apparent, and the gas given off will give a pungent sensation to the nose. If the liquor is not sufficiently clear, or indications appear of the acetous fermentation having commenced, the cider should be racked into clean, strong casks, and fined with isinglass, eggs, or skimmed milk. This operation may be repeated, if found necessary; but it should be performed in clear, cold weather. After the first racking, the casks should be kept bunged close, and further rackings be avoided, if possible, as every racking reduces its strength, and much of the spirit escapes with the carbonic acid gas which is evolved in the fermentive process. The oxygen of the atmosphere, besides, increases the vinegar fermentation. But if these methods fail, resort may be had to the means of impeding the natural operation of the mucilage, or vegetable leaven. This may be done by what is called *stumming*, that is, burning a rag impregnated with sulphur, in the cask in which the liquor is to be decanted, after it has been partly filled, and rolling it so as to incorporate the liquid with the gas; or by putting a drachm or two of the sulphate of potash into each cask, which will precipitate and render insoluble the remaining leaven. If the fruit is good, and properly ground, and the cider racked from the fermenting casks at a proper time, most or all of the subsequent operations will be superseded.

I fear, Mr. Editor, I have been too prolix upon a subject which almost every farmer professes to understand; yet considering it, as I do, of great importance to the community at large, I cannot close this without suggesting to the consideration of the enlightened Trustees of your State Agricultural Society, the propriety of ascertaining, by experiment and analysis, the comparative value of our cider-fruit, and of awarding premiums, not only for the discovery of the best kinds of cider apples, but for indigenous or hardy grapes, best adapted for American wines. J. BUEL.

Albany, Feb. 26, 1827.

SALIVATION OF HORSES.--OIL OF PUMPKIN SEED.

THE following article respecting Oil of Pumpkin Seed, and the Salivation of Horses, we copy from that valuable work, the *American Farmer*. A query was inserted some time since in this Journal, respecting the Salivation of Horses, and its cure. It is generally attributed to what is known by the common names of *puke-weed*, *Indian tobacco* or Lobelia. This, together with the other plant mentioned by Rafinesque, viz: Euphorbia, which we have never seen in Maine, may bring it on, and so may many other acrid plants which are *accidentally* eaten by horses. We believe, however, that these causes act much more seldom than is imagined. It is not impossible, that a certain state or stage of the juices of grass may bring on this salivation, either by fermentation or other cause not well understood—stimulating the coats of the stomach, and exciting a superabundant flow of fluid. We are led to this conclusion by the fact, that horses at some seasons are not so much affected with slavering, as they are at others, although they run in the same pasture,—and we have observed different horses in the same pasture, differently affected;—some very much, others, scarcely any; hence we should be led to infer, that the health or state of the horse's stomach, had its share in producing the complaint.

We have generally effected a cure, by putting the horse to hay a little while. Horses have been troubled with slavers in the winter while fed on hay. This must have been caused either by some acrid plant in the hay, or to some quality of the hay itself—perhaps from improper management in making. Horses have also been affected in the same manner when kept in a yard, and soiled or fed on green clover.

Some horses scarcely mind it; others, are very much reduced by it. "Having purchased of a drover, from the back-woods, a well looking pair of young horses, both did well on red clover, given to them in the yard, until salivation commenced. After this, one of them seemed to hold his own, while the other fell away, greatly. Being determined, if it were possible, to habituate the sufferer to this kind of food, a few weeks reduced him so much that his life seemed to be in danger. It required some considerable time, feeding on grain and the speargrasses, to restore him to his original plight."—[*Lorain's Husbandry.*]

Red-House, N. C., Sept, 14, 1828.

Mr. Skinner,—I have noticed frequent inquiries being made in your very valuable paper, concerning the cause and origin of a disorder which horses are subject to, which we call in this section of country— the Salivation of Horses.

It is a subject of deep importance to the owner of that valuable animal, to discover, if possible, the true origin of this disorder, which that noble animal are more or less subjected in many parts of the United States. It is a laudable object in any person, to endeavor, if possible, to discover and find out a remedy for any disorder which this noble animal is subject to. I cannot better enforce my ideas upon this subject, than to send you an article upon the subject, extracted from the *Western Review*, written by C. S. Rafinesque, Professor of Botany and Natural History in Transylvania College, Kentucky. This article is entitled to great respect, as it is written by a gentleman of acknowledged talents. It contains much valuable matter, and many useful hints as regards this disagreeable disorder. I also send you another article upon the subject, "On the Oil of Pumpkin Seed," extracted from the same work, and written by the same gentleman, which I have no doubt will be of use to some of your friends. As it regards our crops in this section of country, I cannot speak in very flattering terms.—The crops of wheat are very indifferent, owing to the extreme warm winter, and to the great quantity of rain which fell in the commencement of the spring. There will not be a half crop of tobacco made in this county, owing to the coolness of the spring and the great scarcity of plants. The crops of corn are very good, and cotton very promising.

Yours, very respectfully, JAS. W. JEFFREYS.

ON THE OIL OF PUMPKIN SEEDS.

To Dr. C. L. SEEGER, *Northampton, (Mass.)*

Your inquiries respecting pumpkins, which have lately reached me, I hasten to answer to the best of my knowledge.

I understood that pumpkin seeds were pressed like rape seed, and of course cold: when I added "*or like flax seed,*" it was because I had never seen flax seed or linseed pressed warm after roasting, as you say it is done with you.

Pumpkin seeds, being very oily, and containing thin oil, require no heat to help the effect of the press. They will yield their oil to the press as easily as almonds, walnuts, and seeds of the melon tribe.

The Harmonists press this oil in the press used for rape seed oil.

I do not think that the pumpkin seed oil can be employed, like linseed oil, for painting. It is too thin and fluid, but it will answer in the instances where walnut oil is employed, being similar to it in that respect, although otherwise much sweeter and less desicative.

Pumpkin bread and cakes are much used in the interior of the State of Kentucky, as pumpkin pies in New-England. The bread is made either by itself or mixed with corn meal, by kneading pumpkins either raw or boiled, and baking them immediately afterwards, without any addition of yeast. It has, therefore, a great similiarity to corn bread, and is eaten either warm or cold. It is very sweet and of a reddish color: I cannot say it is very palatable to me, but those that are used to it like it well. You know that corn bread is not liked at first by many persons. I think that the best pumpkin bread is that made by uniting equal parts of corn meal and boiled pumpkins.

Respecting the cultivation of pumpkins, I can hardly give you any additional information. Their culture is well understood all over the country, and all the farmers know how to avail themselves of the facility which they have of growing among corn, without injury to either crop. I do not conceive that any positive advantage might result from their separate cultivation. But manures might be highly beneficial in either instance, and would increase the crops.

I remember the following additional uses which may be made of pumpkins:

1. The cakes, remaining after the oil is pressed from the seeds, are eaten greedily by cattle and hogs.

2. In Europe, they make good preserves of pumpkins, by cutting them in slices and boiling them for a long time in strong syrup of sugar.

3. In the south of Europe, a very good soup is made by mashed or diluted pumpkins with oil, butter, or broth. This dish is called *Furlata* in Tuscany. Rice is often added to it.

4. The hard skins of pumpkins, if uninjured, may be used for pails, buckets, baskets, &c. The pumpkins may be made to assume almost any shape, by being confined while young, in wooden or hard vessels, which they will fill gradually, moulding themselves to their shapes. I remain, respectfully, yours, &c.

C. S. RAFINESQUE,
Prof. of Botany and Natural History.

Transylvania University, Sept. 10, 1819.

ON THE SALIVATION OF HORSES.

BY C. S. RAFINESQUE.

This disorder frequently attacks horses in many parts of the United States. It is well known to consist in an unnatural effusion of saliva in a watery state, flowing often with rapid succession, and debilitating exceedingly the animals subject to it. Cows, also, have been known to be slightly affected by the same disorder; but no other domestic animals.

Various conjectures have been formed on the cause of this morbid affection, some of which are rather ludicrous if not extravagant. Such, for instance, is that which ascribes it to a spider swallowed by the horse! But I am not aware that any one has published as yet the real cause; and the knowledge of a speedy remedy seems to be still more wanted.

Being enabled to point out the true cause, and to offer a remedy, I venture to publish both in the expectation of contributing thereby to lessen and prevent the injury arising from neglect and accident.

I am happy to mention that I am indebted to my worthy friend, Mr. Bradbury, for the leading facts in this statement. We both agreed in conjecturing properly on this subject; but he had the advantage to ascertain the facts by actual experiments, and to point out the proper cure.

Two kinds of weeds, which grow occasionally in meadows and pastures, produce this disorder, whenever they are accidentally eaten by horses and cattle, together with clover or grass! Sheep and hogs never eat them. The first and the worst is the *Euphorbia hypericifolia*, a small milky plant with opposite smooth leaves and very small white flowers. The second is the *Lobelia inflata*, or asthma-weed, a larger plant, with alternate hairy leaves, blue flowers and swelled seed vessels. Both have the leaves ovate, oblong, and slightly toothed.

They both blossom at the end of the summer, when of course they are largest and most detrimental. Being mixed with the second growth of clover and grass, they sometimes become entangled thereto, and are eaten by horses, who would probably reject them otherwise. They may likewise become mixed with the second crop of hay, and be eaten with it by horses. Hence has arisen the vulgar opinion which ascribed this disorder to the second growth of clover.

Both the above plants have energetic properties. All the species of the genus *Euphorbia* are strong drastics, and the *Lobelia inflata* is little inferior to said genus in energy; it has been usefully employed in the cure of asthma and other disorders: it was one of the Indian medical plants. They produce a slight salivation even in man.

Some other plants may have similiar salivating properties, but the two above mentioned are the most common; being found almost all over the United States. They are not uncommon in Kentucky.

By attending to this, it will be easy to prevent the disease: since they are both annual plants, which may easily be destroyed in the meadows, by pulling them up before they ripen their seeds. Should they grow too thick, horses and cattle should not be allowed to pasture where they grow, (when the weeds are in blossom,) and burnt on the ground.

Should the horses and cattle happen to eat them notwithstanding, and be attacked with the salivation, they may be cured in a single day by feeding them plentifully with cabbage leaves, which appear to be an effectual antidote for this peculiar disorder.

If no cabbages should be at hand, the leaves of turnips, radishes, mustard, and such other plants of the cruciferous tribe, might probably answer equally as well.

I venture to hint that cabbages and the cruciferous plants might, perhaps, become an efficacious remedy in the morbid salivation brought on men by an excessive use of mercurial preparations, tobacco, &c. It is by similar analogies that the materia medica is often enlarged, and effectual remedies are discovered, or succedaneous palliatives adopted.

It is my wish that these facts, conclusions, and hints, may become useful, since the constant aim of science should be, to apply its extensive resources to the practical benefit of our fellow beings. And such, I trust, will always be the ultimate objects and results of my pursuits.

SAVE YOUR POMACE.

It is customary, with many of our farmers, to throw the pomace out by their cider-mills, year after year, there to collect in one huge heap, or else to draw it out, and put it under some stone wall, or in some bye-place, as they would a nuisance, which they are glad to get rid of. Now, with due deference to older heads, we pronounce this a wasteful and slovenly practice. "Why, what in the world is it good for?" say they; "it is like a pile of cedar chips, and has neither heart nor nourishment in it; it's fit neither for manure nor fodder." We know a person, who very carefully shovels it away from his cider-house and carts it into a mud-hole, under the impression above stated. Now we should not be surprised, if some of his posterity, should hereafter be seen, digging out that said mud-hole, and spreading its contents upon the very land, which it is now so carefully kept off of. The fact is, that Pomace is fit, both for manure and fodder; that it is indeed too valuable to be thrown away. It is composed principally of vegetable fibres, rendered comparatively inert, it is true, by having the juices—mucilage, sugar, &c. &c., partly pressed out of it. But a little quick-lime mingled with it, would bring it to a state of putrefaction or decomposition, and render it soluble, and consequently fit for nourishment to plants. But the better way to reduce it to the state of manure, is, to give it to your cattle and let them pass it through that mysterious laboratory—their stomachs. Thus a greater saving will be effected, nourishment will be afforded to your cattle and manure given in return. It is thought by some, that cattle will not eat it, and by others, that it is hurtful to them. Let us prefer the question to the "dull ox" in person. Offer him a quantity that has been kept clean, and he will soon convince you, that it is far from being unpalatable. The cows on our common, have been teaching this lesson to us, for several days. Somebody had left there a load or two of pomace, and they have been feasting upon it until the rains came, and what remains is trampled into the sand and mud.

We find the following communications in the *N. England Farmer*, which will serve to corroborate our opinion upon the subject.

[**From the Middletown (Conn.) American Sentinel.**]

APPLE POMACE.

On taking notice of large heaps of apple pomace near some cider-mills in the vicinity of Middletown, I am induced to mention, that it is good for cattle, sheep and swine, and ought not to be wasted, for it is good for nothing for manure: I tried it more than 10 years ago, by carting away a large heap of it, which had lain accumulating many years, and was satisfied that it did not pay me for my trouble; I could not say it helped the crop, although it was put on sandy soil, and the land inclined afterward to be mopy, and bore less grass. It was according to my father's custom, and the practice of steady habits, to keep milch cows away from pomace, but wishing to prove all things, I kept a cow principally upon it more than three months in the year 1786, feeding her sparingly at first, for a few days, and then letting her lie at a heap which was replenished with fresh pomace every few days, and where there was little else to eat, and we thought she did as well as the other cows which lay in good rowen feed, and it did not dry up her milk, as farmers generally suppose it will. If a cow eats her fill of apples, it checks her milk, and so it will if she eats her fill of grain, and overeating grain sometimes causes death, yet cows might do well on apples after being accustomed to eat them, even by lying in an orchard and eating as many as they wish; if cows are allowed to take their fill of pomace at first, it may check their milk, and make them stagger; it is the distention of the stomach, rather than the injurious effects of the apple or pomace, that checks the milk. I have never wasted any pomace since my experiment, when I have owned a cider-mill, but in the year 1794 I sold my place and bought another farm, and had no cider-mill for many years, but the trouble of going a mile to make cider, loss of the pomace, and paying for the use of the mill, induced me to build one near my house, where two men could easily roll a hogshead of cider from the mill into the cellar.

No pomace has been suffered to lie near the mill since it was built; we place a cart close to the press, and throw in the pomace and carry it away and spread it for cattle to eat, throwing a little to the hogs, (which is but very little more labor than to carry it by hand two rods, and throw it in a heap,) and the cattle will eat the pomace, and the apple seeds which scatter, are picked up by the fowls.

I like this practice better than to have a heap of stinking pomace near the mill, which is not worth carrying away. If you have more pomace than your cattle will eat, you can dry it, house it, and feed it out in winter; it will be saving hay. I have told many farmers of my practice, who feed out pomace in the same way; and if I have published something like it before, the reader will excuse me for having it printed again, when we are sensible that many people read very superficially, and most people are apt to think their own method is the best, and it becomes necessary to give precept upon precept; but I have no motive but public utility.

I have also published how to make cider, but people like their own mode best, although Newark cider sells in New-York for four or five times as much as that which is made in New-England; and I think it is wrong to have the Yankees so much outdone: but making cider is nearly done with for this year. I hope that some more of our farmers will, at least, feed out a little pomace for a trial, against next year.

A Farmer.

[From the New-England Farmer.]

POMACE.

Mr. Fessenden,—Seeing in your paper of the 16th of November, an article relative to the disposal of apple pomace, which, from my own experience, I think incorrect, I have thought proper to offer a few remarks on this subject.

I have for eight years past made from 150 to 300 barrels of cider annually, and have disposed of my pomace in the following manner: my piggery is situated near my cider-mill house, and consists of two apartments, each sufficiently large to contain my pomace, and other substances intended to make manure, for one year. Here I throw my pomace, when sufficiently pressed, for my hogs to work over, which gives them constant employment, and I am of opinion that they get considerable nutriment from it. The next season, after the frost is out of the ground, I throw in some loam, and in the summer, at leisure times, I continue to throw in weeds from my vegetable garden. My hogs keep continually rooting this compost over, and causing the pomace to decompose, which, at the end of fifteen or eighteen months, makes excellent manure.

