secured. An illustrated description of this apparatus will be found in another column.

## AMMONIA AND ITS USES IN THE ARTS.

Ammonia is, in many respects, a peculiar substance, and much might be said of its composition and chemical relations to other bodies. Our purpose is, however, in the present article, to give only a brief and popular account of its manufacture on an extensive scale, and to say something of its important applications in the arts.

Ammonia has been long known under various names, *aqua caustica*, spirits of hartshorn, sal volatile, and lastly, ammonia, from Ammonium, a district in Africa, taking its name from the Temple of Jupiter Ammon, the salts of ammonia having been formerly obtained there.

The production of ammonia is now very large and necessarily so, as the already large demand for it in the various arts is constantly increasing.

Ammonia has been made by the direct combination of the gases which compose it, namely, nitrogen and hydrogen, but this method has never been made profitable in its manufacture. It is most cheaply and extensively obtained as a collateral product in other manufactures.

It is one of the by-products in the distillation of coal in gas works, and also in the manufacture of boneblack. It has also been made under patent process, which consists in distilling a mixture of two parts of guano with one part of lime, or other caustic alkali, the gaseous ammonia being conducted into water which is thus saturated with it, forming a commercial *aqua ammonia*.

Several other patents have been granted on processes for manufacturing ammonia. One of these is a method for extracting ammonia from gas water. The gas water is put into a retort with slaked lime, and distillation performed as in the guano process.

An improvement was made and patented, 1838, for the production of ammoniacal liquor from gas water, which was a great advance on the old methods, as it enabled the product to be obtained in a concentrated form.

One of the most recent sources of supply has been found in the boracic acid manufactories of Italy, which formerly allowed enormous quantities to be wasted. It is now estimated that over one million pounds of ammoniacal salts are produced by these establishments.

In the beet-root sugar manufacture, large quantities of sulphate of ammonia are allowed to go to waste.

Ammonia has been proposed as a means of generating motive power, but the experiments hitherto tried in this field have not proved very successful, though the liberation of this gas from its salts, in a close vessel, may be made to generate an enormous pressure, and its ready absorption by cold water renders the application of the condenser perfectly easy. One of the obstacles met with in these attempts has been the difficulty of constructing cheap machines out of materials which are not chemically acted upon by this gas, but it still seems to us that the method might be advantageously applied to the generation of motive power under circumstances where steam is not admissible. We do not, however, believe it can be worked as economically as steam for many of the purposes for which it has been proposed.

Machines for manufacturing ice, employing liquid ammonia, have been constructed, on the principle, that when liquids expand into gases, they absorb heat from surrounding bodies. The same principle has, however, been more cheaply applied in the use of volatile hydrocarbons as a substitute for the liquefied ammonia. The details of these different machines are, of course, dissimilar, but the general principle of their operation is the same.

To specify the widely extended and various uses to which this substance is applied in the arts, would compel us to greatly lengthen this article. Suffice it to say, that it is one of those essentials to the present status of the industry of the world, the absence of which would be felt scarcely less than soda or sulphuric acid.

## THE EXHIBITION OF THE AMERICAN INSTITUTE.

The fair of the American Institute was duly opened at the Empire Skating Rink, Third avenue, between Sixty-third and Sixty-fourth streets, on the 8th inst., and although things are yet in a somewhat chaotic condition—the department of machinery especially—the signs indicate a brilliant display. The confusion is not due to want of exertion on the part of the managers so much as to the dilatoriness of exhibitors.

None of the machinery was running at the time of our going to press, though there will be no long delay.

None of the departments was complete at the time of our visit; the art department being specially meager. There are one or two crayon portraits worthy of special notice, but beyond this and some excellent photographs, there was very little worth seeing.

