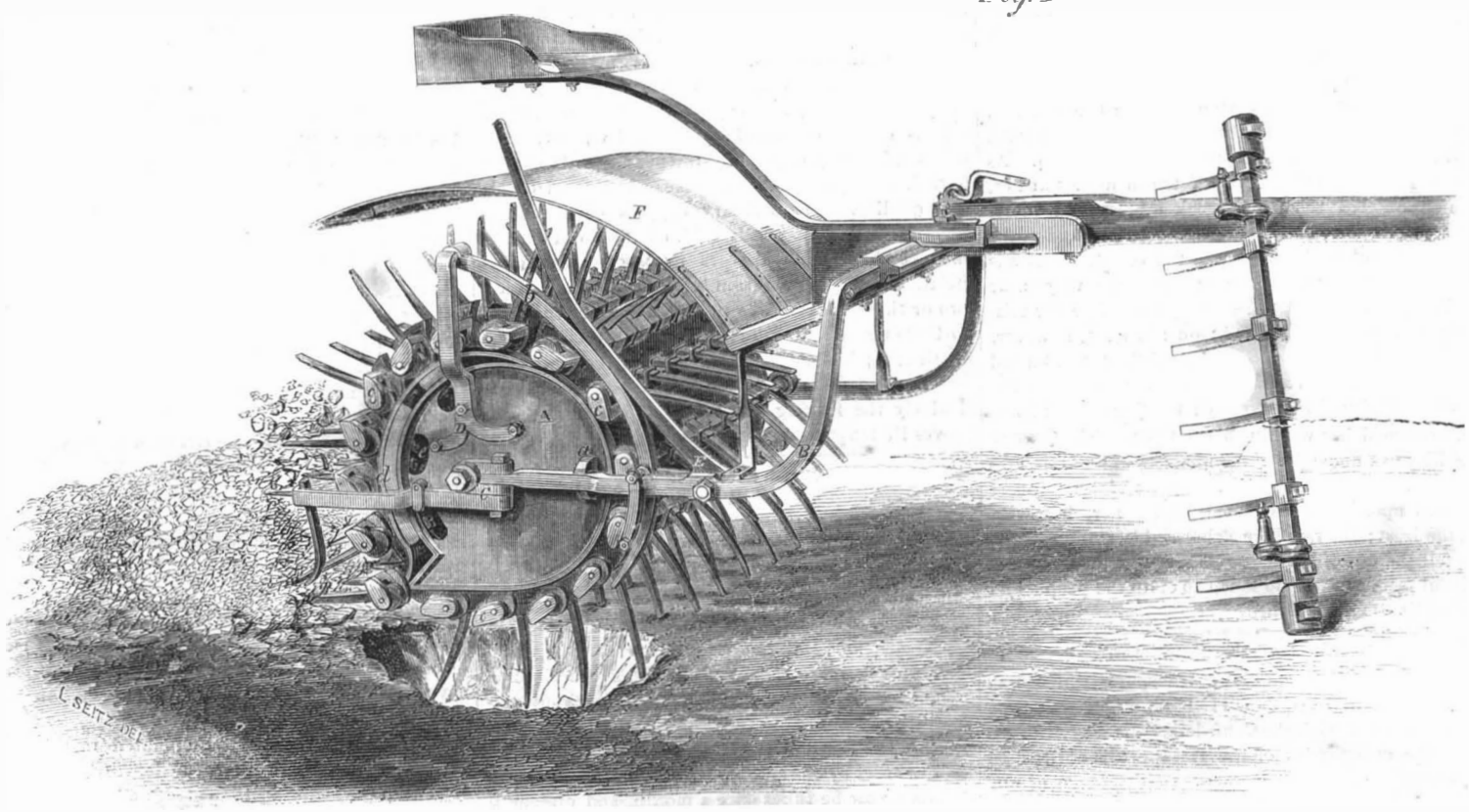
Scientific American.

A WEEKLY JOURNAL OF PRACTICAL INFORMATION IN ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES

VOL. VIII.—NO. 9. (NEW SERIES.) | NEW YORK, FEBRUARY 28, 1863. | SINGLE COPIES SIX CENTS. $3 PER ANNUM—IN ADVANCE.

COMSTOCK'S PATENT ROTARY SPADER.

