ICE A NECESSITY.---HOW IT IS OBTAINED IN QUANTITY.

As a class, man is proverbially ungrateful. Those comforts which lighten his labors, day after day, he regards as matters of course, and gives not one single thought in gratitude for the enjoyment consequent upon them, nor one single reflection upon the care and labor expended in order that he may enjoy them. Little does he think, while sipping his ice water, after a day of toil under a sun high in heaven, and with the thermometer far up in the nineties, of the immense amount of labor expended a few months before in gathering and storing that substance which shall render his water palatable. Now that the hot season is once more upon us, it may not be inappropriate to give within the space of a short article, a description of the process of gathering the immense crop of ice which is necessary to supply the demands of sweltering humanity in our cities.

When we consider that seventy years ago ice in cities was deemed a rare luxury during the summer, and it was only within the power of the wealthy to pay the prices demanded,it must be conceded that the increase in its consumption and decrease in price have been wonderful, when, today, rich and poor alike demand it as one of the necessities rather than the luxuries of life. In the city of New York, seventy years ago, a few tuns satisfied the demand; for consumption during the present season, in this city alone, 1,000,000 tuns have been harvested, engaging the energies of six companies with an aggregate capital of $4,000,000; in its transportation and delivery, employing forty barges, five steamers, three hundred wagons, five hundred horses, and seven hundred men.

Many of the ice houses, in which the ice is stored until needed, are built of brick, with double, triple, or even quadruple walls, the spaces between the walls being filled with sawdust or some like substance. They are from 200 to 400 feet long and from 100 to 200 feet wide, and are sometimes three and four stories in hight. Airtight doors close each floor.

A proper time having arrived for the gathering of an ice crop, all is hurry and bustle. No time is to be lost, and here we fully comprehend the truth of the maxim that "time is money;" as the ice companies may be obliged to content themselves with but one crop of ice, everything depends upon the haste with which it is gathered, for should an unpropitious change take place in the weather, thousands of dollars' worth will be lost. All day long the men are as busy as bees, and, should the night be clear and the moon gracious, no respite is given, and the dawning of another day sees the work being carried hurriedly on. The ice field having been fenced in and the snow scraped off, the ice is planed to a depth of two or three inches to remove the porous ice coating from the solid mass beneath. A machine called a marker, drawn by horses, then cuts narrow grooves five feet apart over the whole length of the field; these are crossed by similar grooves, dividing the field into squares; these grooves are deepened and the squares made smaller by a harrow having three rows of teeth two feet apart. One row of blocks having been separated from the field by means of a hand saw, it is lifted upon the surface and hurried to the house. Rapidly a gang of men pry off the blocks with crow bars; the blocks are elevated upon an inclined plane, lowered into the house, and packed in sawdust, bran, shavings, or bark. As soon as one story is filled, the doors are closed, the next story is treated in the same manner, and so on, until the house is filled, when it is closed, not to be op ned until the ice is needed. The ice is handled as little as possible, for like riches, with much handling it may take to itself wings and fly away.

SCIENTIFIC INTELLIGENCE.

EXPLOSIVE ACTION OF OZONE.

A number of mysterious explosions of various nitrogen compounds have attracted the notice of chemists, and some experiments have been instituted with a view to an explanation of the phenomena. It has been found that nearly all of the mixtures composed of nitrogenous substances and used as explosives, are decomposed with more or less violence by ozone. A powder in which picric acid was a constituent, caused great damage in the laboratory where it was made, in consequence of the action of ozone. At first the cause of he accident was inexplicable, but careful research traced it o the ozone in the atmosphere.

Nitro-glycerin is at once decomposed by ozone into nitric acid and other compounds. Gun cotton is also destroyed, sometimes with explosive force, and so on through the list of explosive compounds. An extension of these researches may eventually afford an explanation of the spontaneous decomposition of certain bodies, and may suggest precautions to be observed to prevent a recurrence of the accidents; and it has been suggested that a new test for ozone might be found in this way.

