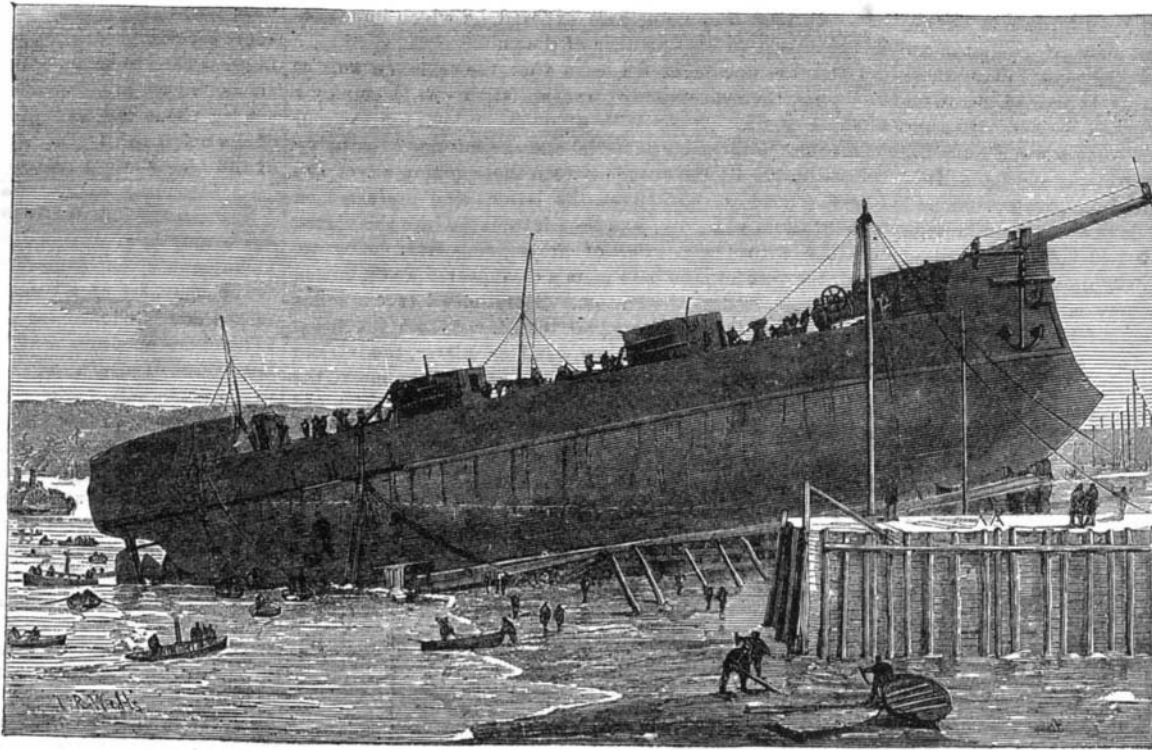


**DISASTER IN LAUNCHING A TURRET SHIP ON THE THAMES.**

The ironclad man-of-war and steam ram *Independencia*, just built for the Brazilian government at Dudgeon's yard Blackwall, London, is now lying, to all appearance, a wreck on the foreshore close to Cubitt Town Pier, with the tide at high water washing over her decks, having met with a disaster in launching. The ship is 310 feet long and very broad, having a beam of 63 feet, and she is of 5,000 tons burden, builder's measurement, which is equivalent to a displacement of 10,000 tons when armed and afloat. She has two turrets on deck; the decks are of iron covered with wood, and the sides are covered with a belt of 12 inch armor plates to a depth of about 14 feet. The armor being nearly all fixed while the ship was on the stocks, the weight of the hull was little short of 6,000 tons, and the operation of launching was therefore felt to be one of considerable difficulty. Hydraulic rams were employed to start the ship, which went safely down the slips for about her own length, and then stuck fast. The rams and all manner of appliances were brought to bear, but failed to move the ship further; and when the tide fell she settled down with her stern in the bed of the river, about a third of her length only having left the ways. Her position is a critical one, and the outer shell of her double bottom has given way in the bilges. We give a representation of her as she remains fast on the ways, extracted from the *Illustrated London News*.