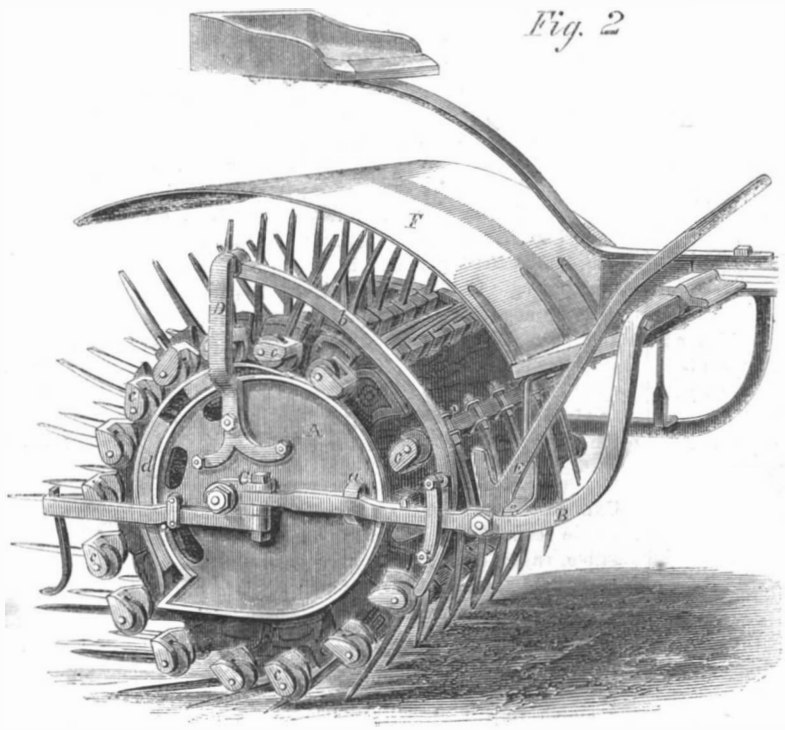
Fig. 1



Improved Rotary Spader.

The cultivation of the soil by mechanical means grows in popularity every day. A few years ago our farmers regarded patent plows, cultivators, and labor-saving machines of a similar character, as so many "inventions of the enemy;" now patented implements for farming purposes can be found for sale in nearly every village store, and in use upon every farm. The annexed engraving represents a new rotary spader of peculiar appearance and construction. The following description will be readily understood by the intelligent reader. The cast-iron cams, A, are provided with an axle to which they are keyed fast; they are attached to the wrought-iron frame, B, by the connection, C, and have further a lug, *a*, which takes against the frame, and prevents the whole strain of the draft from coming on the key. The offset iron arm, D, is bolted to the face of the cam, and has an arm, *b*, jointed to the upper end, which is curved around the periphery of the cam, as shown in the engraving, so that it forms a groove or recess, in which the fork shafts, *c*, travel. The lever, E, is jointed to the frame, and bears against the back of the arm, *b*, so that it is kept up to the lug, against which it bears when the machine is in operation; when not in use the lever is thrown toward the team and carries the arm with it, thus opening the groove.

Fig. 2



The strap, *d*, attached to the hinder end of the cam, has a piece of india-rubber interposed between it and the same, which serves as a spring. The forks are secured upon shafts, the ends of which have rollers that run around the cam as the machine is drawn along. The bottoms of the cams are tangential with the circumference and have also a peculiar hook at the hinder part, by which the action of the forks is much improved, a vibrating or sifting motion being thus obtained, which thoroughly pulverizes the soil. The plane surface at the bottom gives a horizontal movement to the excavating gear and adds very greatly to the efficiency of the tool. The iron apron, F, affords a protection from danger to the driver, in case of the breakage of the seat, from which point the operation of the machine is directed. The team is attached by the usual appliances to the pole, G, against which a detached roller shaft is seen inclined. The apertures, *e*, in the face of the cam wheel are made for convenience of access in adjusting the forks and the shafts in place.

Fig. 2 is a representation of the machine with the forks thrown out of gear with the cams. The lever,

E, is thrown forward, and the arm, *b*, then relaxes and so widens the groove that the forks assume the position shown in the engraving, and the machine may be drawn over the ground without their entering it. The arrangement of the other parts is similar, and presents no peculiarities not previously described.