The exhibition of the American Association of Wool Manufacturers is undoubtedly destined to be one of the most interesting and attractive features of this fair. The following mills are already represented: The Lawrence and Pacific Mills, Lawrence, Mass.; Hamilton Woolen Co., Lowell, Mass.; Wm. Duncan & Son's Mills, Franklin, N. J.; Eddy & Son's Mills, Fall River, Mass.; Lawrenceburg Woolen Mills, Lawrenceburg, Ind.; Hockanum Company, Rockville, Conn.; Harris Woolen Mills, Woonsocket, R. I.; Weybosset Woolen Mills, Providence, R. I.; Central Woolen Mills, Uxbridge, Mass.; Elba Woolen Mills, Providence, R. I.; Rock and New England Manufacturing Companies, Rockville, Conn.; American Mills, also of Rockville, Conn., Kernan and Helm, Utica, N.Y., and others whose goods were not yet displayed, and the names of which we could not learn. The goods in this department already on exhibition are such as to excite the pride of every one who has the prosperity of American industry at heart.

In the machinery department the only things which were arranged were two fine cases of saws, one from Hoe & Co., New York city, and the other from the American Saw Co., also of this city.

Passing from this department we observed a fine collection of agricultural machinery, which we will notice more in detail hereafter. Near this collection stands a beautiful show table of paints, exhibited by Devoe & Co., 117 Fulton street, New York. A great deal of taste is displayed in the arrangement of this table, and the samples of colors exhibited are very fine.

The soda-water fountain exhibited by John Matthews, of this city, is one of the most beautiful designs we have ever seen.

The silk department will attract much attention. Although necessarily much smaller than the exhibition of woolen goods, it is, considering the comparatively recent period since the silk manufacture could be ranked as an American industry, a very remarkable display. Among the establishments represented here we notice P. G. Gimraud, Paterson, N. J.; Frederick Bane, Schoharie, N. Y.; Dale Manufacturing Co., Paterson, N. J.; Cheeney Bros., Hartford, Conn.; W. H. Horstmann & Sons, Philadelphia, Pa.; J. S. Shafter, Paterson, N. J.; and the Oneida Community, of Oneida, N. Y.

We shall give more detailed attention to the various departments in future issues, and we congratulate the managers of the fair on their prospects of success. The exhibition will, undoubtedly, be one of the best ever held under the auspices of the American Institute.

On Friday evening the fair was honored by a visit from President Grant, who was escorted through the several departments by the Hon. Orestes Cleveland, Chairman of the Board of Managers. He spent considerable time in the woolen department, and he was apparently well pleased with the numerous beautiful products of American industry to be seen both there and in all the other departments of the fair. His presence created a great deal of enthusiasm among the large assemblage, and he was repeatedly cheered, while the band played "Hail to the Chief," and other appropriate airs.

## AN EXAMPLE FOR YOUNG MEN.

The career of Gen. John A. Rawlins, the late Secretary of War, who paid the forfeit of life in the service of his country, is a striking illustration of the fact that honor and fame are open to all in this country who unite ability with ambition and integrity. Gen. Rawlins was the son of a poor charcoal burner, who resided at Guilford, Ill., and was compelled to follow his father's trade. In the mean time he was ambitious to rise above his humble position, and earnestly applied himself to the study of books, and was finally admitted to the bar at Galena, where he not only gained an honorable practice, but won a good name, and a host of true friends.

At the outbreak of the war, Grant discovered the sterling merits of this man Rawlins, and from that time they became inseparable friends and co-laborers in the nation's cause. Grant became President, and Rawlins was made Secretary of War—fulfilling all duty assigned to him ably and well.

He died poor, and the keen instincts of our people at once appreciate the character and services of such a man. He could have made himself rich through the many opportunities that came in his way as chief of Gen. Grant's staff, but, like his illustrious superior, he was above the temptation to abuse the confidence of a sacred trust—a rare thing in these days.

The widow and children of the noble Rawlins are left poor by his death, but a purse of $50,000 has been subscribed, or nearly so, in this city to relieve them from want. If republics are ungrateful the people are not.

## RAINLESS DISTRICTS---FREAKS OF THE WEATHER.

In several parts of the world there is no rain at all. In the Old World there are two districts of this kind: the Desert of Sahara in Africa, and in Asia part of Arabia, Syria, and Persia; the other district lies between north latitude 30° and 50°, and between 75° and 118° of east longitude, including Thibet, Gobiar, Shama, and Mongolia. In the New World the rainless districts are of much less magnitude, occupying two narrow strips on the shores of Peru and Bolivia, and on the coast of Mexico and Guatemala, with a small district between Trinidad and Panama on the coast of Venezuela.