**THE FRIGATE INDEPENDENCIA AFTER THE ATTEMPTED LAUNCH.**

**BURNISHING SURFACE COLORED PAPERS.**

Marbled and other papers which have color laid on one side have been hitherto burnished or glazed by rubbing with a polished flint or other stone, worked over the surface by hand. Many attempts have been made to substitute glazing rolls and other appliances for the tedious process, but no good result has ever been achieved. M. Alauzet, of Paris, exhibited at Vienna a machine for manipulating the burnishing stone, and thus economizing the cost without impairing the beauty of the imparted surface. This machine, which may be used for dyed and undyed paper, is double acting; the sheets of paper are represented by *e*, while *a* shows the burnishing steel or stone guided and moved by the bar, *b d t*, and the rod, *g*, which is connected with the crank, *f*. The weights, *t* and *l*, may be increased or diminished according to requirements.

We are indebted to *Engineering* for the engraving.

**Lawn and Pleasure Grounds.**

A writer in the *American Farmer* for September reiterates, what we have often stated, that the love and taste for horticultural pursuits is rapidly growing in this country. He also states the generally known fact that, up to the present time; the great majority of thorough practical gardeners in the United States are foreigners, and even those, however well educated in that profession at home in their native land, have, under a different climate and other influences by which they are surrounded in this land of their adoption, to pass through another term of apprenticeship before they can make their services acceptably available; we speak here of thoroughly educated men in the profession, and not of that crowd of one-year pretenders by which the country is overrun. It has been often remarked that very few native born Americans take to horticulture as a profession; and that when they do, it is usually to enter upon the higher or lighter branches, or follow it as a mercantile or money-making pursuit. Yet it is true, beyond all dispute, that the love of horticulture is growing rapidly, as may be seen by the millions of fruit trees put out as orchards, and tens of millions of flowers used annually in the flower garden, together with the ornamental trees and shrubs which are sought after with avidity.

The residences that formerly stood isolated on the plain are now seen nestling in groves of umbrageous trees, embracing the noblest and most desirable kinds to be found in all temperate climes; now this state of things is pleasing for all lovers of Nature to contemplate, and should not every laudable incentive be used to further its growth? As having a tendency in that direction, we would remind those

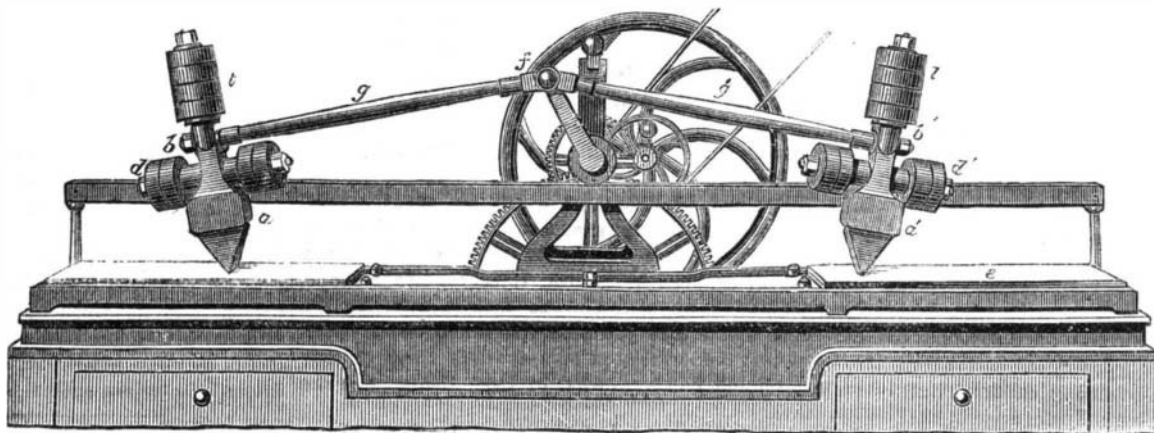
situated in the Middle States that during the present month is a good season to transplant evergreens, and this work is best performed soon after a good rain, or when the ground is mellow enough to admit of getting as many perfect roots up as possible, but by no means permitting the trees after being lifted to be long exposed to the action of the sun or drying winds; cloudy weather is desirable for this work; and should the ground to be planted be light and dry, give a good settling of the earth about the roots with water, finish-

ing the filling in around the stem with loose earth, which prevents the surface from cracking, should a drouth follow.