The patent for this invention was procured May 13, 1862, by C. Comstock, of Milwaukee, Wis., and further information may be obtained by addressing the inventor as above.

The Feat of the "Queen of the West."

One of the most brilliant naval feats of the war—the running of the blockade at Vicksburgh, on the Mississippi, by the ram *Queen of the West*—was performed on the 2d inst., by Colonel Ellet, son of the late brave Colonel C. F. Ellet. The *Queen of the West* is one of the seven rams built by the Government, under the supervision of Colonel C. F. Ellet, and in accordance with suggestions which he had from time to time made to the Administration. The rams have done good service on the Mississippi, and by the last achievement Colonel Ellet, Jr., has covered himself with glory. The *Queen of the West* is a small stern-wheel boat (not iron-plated), she was furnished with an extempore breastwork of cotton bales for the occasion, and armed with this slight protection she steamed down towards the rebel batteries at Vicksburgh. As she neared them they let fly a ten-inch shot at her, which entered the bow, struck a brass gun there, broke it in two, and finally, glanced off and spent itself without further injury to the vessel. This was the greatest damage done, and it came very near ending the career of the little *Queen* before her mission was well inaugurated; on she went, however, and, shooting right up to the face of the town, butted a rebel craft, the *Vicksburgh*, that lay alongside the dock, and injured her severely; the *Queen* then turned and resumed her way down the river. The *Queen of the West* was under fire three-quarters of an hour, and in all that time one hundred guns of all calibers opened upon her, without injuring her, however, in the least; the ram bore a charmed life, and escaped to tell the tale of her achievement. Such daring and skilful feats as these do much to elate the people and do credit to all concerned.

The Loss of the "Hatteras."

The *Hatteras*, United States transport, which was sunk on the night of Jan. 11, 1863, was at that time in close action with the Confederate steamer *Alabama*, and the commander of the transport is entitled to the credit of having engaged that scourge of our commerce regardless of personal results. The *Hatteras* was a small side-wheel boat with a beam engine; she was very vulnerable and totally inadequate to cope with her antagonist. The brave fellows on the transport succeeded in firing some fifty shots from guns of twenty and fifty-pound calibre, and must have inflicted some damage to the hull of the *Alabama*, how great it was we have no means of ascertaining. The *Hatteras* fell in with the *Alabama* accidentally it seems, but if all of our naval officers would exhibit the spirit evinced by Commander Blake, they would doubtless soon find and destroy that formidable vessel, and all the others which are on a kindred mission of plunder.

PLANING-MACHINE BEDS.—We notice an idea advanced in the London *Engineer*, which is that the beds of planing machines should be reversed once a year where their construction permits it. This will equalize the wear of the slides and make them truer than they would otherwise be. We suggest that if they are changed at all, they be reversed every six months, as carelessness will in twelve months so injure a planing machine that nothing will cure it but being made over. If, however, the artisan be up to his business, he will so arrange his work on the bed that it will wear true at all times; if he is obliged to work any length of time on one end of the bed, he ought to divide the periods so as to run first one end of the platen over the slides and then change the other end. In this way the best results will be obtained.

THE number of sea-going vessels in the world is about sixty-five thousand, two thirds of which belong to England and the United States.

Aluminium Bronze.

In the *Philosophical Magazine* there is an article by Lieut.-Col. A. Strange, F. R. A. S., on the properties and present value of aluminium bronze, an alloy consisting of ten parts of aluminium and 90 of copper. Its tensile strength is stated at 73,185 lbs. per square inch, being more than double the breaking strain of gun-metal, and 1,185 lbs. more than the average tenacity of cast-steel. Its resistance to compression is 132,416 lbs. to the square inch; that of cast-iron being 115,542 lbs. As to malleability, this alloy may be drawn out under the hammer almost to a needle point at a red heat. Its rigidity is about three times that of gun metal, and forty-four times that of brass; it is less affected by change of temperature than either of the latter; it may be cast with extraordinary facility into any shape; it does not clog the file, and yields fine elastic shavings on the lathe. It tarnishes much less readily in the air than any other metal or alloy used for astronomical instruments, and will receive the finest graduation possible. It is extremely elastic, can be rolled into sheet metal, or also hammered and drawn, and seems admirably adapted for the tubular parts of astronomical instruments. Its specific gravity is 7·689, nearly the same as wrought iron. To make this alloy extremely pure, copper should be used; the best is copper deposited by electricity; but, since that kind is very expensive, the next best is copper from Lake Superior, which makes an alloy of excellent quality. The ordinary coppers of commerce generally fail, owing, it is said, chiefly to the presence of iron, which appears to be specially prejudicial. Another precaution is to re-melt the alloy two or three times. The first melting, in the proportions above stated, produces an alloy of extreme brittleness; but each successive melting, up to a certain point determined by the working, and particularly the forging properties of the metal, improves its tenacity and strength.