Per contra—the climate of the Khasia Mountains, which lie northeast from Calcutta, is most remarkable for the excessive fall of rain. An English traveler established the fact that in the month of August, 1841, there fell 264 inches of rain. This great rain fall is attributed to the abruptness of the mountains that face the Bay of Bengal and the intervening flat swamp 200 miles in extent. It is not easy always to account for the erratic conduct of the weather upon any established scientific theory, for it is asserted that there is a district in Siberia in which, during winter, the sky is constantly clear, and where a particle of snow never falls.

THE ROOT STEAM ENGINE COMPANY are placing in the Fair of the American Institute, one of their 120-horse power boilers, which is exciting considerable interest among steam engineers. For safety and economy of fuel, large claims are made by the manufacturers. The Company is now composed of some of our shrewdest business men, who have placed sufficient capital at their disposal to enable them to fill extensive orders.

## THE HUMBOLDT CENTENNIAL CELEBRATION.

Alexander von Humboldt was born in the city of Berlin on the 14th September, 1769. The occurrence of the centennial anniversary of the birth of this great man was commemorated in his native city by the dedication of a national monument with appropriate ceremonies. In New York city also, a colossal bronze, representing him in the prime of life, was unveiled. Professor Francis Lieber delivered an appropriate address in German, followed by one in English by Professor Doremus. Numerous German singing societies took part in the celebration, and a banquet was given at Irving Hall.

It was generally supposed that Humboldt was little known and not much appreciated by the people at large on account of the fact that his works are so learnedly written that they can only be perused by one who is already in possession of a considerable amount of scientific knowledge. No supposition can be more erroneous than this. In the winter of 1827–8 Humboldt delivered in his native city, Berlin, a course of sixty-one lectures, commencing November 3d and concluding on the 26th of April. These lectures formed, as it were, the first sketch of the "Cosmos," published subsequently, and were especially arranged for the people at large, those that had not enjoyed the advantages of higher education.

Some scientists of an inferior rank would perhaps have considered it beneath their dignity to appear as teachers. Humboldt did not, though he was then Baron, Chamberlain, Councilor, and confidential adviser of the king.

The inhabitants of Berlin and Potsdam all knew him personally, and showed him as much honor as to a king. With a slow but firm step, the head slightly bent forward, one arm at his back, holding a pamphlet, he was often seen passing through the streets. Wherever he appeared he was received by tokens of reverent esteem, the passers-by stepping aside through fear of disturbing him in his thoughts, and one was often heard saying to his neighbor, "There goes Humboldt."

The following instance goes to prove what reverence even the lowest classes paid him. During the time of the revolution, in 1848, a troop of bristly fellows stormed his house, ignorant of the fact that they were in the residence of the great *savant*: "I have no weapons, my boys; I am an unpretending philosopher, and my name is Humboldt"—uttered a small, bowed, and white-haired figure. "Back!" called the commander of the troop, "this is our great citizen Humboldt; four men remain before his house to watch that no wrong is done to him."

The following sketch of this great man is from the pen of Dr. Francis Lieber:

Who has not enjoyed the pleasure of finding the spots on the chart of human progress where you put down your finger and say, here is Aristotle, and here again; here is Hildebrandt, here is the conquest of Constantinople traced even in the discovery of our continent, even in Descartes and Bacon; here are the causes and the effects of the University; and to trace the lines of civilization radiating in different directions, from point to point? And this delight we may enjoy when meditating on the period of which Humboldt was one of the most distinct exponents. We enjoy it even now, although he has left us but yesterday; for God allowed to him days so long that he passed into history before he passed away from among us. Humboldt died as old as Sophocles.