Cuttings made of the present year's growth root freely at this season, of such hardy shrubs as wigelias, forsythias, spiræas, and deutzias; make the slips about 3 to 6 inches long, removing the leaves entirely from the lawn half, and those on the upper half cut back so as to leave about one inch of the leaves and petioles; then plant them in a sandy soil in some shady place, observing to press the earth close to the cutting; these, when rooted, can remain until next spring, against planting out permanently.

Samples of seeds of choice border plants should be from time to time collected, and placed in a cool airy place to dry; if the kinds collected are pure, and have not been contaminated by impregnation of worthless sorts growing close by, then you are stocked for next year and will have the pleasure also of helping your friends to a few, as the votaries of Flora ought by all means to eschew anything that would border on selfishness. When the flowers in your beds or borders become unsightly from decay, have them removed and the ground raked clean and smooth. Such articles as dahlias should be tied up neatly to stakes. For ourselves, we prefer training them so that they will lie upon the ground, where a greater number of finer flowers will be produced; we attribute the difference to the ground being kept cooler and more regularly moist during the heat of summer.

Toward the end of the month, prepare beds in which to



**PAPER BURNISHING MACHINE.**

plant tulips, hyacinths, narcissus, crocus, and lily roots; a sandy soil, made rich by well rotted cow manure, suits them best.

**Wood the Most Costly Building Material.**

Four fires on the 11th and 14th of July, in Illinois, Wisconsin, and Iowa, destroyed wooden buildings, which cost originally \$350,000, and an aggregate of \$5,080,000 property. These buildings cost about \$70,000 less than brick ones would have done. The wooden buildings burnt at Chicago, July 14, first cost \$150,000, but carried with them property to the amount of \$4,000,000. The wooden buildings burnt in the great fire of 1871, when the entire loss was \$200,000,000, were worth \$2,000,000, or one per cent of the whole. Wood is thus shown to be one of the costliest of building materials

**Herb Cultivation.**  
The London Garden contains the following account of herb raising for commercial purposes, at Mitcham, England, a place long celebrated for its herb fields, from which the London herbalists derive their mint, sage, licorice, and similar herbs. Of these, as a rule, distillations are made by the growers, and they are disposed of in a semi refined condition, or the herbs themselves are brought into market as soon as they are harvested.

*Chamomile.*—To this several acres are devoted, the double flowered kind being preferred on account of the weight of the produce; but both single and double sorts are grown. In March, old and somewhat spent plantations are broken up and the plants divided into good rooted slips, which are planted in well prepared ground in rows 2½ feet apart, and 2 feet asunder in the rows. A common practice, however, is to plant as thick again as this, and to thin out the plants afterwards to the distances just named. The plantations are intercropped with lettuces in spring. As soon as the blooms begin to expand, they are fit for gathering, and from that time, as long as they yield sufficiently to pay, the flowers are gathered several times in a season by women, who are either paid a regular day's wages, or a penny, or thereabouts, per pound for picking.

*Lavender.*—This is extensively cultivated at Mitcham, both farmers and cottagers bestowing special attention on it; and this district presents a lovely sight in the last fortnight of July, when the different fields of it are in full bloom, the air for miles around being loaded with its fragrance. Lavender is increased by means of rooted slips, planted out, in rows about 18 inches apart and half that distance asunder, in March or April. Sometimes the sets are planted as wide in the row as the drills are apart. For the first year the produce amounts to but little; and, therefore, parsley or lettuce is planted between the rows. As soon as the plants have grown sufficiently to become crowded, every alternate row, and also every alternate plant in the rows left, is lifted—say in spring—and transplanted into another field, so as to form a new plantation. Thus the plants stand 3 feet apart each way, or 3 feet one way and 18 inches the other. Coleworts, lettuces, or other early and quickly matured crops, are raised among the lavender in the early part of the year; but, after June, all such catch crops are removed. The flowers are usually harvested in the first fortnight of August, and, as has been stated, are distilled at the farm on which they are grown.