The next season for making cider, my pomace is thrown into the other assortment, which passes through the same process. I usually keep six or eight hogs, which are divided and kept in these apartments. My mill-house, and other accommodations attached to it, consists of a building 80 ft. long and 23 ft. in width. The water-spouts of this building have conductors to carry the water into each of these apartments, which are kept continually moist, and which I think very important for my hogs to wallow in, in the heat of summer, as well as to decompose the pomace. I take out of one of these apartments upwards of 25 ox-cart loads of excellent manure, every spring. I have given my low mowing land a top-dressing of this manure, and have taken the same year, a crop of hay equal to 2 1-2 tons to the acre, and a crop of rowen equal to one ton to the acre. This manure I consider worth to me from 25 to $30, besides the service the pomace is to the hogs.

Before the adoption of this plan I used to throw my pomace into my pastures, upon rocks, and received little or no advantage from it.

I have not written the above with a disposition to differ from any person in opinion, but with a view to general utility, upon a subject apparently trifling, yet connected as it is with the numberless items that engage the attention of farmers, it may serve as a spoke to support the firm wheel of Agriculture. A FARMER.

Norfolk County, Dec. 4, 1827.

To this last communication succeeded another, not approving the plan of the Norfolk Farmer, as being the most economical, because all of the pomace could not be consumed by six or eight hogs; and alleging that pomace did not contribute much to the manure, until it had passed through the stomachs of the hogs. He recommended that the pomace should be carefully dried under cover, and dealt out to the stock at such times, and in such quantities as was most proper; thus making it an article of fodder or rather of luxury. We are aware, that there is a prejudice against the use of pomace, and also of apples, as an article of food for hogs or cattle—that they are injurious, &c.; but we presume, that whenever this kind of food has been injurious, it was on account of the animal eating too much and thus cloying the stomach. We know a practical farmer who frequently fats his beef, and hogs, upon nothing but apples, and has ever found it a palatable and nourishing species of food. We hope to have a communication from him on this subject.

EXTRAORDINARY YIELD.

The River La Plate or long red Potato, is noted for its fruitfulness. A gentleman of this town, raised the present season from two bushels and a peck, fifty bushels. The ground was broken up last year, planted with potatoes and manured very liberally. The present year it was not manured at all—the potatoes were cut into one or two pieces—one piece was planted in a hill and the eyes were carefully placed uppermost. They were hoed as soon as they were up, and also after they were about six inches high.

Another person informs us, that he once raised over three pecks from one potato of this kind.

MISCELLANEOUS.

Disease of Silk Worms, and its cure.

In the southern parts of France, where silk worms are raised, it is very common to observe the insects attacked by a disease called the jaundice, in consequence of the color acquired by them. Very careful examination is continually made for the discovery of such worms as may be attacked by it, that they may be removed, lest the disease, being contagious, should spread to the others.

The Abbe Eysseric of Carpentras, had recourse to a remedy in these cases, which, though apparently dangerous, had been warranted by the success of twenty years. He used to powder his worms over with quick-lime by means of a silk sieve; he then gave them mulberry leaves moistened with a few drops of wine, and the insects instantly set about devouring the leaves with an eagerness which they did not usually show. Not one of the hurdles upon which he raised his worms, appeared infected with the jaundice. It was at first supposed, that the cocoons of silk were injured by this process; this, however, is not the case, and his method of practice is now adopted generally in the department of Vaucluse.

[*Bull. Univ.*, D. viii. 360.

Tenacity of Iron, as applicable to Chain-Bridges.

The following results have been deduced from experiments made in Russia, and detailed by M. Lamb, in a letter from Petersburg, *Ann. des Mines*, x. 311. In the apparatus contrived for the purpose, the power was applied by a hydraulic press:

The best iron tried, supported 28 tons per square inch, without being torn asunder. The bars began to lengthen sensibly when two-thirds of this power had been applied, and the elongation appeared to increase in a geometrical ratio with arithmetical increments of power. The worst iron tried, gave way under a tension of 14 tons to the square inch of section, and did not lengthen sensibly before rupture. By forging four bars of iron of medium quality together, an iron was obtained which did not begin to lengthen until 16 tons had been applied, and supporting a weight of 24 tons without breaking.

Taking these results as sufficient data, it was decided by the committee appointed for the purpose, that the thickness of chains in a suspension bridge, should be calculated so that the maximum weight to be borne should not exceed eight tons per square inch of sectional surface, and that before being used they should be subjected to a tension of 16 tons per square inch, and bear it without any sensible elongation. [*Jour. of Science and Arts.*

Cementation of Iron by Cast Iron.

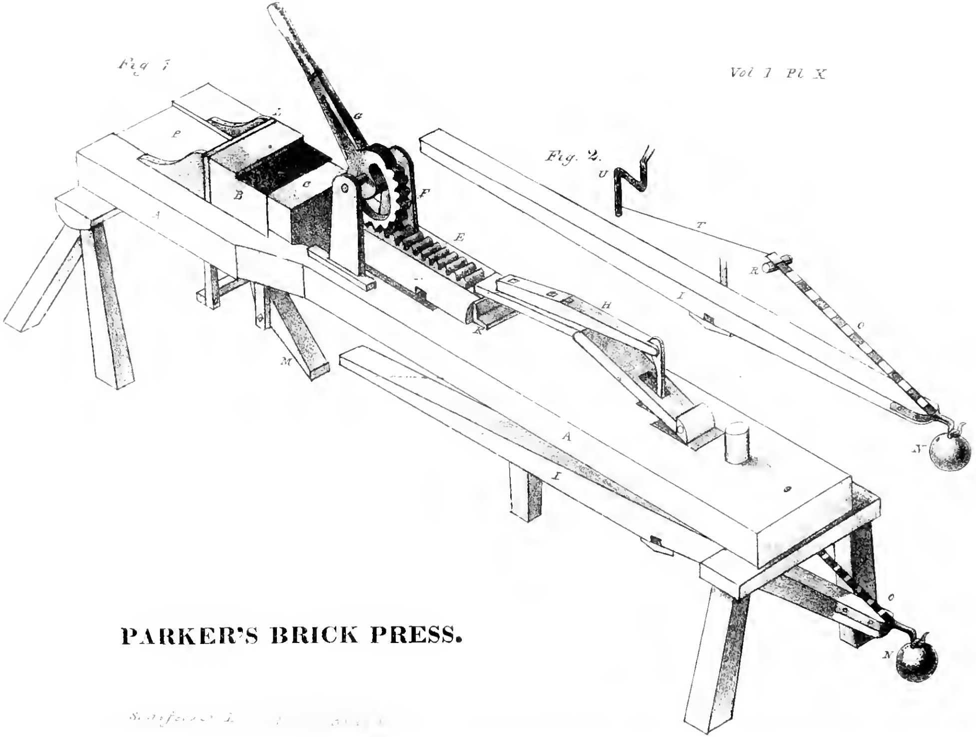
Pure iron, when surrounded by, and in contact with, cast-iron turnings, and heated, is carbonised very rapidly, so as to harden, to temper, and, in fact, to exhibit all the properties of steel. M. Gautier finds this a very advantageous process in numerous cases, especially where the articles to be case-hardened, or converted into steel, are small, as iron wire, or wire gauze. The temperature required is not so high as that necessary in the ordinary process of cementation, and the pieces to be carbonised are not injured in form. The kind of cast-iron used, should be the gray metal, and the more minutely it is divided the more rapid and complete is the operation. By covering the mass of cast metal, in which the iron to be carbonised is enveloped, with sand, oxidation, from contact of the air, is prevented, and the cast metal may be used many times. Plumbago experimented with in the same manner, does not produce the effect.

[*Jour. de Pharmacie*, 1827, p. 18.

For the Farmers' and Mechanics' Journal.

QUERY.

A good way to acquire information, is, to admit our ignorance, and frequently ask questions of those who have attended to the subject. This may appear frivolous to those who care nothing about the subject, or have no thirst for information. But almost any question, if properly considered and answered, will elicit information. I would inquire, therefore, where is the centre of bearing in the hub of a common cart-wheel, supposing the under side of the axle a straight line and the wheels standing on a level with each other? And also, what is the best mode of fitting axle-trees to the hubs of wheels for common roads, taking into consideration the greatest strength and the least friction? S. H.



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MECHANICS.

For the Farmers' and Mechanics' Journal.

Specification of the Patent granted to Wm. Coburn, *for a Method of Extracting Tannin from Bark, &c., by Steam.*

To all persons to whom these presents shall come, William Coburn, of Gardiner, in the County of Kennebec, and State of Maine, Currier, sends greeting:—

Be it known, that I, the said William Coburn, have invented, constructed and applied a new and useful improvement in the mode of applying *steam* for extracting *tannin* and other ingredients contained in *Hemlock*, *Oak*, or any other Bark, or from the leaves and branches of *sumach*, *oak*, or *chestnut*, or from any other substance usually used in the tanning or manufacturing of skins into leather.

This improvement consists in applying *steam* to the substance from which tannin is to be obtained, in the following manner: viz. The steam is conveyed from the boiler, by a tube into the lower part of a *cistern* or *tub*. The tub, or vessel used for that purpose, is furnished with a false bottom perforated with holes, and raised a few inches from the true bottom. The tub is filled with the substance to be acted upon by the steam, which is suffered to pass into the tub between the bottom. Cold water, or bark liquor, is then occasionally poured into the top of the tub, and the liquor thus obtained is drawn off by means of a cock placed between the bottoms of the tub. The advantages of this mode are,

1st. The simplicity of the apparatus necessary for the application of the steam; no pressure is required to confine the steam in the tub, other than the weight of the materials acted upon.

2d. By the application of cold bark water, or liquor, or cold water, the steam is found to penetrate the substance much more easily, and a greater quantity of tannin, &c. is obtained.

Gardiner, November, 1828.

Mr. Editor,—By experiments in my mode of extracting *tannin* as above described, I think that a saving of about one-third may be effected in tanning, by using my apparatus. A quantity of bark that had been thrown out of the vat for a day or two, and considered as spent, was put into the cistern and steam applied. It was estimated, that one-half as much tannin was extracted, as had been before by the common process.

Other experiments were instituted upon bark treated by different methods, with similar results. WM. COBURN.

We, the undersigned, have examined Mr. WM. COBURN's apparatus for extracting tannin by steam, and are convinced that more tannin can be extracted by his mode, than by any other with which we are acquainted.

BENJAMIN COOK,
BENJAMIN ELWELL,
HENRY LEEMAN,
MYRICK HOPKINS,
BENJAMIN WEYMOUTH, } *Tanners.*

Gardiner, Nov. 17, 1828.

On the Manufacture of Glue, or Size, for the use of Weavers, Paper-hanging Manufacturers, &c.

GLUE is made from hides, skins, and pelts; the skin of the ears, legs, &c.; and the older the animals are producing them the better.

Hide-roundings are the best material for this purpose: viz. the clippings of hides, which have only been limed; as leather which has been tanned, or dressed in oil, is of no value for glue or size; except for the use of the *black paper-case makers*, who use *tanned* leather for making their glue.

The proportion of their value for this use is nearly as follows:— 112lbs. of the hide-roundings are equal to making 56lbs. of glue; the same quantity of chamois-leather or glovers' clippings, not oiled nor tanned, or of alumed or whittawed leather, to 40lbs. of glue; of hare and rabbit skins, (which are never limed, and are mostly used by buckram-stiffeners and linen-dyers, in consequence of their not having any lime or alum in them,) to 35lbs. of glue; also the same quantity of fellmongers' shreds yield from 25 to 28lbs. of glue; and of parchment slips or cuttings, from 14 to 16lbs.

A great deal, however, depends upon the various articles enumerated, being perfectly free from lime, dust, or dirt, their perfect state of dryness, and their good condition.

The expenses of boiling them into glue are much reduced when the various articles have been soaked in water for 24 hours previous to boiling them in other fresh water.

The quantity of water must be regulated by the strength of the glue or size required; allowing one pint of water for an ounce of glue, or two gallons for a pound of glue, for single size.

The hide-roundings require one gallon of water for 16 ounces; alumed leather, chamois leather and glovers' clippings, one gallon per 20 oz.; hare and rabbit skins, one gallon per 24 oz.; fellmongers' shreds, one gallon per 28 oz.; and parchment cuttings, one gallon per 50 oz.

The exact quantity of water ought first to be put into the boiler, according to the quantity of size intended to be made; and when the article to be boiled into size, is added, the depth, or quantity of liquid required to be constantly maintained till the gelatine is extracted by the boiling, will be correctly ascertained; and any visible waste occasioned in the boiler during the operation, must be continually supplied, by adding the necessary quantity of water; or otherwise considerable time will be lost in the process.

An iron pan, or boiler, is much better than any other, provided that care is taken to add cold water, by a little at a time, while the boiling is continued. And it is also necessary to have an iron grating placed inside the boiler, in order to prevent the article from burning to the bottom of it, and to lessen the time and trouble required in frequently stirring it.

We have extracted the above useful particulars from the *Manufacturer's Assistant*, a work containing much valuable information; to which we may also add, that, after the boiling is completed, the clear size ought to be strained from the dregs, to finish it for use. And that the paper-hanging manufacturers prefer to make their white size for light colors, of the skin which covers the foreheads of calves, previously freed from the hair by liming them. The skins of soles, and no doubt of other fishes also, after being freed from all greasiness by soaking them in lime-water, will very readily dissolve into a size in water, by the assistance of heat; and which, after straining it clear, may no doubt be usefully employed for many of the purposes of isinglass, &c. [*Tech. Repository.*

On Improving the Quality of Saws, by Hammer-hardening their Teeth.

The Editor lately mentioning to Mr. Christie, the worthy Secretary of the London Mechanics Institution, Mr. Turrell's great improvement in gravers, effected by hammer-hardening them; it occurred to him, that the practice, frequently adopted by smiths, and other workmen, of hammering the worn and blunted tops of the teeth of their back and frame-saws, merely with a view of spreading them sideways, so as to free themselves in use, previous to filing them sharp again; must not only have that effect, but must likewise greatly conduce to the improvement of their *hardness* and *toughness*, from the *condensing effect* of the hammer upon them.

Mr. J. I. Hawkins, on being informed of this, by the Editor, perfectly agreed in this opinion of Mr. Christie's; but, with his usual acuteness, suggested the farther improvement of first filing the teeth into shape, and then finishing them *by hammer-hardening their tops;* which would not only spread them out sideways, but would also preserve to them all the advantages of the effect of the hammer upon them; which, according to the present practice of filing them after hammering them, are in a great measure lost; and he thought there would be little difficulty in applying his improvement to the teeth of all saws, which were not exceedingly small. He would screw the saw fast in a vice, (the teeth in the chaps of which were guarded from indenting the saw, by plates of copper lining the chaps on each side,) and, with the flat cross-pane of a hammer, the handle of which was held towards the fore part of the saw, and the hammer itself at a proper angle, to suit the form of the teeth, he would then hammer-harden every individual tooth.

The best saws are those which have been considerably condensed by hammer-hardening them on their sides, in making them; but this additional process, of hammering the tops of their teeth, cannot but prove a considerable improvement upon them.

[*Technical Repository.*

On the great improvement made in Brick-layers' Trowels, by Hammer-hardening them. *By* Mr. George Walby.

There is, perhaps, no implement which undergoes more severe treatment than the brick-layer's trowel does, in its constant employment of hacking bricks into shape, and thus encountering the pieces of flint, pebbles, &c., ordinarily mixed with the clay; and which, besides having a tendency to injure its edges, also render it liable to break continually. Mr. Walby, therefore, by his excellent processes, accomplished a most difficult task, and rendered his superior trowels highly prized, by those persons who were the most competent judges of their merit, from their constant experience in their use; and, indeed, his brick-trowels, like the hand-saws made by the Editor's late father, were continually changed, by grinding, into other and smaller kinds, until they became too diminutive for any useful purpose; their originally excellent quality remaining perfect to the last.