Humboldt received the living traditions of the great circumnavigator, Cook, through Foster, Cook's companion, and lived to gather facts for his Cosmos from the latest reports of the geological surveys of our States. He lived when Voltaire died, and must have grown up with many French ideas floating around him, for Humboldt was a nobleman whose family lived within the atmosphere of the Berlin court; and he lived to witness the great revolutions in literature as well in Germany as in France and England. He lived when Rousseau died (the same year that Voltaire deceased), and must have remembered, from personal observation, that homage, which even monarchs paid (at a distance, it is true) to the Contrat Sociale, and he outlived, by some weeks, De Tocqueville. He lived through the period of the American Revolution, was a cotemporary of Washington and Adams, and a friend of Jefferson. He lived through the French Revolution and the age of the classic orators of Britain. He lived through the Napoleonic era and the resuscitation of Prussia and of all Germany. He studied under Werner, with whom mineralogy begins, and knew Houy. He knew La Place, survived Arago and Gauss, and worked with Enke. He lived with Kant, and knew Schelling and Hegel. He knew Goethe and read Heine. He read "Gibbon's Decline" as a work of a living author, and perused Niebuhr, and later still praised Prescott. He grew up in the Prussian monarchy according to the type of Frederic the Great, and with the fresh reminiscences of the Seven Year's War, and left it changed in army, school, government—in everything. He saw the beginning of the Institute of France, and lived to be considered by its associates as one of its most brilliant ornaments at its most brilliant period. He lived through the periods which distinctly mark the science of chemistry, from Lavoisier to Rose and Liebig. Humboldt was seventeen years old when the great king, perhaps the most illustrious despot of history, died so tired by the genius of his own absolutism that we cannot forget the words of the dying king; "I am weary of ruling over slaves;" and he lived through the whole period of growing popular sentiments and habits, of constitutinal demands, and revolutionary, fearful conflicts. He wore the lace and ruffle of the last century, and the more practical dress of our times. Yet no one ever heard from him any useless regret for what had passed and was gone. I have heard him speak with warmth of noble things and men that he had known, but not with gloomy despair of the present or the future.

What an amount of thinking, observing, writing, travel-

ng, and discovering he has performed, from that juvenile essay of his on the textile fabrics of the ancients to the last line of his "Cosmos," which reminds us of Copernicus reading the last proof-sheet on his death-bed, shortly before his departure; or of Mozart, who, in his darkened room, directed with dying looks the singing of a portion of that requiem which he had in part composed, conscious that his ears would never hear its pealing sounds of resurrection. Let us, one and all, young and old, symbolize by the name of Humboldt the fact that, however untrue assuredly the saying is that genius is labor, it *is* true that the necessary co-efficient of genius and of any talent is incessant diligence. We are ordained not only to eat the bread of our mouth in the sweat of our brow, but to earn in the same way the nourishing bread of the mind. This is no world of trifling; it is a world of work; and Humboldt, like the Greeks whose intellectuality he loved to honor—whose Socrates loved to say: "Arduous are all noble things"—was a hard-working man—far harder-working than most of those who arrogate the name to themselves. He ceased to work, and to work hard, only when he laid himself down on that couch from which he rose no more.

I visited Humboldt at Potsdam in the year 1844, when he had reached, therefore, the age of seventy-five; for you know that he was born in that remarkable year of 1769, in which Cuvier was born, and Wellington, and Chateaubriand, and Napeleon—just ten years after Schiller, just twenty after Goethe. Humboldt told me at that time that he was engaged on a work which he intended to call "Cosmos."

I desire to show what interest he took in everything connected with progress. I have reason to believe that it was chiefly owing to him that the King of Prussia offered to me, not long after my visit, a chair to be created in the University of Berlin, exclusively dedicated to the Science and Art of Punishment, or to Poenology, as I had already called this branch. I had conversed with the monarch on the superiority of solitary confinement at labor over all the other prison systems, when he concluded the interview with these words: "I wish you would convince Mr. von Humboldt of your views. He does not entirely agree with them. I shall let him know that you will see him."

Humboldt and prison discipline sounded strange to my ears. I went, and found that he loved truth better than his own opinion or bias, and my suggestion that so comprehensive a university as that of Berlin, our common native city, ought to be honored with having the first chair of Poenology, for which it was high time to carve out a distinct branch, treating of the convict in all his phases after the act of conviction, was seized upon at once by his liberal mind.