USE OF GLYCERIN IN TESTING FOR GRAPE SUGAR.

Glycerin possesses the property, in the presence of soda or potash, of dissolving a considerable quantity of hydrated oxide of copper. On this account, the alkalies do not give a precipitate from copper solutions to which glycerin has been added. Hence the copper solutions for testing for grape sugar can be advantageously prepared with a small proportion of glycerin, as they can be rapidly made, do not easily decompose, and withstand the action of diffused light. A standard solution can be prepared as follows: Dissolve 16 grammes pure sulphate of copper (blue vitriol) in 64 grammes of water, and gradually add 80 cubic centimeters caustic soda, specific gravity 1·34 (about 112 grammes), and then add, with constant agitation, 6 to 8 grammes pure glycerin, until the liquid is clear. It would be possible to prepare a solution, in this way, of a fixed value for the quantitative determination of grape sugar, and such a method could be applied to the analysis of cane sugar by converting the latter into grape sugar, previous to making the test.

DEATH OF PROFESSOR PAYEN.

Professor Anselme Payen died recently in Paris at the advanced age of seventy six, having been born January 17, 1795. After completing his studies, he was one of the first persons to appreciate the importance of the beet sugar manufacture to the prosperity of France, and early became a director of one of the largest sugar refineries. Afterwards he assisted in the foundation of several important chemical works, until he was called to the chair of applied chemistry at the *Conservatoire des Arts et Métiers* in Paris, where he devoted the remainder of his days to instruction by lecture and laboratory practice, and where he wrote his numerous papers on applied science, and prepared his learned work on the application of chemistry to the arts. He was long an authority in all matters of the application of science to the wants of man; and his own investigations were among the best contributions the French have made to this branch of knowledge. We remember him as an urbane, kind man, always ready to lend a helping hand to those who applied to him, an admirable specimen of a scientific teacher. He remained at his post during the recent siege of his native city, and took an active part in the food discussions at the meetings of the Academy. His health was not perceptibly impaired, but the strain appears to have been too much for his overworked brain, and he died suddenly of apoplexy. His death will be severely felt at the institution where he has so long and successfully labored, and the scientific world in general will regret to lose one of its most active and useful members.

NEW TESTS FOR PETROLEUM.

Good petroleum should possess the following characteristics:

1. The color should be white or light yellow with blue reflection; clear yellow indicates imperfect purification, or adulteration with inferior oil. 2. The odor should be faint and not disagreeable. 3. The specific gravity at 60° Fah. ought not to be below 0·795 nor above 0·804. 4. When mixed with an equal volume of sulphuric acid of the density of 1·53, the color ought not to become darker, but, on the contrary, lighter. A petroleum that satisfies all of these conditions and possesses the proper flashing point may be set down as a pure and safe article.

SILVERING GLASS.

The various methods invented by Liebig, Bothe, Böttger, and others for depositing silver upon glass have been considerably modified and improved by Krippendorf, in Switzerland, and we give below a condensed statement of the latest improvements introduced by him. The following are the labels required for the materials to be used in silvering glass:

1. Seignette salts; that is, tartrate of soda and potash.
2. Solution of seignette salts in the proportion of one gramme to fifty grammes of distilled water.
3. Caustic ammonia, fifty cubic centimeters.
4. Solution of nitrate of silver, 1·8.
5. A flask of 1,000 cubic centimeters capacity for the reducing liquid.
6. A second flask of same size for the silvering solution.

With the help of the above chemicals and flasks, the two normal solutions, viz.: (1) the reducing liquid; (2) the silvering liquid can be prepared in the flasks (5 and 6).

1. The normal reducing solution: 900 cubic centimeters (grammes) distilled water are mixed with ninety cubic centimeters seignette salts solution (2) and the mixture brought to boiling over a suitable fire. During the boiling of the liquid, by which considerable steam is evolved, twenty cubic centimeters of the nitrate of silver solution are added from No. 4, by which the whole liquid is blackened. The whole is allowed to boil for ten minutes until the so called oxytartrate of silver is formed, when the reducing liquid is ready for use. This normal liquid can be preserved any length of time; in fact, it seems to improve by age. It can be kept in flasks, and when required for use must be carefully filtered. Experience has shown that it is better to prepare the normal reducing liquid in a flask rather than in a capsule.