They were made of the best shear-steel, carefully worked throughout, and especially to avoid over-heating the steel; and towards their finishing in the plating or forging, and when nearly reduced to their proper thickness, besides beating them in a clean hollow-fire, to avoid contact with cinders, &c., he also removed all scales upon their surface, previous to giving them their last planishing, under the rapid blows of a hammer driven by a steam-engine, by means of a very ingenious revolving elastic steel brush of his invention. He carefully attended to the proper hardening heat, and quenched them in a composition or hardening liquor, similar to those used by saw-makers: he next blazed them off to the spring temper; and, lastly, *hammer-hardened them as much as possible.* They were then ready for grinding, after which operation, their elasticity being again restored by blueing them, they were glazed or brightened, ready to be mounted into their handles.

We have many particulars of the various tools, used by Mr. Walby in his practice of trowel-making, and which are well deserving of being published.

On the improvement of Drills, by hammer-hardening them cold.

Mr. Andrew Pritchard, the inventor of the hard-shell lac cement, finding that steel, when hardened and tempered, is susceptible of receiving the condensing effect of the hammer; has applied it, with considerable advantage, to the points of small drills, by hammering them upon their flat surfaces.

On improving the Edges of Square Broaches, or Boring-bits, by Hammer-hardening them.

Mr. Joseph Clement, an excellent workman, and mechanical draughtsman, informed the Editor, since the publication of Mr. Turrell's great improvement in gravers, that a friend of his in Scotland, many years since, improved the quality of his square broaches, by hammer-hardening them cold, after being hardened and tempered upon their flat sides. He, however, kept this process nearly a secret.

The Editor thinks it would have been much better *to have hammered them upon their angles, as Mr. Turrell does his gravers,* which would have had a much better *condensing* effect; and then to have ground them again, to bring up the blunted edges to their proper figure for use. The five-square broach is also equally susceptible of improvement in this way. [*Tech. Repository.*

Experiments showing how quickly Lime imbibes Carbonic Acid Gas, and is injured by Exposure to Air: Practical Inductions, &c.

On the 22d of August, 1776, I exposed two pounds avoirdupois of well-burned noneffervescent chalk-lime, in fragments of the size of a walnut, spread on a board, in a dry unfrequented room. I exposed the same quantity of this lime, at the same time and in the same manner, in a passage through which there was a constant current of air; and I put the same quantity of this lime, in fragments of the same size, in a box which might hold as much more of it, and placed the box loosely covered with its lid, close by the first portion of lime.

In twenty-four hours, the superficial lumps of the first parcel cracked in some parts a little, those of the second cracked more, those of the third were not visibly altered. In forty-eight hours, the first parcel cracked so much as to fall into smaller fragments on being moved, and these were reducible to powder by pressing them between the fingers: The second parcel underwent the like or rather a greater change, for it was more cracked and friable: The third now begun to crack in the superficial parts.

On weighing them, I found that the first parcel weighed 2 lbs. 5 oz., the second, 2 lbs. 6 oz. 1 dr., the third, 2 lbs. 1 oz. 10 drs.: I then returned them to their former stations.

In six days, the first parcel weighed 2 lbs. 10 oz. 7 drs.; the second, 2 lbs. 12 oz. 1 dr.; the third, 2 lbs. 4 oz. 8 drs.

In twenty-one days, the first parcel weighed 3 lbs. 1 dr.; the second, 3 lbs. 2 oz. 1 1-2 dr.; the third, 2 lbs. 6 oz. 8 drs.

During this increase of weight, the fragments split into smaller pieces, but did not fall into powder, except in a small part of them, or when they were handled.

By similar experiments made on well-burned stone-lime, I found that this imbibes matter from the air nearly in the same manner as chalk-lime, but rather more slowly; which I think is owing to its closer texture.

On exposing common chalk, or stone-lime, in the same way, I find that it increases in weight much less and more slowly.

To discover the quantity of water which the lime imbibed from the air, and which contributed to this increase of weight, I put each parcel in a glass retort; and adjusting to it my apparatus whereby all that is condensible is saved, whilst elastic fluids are at liberty to escape, I found that the quantity of water contained in each parcel of lime, was nearly in some, and in others accurately 1-24th of the gained weight, the remainder of the weight gained was of carbonic acid gas mixed with a little air, which latter I do not reckon, because it was already weighed in the lime.

If a glass bottle be filled with fragments of well-burned chalk-lime, or stone-lime, or shell-lime, and well stopped with a ground glass stopple slightly waxed where it fits the neck of the bottle, the lime will remain unaltered in weight, or in any other known particular, for a year or two; as I have repeatedly experienced: even the phosphorescence of lime is thus preserved in its full lustre, for a year or more.

Thus it appeared that well-burned lime imbibes carbonic acid gas from the air, the sooner, as it is the more fully exposed to it: that lime imbibes this matter from the open air, the more greedily as it is more perfectly deprived of it previous to the exposure: that lime cannot be long preserved unaltered in any vessels which are not perfectly air-tight, but may be kept uninjured for any time in air-tight vessels filled with it: that chalk-lime, by reason of its sponginess, or by some other condition of it, requires to be kept less exposed than stone-lime, and well-burnt lime less exposed than common lime, to render the depravation of them equal in equal times: that if carbonic acid gas imbibed by lime previous to its being used in mortar, be as injurious to the mortar, as the carbonic acid gas retained in equal quantity by ill-burned lime is, lime grows the more unfit for mortar every hour that it is kept exposed to air, whether in a heap, or in casks pervious to air.

I think, moreover, that these experiments show that lime undergoes these changes by exposure, much quicker than has been suspected; since well-burned chalk-lime kept in a dry room, imbibes near a pound of carbonic acid gas in three weeks, in the summer season.

Not to trust to theory what I could prove by experiment, I did not rest satisfied with the observations and reasons which might persuade one, that lime, which has imbibed some carbonic acid gas, is as unfit for the uses now under consideration, as lime which retains an equal quantity of the like matter by reason of the deficiency of heat in burning it.

I tried parcels of well-burned chalk and stone-lime, some of which were used fresh, others exposed two days, others six days, others twenty-one days, in the same circumstances; by making several specimens of mortar with them, and exposing the specimens in the manner already related; and in a few months I was satisfied that the specimens made with fresh lime were the hardest and best, and that the others were worse, as the lime of them had been longer exposed; for those made with the lime which had been exposed three weeks and had gained four or five ounces to each pound, were so easily cut or broke, so much affected by moisture and drying, and so liable to break off from the tiles, as to be utterly unfit for the ordinary uses of mortar.

After this there remained no doubt that lime grows worse for mortar every day that it is kept in the usual manner in heaps or in crazy casks; that the workmen are mistaken in thinking that it is sufficient to keep it dry; that lime may be greatly debased without slaking sensibly; and that the superficial parts, of any parcel of lime, which fall into small fragments, or powder, without being wetted, and merely by exposure to air, are quite unfit for mortar; since this does not happen until they have imbibed a great deal of carbonic acid gas.

I now saw more clearly another cause of the imperfection of our common cements. The lime being exposed a considerable time before it is made into mortar, and drinking in carbonic acid gas all the while, the quicker as it is the better burned, is incapable of acting like good lime, when it is made into mortar; and often approaches to the condition of whiting, which with sand and water makes a friable perishable mass, however carefully it be dried.

[*Higgins' Experiments and Observations.*

ON BLACK DYEING,

AS APPLIED TO WOOLLEN CLOTH AND HATS.

THE dyeing of black has deteriorated so much within the last forty years in England, and in this country as the copyist of England, that the colors would be considered as unwearable, were not the cloths as evanescent in their fabric as the colors are fugitive. The faint miserable colors given to the blacks in the present day, has been mainly the result of the prevailing passion for cheap goods. To meet and indulge that ridiculous unprofitable passion, the manufacturer has been compelled gradually to make his goods in the most flimsy manner, and the dyer to make his color at as low a rate as possible. So much has the dyeing of black been lowered in the west of England, that a piece of twenty yards of broadcloth which forty years since was charged thirty shillings, is now done for six shillings and eight pence, and the dyer makes nearly the same profit now as he did then.

Before the year 1790, all the black cloths dyed in England, excepting the coarser grades, were colored blue in the woad-vat previous to their receiving the black dye; and a considerable portion of nutgalls was used with logwood, &c. in finishing the color. All the black cloths brought from England, have a white and a blue rose near the end. The white rose was designed to show that the cloth was white previously to its being dyed blue; for, as cloths dyed other colors, if found defective, were usually dyed black to cover their imperfections, and as repeated colorings were found to injure the texture of the goods, the dealers would not give the same price for cloths without the white rose. The blue rose was designed to show that it had received the blue dye, and the color of the rose was considered a criterion of the depth of the blue given. The white and blue roses are still preserved; but the blue is never put on, excepting by dipping a corner of the cloth in the blue-vat, and by tying a rose on that part. Nutgalls, which were found to give permanency to the colors, have also been exploded as too expensive; and the blacks now given to the public, are dyed with only logwood, fustic, and sumach. The latter being the only material in the composition that has any tendency to impart the least degree of permanency to the color, and that is necessarily used in such small portions, to preserve the blue bloom of the now fashionable colors, as to have but little effect in checking the fugitive dye of the logwood.

The French and the Germans have always made much better black, and given to that color a far greater degree of permanency than the English. I am aware that this opinion will be considered as high treason by English agents, through whose influence the most flimsy goods, and the most miserable colors, have become fashionable in this country, and the public taste in this particular, been materially vitiated. To prove the correctness of this opinion, I need only request any citizens, who have an opportunity of doing it, to compare an English black that has been worn three months, with a French black that has been worn the same time.

The color put on hats is even more fugitive than that put on the cloth; and it is high time that our dyers, both of woollen and hats, should pursue some mode of giving more permanency to their colors. The primary object of this essay is, to show them how this can be effected, without any additional expense to the operator. I am aware that it would be worse than useless to attempt to bring our dyers back to the old expensive but highly permanent process of giving a woad-blue to their goods before coloring them black: for the public taste has become so highly vitiated by the passion for cheap goods, that firmness of fabric, body, and permanency of color, and every other quality that give to them an intrinsic value, are now never taken into consideration. As giving a blue ground is out of the question, and as the nutgalls, the next most permanent mode, must also be resigned as too expensive, I have to direct the attention of our dyers to a material growing abundantly in this country, which answers even a better purpose than nutgalls, and will cost no more than the process now pursued.

Most persons living in the interior of the country, know that the bark of the swamp-maple will make good black ink, though they may not be aware that four pounds of this bark, dried and ground, are equal to one pound of the best galls. The black obtained from this bark is equally as permanent as that from galls, and as the bark gives a much smaller portion of extraneous precipitate, it will clean better, and make a much brighter color. Those dyers who formerly used nutgalls, will know what quantity of swamp-maple to use to a given quantity of logwood; but I should suggest to more modern dyers to leave out one pound of logwood for every pound of bark used by them.

Some few of our woollen dyers have, at my suggestion, used the maple bark for three or four years, and their colors are much esteemed both by dealers and consumers. Should the colors prove too blue, they may be altered to any hue by the use of sumach or alder bark. W. P.

[*New-York Statesman.*

GURNEY'S STEAM COACH.

This beautiful specimen of mechanical invention appears at length to be brought to a state of perfection, beyond which we hardly think it possible to make any essential improvement. We had an opportunity of witnessing the operation of this machine on Wednesday last, through the Albany road, and the streets adjacent to the Regent's Park; and we should say its progress could not have been less than at the rate of 12 miles per hour; and in some parts of the road, where the rain had not rendered the gravel extremely heavy, the speed of the carriage could not have been less than 14 miles an hour. From the late improvements by Mr. Gurney, with a view of producing a uniform supply of water to the boiler, (or rather the steam generating pipes,) and also in order to produce a regular *blower*, or current of air, through the fire-chamber, the difficulties which maintain an adequate supply of steam, appear to be completely obviated. To persons not acquainted with the numerous difficulties which present themselves in bringing into full operation such a complicated piece of machinery, it would be difficult to obtain an adequate opinion of the merits of this invention. We have, from time to time, examined its progress in detail; and we have no hesitation in saying, that the arrangement by which the supply of water to the steam-pipes is ejected by Mr. Gurney, is one of the most beautiful specimens of ingenuity we have ever witnessed, among all the curious applications of the steam engine, either for stationary purposes or for propelling vessels. The difficulties are almost inseparable, in order to reconcile the necessary power required for propelling a carriage of this kind, with the prejudices of fashion which prevail, with regard to the appearance of a stage coach. The necessity of consulting appearances, has, in fact, greatly added to the difficulties of bringing this invention to perfection, as a vehicle for passengers.

But it appears to us that the ingenious inventor has at length vanquished all the obstacles, both with regard to maintaining a uniform speed, at discretion, or at least 10 or 11 miles an hour; and, from having the centre of gravity below the horizontal line of the axles, the risk of overturning seems to be entirely obviated. We understand a carriage will be completed to carry passengers, in the environs of London, in three weeks or a month from the present time. Taking into consideration the perfect control of the engine, and the uniformity with which it is now capable of being managed by an ordinary conductor, we should say there is scarcely a possibility of its not ultimately superseding the use of horses in running four-wheel carriages, for the conveyance both of goods and passengers. We believe it is estimated, that the expense of conveyance may be reduced to one-half or two-thirds of the present average charge of stage coaches. [*Lond. Week. Report.*

CEDAR TREE.

To the Editor of the American Farmer:

Sir,—The following account, which I find in the *Richmond Enquirer*, of an incident which is stated, I believe, to have taken place in that city, discloses the existence of a new and important property in the cedar tree. An answer, however, to the following query, which I take the liberty of proposing through the columns of your valuable paper, may render the discovery more complete, and obviate a difficulty I have heard started, as to the means of turning the accident to advantage:—It is well known that there are two species of cedar, whose qualities are so different, that whilst one may be possessed of the property mentioned below, the other may be entirely devoid of it. To which of these kinds of cedar does the power of conducting the electric fluid belong?

J. S. Skinner, Esq. *Baltimore, Oct. 29.*

Lightning.—A house, occupied as a gig-maker's shop, was struck with lightning; it was built of wood and covered with pine slabs, and the rafters composed of *oak* and *cedar*. A cedar and oaken rafter are joined at top, a cedar piece and oaken piece making one rafter; and in putting them up, the cedar and oaken parts of the rafters are placed alternately on each of the sides of the framing.—When the lightning struck, it commenced at the southern extremity of the building, and in every instance shivered the oaken parts of the rafters, and did not so much as leave a sign of its touch upon the cedar. The electric fluid actually skipped over every rafter of cedar, and rent in splinters every one that was of oak; and, although the cedar and oaken rafters were nailed together at the top, yet, wonderful to tell, even the iron appeared to lose its attractive quality, and the cedar was left untouched, the fluid seeming to evade the cedar and spend the whole of its violence upon the oaken rafters, splintering them upon one side and the other, throughout the length of the building.

It is stated in the same journal, that there never has been known an instance of a cedar tree having been struck by lightning. If this be true, it is an invaluable discovery to ladies and gentlemen who are nervous in a thunder storm.

The laurel, also, was thought by the ancients to be a tree invulnerable to, or rather sacred from the thunder stroke. Hence a wreath of it was a proper reward for heroes. We do not know whether modern science has found any reason in this ancient superstition.

To stain Horn in imitation of Tortoise-Shell.

Take an equal quantity of quick-lime and red-lead, mix it up with strong soap-lees, lay it on the horn with a small brush, in imitation of the mottle of tortoise-shell; when it is dry, repeat it two or three times.

Another Method.—Grind one ounce of litharge with half an ounce of quick-lime, to the consistence of paint with a sufficient quantity of liquid salt of tartar, put it on the horn with a brush in imitation of tortoise-shell, and in three or four hours it will have produced the desired effect; it may then be washed off with warm water: if not deep enough, it may be repeated.