Many of my young friends have asked me, as their teacher, and, indeed, many other friends have repeated the question—Was he not the greatest man of the century? I do not believe it is fit for man to seat himself on the bench in the chancery of humanity, and there to pronounce this one or that one the greatest man. If all men were counted together, each one of whom has been called in his turn the greatest of all, there would be a crowd of greatest men. Mortals ourselves, we should call no one the greatest. History is abstemious even in attributing simple greatness. But if it is an attribute of greatness to impress an indelible stamp on the collective mind of a race, and to give a new impulse to its intellect; if greatness, in part, consists in devising that which is good, large, and noble, and in perseveringly executing it by means which, in the hands of others, would have been insufficient, and against obstacles which would have been insurmountable to others; if it is great to graft new branches on the trees of science and culture, leading the sap to form henceforth choicer fruit; if the daring solitude of lofty thought and loyal adhesion to its own royalty is a constituent of greatness; if lucid common sense—the health and rectitude of our intelligence which avoids, in all direction, the Too-Much—is a requisite of greatness; if rare and varied gifts, such as mark distinction when singly granted, showered by Providence on one man—if this makes up or proves greatness, then indeed we may say, without presumption, that one of the great men has been our own.

That period has arrived to which Crœsus alluded in the memorable exclamation, "Oh! Solon, Solon, Solon!" And we are now allowed to say that Humboldt was one of the most gifted, most fortunate, and most favored mortals—favored even with comeliness, with a brow so exquisitely chiseled that, irrespective of its being the symbol of lofty thought, is pleasant to look upon in his busts as a mere beautiful thing; favored even in his name, so easily uttered by all the nations which were destined to pronounce it.

When we pray not only for the kindly fruits of the earth, but also, as we ought to do, for the kindly fruits of the mind, let us always gratefully remember that He who gives all blessed things has given to our age and to all posterity such a man as Humboldt.

### The Cedars of Lebanon.

Mr. Jessup, an American missionary, has recently discovered several extensive groves of cedars in Lebanon. Of these there are three of great extent in Southern Lebanon. This grove lately contained 10,000 trees, and had been purchased by a barbarous Sheikh, from the Turkish Government, for the purpose of trying to extract pitch from the wood. The experiment of course failed, and the Sheikh was ruined, but several thousand trees were destroyed in the attempt. One of the trees measured fifteen feet in diameter, and the forest is full of young trees, springing up with great vigor. He also found two small groves on the eastern slope of Lebanon, overlooking the Buka'a, above El Medeuk; and two other large groves containing many thousand trees, one above El Baruk, and another near Ma'asiv, where the trees are very large and equal to any others; all are being destroyed for firewood.

### New Style of Photographs.

The process is due to Mr. Charles Durand.

Put into a small mortar a teaspoonful of kaolin, add thereto about a quarter of an ounce of sensitive collodio-chloride, and well stir with the pestle until it becomes a smooth paste. Add to this three fourths of an ounce more of the collodion, and again stir, and pour the whole into a bottle with one or two drops of castor oil. Well shake, and place it aside until the coarse particles have subsided.

Edge a piece of talc or glass for about a quarter of an inch all round with dilute albumen, afterwards coat with the kaolin collodion, and dry by gentle heat, when the talc or glass, if placed upon a piece of white paper, will have the appearance of alabaster.

If the film splits, it should have a trifle more castor oil in the collodion; but the best remedy is to choose a more powdery collodion.

If the film is upon glass, the progress of printing may be examined from the back; but if talc be the medium used, it may be turned back in the same manner as when printing upon paper.

Tone, fix, and wash in the same manner as with an ordinary collodio-chloride print upon opal glass, and mount in a frame or case, to protect the picture from being scratched. It must not be varnished.

After three years' trial, the film has been found not to crack or leave the talc or glass after the picture has been once finished.

Many pretty effects may be produced by putting different colored papers behind vignettes produced in this way, as whatever color is placed behind the picture gives a delicate tinge of that color to the picture.