Hints about Pianos.

If the piano-forte be the instrument of use, bring it out from the wall, so that a free space be before you when you sing or play. Never sing up against a wall, if you can help it, or subject your friends to this sore trial. Moreover, never lumber a piano with music and books; it is unartistic. Above all, keep your piano in tune. If an instrument is worth having, it is worth being kept in good order. You cannot have a piano long out of tune without getting your ear out of tune, and if a singer, your voice. The Erard grand pianos of New York are all kept in order by one accomplished tuner. For twelve dollars a year he tunes once a month, and oftener if necessary. Such an arrangement should be made for pianos of every make. It improves them, and they last the longer for it. A very awkward accompaniment of the piano-forte is the piano-stool. It is clumsy and heavy to move; has a special facility for upsetting; the screw is often in a crippled state; and at best, it is but an insecure, uncomfortable, and shaky contrivance. A seat of far greater convenience and elegance at the piano, particularly with the present flowing style of ladies' dresses, is an ottoman-shaped seat somewhat long, like an organ-bench, but tastefully modeled. It might be upholstered, though it were better not. It should, of course, be made for the purpose, and of the right hight. The most comfortable off-hand or improvised seat is a cane chair; and, by the way, let us suggest to gentlemen never to sit on a piano-stool. The dignity of but few men is equal to the situation of a perch on such a tripod, with the coat-tails hanging down behind; a chair, by all means!—*Once a Month.*

UNINFLAMMABLE PREPARATION.—Numerous substances have been tried to render muslin dresses incumbustible, the best being the tungstate of soda and the sulphate of ammonia. Tungstate of soda, prepared expressly for rendering fabrics non-inflammable, can be obtained, by order, of any chemist. Directions for use:—To three parts of good (dry) starch add one part of tungstate of soda, and use the starch in the ordinary way. If the material does not require starching, mix in the proportion of one pound of tungstate of soda to two gallons of water; saturate the fabric with this solution, and dry it. The heat of the iron in no way affects the non-inflammability of the fabric.

The Tallow Tree in China.

The tallow tree, called by the Chinese "Oo-Ricon," is of the hight and appearance of a pear-tree, with twisted branches and a large round head. The trunk is short and thick, and the bark smooth. The leaves are alternate, and resemble those of the black poplar. The blossom is yellow; but the most singular part of the tree is the fruit, which is enclosed in a husk like that of a chestnut. When the fruit is ripe the husk opens of itself, showing three white grains about the bigness of a filbert. These grains contain the beautiful vegetable tallow so useful to the Chinese. The fruit of the tallow tree goes through nearly the same process as the seed of the oil plant.

The machine by which it is bruised consists of a wheel moved backward and forward in the trunk of a tree, which is shaped like a canoe, lined with iron, and fixed in the ground. The axis of the wheel is attached to a long pole, which is laden with a heavy weight and suspended from a horizontal beam. The berries thus bruised and divided are exposed for a considerable time to the action of steam, until they become very soft, when they are quickly thrown into layers of straw, covered up again with other layers of straw, and spread about as equally as possible. Men do this with their feet; and as the berries are very hot, and, of course, warily trodden upon, the operation bears a striking resemblance to dancing. The appearance of a number of men gravely and carefully performing sundry evolutions on their toes, has been described as irresistibly ludicrous, particularly as it is unaccompanied by music; by this process large cakes are formed of the mingled grains and straw. The cakes thus formed are afterward pressed.

The tallow is hard and white, and has all the properties of that obtained from animals. Three pounds of vegetable oil are mixed with every ten pounds of the tallow, and a quantity of wax is used to give it consistence.