2. The normal silvering liquid: Nitrate of silver is dissolved in water, and ammonia gradually added until the brown precipitate is nearly all dissolved, then filtered, and diluted until there is one gramme of nitrate of silver in 100 cubic centimeters of the liquid. For those who are not chemists, it is as well to take 900 cubic centimeters distilled water, add eighty cubic centimeters of the silver solution from No. 4 (1·8) and afterwards 100 drops caustic ammonia from No. 3.

3, The silvering process: Equal volumes of the liquids (1) and (2) are carefully and separately filtered and afterwards poured together into a vessel of the proper size, and the well cleaned glass plate introduced. In about ten minutes a decomposition of the mixture begins to take place, indicated by a blackening of the surface, and pure metallic silver will be deposited upon the plate. The introduction of the plate and the cleaning of it take place precisely as in photographic operations, otherwise irregular lines and unequal deposits of silver result. Gentle heat and sunlight facilitate the operation, while cold and darkness retard it. Finally the plate is removed from the vessel, rinsed with pure water, and varnished or otherwise protected by a background. Good photographic varnish can be recommended for coating the film. For bath, after the operation, contains fifty to sixty per cent of the original silver, which can be reclaimed as chloride by the addition of hydrochloric acid. Hollow ware, reagent bottles, and test tubes are silvered by simply pouring in the solutions (1) and (2) in the same way as described above. The silvering the interior of large flasks, it is well to introduce a small quantity of the liquid at first, and to turn it rapidly around until the surface is covered with a thin deposit. Treated in this way, the operation becomes a very simple one, and may lead to the introduction of silver mirrors as substitutes for quicksilver glasses for very many purposes.

The New Railroad Depot at Forty-second Street and Fourth Avenue.

Among all our large commercial buildings, the railroad depots are those of which New Yorkers have least cause to be proud. Discomfort, shabbiness, and dirt, concentrated in ill-ventilated structures, have generally hitherto been all the accommodation to the public that our railroad kings have seen fit to give. But at last a building has been erected, where space for business, order and discipline in arrangement, ample ingress and egress, and substantial elegance of interior and exterior, are provided. This is the new Union depot, corner of Forty-second street and Fourth avenue, and it is intended to be the New York terminus of the New York Central and Hudson River, the New York and Harlem, and the New York and New Haven lines, which are all, directly or indirectly, under the control of Commodore Vanderbilt.

The building is nearly 800 feet in length by 240 in width, and is thus about four acres in floor area. The crown of the arched roof is over 100 feet from the ground; and the iron and glass of which the roof is built, and which is now the universal system of roof building for railroad purposes, inure to the depot plenty of light and an airy and pleasant appearance. Offices for the transaction of the business of the three roads, well built and decorated, are exterior to the depot itself, and face Forty-second and the adjacent streets; and waiting rooms, with restaurant adjoining, and toilet accommodation are also provided.

Telegraphic communication is made from the depot master's office to all the switches, and the centralization of all the switch arrangements will be found to prevent the numerous slight accidents which often occur in and about a railroad depot, accidents of which the public hears nothing, but which add greatly to the expenses of a railroad. To these well designed and costly arrangements, it will be necessary to add a well disciplined, courteous, and business like staff of clerks, porters, and attendants; and the traveling public will appreciate the convenience of the new terminus, and one of our railway presidents will have got rid, as far as he is concerned, of a lasting reproach to New York.

Munroe's Refrigerator.