Another Method, still better.—Take a piece of lunar caustic, about the size of a pea, and grind it with water on a stone, and mixing with it a sufficient portion of gum arabic to make it of a proper consistence, you may apply it with a brush to your horn, in imitation of the veins of turtle and tortoise-shell.

Note.—It would, perhaps, be as well to mix with it a portion of red-lead, or any other powder, to give it a body. This, if properly applied, will stain the horn quite through without hurting its texture or quality; only be careful when the horn is sufficiently stained, to let it be soaked for some hours in plain water previous to finishing and polishing it. [*Cabinet-Maker's Guide.*

To make Composition Ornaments for Picture Frames, &c.

Take any quantity of whiting, as much as you think you shall have occasion for, for the present use, mix it up with thinnish glue to the consistence of putty, and having a mould ready, rub it well all over with sweet oil, and press your composition in it; take it out, and you will have a good impression, which you may set by to dry, or, if wanted, you may, before it gets hard, apply it to your work with thick glue, and bend it into the form required for the angles of your frames, &c.

Note.—If you have not a mould at hand, you may make one of the composition from any leaf or pattern you may wish to copy, and letting it get quite hard, use it as a mould, first oiling it well.

You will find this composition of great use for copying any pattern you may wish from good models. [*Ib.*

AGRICULTURE.

CULTURE OF HEMP.

THE following remarks upon Hemp, we have compiled by request of several subscribers. We have inserted selections on the culture and management of this article, from various authors, in former numbers; but, although there may be some repetition, we hope that further attention to the same subject, may not be entirely useless.

Hemp, (says Loudon,) is one of the few plants employed in agriculture, which have the male and female flowers on different and distinct plants. This circumstance has some influence on its culture for seed.

Soil.—The soil best suited for hemp, is a rich, deep, mellow, vegetable mould. A deep alluvial soil, or such as is better known by the name of intervale, also produces it luxuriantly, and if it be moist, or more inclining to moisture than dryness, it will be still better. It was formerly cultivated on such soils, (in this State,) during the Revolution, for the purpose of being manufactured into twine, &c. for nets and seines. Almost any soil, however, if it be not exhausted, or if it be well manured and *well worked*, will produce it abundantly. It is important that the soil should be well pulverized. Indeed, most of our New-England farmers fail in this important part of cultivation; they do not use the plough and harrow enough. Old grass lands, that have been broken up, and have had one crop of potatoes, or corn, taken from them, would be suitable. It is not necessary that the soil should be extremely rich; for in this case, the hemp will grow too luxuriantly and coarse. On the other hand, it should not be very poor; for the crop will, of course, be thin and light.—The ground should, if possible, be ploughed in the fall, that it might have the benefit of the frosts of the winter, and spring ensuing. If fall ploughing cannot be effected, however, it should be done as early in the spring as possible, and well pulverized.

Time of Sowing, &c.—Hemp should be sown as early in the spring as the frost will permit. It is generally sown broadcast, or as wheat and rye are sown in the country. Great attention should be paid to harrowing it in; that the ground be well broken and no hard lumps or clods left. For this purpose, a bush-harrow should be used. in conjunction with the common kind, and a roller would be highly useful.

The quantity of seed, to be put upon the acre, must vary according to the quality of the soil. The judgment of the farmer, and the object he has in view, must regulate this. From two to three bushels, however, may be considered as the average quantity per acre. The seed should be good,—have a plump appearance, and be fresh, heavy and bright. No particular culture is required after it is sown, except, that, in some instances, the weeds are pulled out; this, however, is very seldom done, as the hemp springs up and choaks the weeds. On this account it is often sown for a weeder upon a soil that has become foul with weeds; "the quickness of its growth and the exclusion of the free circulation of air about its roots, occasioned by the largeness of its leaves, killing or suffocating all sorts of weeds or under growth."

Time and Mode of Gathering.—There are different rules observed, with regard to the time of gathering hemp. Some harvest it as soon as it is out of blossom. Perhaps a better criterion is, the change of color, which takes place very soon after the pollen of the male plant, has become matured, or, in other words, as soon as the male flowers begin to wilt. The leaves turn yellowish, and become somewhat speckled. In some countries, they sow their hemp in drills, or rows, and pull or reap the male plants as soon as they begin to change. The best way, however, for saving seed, is, to sow a separate field for this particular purpose. After the seed is threshed out, the fibre, or lint, can be obtained. It is best to reap or cradle it. The following letter, from an experienced cultivator of hemp, gives us valuable information on the subject:

"There is no invariable rule as to the time of cutting hemp planted for seed, by the general complexion of either the male or female; but particular care must be had to the color of the seed, when the hull that encloses it is taken off. The seed should be generally changed to a grey or brownish cast. If two-thirds of the seed wear that appearance, the sooner you cut the better. It should be bound in small bundles immediately after cutting, and set up in small stacks,—from four to six bundles in a stack—binding in all the branches, by putting three bands round the same, near the top of the shocks or stacks. It may stand in this situation until dry enough to thresh,—say from five to ten days, as the weather may be for drying.

The seed may be threshed in the field on sheets made of strong cloth, or on a floor. Great care should be used in moving the hemp to the place of threshing. If threshed in the field, it should be moved on a cloth attached to two poles, like hay-poles, to save the loose seed. If removed to a barn, it should be done on a cart or waggon, with a cloth or tight box.

We clean with a common fanning-mill, taking care to give the the proper speed, and to guage every part to suit the weight of the seed.

After the seed is cleaned and put into bins or casks, it will be well to shovel it over, to prevent it from heating. I am quite sure that seed kept from heating and from wet will be good as long as three years, if kept cool in the summer.

If your hemp is sown broadcast, and you design to save the seed, cut it when about half the seeds have begun to change their color, and proceed as above directed—only you will thresh within four fair days, *without breaking the bundle*, and put the hemp under cover to completely cure,—and when thoroughly cured, you may thresh again, breaking the bands as other grain.

Mr. Lewis Buffet, of Scaghticoke, the last year, sowed five bushels of seed on two and a half acres of land. He cut his hemp with a cradle, and practised as here directed. He saved sixty-six bushels of seed, of a good quality; and his share of the hemp sold for seventy-two dollars, after paying for the dressing in hemp. Total value of the lint, one hundred and eight dollars. Such hemp, when broken in an unrotted state, and subjected to a water process after breaking, and properly cleaned, will equal the best Russian hemp.

We use the common corn-cutter for cutting planted hemp; but use it carefully, so as not to jar off the seed.

In all cases where you wish to save the lint, you will be careful to put the stem under cover as soon as you can, to prevent it from being stained by the weather.

N. B. Use the common flail for threshing.

I am in great haste,

Your obedient servant,

JOSEPH HINES.

Stillwater, N. Y., Aug. 21, 1828."

The hemp, when cut, should be suffered to dry a day or two, then bound up in small bundles and shocked together, or housed until it is put into the water to rot.

Rotting.—This is performed in various ways: By water—by exposure to the dews—by steaming, &c. &c. The object of it is, to separate the lint from the epidermis, or outer skin, and also from the inner part of the stalk, to which it adheres, by means of mucilaginous or other matters. The lint also probably contains some coloring, extractive and other vegetable matters, which must be cleared away; and the more perfectly this is done, without injuring the texture and strength of the fibre, the whiter and better will it be. This is effected by a slight putrefaction of the mucilage, &c. And it has been found by experience, that *water* is preferable to any other agent. The water used for this purpose, should be soft, that is, contain no lime or salts; and it is best that it should have some slight motion, in order to wash away gently the matter which may be separated from the lint. A pond that is clear and pure, and whose waters are agitated by the winds; or a gentle stream is suitable for the purpose.

Stagnant waters were formerly preferred, because they were not only thought to have produced the desired effect in less time, but also, from an idea that running water would make the fibre "red and towey." This may be the effect in some streams that are rapid, or that contain any ferruginous matter.

The hemp should be completely covered by the water, but it is thought best not to touch the bottom. Stakes may be driven into the bottom of the pond, or stream, to prevent the hemp from floating away, and boards or planks put over it, with stones upon them, if necessary, to keep it completely immersed. The bundles should be laid crossing each other. The hemp should continue under water, until the fibre will separate from the other parts of the stalk, and no longer. To ascertain this, take out a handful of the hemp, dry it, and rub it between the hands; if it separates easily and perfectly, it is time to take it out. The length of time to effect this change, must depend very much on the temperature of the water, and weather. It is generally accomplished in *five days*, —say from five to ten days. Particular attention should be paid to it, for if suffered to remain in the water too long, it will be injured. It is in this part of the process that experience is the most required, and a thorough knowledge of it the most important step, or point, to be gained; for on its management in rotting, or *wretting*, as it is sometimes called, depends the strength and beauty of the fibres, and consequently its value. The farmer, therefore, who is unacquainted with rotting it, should proceed with the utmost care and caution, lest he spoil his crop and lose his labor.

Management after being Rotted.—After being rotted, it should be taken out, and dried as speedily as possible. This may be effected by untying the bundles, and spreading them on some clean grass, or, by standing them up on the butts, against fences, &c. No considerable rain should be allowed to fall upon it, while drying. When sufficiently dry, it should be put in some dry but airy situation. Great care should be taken that no dampness comes upon it, for this would make the fibre rot. and when this takes place, it will be likely to communicate to the whole heap.

Mode of Dressing.—The ingenuity of man has devised a great variety of machines for dressing or breaking hemp and flax. The most simple kind, however, and one that may be made by any farmer, is a modification of the common brake. by Mr. Bond. This brake is made heavier than common, which may be done by using heavier materials, or by loading a common kind by weights. A piece projects behind, and a wheel is attached with cogs, or kams, to raise or move it, in the same way that a trip-hammer is moved. The moving power may be either horses or water.

If the hemp be very long,—say eight or ten feet. some recommend to cut it in two. Care should be taken to keep the long and short hemp separate, and the butt and seed ends ought not to be put together. It should be dressed perfectly clean. About twelve handfuls make a head, which should be tied by a small band near the head. or largest end, and then packed into bales of such sizes as suits the convenience of the farmer or purchaser. Great care should also be taken to keep it perfectly dry.

GENERAL REMARKS.

Some people have objected to the raising of hemp because it is an exhausting crop. It is not, probably, more exhausting than wheat. The following letter affords good evidence that it need not be feared on that account.

"*To the Editor of the Bellows Falls Intelligencer:*

"Sir,—In answer to the questions you have been pleased to ask in relation to the culture of hemp, &c., I can briefly remark, that during the years 1813, 14 and 15, I sowed upon my farm about one acre of hemp: it was sowed upon what it is termed meadow land, upon the Connecticut river, and was continued upon the same piece of land three years successively. There appeared to be no very essential difference in the several crops. either as to quantity or quality. It may be proper to remark, that during this time no manure was put upon the land. The great labor then required to water-rot it in the stem, rendered the growing of hemp both expensive and burthensome and finally induced me to relinquish it altogether. From my own experience on the subject, I am fully satisfied. that a hemp crop *is not what would be called an exhausting crop.* but may be successfully and profitably cultivated upon good land, with the same attention that we usually bestow upon our grain and other crops.

Under this conviction, and the additional inducements of obtaining a market for hemp without the process of water-rotting, which is superseded by a newly invented machine for cleaning, I have engaged to plant a part of my land the ensuing season for the purpose of raising a crop of seed; in order to be in preparation to raise the lint the following season. I am, Sir, &c. AMOS PARKER.

Springfield, Vt., Oct. 10, 1828."

From four to eight hundred pounds of fibre may be considered as a fair crop per acre.

On the use of Sand in Propagating Trees, Shrubs, and Plants, from cuttings of them. By Mr. THOMAS HAYNES, *of Oundle, Northamptonshire.*

"THE *finest white sand is superlatively useful to autumn-planted cuttings of the more tender evergreen trees and shrubs.* In the business of planting cuttings of these under hand-glasses, in the autumn, as well as the more hardy green-house plants, such as myrtles, faschia, roses, cistuses, germander, &c., no unmixed soil whatever can be found to bear a comparison with the *finest white sand;* as cuttings planted therein will be far more secure from mouldiness throughout the autumnal and winter seasons; during which times, the pots in which they are planted, generally remain standing up to their rims in the common ground, as the greatest preservative from frost; but in which situation, they are more exposed to the ill effects of damp, than if standing on the surface.

"Although but little more than a knot, or a swelling protuberance, at the foot of each cutting, can be effected, during the first autumn; yet, on the advance of spring, they will early make roots, even without the addition of any other soil or article to promote their growth; and which young plants, being potted off, or transplanted in some way, as soon as they have formed sufficient roots; immense *quantities, from these small cuttings, may thus be annually propagated,* by the help of full sized single hand-glasses! This process, however, will not extend to any other description of plants than the evergreens.

"In the propagation of the trees and shrubs alluded to by this process, it must be recollected, that the sand is to be considered as no farther essential, than to strike or promote growth in the cuttings, sufficient for transplantation; as, on their being removed into another situation, in the next stage of the process, a mixture of suitable soil, with a proportion of sand only, will be requisite.

"We are not asserting that *yellow sand* will not equally apply in both cases, of planting cuttings of hardy evergreen trees and shrubs, both by summer planting, in the open exposure, and autumn planting, under hand-glasses; but in all the experiments we have witnessed, and throughout the whole of our own practice, *white sand,* where it could be obtained, has been invariably applied, and most successfully.

" When we reflect, that *mouldiness* is the chief annoyance to cuttings of almost every description, when planted under hand-glasses; every propagator should strenuously guard against it: and we know of nothing *so likely to discharge wet, and prevent undue retention of moisture, as sand alone;* and this, in preference to every other soil and compost.

" There are few soils with which sand cannot be intermingled to the greatest advantage in various other branches of horticulture, as well as in the propagation of plants and flowers; it being admirably adapted, from its loose and open nature, to expand the pores of heavier, more close, and adhesive soils, thereby opening the entire mass of compost, and rendering it porous, and open to the free admission, and full expansion of the delicately fine, and thread-like roots of plants and flowers; and in which we have most satisfactorily witnessed its singular and superior efficacy! We have known in various cases, plants to have been placed in soils most opposite and ungenial to their natures and constitutions, and thereby early inclining to decay; but which were speedily restored to their original vigor and complexion, by a proper and timely application of white sand.

" The sand which has invariably been found to surpass all others for general and special purposes in horticulture, is *a peculiarly soft and fine white sand, of an unusual smoothness, nearly as fine as flour-emery.*

" Where none other than the common white sand, which is usually coarse, can be obtained, small quantities of the most fine can be sifted out with a fine sieve. [Or still better procured from it by washing over.—*Ed. Tech. Rep.*]

" Little argument can be necessary to convince the unprejudiced florist, gardener, or amateur, of the general utility of suitable sands being mixed with the more cold and heavier soils; thereby rendering them open and porous to discharge all copious falls of rain, dissolving snow, &c., and which tend to overcharge adhesive soils with an undue proportion of moisture, and thereby to chill and starve the stock of plants and flowers." [*Tech. Repository.*

SALIVATION OF DOMESTIC ANIMALS.

Fayette, Ky., Oct. 5, 1828.

MR. SKINNER,—In No. 28, Vol. 10, of the *American Farmer*, (to which I am a subscriber,) there is a communication from Mr. J. W. Jeffreys, of N. Carolina, enclosing some reflections " On the Salivation of Horses," by C. S. Rafinesque, late of Lexington, Kentucky.

It is the object of this notice to correct several mistakes into which the latter gentleman has fallen, in treating of a subject about which he had no practical knowledge.

He says, no other domestic animal is liable to the excessive flow of saliva of which he speaks, and which is so extensively and injuriously known among us, but the horse and the cow, and the latter only slightly. This is not true. Hogs are quite as liable to it as cows. I have seen every hog on my farm, of all ages, amounting to several hundreds, afflicted with it at the same time. I never knew it terminate fatally in any animal but the horse.