*Licorice.*—This was once largely grown at Mitcham, but, although it is grown in considerable quantities, it is not now so extensively cultivated there as formerly, on account of the cost attending its culture. It entirely occupies the ground for three years, and during that time requires great attention in the way of cleaning, besides the ultimate cost of trenching out the roots, or, rather, underground stems. The ground, being deep, is heavily manured in autumn or winter, when it is trenched and laid up in ridges, in a rough state, till spring. It is then leveled, marked off in drills about 2 or 3 feet apart, and some 3 or 4 inches deep, and in these the sets are planted in March. The sets consist of finger length pieces of the old root stems, each containing an eye or two. During the first year the ground is usually intercropped, as is also the case in the earlier portion of the second year; but after the middle of the second summer, and throughout the whole of the third year, the licorice requires all the room. When the stems are matured in the autumn of each year, they are cut over close to the ground; and if time can then be spared, the soil between the rows is forked over, some well decayed manure being occasionally worked into it at the same time. The lifting of the crop, which usually takes place in the end of the third season, is a difficult operation, involving much labor. A deep trench is cast out, lengthways, alongside the first row, and by means of forks, pulling ropes being even sometimes employed, the root stems are extracted. In this manner the whole of the rows are treated, until all are successfully lifted. The roots may then be stored in sand or pits, like beets, carrots, or potatoes. Growers of licorice do not always harvest the crop; on the contrary, they some-

times sell it as it stands in the field, and the purchaser lifts it himself.

**Mint**—Both spearmint and peppermint are largely grown at Mitcham, particularly the latter; indeed, this crop ranks second in importance only to lavender. It is first planted in rows 13 inches apart each way, and in the end of the next two seasons it is plowed in. The plantations are kept free from weeds during the summer by means of hoes; and about the end of the first week, or during the second week of August, is the usual time for cutting mint for distillation. In the Fulham fields, and in other districts in which market gardening is carried on, mint is largely grown for sale in a green state. For this purpose the dampest piece of ground is selected for its culture, if it is to be a permanent plantation; but it will grow in almost any soil. It is planted in rows a foot apart, and the ground is intercropped the first year; but afterwards it runs through the soil in such a way that it becomes a complete mass of undergrown stems and roots. It is cut and bunched for market as required, the greatest demand for it being during the pea season. It is also forced in large quantities. "I have seen a range of 43 light frames filled with mint alone. These beds are made up in December or January, when the ground they occupy is excavated to a depth of 20 inches, and filled in with fermenting manure packed 6mly. A few inches deep of soil are then added, and in this the mint roots are thickly planted. Linings of manure are also placed round the frames, the sashes during the night and in cold days being also covered with it."

**Poppies**.—Of the white kind, several acres are grown. They are sown in rows in spring, some 20 or 24 inches apart, and require no further care, beyond a little thinning and cleaning, till August, when their seeds ripen.

**Sage**.—This forms an important crop, which, under favorable circumstances, is pretty remunerative; the stalks being cut over, bunched, and sent to market at once. New plantations are formed with rooted slips, obtained by dividing the old plants; they are inserted, late in spring, in rows 1 or 2 feet apart, and about a foot asunder in the row. During the first season parsley or lettuce forms an inter-crop, which also occupies the ground during the earlier part of the succeeding ones. Except hoeing and cleaning, the plantations need no care so long as they continue in a thriving condition; and when the lines get broken, and blanks and sickly plants occur, the plantation is broken up. Both the reddish and green-leaved kinds are cultivated.