In this refrigerator, a box or outer casing, made of wood and of any convenient or required form, size, and proportion, contains a porous vessel, either made in a single piece or in slabs or pieces of any material (preferably of kaolin), but of any mineral or other substance which possesses the required degree of porosity. The outer surface of this porous vessel or evaporating medium is corrugated, to present a more extended evaporating surface, or it may be made with double walls or projecting wings, or in any form for the same purpose. It has a channel or gutter around the top, either continuous or in sections, into which water or other liquid is placed. This liquid is absorbed by the porous vessel, so that the latter becomes saturated with the moisture. Any water or liquid which may drip from the vessel or evaporating medium is caught by a hopper shaped false bottom and conducted into a watertight drawer, whence it may be discharged at pleasure through a faucet. The vessel or absorbing and evaporating medium is supported above the drip bottom in any suitable and substantial manner, any device being employed which will not obstruct the current or currents of air from passing up or down entirely through the refrigerator. Between the casing and the evaporating medium is an open space on each side, which open space extends from the top entirely through, and in the top are orifices for the admission or discharge of air. In practice the air current is downward, and the more rapid the evaporation of the liquid or moisture, the stronger will be the current of air. The evaporating vessel is lined on the outside with zinc or other metal, but preferably with some mineral composition, cement, or plastic material, either waterproof in itself or used in combination with a waterproof coating on the vessel, so that moisture shall be entirely excluded from the preserving chamber. By this means the use of ice is dispensed with The temperature in the preserving chamber is, the inventor claims, readily reduced to 40° in the hottest weather. In fact the temperature is more readily reduced in hot than in moderate weather, as the evaporation will then be more abundant. The improvement applies not only to refrigerators for family use, but to refrigerating compartments on board of vessels or on railroad cars for the transportation of meats, fruits, and vegetables. The motion of such vessels or cars will produce currents of air, which might be conducted to the absorbing and evaporating medium, and utilized in maintaining a low temperature in a preserving chamber. Lateral as well as vertical currents may be employed, and the air may be forced in contact with the evaporating medium by a blower or otherwise, as may be found most convenient, or as circumstances may dictate. This apparatus is the invention of Charles E. Munroe, of Cambridge, Mass.

GLUE KETTLES.—A few holes, bored in a glue kettle, in a horizontal line near the rim, will allow steam from the boiler to enter the kettle, and so prevent the glue from solidifying on the side. The holes need not be bored all round the kettle, as it is handy to be able to pour glue out of one side without wasting it.

What an Editor should Eat.

It is often said that editors are born, not made. This, says the *American Newspaper Reporter*, is doubtless true, as it is of many other occupations in life. Yet we have abundant evidence to show that men born with great capacity for certain occupations are frequently beaten in the race by men of much lower caliber. It is clear that to be born for a position is by no means all that is necessary to enable one to fill it satisfactorily.

In the editorial profession many of the most noticeable failures have been the result of bad habits—mental, moral, or physical. Publishers will almost always prefer the even good sense and correct habits of average capacity to the fitful brilliancy of a born editor, whose habits are constantly stealing away his efficiency. To be a thorough editor, however, in all things, is a high ambition, and given first the mental capacity at birth, adding a thorough education and good habits, and everything worth having will be his. The question of food has assumed a large importance in the scientific world, and few things have so great a power over intellectual usefulness as what we eat and drink. An organism which is expected to be always clear, reliable, and ready, requires careful treatment to insure its usefulness. In all questions of stimulus an ambitious editor will always be a radical. No reliance can be placed in any stimulant whatever. It betrays when least expected to do so, and often destroys in a moment all that the labor of months, or even years, had accomplished. "I have never trusted," says Parton, "to a single sentence written under the influence of a stimulant." And it is well known that none of our journalists who have a reputation for long continued or arduous literary labor, ever depend upon stimulants in order to accomplish it.

After abstinence from stimulus, and a habit of perfect regularity in all things, the food question becomes of the highest importance. It is well known that certain kinds of food are peculiarly fitted for keeping the brain in a state of healthy activity. Many literary men here and in Europe permit themselves coffee, tea, and condiments in moderation, and for the rest confine themselves almost entirely to fish, fruit, vegetables, milk, and the various kinds of farinaceous food, Graham bread and oat meal taking the lead. These articles have, by repeated experiments, been found to be the best for brain workers. Some constitutions, however, seem to thrive best on a strictly vegetable diet.