The disorder is attributed by him, to two plants or weeds, which are not uncommon in this region, viz: the Euphorbia hypericifolia, and the Lobelia inflata. This, I apprehend, is also incorrect. The former weed abounds among us; but, as he truly states, hogs do not eat it; yet they are more subject to salivation than any animal beside the horse.—The latter weed does not grow on my plantation, nor in my vicinage, and yet my stock, especially my hogs, are annually more or less salivated.

This disorder is a very disagreeable one, and extremely injurious to our stock; one which every body can account for as they suppose, yet one which all allow to be perpetuated among them. I have no theory on the subject, but I will state a few facts which I have observed for some years.

I believe most domestic animals are subject to the disorder. Horses, cows, hogs, sheep—and even my goats, I have seen salivated.

The condition of the animal at the time, whether fat or poor, sick or well, seems totally immaterial—all being equally liable to be attacked.

The period of its arrival, and length of duration, are uncertain; except that it is never seen but in warm weather—and other things being equal, the warmer the weather the worse the salivation. It lasts from six weeks to five months. It seems to be much more violent during a dry than a wet summer.

Stock, grazing on red clover of the first or second crop, on a recent harvest stubble of any kind, or on an unmixed blue grass pasture of recent formation, are not often salivated.

On the contrary, stock pasturing on red clover older than the second crop, on an old white clover field, or on pasture land of any kind very closely bit down, are very liable to be salivated.

The free use of water and of salt, will greatly mitigate the disorder.

There is a very large weed found in the corners of fences, and in other rich, untrodden spots, common among us, called the *rich* or *bull weed*, which all stock, but especially horses, are very fond of, that will mitigate the flow of saliva in a few hours, and stop it in a few feeds, if the animal has not access to whatever originally produced the disorder.

The disorder may be always cured in a day or two, by feeding the animals on any kind of grain whatever. I have seen a horse salivated and cured several times in a week, just as his food was changed.

Upon the whole, I do not pretend to know what is the immediate cause of the disease; but I am satisfied that it is produced by something taken into the stomach of the animal, and that it can always be cured in a few days at farthest, by resorting only to nutritious and healthy food. It seldom produces death, except in aggravated cases, attended with great neglect. I do not think it is attended with pain, nor even by soreness about the mouth or salivary glands, but produces its effect by a perpetual wasting away of the principle of life. It unquestionably produces no constitutional injury; for all you gourmands know the excellency of our beef; the most patriotic citizen in St. John's Colleton will testify to the lusciousness of those swine which have become his abomination; and I doubt not Mr. McD******, himself, rides a blood-horse exported from Kentucky by the Downings, in his circuits through his district. If you think it of any consequence, you can use these remarks, which are of no other value than as they may correct errors, which are given dignity to by be being circulated in your paper. Your obed't serv't, B.

[*American Farmer.*

FOOT ROT IN SHEEP.

We are sorry to hear that this troublesome disease continues in some flocks. It is, however, principally confined to the Saxonies. It is hoped that no pains will be spared to eradicate it. The following recipe will be an excellent accompaniment, to the wash laid down in the 2d No. of this volume; and if but one can be used, it would be better to use this, because it will adhere to the foot much better.

The following mode of treatmeat is recommended for this most troublesome disease in sheep, by a very intelligent and highly distinguished gentleman residing in Vermont, in a letter to his friend in Boston. This gentleman was among the first who introduced the fine-woolled sheep into this country, and is now the owner of a very large flock of the finest woolled sheep, many of which were imported direct from Saxony, and are of the purest blood. The opportunities this gentleman has had, both in Europe and in this country, for investigating the causes and effects of this disease, renders his advice invaluable; and every wool-grower should preserve these directions as a rich legacy from one of his country's benefactors.

"By great attention with dry, hilly, sound pastures, the constitution may be so improved that we may ultimately eradicate this vexatious and injurious disease. My remedy has been as follows: When the sheep were only slightly affected, to put on one, two or three dressings of blue vitriol, powdered fine, either dry, or mixed with olive oil, to the consistence of soft salve, and when the fœtid smell has subsided, dress with white-lead, thinly mixed with olive oil. When olive oil is not at hand, hogs' lard will answer, or even dry white-lead. If the disease is bad and has taken deep hold between the horn and the sensible part of the hough, there is no remedy short of paring away the horn as far as it appears unsound, and cutting away the livid flesh, when apply the blue vitriol as above, until the fœtid smell has subsided, when finish the cure with white lead. The sound flesh may readily be distinguished from the diseased, by the former's bleeding freely, and the blood and flesh having a bright and lively appearance, like a fresh cut in a healthy part of the body, whereas the diseased part will be of a greenish brown, or liver color. At this season of the year, when the horny part of the hough is pared off, it will be necessary to put on a boot made of sheep-skin, and moderately tied with a woolled string, round the fetlock joint, to defend the hough from cold and dirt. The boot ought to be daily washed in strong soap-suds, and every four or five days replaced with a new one. The sheep ought to be dressed every morning, and before each dressing, the diseased part ought to be well washed with warm, strong, soft soap-suds. Prior to driving the sheep into the pen to be dressed, it will be well to sprinkle the pen over with slacked lime, to prevent the disorder being increased by contact with the infectious matter. Much attention ought to be paid to the separating the lame sheep from the flock, and when cured, to their being taken from the lame flock. Attention ought also to be given to the cleanliness of their sheds, and that they do not run on wet ground. Sometimes lameness proceeds from cracks between the houghs, i. e. the skin which connects the two houghs together; but the milder type of the foot-rot also often commences between the houghs. They are, however, easily distinguished from each other, for in simple cracks the hough retains its natural coolness, whereas foot-rot is invariably attended with heat in the hough, particularly about the crown, i. e. the part between the horn and the hair. For simple cracks, soap-suds and white-lead are sufficient. One part oil of vitriol and three parts water mixed, is used by many instead of blue vitriol. Attention ought to be paid to cleaning the issues. Pure water and as much salt as they will consume, are at all times necessary to the health of sheep." [*N. E. Farmer.*

GOOD BACON.

The following is the mode of curing Bacon in Virginia, laid down by a gentleman of the Isle of Wight county, who had much experience in the process. It is needless to say that Virginia hams enjoy a reputation scarcely short of those from Westphalia. There is a considerable quantity of Bacon cured in this part of the country, but often in a manner so injudicious, that the meat becomes excessively hard, its flavor is lost, and the palate is regaled with nothing but a villainous compound of salt and smoke. The suggestions contained in it may also be of service in the curing of salmon.

"To have good Bacon, the pork must be fat; it may *possibly* be too fat, though that is very rarely the case in Virginia. Hogs about 18 months old, which are raised poor, and afterwards well fatted, in a *short time* on *corn*, are, I think, decidedly to be preferred. Before the pork be salted up it should be thoroughly cold, a circumstance indispensable to its lasting preservation; and it is at least the safest course, in our uncertain climate, to lose no time afterwards. To give bacon its most exquisite flavor, both molasses or sugar and saltpetre should be used. I usually put a table-spoonful or two of molasses on the flesh side of the ham, a little before it is salted, and after the molasses is rubbed over it, a heaping table-spoonful of finely pulverised saltpetre; the ham supposed to weigh, when cured, from 12 to 15 lbs. I put nearly the same quantity on the middlings and shoulders, and proportionably on smaller pieces, believing that it essentially contributes not only towards improving the flavor and appearance, but also to the preservation of bacon, and as a preventative against the worm, bug, and skipper. In order to ensure perfectly sound bacon, the pork must be salted at least *twice*. The second salting should take place about the third day after the first, at which time I add about a third of the quantity of saltpetre applied in the first instance. If, however, the pork should be frozen when salted in the first instance, it should be re-salted as soon as practicable after it thaws, without which there is great danger of injury. I use the Liverpool sack salt, and prefer it on account of its fineness. A bushel to the thousand weight of pork is perhaps quite enough. Care should be taken to let the brine drain off from the pork, whilst in salt, as its contact with it tends to injure its flavor. If salted in casks, there should be a hole in the bottom after the second salting, that the brine may escape. There are different opinions as to the length of time the pork should remain in salt. I would recommend four weeks. If saltpetre in sufficient quantities be used, *fat* pork can scarcely be made too salt. I have known prime excellent bacon to have remained in salt more than three months.—The last operation in the curing of bacon is the smoking of it. This may be sufficiently well done perhaps with any kind of wood, but strong solid green wood, as hickory or oak is the best. Contrary to old opinions, the operation is carried on in the closest smoke-house; a considerable degree of heat, too, is not only perhaps not injurious, but promotes and facilitates, I believe, the operation. The old idea of the fire-tainted meat is erroneous. The effect, so called, is occasioned by the pork not being thoroughly cured—In hanging it up, it is most advantageous to put the joints highest, for, as they are most assailable by the skipper-fly, they are least liable thereby to have eggs deposited on them. There is an opinion which has long universally prevailed, and which I think the experience of the last winter has belied. It is, that if pork be once thoroughly cold before salting, it may with proper care be saved. This, in ordinary winters, is true. But in such a winter as the last, when the thermometer ran, in 24 hours, from between 30 and 40 to 60 and 70, and remained so for four or five days, I do not think that fat and large pork can be saved by any reasonable attention to it."

[*Virginia Phœnix Plough-Boy.*

To preserve Bacon sound and sweet through the summer.

Dear Sir,—In the *Farmer*, volume 3, page 309, you published a communication from Mr. J. W. Lincoln, of Worcester, recommending, that hams, after being soaked, should be packed away *in oats*. I followed his advice last year, and really feel so much indebted to him for the hint, that I must thus publicly thank him; and for the benefit of my neighbors ask you to republish his letter. To give you the *best* proof of the beautiful state of preservation secured by this method, I send you a ham weighing 11 3-4 lbs., you will find it perfectly fresh and full of essence—free from all sort of speck or blemish. Those practising this mode of preserving their bacon free from skippers or vermin of any kind, should recollect, that the chest or cask ought to be perfectly tight, and raised about six inches from the ground, and the oats packed in, quite tight. A ham of this size should be boiled three and a half hours at least.

[*N. E. Farmer.*

[Some people do not smoke their bacon at all. After the hams have lain in the pickle a sufficient length of time, they are taken out and hung up to dry; and after they are thoroughly dried, they are packed away in oats or wheat. Hams thus treated, will keep a long time, perhaps as long as if they were smoked or washed in pyroligneous acid.]

MISCELLANEOUS.

Cattle Fairs before the Revolution.

Before the Revolution, regular Cattle Fairs were held in the town of Hardwick, under the patronage of Timothy Ruggles, one of the most distinguished men in our county in former times. The political commotions which overspread the land swept away the custom so beneficial to the agricultural community.—We notice that the enterprising inhabitants of Southbridge, propose to revive the ancient usuage, and hold, on Saturday, the 8th day of November, a *Fair*, for the exhibition, sale, and exchange of cattle, horses, and specimens of the mechanic arts.

The beneficial effects which have resulted from the encouragement given to industry by the Agricultural Societies, have been manifested in the annually increasing numbers of beautiful and valuble animals which crowd to their exhibitions, and in the spirit of improvement and of liberal competition which has gone through the community.—The shows of these associations, while they present to observation and imitation the rarest specimens of the productions of the earth, of mechanical skill, and of *good breeding*, have not been occasions where the farmer could part with his surplus property, or supply his wants by sale or exchange. The best premium on the productions of skill and industry, is in the price they bring to the proprietor. Periodical sales have been attempted by the New-England Society, and it is said with a degree of success, although limited, not inconsiderable in application to manufactures. The experience of other countries, the best practical guide in our own, demonstrates, that such open markets are eminently useful in their connexion with agriculture. Under judicious regulations and salutary provisions for the preservation of order, and securing fairness in the conduct of business, they may doubtless be rendered advantageous to our citizens, allowing choice and competition in purchasers, without the disturbance of those scenes of tumult and blood-shed which disgrace the riotous and debased population of other lands whenever assembled

[*National* (Worcester) *Ægis.*

Hint to Stage Owners, and others, who travel in carriages in cold weather.

The inconvenience and suffering, which arise from cold feet, while riding in stages in the winter, are obviated in the north of France, by means of pewter tanks, made after the manner of water plates, fitted to the bottom of the stages, and filled with hot water at each stopping-place, which impart not only warmth to the feet in the coldest weather, but a pleasant glow of heat through the whole stage.

PLUMBAGO CRUCIBLES.

A FRIEND has just sent us a black-lead crucible, manufactured in Boston. The black-lead, or Plumbago, is from a mine in Sturbridge, Mass., owned by a gentleman of Boston, who is engaged in working it with every prospect of success and profit. This crucible is, in every respect, equal to any manufactured in Europe. It is pleasing to notice the successive steps, which our country is taking in the arts. Every day brings with it some new discoveries in our mineral treasures, or some use of them, in the various occupations of life. This person has been instrumental, it seems, in bringing into use this mineral, which heretofore was undoubtedly considered useless rubbish ; and we hope his enterprise will be amply rewarded. We are glad that men of science and capital, are beginning to turn their attention to the mineral resources of New-England. It will be found that she abounds in almost every thing of the kind, which is needed in the common arts, and which, when fully developed, will be an almost inexhaustible source of wealth and comfort to her citizens. We are promised a more particular account of the above mentioned mine and manufactory for a future number.

MUSTAPHA.

Edwards del.

SELIM.

THE

NEW-ENGLAND

FARMERS' AND MECHANICS' JOURNAL.

VOL. I. GARDINER, DECEMBER, 1828. No. 12.

MECHANICS.

THE following is taken from *Hale's Carpentry*, a work which ought to be in the hands of every "brother chip" in the nation. It is compiled from the best of the English and other authors, and presents, in a condensed form, the essence of those works which are rare, and too expensive to be purchased by our carpenters in general, and yet it is not read so much as it should be. Why are our mechanics, in general, so afraid of a book? Why is it that those, who can scarcely make a movement in their respective arts, but they put in practice some of the fundamental principles of mechanical philosophy, should be so stubborn in keeping themselves ignorant of those principles; and not only themselves, but others? Why should not a Carpenter be a philosopher, and a learned man? Is there any inconsistency in the thing? Would it injure him in the least, if he should become an adept in any of the natural sciences? Would it render him the less skilful in shingling a hovel, or planning a church?

The principal objection that has been urged against giving mechanics, &c., an insight into the sciences, and one that has been brought forward even in the councils of the State, is, "*that it will make gentlemen of them.*" Now there is no term in the English language more abused, or more vaguely used than this same word *gentleman*. If by it is meant that nondescript biped, which we sometimes see on the end of a cigar, wagging his tea-colored beaver, cracking his whip, and abusing the *waait-a-r* of a country tavern, Heaven forbid all learning. But if by Gentleman is meant, that man of a well-informed and noble mind, who understands his business and minds it—who knows his place in society and keeps it,—who is aware that he has a country, and honors it—who pays to others, and to himself, that respect which he ought, and "who does as he would be done by,"—then by all means give them learning.—The book in question will not make a man a Carpenter, or a Philosopher, by merely buying it. It should be studied, and studied attentively, and the person who has done that, will find himself well paid for the trouble, and well prepared to proceed to the higher and more important study of Architecture—a science, as grand, as noble, as interesting, and, in this country, as little understood as any there is.

OF SCARFING, &c.

Taken (with a few omissions) from Tredgold's Elementary Principles of Carpentry.

The joints having to support whatever strains the pieces joined are exposed to, should be formed in such a manner that the bearing parts may have the greatest possible quantity of surface; provided that surface be made of the best form for resisting the strains.

For, should that part of the joint which receives the strain be narrow and thin, it will of course either indent itself into the pieces to which it is joined, or become crippled by the strain; and whichever of these happens, a change must be produced in the form of the framing.