I may add that I have tried oxide of zinc in place of kaolin, and that it also gives a good effect, but not better than the latter. There is another point worth naming. For those skilled in the use of powder colors, here is the most delightful surface which can possibly be worked on. The surface has a tooth which *bites* the color most perfectly, and the purity of the white gives a rare delicacy and brilliancy to the applied colors. By skillful manipulation and some knowledge of flesh painting, an effect resembling a highly-finished miniature can be obtained. A good print produced in this way on mica, and backed, to give warmth, with cream or buff-tinted paper, makes one of the prettiest, cheapest, and most easily produced portraits for a locket which can be desired.—*Philadelphia Photographer.*

## Editorial Summary.

TO REMOVE RUST.—A lady writing from Vermont to the *Hearth and Home* says that she accidentally discovered an easy way of removing rust from steel. She put a number of badly-rusted forks in a tumbler of kerosene oil, and after leaving them there some time, found that the rust had become so much loosened that it rubbed off readily. She says that she has since then used the oil to clean her knives and sewing machine. We suppose that many of our readers have already learned of the beneficial effects of oil on steel, but we give the correspondent's experience for the benefit of those who have never used it for such a purpose.

WONDERS OF SCIENCE.—Wonders of science never cease! Some years ago the opinion was expressed by a distinguished astronomer of Cambridge, England, that if the earth's atmosphere were but increased thirteen thousand yards in hight, so as to have an increased power of retaining the warmth poured upon it from outer space, we might do without the sun altogether, so far as our heat supply is concerned. More recently, by means of an instrument called the galvanometer, used in connection with a refracting telescope, it has not only been proved that the stars actually give heat to the earth, but the comparative amount of heat received from different stars has been, as it were measured.

DECAY OF IRON RAILINGS.—Every one must have noticed the destructive combination of lead and iron, from railings being fixed in stone with the former metal. The reason for this is, that the oxygen of the atmosphere keeps up a galvanic action between the two metals. This waste may be prevented by substituting zinc for lead, in which case the galvanic influence would be inverted; the whole of its action would fall on the zinc; the one remaining uninjured, the other nearly so. Paint formed of the oxide of zinc, for the same reason preserves iron exposed to the atmosphere infinitely better than the ordinary paint composed of the oxide of lead.

A CORRESPONDENT from Plymouth, Mass., kindly refers us to an article supposed to be the one alluded to by several correspondents lately, deprecating the use of night soil. It is on page 103, Volume III. of the New Series of SCIENTIFIC AMERICAN. Referring to the article, we find it to be a short extract from an exchange on the use of artificial manure called *poudrette*, made from night soil, and was so credited. It was copied by some other journal and improperly credited to the SCIENTIFIC AMERICAN. Having got started in that way, it has gone the rounds.

A BLIND man in Chicago has invented a tin lunch box, with a receptacle for cold coffee inside of it, and the whole thing is only 4½ inches wide and 9 inches long. The box is so constructed that when empty it can be conveniently folded together, like a thin book, and carried in the pocket.

M. JANSSEN, in a letter dated from Darjeeling, Sikim, British India, 22d May last, says that the spectra of some stars, which are rather ruddy colored when not disclosing the presence of hydrogen, do positively disclose the presence of aqueous vapor.

THE month so far has brought us a series of accidents and casualties, by land and sea, which will make it memorable. The damage done by the recent gale in New England, and the Avondale disaster, are the two most remarkable occurrences of this kind, but the number of minor accidents has also been very numerous.

THE *American Horological Journal* says that rings with settings likely to be damaged by heat may be soldered without injury if the part liable to injury be buried in a piece of raw potato.

SALE OF MACHINERY.—We call the attention of our readers to the Auction Sale of machinery of the Spencer Repeating Rifle Co., advertised in another column. It is to be sold in Boston on the 28th of September.

THE loss of weight experienced by a rower through perspiration in a prolonged contest like that of the Harvards with the Oxfords is from four to eight pounds.

THE metal sodium is stated not to take fire on cold water, but this is incorrect. A small piece of the metal will not do so, but a piece the size of a nut will frequently ignite.