Miles Grant, editor of the *World's Crisis*, has done a vast amount of intellectual labor; yet, after being eighteen years a vegetarian, he finds himself in the most perfect mental and physical health. The articles chosen are those preferred in the highest scientific circles, though, as we have indicated, few consider coffee and animal food, in strict moderation, injurious. The bread adopted by Mr. Grant, and which he says, with reason, will enable one to labor longer, and with less fatigue than any other one substance, is made with coarse Graham flour, mixed with water and baked in an oven. Oatmeal, in its various forms, is next on the list, and beans (boiled without meat) and baked apples are next in order. Two meals a day are found to be better than three, and they should be taken, Mr. Grant thinks, wholly without condiment, though equally high authority says that a sufficiency of condiment should be used to render the food palatable. A window in the sleeping room should be left open, feather beds avoided, and the hours kept as regularly as possible.

These seem simple directions, but Mr. Grant affirms that it is through these means that he has been enabled to fulfil his editing duties with comfort, and to preach, when necessary, fifteen sermons per week.

How to discover Sewage Contamination in Water.

Now that the warm summer months are approaching, the quality of the water used for drinking purposes becomes a matter of anxiety to the thoughtful householder. This is particularly the case in country districts, where the supply of water is obtained from wells, and may be affected by unsuspected sources of contamination. In the spring, therefore, every householder should call in the powers of the analyst, in order to demonstrate the purity or approaching foulness of his water supply; and this even though the water be clear, bright, and tasteless.

The reason an apparently pure sample of water should be analyzed is simply this: A water may contain so small an amount of sewage, that micro chemistry will alone reveal its presence; and waters which contain such small quantities of sewage may remain innocuous through the winter, and only develop their ill effects on the approach of warm weather, and then suddenly.

The possibility of approaching danger having been indicated by the analyst, it may often be turned aside by a little attention to surface drainage, which is most commonly the source of contamination. Surely it is worth while to spend a guinea or two in order to prevent a pestilence whose cure may cost many times the sum.

The trouble involved in getting the matter into the right hands need not be great, as your chemist and druggist will almost certainly know of a suitable analyst, and will probably negotiate the matter. The samples for analysis should be collected in half gallon bottles, which have been properly cleaned and have well fitting glass stoppers; one such bottle will suffice for an ordinary analysis. Here again your chemist will help you, and provide a bottle ready for filling. In drawing the water, say from a well, the pump should be worked for a few minutes before filling the bottle, so that the sample sent may be unquestionably free from casual impurity.

It may interest general readers if we point out the chief features of the chemical evidence on which the analyst bases his judgment of a sample of water. We find, in the pages of a cotemporary, an account of the methods employed, from the pen of Mr. S. W. Rich. In the ordinary examination of a sample of water used for domestic purposes, two points have to be investigated: First, the freedom of the water from sewage contamination; secondly, the character of the water from a soap consuming point of view. The first point is determined by a series of micro-chemical processes, which indicate the presence of the elements of sewage in their characteristic form, and more particularly of "ammoniacal" and "albuminoid" organic matter. We may explain that these terms are applied to organic matter in a more or less advanced state of decomposition, from which ammonia is liberated, under specified conditions, and that the quantity of ammonia thus obtained commonly serves as a direct measure of the amount of sewage contamination. Collateral evidence has to be considered. The second point is determined by a direct estimation of hardness, and is interesting from an economico-domestic point of view. It is also customary to examine samples of water for lead, as this poisonous metal is frequently present where it is least suspected.

Druggist's Apparatus for Dividing Powders.