The effect of the shrinkage and expansion of timber should be considered in the construction of joints. On account of the shrinkage of timber, dovetail joints should never be used in carpentry, as the smallest degree of shrinking allows the joint to draw out of its place; and, consequently, it loses all its effect in holding the parts in their proper situation. Dovetail joints can only be used with success, when the shrinkage of parts counteract each other; a case which seldom happens in carpentry, but is common in joinery and cabinet-making.

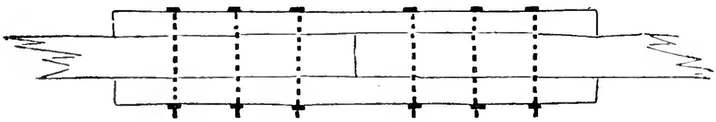
Joints should also be formed so that the contraction or expansion may not have a tendency to split any part of the framing. The force of contraction or expansion is capable of producing astonishing effects where the pieces are confined, and may be sometimes observed in framing that has been wedged too tightly together in improper directions. The powerful effect of expanding timber is well known to quarry-men, as they sometimes employ its force to break up large stones.

In forming joints, the object to be attained should always be kept in view, as that which is excellent for one purpose may be the worst possible for another.

Of lengthening pieces of Timber, that are to resist strains in the direction of their length.

The simplest and perhaps the best method of lengthening a beam is to abut the ends together, and place a piece on each side; these, when firmly bolted together, form a strong and simple connexion. Such a method of lengthening a tie is shown by the following figure; and is what ship-carpenters call *fishing* a beam. It is obvious, however, that the strength in this case depends on the

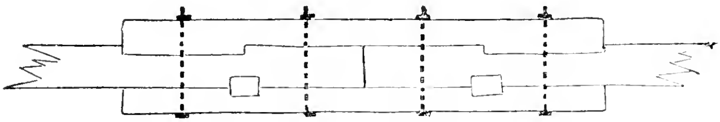
Fig. 55.



bolts, and the lateral adhesion and friction produced by screwing the parts together.

The dependence on the bolts may be much lessened by indenting the parts together, as shown by the upper part of the annexed figure; or by putting keys in the joint, as shown by the lower side

Fig. 56.



of the same figure; but the strength of the beam will be lessened in proportion to the depth of the indents.

The only reasons for not depending wholly on bolts, are, that should the parts shrink ever so little, the bolts lose a great part of their effect; and the smallness of the bolts renders them liable to press into the timber, and thus to suffer the joint to yield.

The sum of the areas of the bolts should never be less than two-tenths of the area of the section of the beam; and it is not a good practice to put the bolts near to the end of the pieces.

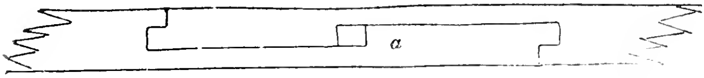
The most usual method of joining beams is that called *scarfing*, where the two pieces are joined, so as to preserve the same breadth and depth throughout; and wherever neatness is preferable to strength, this method should be adopted.

From Fig. 57 to Fig. 60, four methods of scarfing are shown. The first, Fig. 57, is the most simple; it depends wholly on the bolts, and in this and like cases, it is best to put a continued plate of iron on each side for the heads of the bolts. The ends of the plates may be bent and let into the beams.

Fig. 57.

The annexed figure is a joint that would do without bolts, but is is clear that the strength would not be quite so great as half the

FIG. 58.



strength of an entire piece. The key or double wedges, at *a*, should only be driven so as to bring the parts to their proper bearing, as it would be better to omit it, than to drive so as to produce much constant strain on the joint. It is not necessary that there should be a key, except when bolts are to be added, and then it is desirable to bring the joints to a bearing before the bolts be put in. The addition of bolts and straps makes this an excellent scarf.

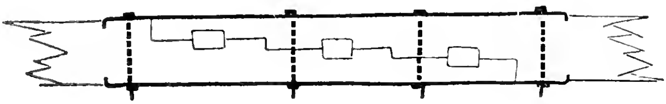
The following figure is a slight modification of the last described scarf, where the keys are supposed to be of hard wood; if of a

FIG. 59.

curled grain so much the better. In this form the scarf is easier to execute, and equally as good as the last, when bolts are used.

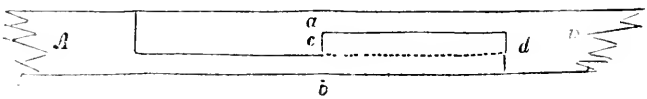
The next figure represents a scarf where the oblique joints in the last examples are avoided, and the same degree of strength is obtained; at the same time it is very simple and easy to execute.

FIG. 60.



To determine the length of a scarf, in joining beams, it is necessary to know the force that will cause the fibres of timber to slide upon each other. The researches upon this subject have already been laid before the reader in CHAP. VIII. PART I. To apply them to our present object, let *A B*, in the succeeding figure, be

FIG. 61.



part of a scarfed beam, strained in the direction of its length, and put together without bolts. Now, it is plain that the strength of the part $c\ b$, must be exactly equal to the force that would cause the fibres to slide at the dotted line $c\ d$; for if the part $c\ d$, were shorter, the joint would be less strong than it is possible to make it. Also, if the depth of the indent $a\ c$ be too small, it would be crushed by the strain; consequently, the parts must have a certain proportion, so that the joint may be equally strong in each part.

In the first degrees of extension and compression the resistance is equal, therefore the depth of the indent $a\ c$ must be equal to the part $c\ b$, in order that the strain may be equal; and it is evident, that when there is only one indent, as in this example, the depth $a\ c$ should be one-third the whole depth. Also, let d be the depth of the beam, and m the number of indents; the $\frac{d}{3m} =$ the depth of each indent. Or the sum of the depth of the indents must be equal to one third of the depth of the beam.

To determine the length of the part $c\ d$, we must know the ratio between the force to resist sliding, and the direct cohesion of the material. Let the ratio be as $1 : n$; then $c\ d$ must be equal to n times $c\ b$; that is, in oak, ash, or elm, $c\ d$ must be equal to from 8 to 10 times $c\ b$.

In fir, and other straight-grained woods, $c\ d$ must be equal to from 16 to 20 times $c\ b$.

Hence may be derived some maxims that will be sufficiently accurate for practical purposes:

i. In oak, ash, or elm, the whole length of the scarf should be six times the depth or thickness of the beam when there are no bolts.

ii. In fir the whole length of the scarf should be about twelve times the thickness of the beam, when there are no bolts.

iii. In oak, ash, or elm, the whole length of a scarf depending on bolts only, should be about three times the breadth of the beam; and for fir beams it should be six times the breadth.

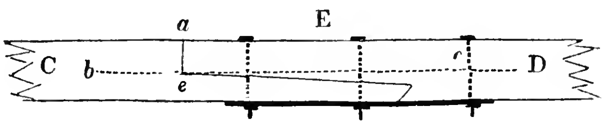
iv. When both bolts and indents are combined, the whole length of the scarf for oak and hard woods may be twice the depth; and that for fir, or soft woods, four times the depth.

Of lengthening Beams that are intended to resist cross strains.

Beams to resist cross strains require to be lengthened more frequently than any others, and from the nature of the strain, a different form must be adopted for the scarf from that which is best for a strain in the direction of the length. There are cases where beams are exposed to both strains at the same time, but the cross strain is generally that of the most importance. Of this we have an example in the tie-beam of a roof, where the strain in the direction of the length is very small compared with the cross strain.

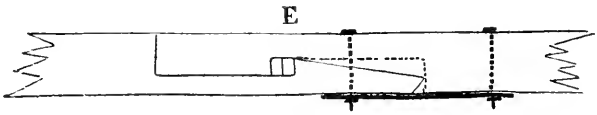
Let C D, Fig. 62, represent a beam strained by a load at E, and supported at the ends. All the parts above the middle of the depth, $b\ c$, will be compressed, all below will be extended; therefore, the square abutment $a\ e$ is better for the upper side than any complicated joint whatever; and it is evident, that all oblique joints should be avoided on the compressed side. In this figure the whole of the strength of the lower side depends on the bolts and strap.

Fig. 62.



The following figure shows another form, where the lower side is indented so as not to depend wholly on the strap and bolts; and

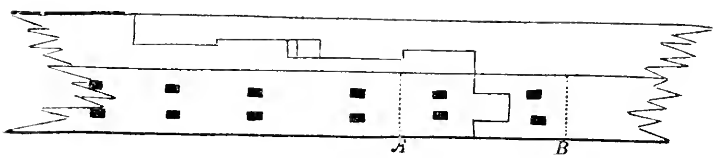
Fig. 63.



a key is introduced to tighten the scarf. It will readily appear, that had the joint been cut to the dotted line instead of the oblique line, the strength would have been much impaired.

The annexed figure represents an angular view of a scarf, where it is jointed the contrary way. An iron plate at A B is supposed

Fig. 64.



to be removed, which shows the tongue at the end of the scarf. This method appears to me to employ more of the strength of the timber than any other, and is very well adapted for a tie-beam where it is strained both across and in the direction of its length.

In all these cases the depth of the indents, and the length of the scarf. will be obtained by the same rules as for beams strained in the direction of their length.

In scarfing beams to bear a cross strain, it would be a great advantage to apply hoops or straps instead of bolts, as the coachmakers and ship-carpenters do. It would be easy to form the scarf so that hoops might to be driven on perfectly tight.

There is no part of carpentry that requires greater correctness in workmanship than searfing; as all the indents should bear equally, otherwise the greater part of the strength will be lost. Hence we see how very unfit some of the complicated forms shown in the old works on carpentry were for the purpose. It is certainly very absurd to render the parts difficult to be fitted, when the whole of the strength depends on their fitting well. "But many," says Professor Robison, "seem to aim at making the beam stronger than if it were one piece; and this inconsiderate project has given rise to many whimsical modes of tabling and scarfing."

ENGLISH PATENTS.

To Thomas John Knowlys, Esq. *and* William Duesbury, Color Manufacturer, *for their having invented certain improvements in Tanning*. Enrolled February, 1827.

This improved mode of tanning, consists in suspending the hides in a close vessel, from the interior of which the air is to be exhausted by means of an air-pump, and when the vacuum within is sufficiently perfect, the tanning liquor is admitted, which immediately penetrates into the pores of the hide, occupying the place from whence the air has been extracted. By these means the operation of tanning will be greatly facilitated.

The hides to be tanned, are introduced into the vessel, and are suspended by hooks at the upper corners, with weights at bottom to keep the skin extended. As many of these hides as may be required to be tanned, are in this way placed within the vessel, and when the lid is tightly fixed on, the air is to be extracted from the interior by means of an air-pump.

When a sufficient exhaustion has been effected within the vessel, the cock of the air-pump is to be closed, and another opened, and the tanning liquor introduced; after which, the air-pump may be again worked to draw all the air from the pores of the skins; and to prevent ebullition, a quantity of oil is to be placed upon the surface of the tanning liquor.

The tanning liquor is to be first used in a weak state, and its strength increased daily, until the process is complete. A pump and tube, are to be employed for drawing off the spent tan liquor.

The subject of this patent is an example of the wide range through which a valuable hint may be sometimes usefully extended. In the second volume of our first series, page 36, will be found a communication from John Oldham, Esq. of the Bank of Ireland, on his improved method of sizing, dying and wetting paper, for printing Bank Notes, and other purposes, which process was, by placing the bundle of papers, in a close vessel, and after exhausting the air from the vessel, and, consequently, from the pores of the paper, introducing the size dye or water, which instantly penetrated the paper, in a more perfect way than had been effected by any other means that had been before resorted to.

The same mode of operating, has been, subsequently, employed in dying, and in some other branches of the arts. with very great success, and is, in the patent above, proposed to be applied to tanning. But with what propriety it can now be claimed as a new invention, we do not see ; the exclusive right of employing the same principles, as a novel process in tanning appears to be rather equivocal. [*Lond. Journ. of Arts and Sciences.*

To Francis Halliday, Esq., *for his invention of certain Improvements in raising or forcing Water.* Enrolled February, 1827.

This is a sort of rotary pump, constructed upon the same principles as a rotary steam engine invented by the present patentee in 1825.

A wheel, carrying four vanes as pistons, works through the middle of a semi-circular chamber. One end of this chamber is open, and sufficiently wide to admit the broad faces of the pistons ; the other end is closed, excepting at the narrow space through which the wheel passes edgewise, and fits tightly.

The wheel is proposed to be placed horizontally, and to turn in that direction upon a vertical shaft. The semi-circular chamber is, of course, horizontal also, and, with the wheel, is intended to be placed at the bottom of a well, or other reservoir, from which the water is to be raised.

The semi-circular chamber being immersed in the water, and open at one end, will, of course, be filled with water, and the vanes or pistons, as the wheel goes round. entering the chamber in succession, will shut in the volume of water immediately before it, and press the water towards the closed end of the semi-circular chamber, where, being unable to escape, it will rise in a perpendicular pipe leading upwards from that end of the chamber.

It has been said, that the semi-circular chamber, lying in a horizontal position at the bottom of the well, is open at one end, by which the water flows freely into it, but that it is closed at the other end. except a narrow channel through which the wheel passes edgewise, fitting the opening closely. Now each piston attached to the wheel, in entering the open end of the semi-circular chamber, presents its broad face to the volume of water, and its edges fitting the internal part of the chamber closely, of course, the volume of water is driven forward by the piston, until the piston next following enters the chamber, and brings forward another volume of water, and so on. When the first piston has performed its duty, that is, brought the volume of water forward, an arm on the outside of the wheel, attached to the axle of the piston, strikes against a projection, and turns the piston round edgewise, which shuts it into the face of the wheel, and allows it to pass with the wheel freely through the narrow channel at the closed end of the semi-circular chamber.

In this way the successive pistons will continue as the wheel revolves, to drive the volumes of water along the semi-circular chamber, and, consequently, to force it up the perpendicular pipe, by which means the water will be continually rising from the well, or reservoir below, to the discharge-pipe above, and so pass off at a higher level.

It is scarcely necessary to add, that the rotation of the wheel carrying the pistons, may be effected by means of bevel gear at top, and which may be driven by a winch or by any other power. [*Ib.*

AMERICAN PATENTS.

For Propelling Vessels in the Water; HULL CASE, *Huron County, Ohio, August* 13, 1828.

THIS patent is taken for a scheme which has been repeatedly tried, and as repeatedly failed. The present patentee, however, assured us, in conversation, that he had fairly tried the experiment, and that he is confident he can ascend against a current, and head wind, *by the force of the wind itself.*

He places a horizontal shaft across the vessel, which carries paddle wheels, like those used in steam boats. An upright shaft is geared into this horizontal one, by bevelled wheels: this upright shaft has projecting arms, which support four jib-sails, which are fixed in a manner very similar to those of some of our horizontal wind-mills, and which will turn, by the wind, be it in what direction it may. The force of the wind upon these sails, is to be the propelling power. [*Franklin Journal.*

An improvement in the Machine for Washing Cloths; JOSEPH HATHAWAY *and* RUFUS HATHAWAY: *the former of Pultney, Steuben County; the latter of Canandaigua, Ontario County, New-York, September* 5, 1828.

THIS machine consists of two hollow cylinders. The outside cylinder is fixed in a suitable frame, its axis being horizontal. This cylinder is made water-tight, and is divided into two parts, the lower half forming a trough, and the upper half a cover or lid. Within this cylinder, another is made to revolve, by means of a crank and gudgeons. The circumference of the inner cylinder, is formed by slats, dove-tailed into the circular ends, and standing about three-quarters of an inch apart. Into this, the cloth to be washed is put, there being a door for that purpose. The slats are sloped on the sides in reversed directions, so that when the inner cylinder is turned either way by the crank, the water shall have a tendency to flow from the outer into the inner cylinder. The motion proposed to be given, is a vibratory one, by turning the crank each way, about half a revolution. On two opposite slats, pins are placed, pointing towards the centre of the cylinder; these are intended to change the position of the cloth to be washed. The frame is to be kept together, and tightened, by iron rods with heads, screws, and nuts.