The best candles are also coated with wax. When properly prepared they burn almost without smoke, and are free from disagreeable smell. It often happens that the candles prepared with vegetable tallow burn with a great flame, throw out much smoke, and consume quickly; but this is attributed to a slovenly and dirty mode of preparation and to the nature of the wick, which is usually made of a dry and light wood, not much unlike the wick of a rush-light. Candles made of this tallow by Europeans have been found very nearly equal to those made of wax.

The tallow tree is usually planted in extensive plains and in regular order, the leaves being either of a deep purple or brilliant red, and the blossoms of a bright yellow; the contrast is said to have a very pleasing effect; and European travelers have described the groves of those trees as the most beautiful objects of a Chinese landscape. This tree has now been successfully acclimatized in Algeria; it requires no care or watering.

Good Advice on Sundry Subjects.

Never cut a piece out of a newspaper until you have looked on the other side, where perhaps you may find something more valuable than that which you first intended to appropriate.—Never put salt into your soup before you have tasted it. I have known gentlemen very much enraged by doing so.—Never burn your fingers if you can help it. People burn their fingers every day, when they might have escaped if they had been careful.—Don't put your feet upon the table. True, the members of Congress do so, but you are not a member of Congress.—If you form one of a large mixed company, and a diffident stranger enters the room and takes a seat among you, say something to him, for heaven's sake, even although it be only, "Fine evening, sir!" Do not let him sit bolt upright, suffering all the apprehensions and agonies of bashfulness, without any relief. Ask how he has been; tell him you know his friend, so and so—anything that will do to break the icy stiffness in which very decent fellows are sometimes frozen on their *debut* before a new circle.—*Exchange.*

THE total foreign debt of Ohio is $14,141,662. The debt of Illinois is $13,337,381, most of which is foreign. The public debt of Pennsylvania is $40,448,213.

Scientific Warfare.

We should like to see a soldier rigged out in the numerous devices which have appeared since the commencement of the war, in our excellent contemporary, the SCIENTIFIC AMERICAN. We should like, also, to know what he would weigh in full working order; *i.e.*, able to do such small repairs as his arms might need, to make gunpowder, to cut off a leg or perform other surgical operations, to distill foul water, to purify beef, to cook such food as soldiers use, to patch shoes and breeches, and having withal wherewith to make a bed, a table and a few chairs. It has always puzzled us to know how the man of war would transport all of these useful appliances; but the difficulty is now removed. The last number of the SCIENTIFIC contains the "Portable Breastwork," which is, in brief, a wheelbarrow with a piece of boiler plate about as big as a barn door, so fixed as to be adjusted at any angle, thus affording a complete protection to the infantry man in the field. We see no objection to the use of this apparatus, provided the ground is in all cases smooth and hard, with no dead bodies in the way, and no high winds. The many advantages attending the use of the "Patent Life-preserving Wheelbarrow" can hardly be enumerated. With this, the soldier could easily transport a small stove, writing desk, library, hammock, tent, a barrel of apples, a bushel of doughnuts, reports of investigating committees, hospital stores, &c. The order of battle need not even be disturbed at night; since each soldier could camp where he stood. In event of defeat, a rout would be utterly impossible; for no cavalry nor foot troops could ever make their way over such *chevaux de frise* as would be presented by the debris of half a dozen regiments of wheelbarrows. The only danger would be that the unscientific enemy might some night, when each man was sound asleep in his wheelbarrow, take it upon them to wheel off our troops; but doubtless the inventor of the machine could arrange a patent brake for the wheels.—*Railway Times.*

All that the facetious editor says is true. Look also at what our inventors are doing among the appliances and utensils of the laundry and kitchen. We have lately been impressed with the idea that "Biddy" has rather a good thing of it in the kitchen, and our suspicions are now resolved into certainty; she has only to turn a crank and the garments issue from the squeezing machine much "dhrier," as she phrases it, than even her brawny arms could twist them; she need not henceforth crack and strain her mighty thews in vain. So also with the hand-irons. The "exile from Erin" is no longer in danger of overheating the delicate cuticle with which Nature has covered her fingers and arms; the heat-intercepting envelope (illustrated in this number) shields her from injury, and protects her from the too fervent heat of the iron. The portable clothes-dryers come to the aid of "Biddy," and enable her to hang out her garments from the windows, so that her fragile limbs are not endangered by descending the stairs with heavy burdens; and the washing, churning, and we don't know how many other contrivances of the kind, secure to the modern housemaid an immunity from over-exertion that must be highly delightful. Even milking is now done mechanically, and we saw an individual, only the other day, vending a whistling machine (think of that, ye puckerers!), and it made a melodious echo unapproachable by any human sibillation. Where the inventors will cease in their efforts to utilize muscle is, after this latest achievement, quite inscrutable.