George P. Allen, of Woodbury, Conn., has invented an apparatus for proportioning and dividing powders, being intended to provide a simple and efficient means whereby druggists may quickly separate a mass of powder into any given number of equal quantities for doses, instead of the slow and inaccurate method of dividing with the spatula now employed. The invention consists of a board or plate of any kind or substance best suited for the purpose, having any required number of holes or pockets of uniform size and shape made through or in it, and each hole provided with a movable bottom or piston arranged for shifting quickly to vary the depth of the pocket, all the said bottoms or pistons being arranged so as to move equally in relation to the plate or holes therein. In using this instrument the mass of powder is placed on the table and scraped over the holes so as to fill as many as the number of divisions required. If it fails to fill as many holes as the said divisions require, the pistons are raised or the plate lowered, as the case may be, by which the powder in the filled pockets will be raised above the surface, so that some of it may be scraped into the holes not filled, which being done, and the requisite number of holes filled, the division is completed. The pistons are then raised to the level with the table and the powder raised up in separate piles, to be scraped away separately. The pistons are shifted downwards, and the operation of dividing the powders is carried on in like manner, if the pistons are too high at first.

Improved Show Case.

This show case is designed for showing and exposing for sale kid gloves, hosiery, laces, parasols, handkerchiefs, silks, ribbons, and any other merchandise that it may be designed to show in cases. It consists of one or more glass covered compartments so arranged that the back compartments are more fully presented to the view of the customer, enabling the merchant to exhibit a greater quantity and variety of goods in a given space without increasing the hight of the case. The cases may be used in a vertical position, or formed into an entire counter. If more than one case is used in a counter, the compartments are placed in an angular position. Where the cases are made as represented, eighteen sample dozen handkerchiefs, representing a stock of large amount, can be shown in a case three feet by two, thus bringing a great variety before the eye of the customer, while they are all at the same time under the eye of the seller, and, after the sale is made, can be put in order and re-arranged in a short space of time. With show cases of this description, where merchandise of the descriptions named is on sale, it is claimed that at least one third of the usual number of clerks now needed may be dispensed with. George A. Hearn, Jr., of New York city, is the inventor.

School Seat.

Mr. David I. Stagg, of New York city, has invented a new school seat, which is claimed to be a simple, strong, durable, neat, and convenient folding chair, so constructed as to allow the pupils to pass in and out freely and economize space. A pedestal is secured to the floor in the ordinary manner. To the upper end of the pedestal is secured a cross piece which equals in length the breadth of the chair, to the ends of which are securely attached end frames to which the back is attached, and to which the seat is pivoted. The end frames, back, and seat are constructed in the ordinary manner, except that the end frames do not extend below the top of the pedestal. This construction enables a folding school seat or chair to be attached to and supported by a single pedestal or column, so as to obtain, at the same time, the advantages of a folding seat and single column support.

Raising a Sunken Ironclad.

Efforts now making to raise the monitor *Weehawken*, sunk in Charleston harbor during the late civil war, reveal the facts that she lies due east and west on a bottom of mud, and there is about eight feet of water over her at low tide. In this position she is a dangerous obstruction in the channel. All her machinery has been taken up, and likewise the iron of her turret and deck. Her interior is all filled with mud and garbage, among which human bones are here and there visible. The diver is able to see about him when the water is clear. When the water is not clear he is compelled to go entirely by feeling, and in the muddy water, it is said, he sees better by night than by day, owing to the presence of innumerable phosphorescent animalculæ. Over two hundred tuns of iron and various metals have been raised from this ship.

Resignation of the Hon. Horace Capron.

We are to lose the valuable services of the Hon. Horace Capron, as Commissioner of Agriculture. The peculiar fitness of this gentleman for the office which he has so long and so worthily held, has been made familiar to our readers by quotations, from his elaborate reports, which have appeared from time to time in our journal.

Mr. Capron proceeds to Japan, on a mission undertaken at the solicitation of the Japanese Government, to introduce American systems of, and appliances for, agriculture, engineering, railroading, and industrial pursuits generally. The expedition will be aided by a corps of scientific men, and the best possible results from it may be looked for.

Mr. Capron's resignation takes effect on 1st next August.

EDITORIAL SUMMARY.