This machine, in its general features, bears a strong resemblance to others which have been heretofore used; the patentees say, "what we claim as new, and as our own invention, in the above described machine, is the operation of the open cylinder, and the manner of fixing in those slanting slats, to carry the water to every part of the machine, to serve as drenchers; also the iron rods that fasten the frame together." [*Ib.*

An improvement in the Mill for Grinding Corn, or other Grain; REUBEN MEDLEY, *Bloomfield, Nelson County, Kentucky, September 5, 1828.*

THE main object of this invention appears to be the turning of both mill-stones in opposite directions; as this is not new, the claim of the patentee must rest upon the manner of effecting this object. A vertical wheel, with cogs upon its face, works into two vertical trundles at its upper and lower points, and, of course, turns them in opposite directions. These trundles are attached to the spindles of the upper and lower stones, and the desired motion is thus attained. The manner of attaching the spindles, and hanging the stones, we do not think it necessary to describe. The patentee says, "what I claim as new, and as my invention, or discovery, in the above described grist-mill, is the use, or application of the whole machine, with the exception of the two main wheels, and the wallower in the horse-mill." [*Ib.*

Specification of a Patent for a Socket Vice. Granted to LUTHER HEMMINWAY, *of Sullivan, Cheshire County, New-Hampshire, September 4, 1828.*

THE socket vice may be made of any size, according to the use to which it is to be applied, and of metal or wood. When made to be used as a socket for awls, it should be of steel; its whole length should be about two inches and three-fourths; one end, for about three-fourths of an inch, should be round, and about one-fourth of an inch in diameter; beginning three-eighths of an inch from the end, it should taper slightly to the end, upon which, for the same distance, a screw should be cut; it should then diminish, and again increase in diameter, in both cases slightly, and gradually; at three-fourths of an inch from the end it is flattened abruptly, forming a shoulder on two sides, and is made tapering on the two edges, to the other end, where it is pointed; a hole is made longitudinally into the round end, about three-fourths of an inch deep; it is then cut twice transversely, from the end to the bottom of the hole, dividing it into four equal parts; a hollow screw, or nut, adapted to the vice, is screwed upon this end, compressing it so as to hold, firmly, the shank of the awl; the outside shape of the nut should be square, so that it may, by means of a small wrench, be easily screwed on or off. The pointed end of the socket vice, may be inserted in a handle of wood, so far as to the commencement of the screw. When made for other uses, the size and the form of the shank may be varied, to suit such uses.

LUTHER HEMMINWAY.

[*Ib.*

TO MAKE GLASS-PAPER.

TAKE any quantity of broken window-glass, that which has rather a green appearance on the edge is best, pound it in an iron mortar, then have two or three sieves of different degrees of fineness, ready for use when wanted; take any good tough paper, fine cartridge is best, and having levelled the nobs and bumps from both sides with pumice-stone, tack it at each corner on a board, and with good clear glue, diluted with about one-third more water than is used generally for wood work, go quickly over the paper, taking care to spread it even with your brush; then, having your sieve ready, sift the pounded glass over it lightly, but to cover it in every part; let it remain till the glue is set, take it from the board and shake off the superfluous glass again into the sieve, and hang it in the shade to dry: in two or three days it will be fit for use.

NOTE.—This paper will be much better than any you can buy, as sand is frequently mixed with the glass, and colored to deceive the purchaser. [*Cabinet-Maker's Guide.*

TO TAKE OUT BRUISES IN FURNITURE.

WET the piece well with warm water, then take some brown paper five or six times doubled, and well soaked in water, lay it on the place, apply on that a hot flat-iron till the moisture is evaporated, and if the bruise is not gone, repeat the same; you will find after two or three applications, the dent or bruise is raised level with the surface; or, if the bruise is small, soak it well with warm water, and apply a red hot poker very near the surface, keeping it continually wetted, and you will soon find the indentation vanished.

[*Ib.*

TO MAKE CEMENT FOR BROKEN GLASS.

TAKE one ounce of isinglass, steep it in half a pint of spirits of wine, for twenty-four hours, then let it dissolve over a slow fire, always keeping it covered, or the spirit will evaporate; then take six cloves of garlic, bruise them well in a mortar, put them in a linen cloth, and squeeze the juice into the isinglass, mix all well together and keep it for use, it being excellent to join glass ornaments, &c. &c. [*Ib.*

AGRICULTURE.

SHEEP.

This invaluable animal is found in almost all climates, from the poles to the equator. The difference in situation, and mode of management, have inevitably made a great many varieties, some of which are now carefully kept up and cultivated, by those who make a business of breeding Sheep. The English carry the plan of having distinct breeds of animals for distinct purposes, to the greatest length, and, as in their division of labor, they find a manifest advantage in it. Hence in England we find a greater variety among their domestic animals, and especially among their Sheep, than in any other country. According to their writers, besides the Merino and Saxony, which are common, almost every county has its peculiar breed which are distinguished from each other by some peculiar quality or property. Thus, they have the Dishley or New Leicester breed, distinguished for long wool and remarkable fattening qualities—The South Downs, distinguished for short fine wool and the excellent quality of their mutton—The Devonshire Nots, distinguished for their great quantity of wool, &c. &c.

This plan is a good one, and ought to be more systematically adopted and pursued in this country. It is, indeed, not necessary to carry the practice so far as the English farmer does, but different breeds of sheep should be kept, and kept pure and genuine for specific purposes. The breeds may be few, for the objects in this region need be but few.

We want, for instance, very fine wool for the finest fabrics. For this purpose the Farmer should raise Merinos; and the Saxonies (which are only a variety of the Merino) may be mingled with them.

For long wool of moderate fineness, that shall be excellent for combing or worsted, and also for very fat mutton, we would recommend the Dishley or New Leicester breed.

For fine short wool, suitable for common fabrics, and for excellently flavored mutton, we would recommend the South Down breed.

For coarse long wool, which shall be suitable for a coarse wiry kind of fabrics, such as *Camblets*, &c., we would recommend the Caramanian.

Now we do not recommend to every farmer to keep all of these breeds, and much less do we recommend that careless, slovenish practice of jumbling all the breeds together, as many farmers do, thereby abusing nature, by thwarting her intentions, and filling the country with Hybrids and nondescripts.

During the *Merino Fever*, as it is called, most of our New-England farmers entered into the speculation. A very few proceeded carefully and judiciously, and have now converted their flocks into full-blooded and genuine Merinos, the wool of which will not suffer in comparison with any whatever. A very few kept, what is called, the old or common breed, and avoided the Merino as they would a wolf. But the majority have gone on without care or system, and their flocks are now neither of one kind or the other. They have neither fine wool nor coarse wool, long wool nor short wool. They have none sufficiently fine to manufacture into superfine broadcloths, nor sufficiently coarse to make a horse blanket; and as for mutton, they are much worse off than they would have been had they stuck to the old breed. A farmer should consider well what he wishes to do with regard to sheep, and what particular object, in this respect, his farm and conveniences will enable him to accomplish with the most profit. If fine wool be the object which engages his attention, let him keep the Merinos, or Saxonies (which is considered nearly the same) and let them be Merinos—all Merinos—and nothing but Merinos. He should content himself with the wool, for the mutton is certainly inferior, to that of the other breeds which have been enumerated.

The different breeds which it is thought would be beneficial to our farmers to keep, and preserve pure, are *four*. Let us attend to their peculiar qualifications and specific distinctions.

1. *The Merino and Saxony*. The Merinos were first introduced into England from Spain in 1787. It is thought, however, by some, that the stock was originally carried from England many years previous. They were first introduced into the United States by Col. Humphreys, of Connecticut, and Livingston, of New-York, and have proved of incalculable service to the country. The Saxonies (originally Merinos) were carried from Spain about sixty years ago, into the electorate of the Duke of Saxony. These have been improved with the utmost care, and have now repaid the trouble, by the immense sales of them for shipping to this country. "This breed bears the finest wool of the sheep species; the males usually have horns of the middle size, but the females are usually without horns: the faces and legs are white, the legs rather

long, but the bones fine. The average weight per quarter of a tolerably fat ram, is about seventeen pounds, and that of ewes, about eleven pounds."

The shape of this breed is not considered very perfect by professed breeders and judges. "The throatiness, or pendulous skin, beneath the throat, which is usually accompanied with a sinking or hollow in the neck, presents an offensive appearance, though it is much esteemed in Spain, as denoting both a tendency to fine wool and a heavy fleece. Yet the Spanish sheep are level on the back and behind the shoulders, and there is no reason to conclude that deformity in shape, is necessary to the production of fine wool.

The fleece of the Merino sheep, weighs, upon an average, from three to five pounds; in color, it is unlike that of any other breed; there is upon the surface of the best Spanish or Merino and Saxony fleeces, a dark brown tinge, approaching almost to a black, which is formed by dust adhering to the greasy properties of its pile; and the contrast between this tinge and the rich white color below, as well as that rosy hue of the skin, which denotes high proof, at first sight excites much surprise.

The harder the fleece is, the more it resists any external pressure of the hand, the more close and fine will be the wool: here and there indeed, a fine pile may be found in an open fleece; but this occurs rarely."—*Loudon.*

2. *The South Down.* This breed of sheep take their name from the extensive downs, or commons, in the counties of Sussex, Kent, &c. England. Very few of them have as yet been introduced into New-England; indeed, we know of but one importation, viz: that of Messrs. A. & A. LAWRENCE, of Boston, in the autumn of 1825. In the Middle and Southern States they are coming more into notice. They were first introduced into the United States (if we mistake not) by that enterprising and energetic agriculturist, JOHN HARE POWEL, Esq., of Powelton, near Philadelphia, who thinks very highly of them, and of whom they could undoubtedly be obtained in great purity. Their specific characters are,—faces and legs uniformly grey; bones fine or small; neck long and slim; rather low before; shoulder high; somewhat light in the fore quarter; sides broad; loin tolerably good; thigh full; and twist good; wool very fine and short, (the staple being from two to three inches in length,) weighing, on an average, two pounds and a half to a fleece, when killed at two years old. Flesh fine grained and of

very excellent flavor. Quick feeders. Constitution hardy and vigorous. Capable of great improvement. LAWRENCE, an English agriculturist, says, they are second to none of the breeds in Britain, and recommends them very highly for "hill or pasture sheep." POWEL, in the *Memoirs of the Pennsylvania Agricultural Society*, says, the South Down Sheep have finer fleeces of shorter staple and much less weight, smaller carcases, less loaded with fat, showing more proof within, affording mutton of finer texture and better flavor than any breed known. Their forms are not so accurate, their fore quarters being lighter and their necks larger than those of the Dishley Sheep, but their chests are sufficiently wide to afford ample space for the position of their lungs; upon the healthful action of which, able, scientific and practical men agree, the vigor and useful animal secretions must depend. They are much more hardy; have more offal; they consume rather more food in proportion to their size than the Dishley Sheep, but by their vigor and activity, are enabled to find support, and to thrive upon bleak and barren hills, where Dishley Sheep would die from exposure, or would starve.

3. *Dishley*, or *New Leicester Sheep*. This breed of Sheep have been introduced into Massachusetts, by S. WILLIAMS, Esq., of Northboro', in that State, and a few importations have been made by others. *Mustapha*, a portrait of whom accompanies this number, is from Mr. WILLIAMS' flock, and belongs to the Editor. The drawing gives a good representation of him, excepting that the legs are rather too long, and too large. The characteristics of this breed, are,—heads clean, straight, broad, and without horns; eyes bright and lively; pelts thin; wool long and fine, admirably well calculated for combing, and weighing on an average, eight pounds per fleece. They fatten kindly and very early, being remarkably well calculated for the market; thriving and remaining quiet on pastures that will scarcely keep other sheep, and requiring less food than others. Constitution not quite so hardy as that of the South Downs. The world is indebted to the celebrated BAKEWELL for this breed, who brought it to a degree of size, &c. really astonishing; and it was rams of this breed, which he let for such enormous prices. In 1789, "He made twelve hundred guineas by three rams; two thousand, by seven, and of his whole stock, three thousand guineas." [See *Bewick's History of Quadrupeds*,—*Loudon*,—*Young's Tour, &c. &c.*]

The superior qualities of the Leicester breed, are,—that they will feed quickly, fat at almost any age, even on indifferent pastures, and carry the greatest quantity of mutton upon the smallest bone. Their carcases are round, have remarkably broad backs, and short legs; and to show the immense weight to which they may be fed, we give the measurement of a Ram of Mr. Bakewell's, mentioned by Young in his Eastern tour, at three years old:—his girt was five feet ten inches; height, two feet five inches; breadth over his shoulders, one foot eleven inches and an half; breadth over his ribs, one foot ten inches and an half; breadth over his hips, one foot nine inches and an half.

The dimensions of a Wedder, or Wether, as we call them, owned by Mr. Culley, and killed when four years old, were as follows:—"Girt four feet eight inches and a half; breadth over his shoulders, one foot three inches; over his middle, one foot seven inches and a quarter; across the breast from the inside of one fore leg to the inside of the other, nine inches. At the dividing of the quarters through the ribs, it measured seven inches and one-eighth of solid fat, cut straight through without a slope; and his mutton was of a most beautiful bright color. But in nothing was he so remarkable as in the smallness of his bones."—*Bewick.*

We mention these facts, to show what can be done with the breed by care and attention, though we are doubtful if such very fat mutton is desirable.

4. *Caramanian*, or *Camblet Woolled Sheep*. This breed is a native of Caramania, a province of Asia Minor. They are large and long legged; necks long, heads horned, backs straight, chests or breasts moderately wide; wool very long, somewhat coarse and wiry, similar to goats' hair. *Selim*,* whose portrait is also presented you, is a half-blood, from the original buck, kept on the farm of Wm. Shotwell, Esq., of Woodbridge, (N. J.,) brought into the United States by Capt. Gerry, in 1825. The following history of him is taken from the *New-York Statesman*:—"He was taken from on board a Turkish vessel bound to Canstantinople, and presented to Capt. Gerry by the Greek Admiral Tombazo, who assured him that he was a native of the above place. Their wool is particularly adapted to the manufacture of Camblets, and their flesh is

* His wool ought not to have been represented quite so long, he being only half blood. In other respects the drawing is very correct.—He belongs to the Editor.

esteemed excellent and delicate. This animal has a broad tail, and the natural color of the wool is dark brown or snuff color; the fleece, before shearing, dragged on the ground, (except under the belly,) so as completely to hide the feet, and weighed 21 lbs.; he is in prime condition and sound health, the size greater than any of the largest sheep of our country. The head is beautiful, the eye piercing and quick in motion; no fleece beyond the ears: the head appears to project out from the fleece, having the resemblance of the dark brown short fur of the deer's head; the horns are handsomely seated and of the middle size.

John Brentnal, Esq., an English farmer of high standing, residing in Woodbridge, in a letter to William Shotwell, of New-York, dated 10th June, 1825, says, he took 21 lbs. of wool from him; that he would have produced from 4 to 5 lbs. more had he not have been robbed; that there were several places of 5 or 6 inches square from which the wool had been taken; further, he is extremely gratified with the frame of the animal; that he is large and perfect, his limbs well proportioned, his skin extremely delicate and white, his strength great; and he has no hesitation in saying, this very extraordinary animal will prove of much greater advantage to our breeds of sheep than the Merino or any other hitherto introduced; as he is but three years old, he will undoubtedly increase in size and produce a still more abundant quantity of wool; observing, that its superior size, the weight of the fleece the length of the wool, and the quality of the flesh, cannot but be the best recommendation; and says, to ascertain the quality of the flesh of a sheep is by the smell. A person handling a buck of the Merino, English or American breeds, will find his hands extremely offensive, which was not the case in shearing this; on the contrary, his fleece and flesh were perfectly sweet. He recommends shearing twice a year. The breed of this sheep must be exceedingly valuable in this country, and we should not be surprised if Mr. Shotwell should receive orders for lambs for England. The hair is not as fine as the Cashmere goats, but it is thicker and in greater quantities."