**Squirting Cucumbers**.—These are raised in frames, like vegetable marrows, and are planted out, about the end of May, in rows some 4 or 6 feet apart, and 4 feet asunder in the row. They flower and fruit at the same time, and the fruits are gathered before they are ripe, otherwise a mere touch would burst them. The fruits are usually distilled by the growers.

#### The Physical Failure of the Hawaiians.

Dr. Nathan Allen, in an interesting paper upon the decadence of the Hawaiian race, makes the following observations: The census of 1872 returned the whole number of the inhabitants, 56,897—males 31,650, and females 25,247.

In 1820, when the missionaries first landed upon these islands, the population was estimated at from 150,000 to 200,000, but may not have exceeded much the first mentioned number. We have, then, in a little over fifty years, a loss of full two thirds of the whole inhabitants.

The efforts of the missionaries were attended with remarkable success. A government of the people has become firmly established, education is generally diffused among all classes, and family instruction has for a long time been established upon a sound basis. In fact, all the advantages of a Christian civilization seem to be enjoyed in an unusual degree by this people.

But, notwithstanding these conditions, the population has kept steadily decreasing every year. Now, what can be the cause? It cannot be from any fault or change in the climate, which has always been represented to be remarkably pleasant and wholesome. It cannot be for the want of good government or for any outward conditions that are unfavorable to growth. It surely has not been for the want of food, as there has never been any complaint from this source; food has been provided in abundance, a variety in kind—cheap and healthy. There certainly have been no wars, pestilence, earthquakes, famines, or calamities of that kind to account for this change. It is true the small pox, the measles, and the leprosy have prevailed there at times, carrying off large numbers, but by no means enough to account for the change.

There is no evidence that there has been any extraordinary mortality on these islands, especially among children, but there is evidence that there has been a steady decrease in the number of births. The decay goes steadily on, and from all present indications it seems likely to continue, till, as a race, they become extinct.

Dr. Allen believes that the great primary cause of this degeneracy is not external to the body, but internal—affording strong evidence that the true law of propagation is based upon physical organization, and that external agents are only incidental conditions or secondary causes. The change of population going on at these islands affords a most fruitful theme for study.

N. O. says: "Your plan for clearing telegraph wires of kitetails, etc., by burning has at least one serious objection, and that is that wooden tenements prevail where kitetails most abound; and in burning them off, there is danger of destroying houses: at least the writer found it so in New Orleans, where he tried it several years ago. It is also a slow process, for rags, when wrapped tightly, do not burn quickly."

#### The Transmutation of Metals.

In the seventeenth century faith in transmutation was unbroken. Helvetius declares that he saw a stranger convert an inferior metal into gold, at the Hague, in 1666. Even Glauber, the discoverer of the salt that bears his name, was a believer in the attractive delusion, and it is said that the discovery was made while endeavoring to find the philosopher's stone among the *terra damnata* of chemical operations. At last suspicion was generally aroused regarding the claims of the alchemists; and in a report read by Geoffroy before the Royal Academy of Sciences at Paris, on the 15th of April, 1722, the tricks were exposed by which impostors had practised on the credulity of the public.

From this document we learn that the ordinary way of producing the appearance of transmutation was to employ a crucible or melting pot with a double bottom, the exterior being of some infusible material and the interior of suitably colored wax. In the space between these gold or silver was placed. Lead or quicksilver, the latter being preferred on account of its volatility, was then introduced into the vessel, together with the powder of projection. Heat being applied, the wax and the base metals disappeared, and a button of gold remained at the bottom. Sometimes a true crucible was used, and the gold or silver introduced into the fused materials by means of a hollow wand or stirrer, the interior of which had been filled with the powder of the metal the production of which was desired. Lead, in which holes had been drilled and filled with gold and then closed up, was also employed; or a piece of gold was washed with mercury and then transmuted into pure gold by an acid.