THE following illustration, says Professor Henry, of the vibratory movement of matter is attested by Professor Horsford, of the United States. The top of the high tower which constitutes the Bunker Hill monument inclines towards the west in the morning and the north at mid-day, and towards the east in the afternoon. These movements are due to the expanding influence of the sun as it warms, in succession, the different sides of the structure. A similar but more marked effect is produced on the dome of the capitol at Washington, as indicated by the apparent motion of the bob of a long plumb line fastened to the under side of the roof of the rotunda, and extending to the pavement beneath. This bob describes daily an ellipsoidal curve, of which the longer diameter is 4 inches or 5 inches in length. By molecular actions of this kind, Time, the slow but sure destroyer, levels to the ground the loftiest monuments of human pride.

IN a recent number of Poggendorff's *Annalen*, Dr. Wein hold states that the black absorption line of sodium can be easily obtained by a simple process. The usual method has been to interpose a flame, colored with chloride of sodium, between a strong light, such as the electric light, and the slit of a spectroscope. The source of light now proposed by M. Weinhold is an ordinary petroleum lamp; the light is allowed to pass through a slit directly on to a prism, and a spirit lamp flame, intensely colored with chloride of sodium, interposed between the prism and the eye, so as to cover the entire spectrum; the black absorption line will then be seen distinctly. If the flame colored with sodium be placed in front of the slit, the bright yellow line will be seen as usual. M. Weinhold has not been successful in using this method with an ordinary spectroscope fitted with telescopes, on account of various practical difficulties.

FORTIETH INDUSTRIAL EXHIBITION OF THE AMERICAN INSTITUTE.—The American Institute will hold its Fortieth Exhibition of National Industries during the coming autumn in the great structure known as the Empire Rink, covering the block between Second and Third Avenues, and Sixty-third and Sixty-fourth streets, opening, August 15th, for the reception of heavy machinery; Monday, August 28th, for reception of goods; Thursday, Sept. 7th, at 12 M., to the public, with an opening address; remaining open every secular day from 9 A. M. to 10 P. M., until and including Saturday, Nov. 4th, when it will close with an address and the proclamation of awards.

CRAMP in horses arises from irregular action of the motor nerves. Rubbing the affected parts with a wisp of hay for ten minutes would be beneficial; and should friction alone not remove the tendency to cramp, the parts affected should be rubbed occasionally with a solution of camphor and olive oil, in the proportion of one part of camphor to four of olive oil.

CEMENT FOR METAL AND GLASS.—The following cement will firmly attach any metallic substance to glass or porcelain: Mix two ounces of a thick solution of glue with one ounce of linseed oil varnish, or three fourths of an ounce of Venice turpentine; boil them together, stirring them until they mix as thoroughly as possible. The pieces cemented should be tied together for two or three days.

THE fifty per cent of silica in the straw and grain, respectively, show why it is that oats flourish luxuriantly on meadow land that has been broken up from grass. It also indicates that potash, for the reduction of the silicates, is absolutely essential as a constituent of the soil. Wood ashes, therefore, are very serviceable in the growth of the crop, as well as in the production of the finer grasses.

THE improved foot lathes made at Laconia, N. H., have obtained quite a notoriety. One was taken with Hall's Arctic Expedition which left this port lately. We learn that they are being sent in all directions—to California, Canada, Cuba, and Europe; many of them to noted places, such as the U. S. Military Academy, West Point, N. Y., Brown's University, Providence, R. I., etc.

AN exhibition illustrating the progress of all kinds of industrial pursuits is announced to be held at Moscow, Russia, next year, being the two hundredth anniversary of Peter the Great. The naval branch of the exhibition will have a most attractive curiosity, a boat built by the great Emperor, who "served his time" as a ship carpenter at Woolwich, England.

A SINGULAR accident happened to a lady in Portland, Me., not long ago. She went to call on a friend, and when she pulled the door bell, the wire broke, and she fell backward, striking her head on the steps. She was rendered insensible and very severely hurt.