We thought we had rather exhausted the catalogue of invention when we chronicled the performance of the whistling machine; since the above was in type we have received a suggestion from a correspondent that some public-spirited person should invent "a pair of tongs for handling chicken and spare-rib bones," as it is very disagreeable to have the fingers greased at the table. We call the attention of inventors to this latest requirement of domestic economy, adding only that if they will also make a machine to masticate tough beef, it will not be unprofitable in boarding-houses and hotels. How is it, Messrs. Inventors, shall we have the tongs for table use?

A COMPLIMENT WELL EARNED.—Mr. William Gorman, the Chief Engineer of the steamship *Roanoke*, has been presented with a splendid gold watch by the agents of that ship, Messrs. Ludlam & Heineken, for services rendered during a severe gale, in which the vessel was caught. We know Mr. Gorman very well and think that the compliment was one well earned and deserved by him; he is a hard-working indefatigable officer in whom our steamship owners can place confidence.

LARGE sums of money are expended annually in obtaining the fertilizing material, guano, from distant islands, in the sea; while in our cities vast quantities of materials embracing the same properties are allowed to pollute the sewers and flow unreclaimed into the sea.

MISCELLANEOUS SUMMARY.

CALIFORNIA WOOL.—In 1855 there were only 360,000 pounds of wool raised in California; in 1863, there were 64,000,000 pounds raised. The *California Wine and Wool Register* says respecting wool:—"The past three years have been marked by a steady improvement in the quality of our wool, and in a less degree by a more careful attention to putting sheep in a marketable condition by the farmers. Our farmers have expended more money upon fine wooled breeding sheep within three years than any other State in the Union has done in ten years; but they will lose much of the benefit of these investments, unless they give to the shearing, tying and packing of their wool much more attention than they have yet done."

THE EXACTIONS OF JOURNALISM.—Every editor knows and has felt the truth of the following assertions, which we copy from an exchange:—"It is one of the hardships of the profession that its working wheels—brains and hearts—are not allowed to lag for sickness or stop for calamity or sorrow. The judge may adjourn his court; the school and the workshop may close shutters; the mourner may veil features, and turn friend and stranger from the door, but the journalist must forget before the *to-morrow* of to-day, must write gaily and freshly as a newsmonger on the trifle of the hour, whatever burden has been laid on that same hour by Providence."

THE "WHAT IS IT" A FAILURE.—The famous submarine battery, which was intended to remove rebel obstructions in the James river, Va., has turned out a complete failure. She cost the Government some fifteen thousand dollars, exclusive of armament. Upon her recent trip she sank at once to the bottom (instead of floating just beneath the surface), and it has since been found impossible to raise her. The frame is fast breaking up by the action of the breakers. She is near Coney Island, and there will soon be nothing left except her iron-work and guns, which may possibly be recovered.

MATERIAL FOR SHIPS OF WAR.—It is proposed to supersede the use of armor plates for ships by willow-wood of the thickness of a foot, having a steel rolled plate of one inch and a half inserted in the middle of the wood. This wood has the property of resisting compression to a great degree, and possesses the same cohesive and repulsive properties as steel. Whalebone, from its cohesion and tenacity, has likewise been proposed as an extra backing for the iron plates, placing the same between the iron and the teak or willow. Horn has its advocates as an additional backing.

TAX ON PATENTED ARTICLES.—Commissioner Boutwell has made the following decisions under the Internal Revenue law in regard to the manufacture of patented articles. Whenever a person is the owner of a patent or of the right to manufacture a patented article, and employs other persons to make such patented article, the patentee or owner of the patent right will be regarded as the manufacturer, and the tax will be assessed upon the sales as made by him or his agents.

AN ice mirage was lately witnessed in Buctouche, Kent county, N. S., by which a portion of Prince Edward's Island, fourteen miles distant, seemed to be suspended in the air and very near, so that the clearing and buildings could be distinctly seen; and with a moderately powerful spy-glass, cattle and vehicles could be distinguished moving about.