Where only a part of the baser metal was to be converted, nails, or bars, consisting half of gold or silver and half of iron or some other metal, were prepared, the gold or silver being painted to resemble the other metal. The removal of this coating or transmutation was accomplished by means of alcohol or some liquid that could dissolve the paint. A nail of this description was at one time preserved in the museum at Florence; and the knife that belonged to Queen Elizabeth, which was half gold and half steel, was of the same nature. Such objects as coins, half gold and half silver, were at one time very common, and were distributed by alchemists as evidences of their power, in order to entrap the credulous.

#### The Austro-Arctic Expedition.

M. Sidoroff, says the *Eastern Budget*, member of the Geographical Society of St. Petersburg, has addressed a report to the Russian Admiralty with regard to the Austrian Polar Expedition, of which nothing has been heard since August, 1872. M. Sidoroff says in his report that the *Tegethoff* was last seen by Count Wiltczek in a gulf near Cape Nassau, whose outlet was then being choked up with ice. Since that time various seamen coming from Novaya Zemlaya have reported that the quantity of drift ice in the Icy Sea had considerably increased, and that in the summer of 1873 it was extraordinarily abundant. Formerly the ice on the coast of the above island only extended to a distance of five versts in the month of June, while in midsummer, 1873, the width of the icy zone amounted to about 100 versts. M. Sidoroff believes that if Cape Nassau had been free of ice, the *Tegethoff* would certainly have gone round the northeastern point of Novaya Zemlya, which is only a day's journey from Cape Nassau, and thus reached the Gulf of Yeniseisk with difficulty. It is therefore probable that the expedition is frozen up and in want of provisions and M. Sidoroff accordingly recommends the Russian government to send food, etc., by land to Cape Nassau, adding that he will contribute \$500 to the expenses of the undertaking. The Admiralty has approved of this proposal, and is now taking the necessary steps for carrying it out.

#### The Lake and City of Van.

The city of Van, on the extreme eastern border of Turkey in Asia, is a new station lately occupied by American missionaries. The Rev. Dr. Barnum writes home, to the *New York Observer*, an account of a journey lately made by himself and party from Harpoot, eastward over the Taurus mountains, a distance of 300 miles, to the city of Van. The author says:

Lake Van, along the shores of which we spent several days in going and returning, is a beautiful sheet of water, without any outlet, sixty or seventy miles in length, and perhaps twenty or thirty in breadth. It is irregular in shape, and is surrounded by mountains, so that in traveling the whole length of the lake you obtain sectional views, which give one almost the impression of a series of three or four lakes, and remind one somewhat of Lake George and the Italian lakes.

The city of Van lies at the eastern end of the lake, and is surrounded by a wall and moat. Just back of the city is a high bluff which is surmounted by the most picturesque castle which I have yet seen. On the rocks are several inscriptions in the cuneiform character, but in the Armenian language. The city is said to have been founded by Semiramis, nearly 4,000 years ago; but I believe this distinguished queen is coming to be regarded by historians as a myth. At any rate the city is very ancient, whoever may have been the founder. Stretching away from the city and the lake for several miles toward the mountains on the east are beautiful orchards and gardens, and here the majority of the people live. The Armenian population of Van and its surrounding villages is very large.

**TO RESTORE OLD ZINC WHITE**.—If kept for a long time zinc white becomes granular and gritty, and useless for painting. It may be restored by ignition in an earthen crucible.—*M. A. Speidel.*

#### Leg Locomotion.

At a recent meeting of the French Academy, M. Marey communicated an account of some new researches on human locomotion. With his usual experimental skill he succeeds in recording the movements of the legs, on a rotating blackened cylinder (in reduced form, by means of wheel work). Weber supposed that, in walking, the leg was displaced merely by the action of gravity, and performed a pendulum movement. This has been variously disproved (by Duchienne and others); and now M. Marey demonstrates that the movement of transport is uniform throughout nearly its whole duration; in rapid paces it commences and terminates with short periods of variable velocity. This uniformity is due, in great part, to action of muscles of the leg, but two other elements have to be considered: 1, the angular movement of the leg about the pelvis, and 2, the horizontal translation of the pelvis itself, that is to say, of the point of suspension of the leg while it oscillates.