We are not so sanguine, respecting the value of this breed, as the person quoted above; but we verily believe it may be made highly useful to us. Why not manufacture our own Camblets? and why not use this wool for all the purposes to which goats' hair is put? Large quantities of this article (goats' hair) are imported from Smyrna, to be manufactured into various articles. It would be much better to raise these sheep and put their fleeces to the same uses.—The Goat is a mischievous animal, and will not thrive in this region. The Caramanian is peaceable and will do well here. Besides Camblets, his fleece may be advantageously used like common hair, for stuffing sofas, couches and matrasses; and a thousand other uses may be made of it, for which other wool would be either unfit or too valuable.

MODE OF PREPARING SOME OF THE CHEESES ENUMERATED IN LOUDON'S LIST.

The Brick-bat Cheese is so named from the form of the mould; it is formed of new milk and cream in the proportion of two gallons of the former to a quart of the latter. It is principally made in Wiltshire in the month of September, and should not be cut until it is twelve months old.

Cheshire Cheese is in universal esteem; it is made from the whole of the milk and cream, the morning's milk being mixed with that of the preceding evening, previously warmed. The general weight is sixty pounds each cheese.

Green, or Sage Cheese, is made by steeping over night in a proper quantity of milk, two parts of sage, one part of marigold leaves, and a little parsley, after they have been bruised. On the following morning, the *greened* milk is strained off, and mixed with about one-third of the whole quantity intended to be run or coagulated. The green and white milks are run separately, the two curds being kept apart until they be ready for vatting; these may be mixed, either evenly and intimately, or irregularly and fancifully, according to the pleasure of the manufacturer. The management is the same as for common cheese. Green cheeses are made in the vale of Gloucester, as also in Wiltshire.

Lincolnshire Cheese is made by adding the cream of one meal's milk to that which comes immediately from the cow; it is pressed gently two or three times, and is turned for a few days previously to being used. It is chiefly made in spring. but the richest is that made in autumn. It will not keep above three months.

Norfolk Cheese is made from the whole of the milk and cream; the size is from thirty to fifty pounds; it is generally colored yellow, and is reckoned a good keeping cheese.

Soft, or Slip-coat Cheese, is made from new milk hot from the cow, and the afterings; and what is required to make one pound of butter, will, in general, make one pound of cheese: this is a small soft rich cheese, which must be used immediately.

Stilton Cheese, which, from its peculiar richness and flavor, has been called the parmesan of England, is made in the following manner:—the night's cream is put to the morning's milk, with the rennet; when the curd is come, it is not broken as is usual with other cheese, but is taken out whole, and put into a sieve to drain gradually; while draining, it is gently pressed till it becomes firm and dry, when it is placed in a vat, a box made exactly to fit it; and it is so extremely rich, that without this precaution, it is apt to bulge out, and break asunder. It is afterwards kept on dry boards, and turned daily, with cloth binders round it, which are tightened as occasion requires. After being taken out of the vat, the cheese is closely bound with cloth till it acquires sufficient firmness to support itself: when these cloths are removed, each cheese is brushed once every day for two or three months, and if the weather be moist, twice every day; the tops and bottoms are treated in a similar manner daily before the cloths are taken off. Stilton cheese derives its name from the town where it is almost exclusively sold; it is made principally in Leicestershire, though there are also many who manufacture it in the counties of Huntingdon, Rutland, and Northampton. Sometimes the cheeses are made in a net, resembling a cabbage net, which gives them the form of an acorn; but these are neither so good nor so richly flavored, as those made in vats, having a thicker coat and being deficient in that mellowness which causes them to be in such general request. (*Bath Papers*, vol. iii. p. 152, 153.) Stilton cheese is not reckoned to be sufficiently mellow for cutting, until it is two years old, and is not saleable unless it is decayed, blue, and moist. In order to mature them the more rapidly, it is a frequent practice to place the cheeses in buckets, which are covered over with horse-dung. Wine is also reputed to be added to the curd, in order to accelerate the ripening of the cheese.

Cottenham Cheese, from the town of that name in Cambridgeshire, is a thicker kind of cream cheese than the Stilton; its superior delicacy and flavor are attributed to the fragrant nature of the herbage on the commons on which the cows are pastured, and according to Professor Martyn, to the prevalence of the grasses, *Poa aquatica* and *pratensis*.

Suffolk, or Skim Cheese, is made of skimmed milk; it forms a part of every ship's stores, not being so much affected by heat as richer cheese, nor so liable to decay in long voyages.

Wiltshire Cheese is made of new milk coagulated as it comes from the cow; sometimes a small quantity of skimmed milk is added. In some dairies it is manufactured in winter as well as summer; in the former case it is liable to become scurfy and white-coated; the last of which defects is frequently concealed by a coat of red paint.

Dutch Cheese is prepared much in the same manner as the Cheshire Cheese, excepting that muriatic acid is used instead of rennet, which renders it pungent, and preserves it from mites; that of Gouda is preferred.

Parmesan Cheese was formerly supposed to be made from the milk of goats, but it is merely a skim-milk cheese, the curd hardened by heat, well salted, pressed, and dried, long kept, and rich in flavor from the rich herbage of the meadows of the Po, where the cows are pastured. The *process*, according to Pryce, (*Bath Papers*, vol. vii.) is as follows:—the evening's milk, after being skimmed in the morning, and standing till ten o'clock, and the morning's milk skimmed about two hours after it is drawn from the cow, are mixed together. The mixture is then suspended in a copper cauldron over a wooden fire, and frequently stirred till it attains about 82° of Fahrenheit; the rennet is then put in, and the copper being removed from the fire, the coagulation quickly takes place, and the curd is afterwards worked with a stick till it is reduced to a small grain. The *whey* now occupies the surface, and a part of it being taken out, the cauldron is again turned over the fire, and its contents brought to nearly a boiling heat. A little saffron is now added to impart color, the whole being all the while well stirred, and the superintendent examining it from time to time with his finger and thumb, to ascertain the exact moment when the curd shall have become sufficiently solid. When this is the case, the cauldron is removed from the fire, and the curd allowed to subside; three-fourths of the whey is then drawn off, water poured round the bottom of the cauldron outside to cool it, so as to admit of a cloth being passed below the curd, which is thus brought up and placed in a tub to clear. When drained, it is put into a wooden hoop, and about half a hundred weight laid on it for half an hour; the cloth is then removed, and the cheese being replaced in the hoop is laid on a shelf; here it remains for two or three days, at the end of which, it is sprinkled over with salt; this sprinkling is repeated every second day for about thirty days if it be summer, and for about forty or fifty-five days if it be winter, after which, no further attention is required. The best Parmesan Cheese is that which has been kept for three or four years, but none is ever carried to market for sale, until it has been kept at least six months.

Westphalia Cheese is of the skim-milk kind, and of a different character from any of those hitherto described. The cream is allowed to remain on the milk till the latter is in a sub-acid state; it is then removed, and the milk placed near a fire spontaneously to coagulate. The curd is then put into a coarse bag, and loaded with ponderous stones to express the whey; in this dry state it is rubbed between the hands, and crumbled into an empty clean milk vat, where it remains from three to eight days according as the cheese is intended to be strong or mild. During this part of the process, which is called mellowing, the curd undergoes the putrid fermentation, and acquires a coat or skin on the top, before it is taken out of the vessel, and kneaded into balls or cylinders, with the addition of a considerable portion of carraways, salt, and butter; or occasionally a small quantity of pounded pepper and cloves. When over-mellowed, a third part of fresh curds, likewise crumbled into small pieces, is superadded, to prevent or correct its putrid tendency. As the balls or cheeses do not exceed three or four ounces each in weight, they soon dry in the open air, and are then fit for use. When nearly dry, they are sometimes, for the palate of epicures, suspended in a wood fire chimney, in a net, for several weeks or months: and both their taste and flavor are said to be remarkably improved, whether kept in a dry air, or subjected to the action of smoke. This sort of cheese, M. Hochheimer, who describes it, affirms to be preferable to the Dutch, Swiss, and even the Parmesan Cheese.

Potato Cheese is a German manufacture, of which there are three sorts. One of the best is thus prepared: Select mealy potatoes and only half dress them in steam, for by bursting, their flavor and efficacy are diminished. Peel them, and then grate or beat them into a fine pulp. To three parts of this mass, add two parts of sweet curd, knead and mix them, and allow them to stand three days in warm, and four or five days in cold weather; form into small pieces like the Westphalia Cheeses, and dry in the same manner. A still better sort of Potato Cheese is formed of one part of potatoes, and three of the curd of sheep's milk. This sort is said to exceed in taste the best Cheese made in Holland, and to possess the additional advantage that it improves with age, and generates no vermin. [*Loudon's Encyclopædia of Agriculture.*

Specification of a Patent obtained for a newly invented, or discovered mode or art, for the care and rearage of Honey Bees, being a mode by which the honey may be taken from the hive; and a new swarm separated from an old one, without injury to either. By FRANCIS KELSEY, *Lockport, Niagara County, New-York, August* 26, 1828.

FIRST METHOD OF SEPARATING.

FOR the purpose of separating a new swarm of bees from an old one, when sufficiently numerous,—1st. Raise the hive a little, and blow into the hive a small quantity of smoke, (tobacco smoke being preferable,) which renders the bees docile and harmless, so that they may be managed with perfect safety. 2d. Remove the hive from the flooring, or other place on which it stands—turn it bottom upwards upon the ground—place over the hive a sheet, or other cloth, and a sufficient thickness of cloths, to render the hive dark; a slight hammering or thumping is then to be made upon the end, of the sticks which run through the hive, which will start the bees from the centre of the hive; the hammering is then to be continued upon and about the hive, near the ground. The bees will, by this means, be driven to the top, and attach themselves to the sheet—the sheet is then to be raised from the centre of the hive; the sheet must be raised from the hive slowly and gradually, and as fast only as the bees will follow it up, the hammering upon the hive to be continued. The bees in 10 or 15 minutes, will nearly all be attached to the sheet, when it is to be removed entirely from the hive, and spread upon the ground; one end of the sheet is to be raised upon a block, or other substance, about one foot high. 3d. Place an empty hive upon the raised part of the sheet, on the block; place a few bees near the empty hive, they will run into the hive, and their noise will attract the others. They then are to be allowed to run into the empty hive, until a sufficient portion of them have taken possession of the new hive. and until the queen bee is discovered, if practicable. The bees are to be made to pass into the new hive slowly, by removing the hive a proper distance from them, which affords a better opportunity of discovering the queen bee ; they may also be made to go slowly by partly covering them with a cloth. The queen bee may be known by the darkness of her color, and the brisk movements of the other bees about her, and the slowness of her movements. 4th. If too great a proportion of the bees should have passed into the new hive, the queen is to be taken and safely kept, until the swarm can be separated, and properly apportioned, when the queen bee is to be returned to the new hive. 5th. The remainder of the bees are to be returned to the old hive, where they will provide themselves with another queen bee. 6th. After the swarms are properly apportioned, the hives are to be placed upon their stand, where both swarms will commence the labors of the season.

SECOND METHOD OF SEPARATING.

The hives are to be made of a size, and of wide boards, and about twelve inches square ; two sticks are to be placed each way through the centre. Seats are to be put under and near the top board, within half an inch of each other. Some time before the hive shall be filled by a swarm of bees, another hive of the same size is to be placed under it, without a top board, but with seats. The comb will be fastened to the seats. When the lower hive is full, they are to be separated ; when the under hive is to have a top board attached to it by cleats ; the cleats to run one and a half inches above the side boards, the better to accommodate another hive. This process may be continued from time to time, as may be deemed necessary.

The first of the above methods is preferable. The honey may be taken from the hives by either of the above modes ; either by removing a part of the honey, and dividing the bees, as above described ; or, by placing all the bees in the new hive, and removing all the honey.

FRANCIS KELSEY.

[*Franklin Journal.*

ECONOMY IN FODDER.

IT may seem somewhat out of season to say any thing on this subject, at a time when there is such an abundance of hay, &c. in every barn. But we see no cause for waste on that account. Another year may bring with it want, in this respect, and the farmer be compelled to sacrifice his stock in consequence. Much may be saved this year, and laid away for the wants of another less abundant.—For this purpose we would recommend a Straw Cutter, to those who can afford it, as being a valuable implement, and one by which a great saving can be effected. Read the estimate made below, and consider the result.

Mr. Benjamin Hale's *account of the savings made by the use of* "Hotchkiss' Straw Cutter," *employed to cut Straw and Hay as Fodder for Horses.*

Mr. Hale is proprietor of a line of stages running between Newburyport and Boston. He says:

The whole amount of hay purchased from April 1, to October 1, (six months,) and used at the stage stable, was - - - - - -		*Tons, cwt. q. lb.* 32 4 0 10
At twenty-five dollars per ton, (the lowest price at which hay was purchased, in 1816,) - -		$800 00
From Oct. 1, 1816, to April 1, 1817, whole amount of hay and straw purchased for, and consumed by the same number of horses, viz:		
T. cwt. q. lb.	*Cost.*	
Straw, 16 13 3 10	$160 23	
Hay, 13 14 1 00	350 00	
	$510 23	
Deduct, on hand April 1, 1817, by estimation, four tons more than there was Oct. 1, 1816, at $25 per ton,	100	$410 23
Saving by the use of Hotchkiss' Straw Cutter, four months of the last six months, or the difference in expense in feeding with cut-fodder and that which is uncut, - - - - - -		$389 77
Whole amount of hay used for the horses of the Salem stage, twenty-five in number, from April 1, to Oct. 1, 1816, viz: -		*T. cwt. q. lb.* 22 0 0 0
At $30 per ton, (the lowest price in Salem,) - -		$660 00
Whole amount consumed by the same number of horses, from Oct. 1, 1816, to April 1, 1817, viz:		
T. cwt. q. lb.	*Cost.*	
Straw, 15 13 0 0	$187 80	
Hay, 2 15 0 0	81 00	$268 80
Saving in using chopped fodder five months, - -		391 20
Total saving in using the straw cutter 9 months, viz:		
At Newburyport four months, - - - -		$389 77
At Salem five months, - - - - -		391 20
Total, - - - - - -		$780 97

The member of the Board of Trustees of the Massachusetts Agricultural Society, to whom the above account was communicated by Mr. Hale, was informed by that gentleman, that he used no more grain from October, 1816, to April, 1817, than was used from April, 1816, to October, 1816.

[*Mass. Agricultural Rep. and Jour.*, p. 400, vol. iv.

NOTICES.

GREAT INVENTION.

BURNAP'S VENEER CUTTER.

It is with pleasure we announce Mr. C. B Burnap's new method of cutting Veneers. His machine is now in successful operation in this village, where it can be examined by those who wish to see one more new thing under the sun. It is so constructed that any log of wood, after being turned round and smooth in the lathe, can be converted into one single sheet of Veneer from one-twentieth to one-quarter of an inch in thickness, according to your wish.—A log of any kind,—Mahogany, Bird's-eye Maple, Bass Wood, &c. &c., can thus be *unrolled* like a piece of cloth. and any particular number of yards or feet cut off that may be desired. The advantages of such a machine can be easily imagined, and we hope the inventor will reap a rich reward, for the time, trouble and money which he has expended in bringing his machine to perfection. It is certainly the most ingenious and useful machine that has been produced in New-England for a number of years. Mr. Burnap calculates that a log, 13 inches diameter and 4 feet long, will give 800 square feet of Veneer 1-20th of an inch thick.

P. S.—A Patent is secured, and Mr. Burnap will be ready to dispose of Rights and Machines in the spring.

CAUTION.

In page 46, we inserted a Recipe for a lute to put around Grafts. It was selected from good authority, and it has also been recommended by other writers, as an excellent preparation. Some complaints have been made, however, by those in this vicinity who have tried it, that it did not answer the expectation, and was rather an injury than otherwise. We mention this, to caution those who are disposed to try it, not to apply it too freely, until they have ascertained its true quality.