THE Bedouins, says Ritson, are a most alert and military race, and yet it is an undoubted fact that the quantity of food usually consumed by the greater part of them, does not exceed six ounces a day. Six or seven dates soaked in melted butter, serve a man a whole day, and he esteems himself happy when he can add a small quantity of coarse flour or a little ball of rice.

A MR. Stokes of Trenton, lately sued Judge Narr of the *True American*, for damages, for having put his marriage among the deaths. Although the editor offered to make it all right by putting Stokes' death among the marriages, the indignant Benedict would not accept the *amende honorable*. Damages six cents.

THE Canadian journals continue to complain of a "plethora of silver."

THE NEW YORK STATE AGRICULTURAL SOCIETY.—The annual meeting of the New York State Agricultural Society was held at Albany on the 11th inst. The report of the Treasurer shows that the receipts for the year were $17,169 02; expenditures, $13,354 96, including $4,486 77 paid on premiuns of the last State Fair; cash on hand, $3,814 06, including the State appropriation of $2,000 for flax machinery premiums. Edward G. Faile, of Westchester, was elected as president, and B. P. Johnson as corresponding secretary. The next State Fair will be held at Utica.

A SHOCKING RECORD.—The suicides in France now average ten a day; the number for the present century, thus far, is over three hundred thousand. Not a day passes in which a suicide may not be directly traced to want of success in life; to the false moralities inculcated by wicked or ignorant writers; to the failure of parents in obtaining a proper influence over their children; to unrestrained appetites and passions; and to the inability of multitudes "to get along in the world" prosperously, for want of thoroughness of preparation for their calling or station in life.—*Hall's Journal of Health.*

THE AGRICULTURAL DEPARTMENT.—The Committee on Agriculture in the House of Representatives has prepared a bill defining the duties and providing for the officers in the Agricultural Bureau. It authorizes the employment of a chief clerk, a botanist, chemist and entomologist, at a salary of $2,000 each per annum; also a disbursing clerk and a chief of statistics at $1,800 each; a translator and draughtsman at $1,400 each, and six clerks at $1,200 each. Here will be a nice opening, we fear, for a new batch of enterprising politicians. They will have a finger in the pie, somehow.

"HEAVY DAYS" IN THE NEW YORK POST-OFFICE.—We find the following in the last *United States Mail*:—"Some idea will be given of the immense labor in the New York Post-office, when the fact is mentioned that, on one day lately, in addition to the usual work, there were received by steamer from Newbern, N.C., 66,000 letters; Port Royal, 16,000; and three mails from New Orleans by different steamers, bringing about 15,000—making, in all, nearly 100,000 extra letters in one day. On the following morning, by the arrival of the *Saxonia* with the European mails, over 30,000 letters were received."

THE skate factory of Messrs. Williams, Morse & Co., in Skowhegan, Maine, has manufactured over 30,000 pairs the present season, all of which were sold to a single firm in Boston. They make nineteen different varieties of skates, and nearly every process in the manufacture is performed by machinery.

IT is stated that, with 125 presses, the Treasury Department is just able to print enough green-backs in two-thirds of a day to pay the expenses of the Government for one day.

WITHIN one month past about 14,000 bales of cotton have reached Cairo, Ill., on their way to a northern market.

NEW LONDON, Conn., is the choice of a majority of the committee on the location of naval depots for a new navy yard.

C. H. ADAMS, of Cohoes, N. Y., has a contract to furnish the army with 36,000 knitted shirts.

PAPER collars have advanced from 25 cents to 40 cents per dozen.

Starvation Prices.

Let those who are fond of grumbling at high prices peruse the following extract relating to the cost of provisions during the siege of Gibraltar by the French and Spanish in 1777:—

"During the siege the most common necessaries of life were exorbitantly dear. Bad ship-biscuit, full of worms, was sold at one shilling a pound; flour, in not much better condition, at the same price; old dried peas at one shilling and fourpence; salt, half dirt—the sweeping of ships' bottoms and storehouses—at eightpence; old salt butter at two shillings and sixpence; and English farthing candles at sixpence apiece. Fresh provisions commanded much higher prices. Turkeys sold at three pounds twelve shillings; sucking pigs at two pounds two shillings; and one pound one shilling was refused for a calf's pluck."