#### A Monument to Liebig.

The pupils of Justus Liebig propose to erect a fitting monument to the memory of their master, and now appeal to the chemists of all nations to aid them in the effort to raise a sum sufficient for the purpose. It has been decided to erect one monument at Munich, where Liebig spent the later years of his life, and, if the fund subscribed shall suffice, to place another—perhaps a copy of the first—at Giessen, the scene of his earlier labors.

Subscriptions in this country may be sent to either of the undersigned, who will forward the sums contributed to the Central Committee at Berlin:

Professor J. Lawrence Smith, Louisville, Ky., Professor E. N. Horsford, Cambridge, Mass., Professor Wolcott Gibbs, Cambridge, Mass., Professor C. A. Joy, Columbia College, East 49th street, N. Y., or Professor C. F. Chandler, Columbia College, East 49th street, N. Y.

#### One Hundred and Twenty Years Old.

There are certain portions of Virginia which have long been celebrated for the healthfulness of climate and the longevity of the inhabitants. Here is the latest example:

Mrs. Katie Shepp, living in the Massanutten Mountain, near Keezeltown, five miles east of Harrisonburg, Va., has, it is stated, now reached her one hundred and twentieth birthday. Mrs. Shepp was married in the year 1774, at the age of twenty. Her husband, who has been dead about sixty years, was in his twenty third year at the time of his marriage, and he was a wagoner in the war of the Revolution. Mrs. Shepp remembers many of the incidents then occurring in the vicinity. Her mind is clear, and she does the work of the family she lives with, as well as her own sewing, and has never used spectacles.

#### A Russian International Exposition.

A permanent International Exposition of machinery is to open at the Museum of the Imperial Polytechnic Society in St. Petersburg, Russia, on the 15th of October next. The object of the exhibition is to promote the introduction and employment throughout the empire of new and improved tools and machinery, whether of domestic or foreign manufacture, by demonstrating their advantages through public experiments. The enterprize is also intended to establish closer relations between the Russian manufacturers and those of other countries. Full particulars may be obtained by addressing Colonel Sytenko, President of the Russian Imperial Polytechnic Society, 2 Rue Panteley Mouskaia, St. Petersburg.

#### Fishing by Means of Explosives.

A method of catching fish, employed for years by poachers in England, is to fill a large stone bottle with quicklime, then to pour in water enough to nearly fill the jar, and cork it up, securing the cork to the neck of the bottle by copper wire. The bottle is thrown into the water, and the pressure, caused by the working of the lime, explodes the bottle and stuns the fish, which then float helplessly on the surface of the water.

**PHENIC ACID FOR THE PRESERVATION OF WOOD**.—It is admitted that, if tar increases the durability of woods exposed to air and moisture, this property is owing to its phenic acid and its creosote. It is, then, rational to believe that, in replacing the sap of the trees with slightly phenic water, they are protected from rot. But phenic acid is insensibly driven from the wood under the influence of water. M. Boucherie considers that phenic acid can only be rendered useful by mixture with sulphate of copper, to defend stakes driven into the sea against the attacks of the *teredo*.

THE British government is spending \$50,000 at Woolwich on a new 80 tun gun, which, when finished, is expected to beat the world. With a sixteen inch projectile, weighing 1,650 pounds, and a maximum charge of 300 pounds of powder, it will pierce the best iron plates, twenty inches thick, at 500 yards, sixteen inch plates at 5,300 yards, and will pitch a sixteen inch shell into a ship or fortress at a distance of 10,300 yards. The steel block forming the inner tube was the largest ever cast, weighing over twelve tons; while the trunnion piece, about eighteen tons, was the largest forging ever produced at the arsenal.

**UTILIZATION OF WASTE SOAP LYES AND OILY LIQUORS**.—Instead of separating the fatty matters from the water by means of mineral acids, the author proposes to treat them with salts of magnesia. Magnesian soaps are thus formed, containing 60 per cent of fatty matter, and which may be used in the manufacture of gas for lighting purposes.—*M. Fohl.*