## MANUFACTURING, MINING, AND RAILROAD ITEMS.

At Ottawa, Canada, there is great activity in the sawed lumber trade Nearly 40,000,000 feet are now piled up at the mills there.

The nickel ore at the Litchfield, Conn., mines will be worked as soon as workmen arrive from Germany. A furnace capable of reducing ten tuns of ore daily is just completed, and two others are building.

A dispatch from Central City, Colorado, states that the bullion shipments in the month of August amounted to $225,000. One company sold 20 tuns of gold ore for $100 per tun, to be shipped to England.

A trial has lately been made of a "steam omnibus" in Edinburgh, Scotland, and the experiment, as far as can be judged by the details given, appears to have been successful. As to the construction of the new vehicle nothing as yet is said.

An Atchison, Kansas, telegram says that the contract for the Nemeha Valley Railroad has been let, and ten miles will be completed by February 15, 1870, and the road will be finished to Pawnee City in eighteen months. This is an outrun of the Quincy and Keesville road, and diverts the business of Southern Nebraska to Chicago instead of St. Louis.

The receipts of internal revenue for July and August, this year, were $36,594,031·75, against $30,890,028·62 same months last year—an increase of $5,704,003·13. The receipts for the fiscal quarter ending September 30, 1868 were $38,735,863·03, and it is estimated that for the corresponding quarter this year they will reach $48,000,000.

It has recently been decided in this city that "Shipping articles" are invalid unless a five cent stamp is affixed for the signature of each sailor. The ground of the decision is, that the agreement is made between the master and each man individually, and that, therefore, one five cent stamp which was affixed to the articles under consideration, was insufficient.

The number of mechanics and laborers employed in the arsenal works on Rock Island at present is greater than ever before. They are classified as follows: Laborers, 600; stone-cutters and masons, 150; carpenters, 50; teamsters, 100; total number, 900. Until this month 700 was the largest number on the island. The August pay-roll will not fall short of $100,000.

The freight on wines from San Francisco to Chicago has been reduced to $4·50 per hundred pounds—one half of the old charge. It is said that this reduction was procured by the efforts of a committee of California wine-growers, who represented to the General Freight Agent of the Central Pacific Railroad that the previously charged rates had the effect of absolutely prohibiting trade in wines.

By the completion of the Western Pacific Railroad on Monday the cars travel continuously from the harbors of New York, Boston, and Philadelphia, to the harbor of San Francisco. Arrangements have been made for carrying through passengers and mails between Sacramento and San Francisco without transhipment inside of four hours. The earnings of the Central Pacific Railroad for August were $572,000, showing a steady increase in passengers and freight.

Professor Hitchcock says that the legislature of New Hampshire has recently inaugurated an examination of the rocks and minerals of New Hampshire in a manner reflecting great credit upon them. During its progress the bounds of the new gold field have been carefully traced out, extending in a narrow belt from Bellows Falls northwardly along the Connecticut river into the dividing ridge between Canada and Maine. The principal New Hampshire gold mine is at Lyman. The vein is fourteen feet wide composed chiefly of quartz, containing galena, ankerite and pyrites.

The British Consul at Chee-foo, China, reports that the wild silkworm is bred in large quantities by the country people of Shan-tung, and a great deal of wild silk is produced annually in the central part of the province, and in the vicinity of Tsi-nan-foo. The silk cloth made from this wild silk is used by the Chinese for summer clothing, is very strong, and wears extremely well. It is thought probable that the wild silkworm may be acclimatized in Europe, and attention has been drawn to it both in Italy and France. Chee-foo can furnish the eggs of both the wild and the domestic silkworms.

Feathers of ostriches and other birds, though naturally black, or dark gray colored, may be bleached by the following process newly discovered by M. Deflot. The feathers are placed for three or four hours in a tepid, dilute solution of bichromate of potassa, to which some nitric acid has been cautiously added. The feathers will then be found to present a greenish hue, owing to the oxide of chromium precipitated on the substance, and to remove this the feathers are placed in a dilute solution of sulphurous acid in water, whereby the feathers become perfectly white and bleached. Care is to be taken that the solution of bichromate be not made too strong; and that not too much acid be used, which would cause an irremovable yellow color.