THE "NEW YORK WORLD."—TRIMMING THE STEREOTYPES.

so diffident are English women that last year only fifty-nine accepted these offers, and now the society, through *Macmillan's Magazine*, calls for "respectable and capable" loverless but not unlovely women to go forth for love of God, love of man, or love of money, as missionaries, as philanthropists, as housekeepers, or as helps, to subdue the colonies and replenish them, lest England become a kingdom of calico. There is no chance for an immigration of men; Englishmen even go to America for wives. The good women of England, therefore, standing on the census and seeing 900,000 more petticoats than pantaloons on the island, already behold a greater catastrophe than Macaulay's New Zealander is to see—a land without husbands!

Novel Reactions of Milk.

If a little tincture of guaiacum is added to fresh milk a blue color is produced. Milk heated to 80° or upwards remains uncolored. Sour milk takes the same tint, but the reaction is prevented by the addition of mineral acids and alkalies. If a little starch paste mixed with potassium iodide is added to milk which has been mixed with old oil of turpentine, a fine blue band appears at the surface of contact and spreads rapidly. Milk freed from albuminous matter does not give this reaction. If to fresh milk there is added first acetic acid to precipitate the caseine, then some caustic potassa, and lastly a trace of a solution of copper sulphate, the violet reaction characteristic of peptone does not appear; but if the milk is allowed to stand fifteen to twenty hours before this treatment, the violet color is obtained. Mr. Arnold considers the blue color due to ozone.

The Mount Etna Observatory.

The Municipality of Catania, in Sicily, has just completed the erection upon Mount Etnaof an observatory at the height of 9,671 feet above the sea level. It is believed that in the Etna observatory spectroscopic results will be attained which are impossible at all the previously existing astronomical stations throughout Europe. The site of the observatory has been so selected that, in case of an eruption from the crater, a stream of lava would be divided above the building, and would pass it without injuring it. The structure surrounds an enormous pillar, which supports the great refractor, and the telescope is covered by a movable iron dome. In addition to the telescope the building is furnished with a collection of meteorological and seismological instruments. From the summit a lovely view is to be had of the half of Sicily, Malta, the Lipari Islands, and part of Calabria.

WHITEFISH IN CALIFORNIA.—The California Fish Commissioners have been successful in propagating whitefish from Lake Michigan in Clear Lake. In 1873 about 25,000 young whitefish were placed in the lake. Fine specimens are now being taken.

Writing on Glass.

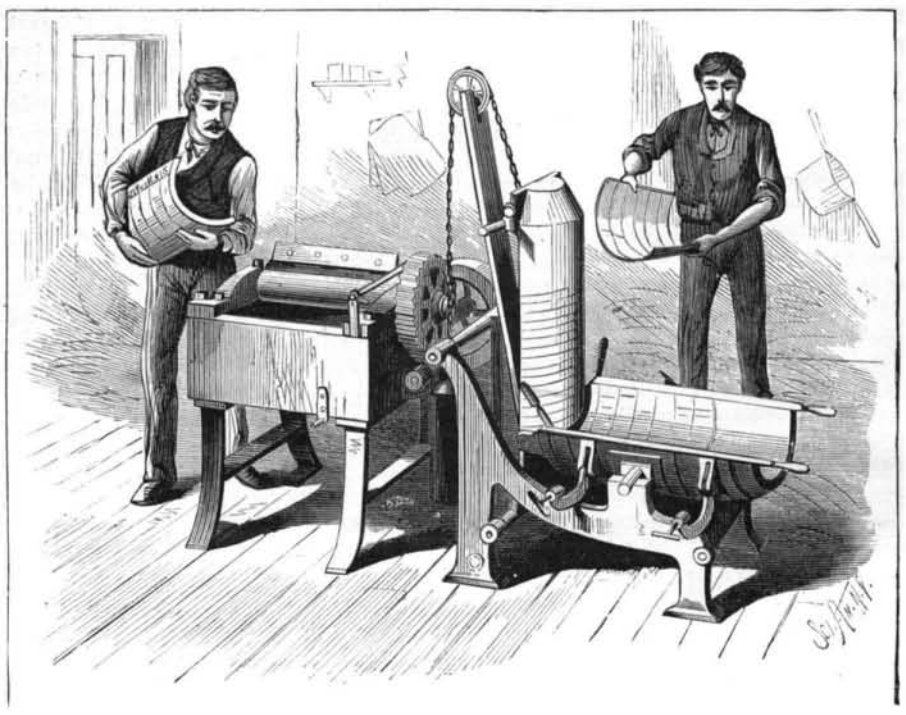
The following formula of a good varnish for writing on glass is given by M. Crova, in the *Journal de Physique:* Ether, 500 gr.; sandarac, 30 gr.; mastic, 30 gr. Dissolve, then add benzine in small quantities, till the varnish, spread on a piece of glass, gives it the aspect of roughened glass. The varnish is used cold. To have a homogeneous layer, pour over that already formed some oil of petroleum, let it evaporate a little, then rub in all directions with cambric cloth till all is quite dry. With ink or lead pencil, lines can be produced on this surface as fine as may be desired. Thus a drawing may be prepared in a few minutes and immediately projected.

Shrimp Canning.

Shrimp canning has recently been added to the industries of New Orleans. One new establishment employs 150 boys and girls and from 20 to 30 skilled workmen. Already the output is 10,000 cans a day, and it is expected that the product will soon be doubled. The shrimps are cooked and canned by a new process. It is intended to undertake also the canning of oysters, which are abundant along the Gulf coast, and, during the proper seasons, the figs and other fruits of the South.

Singular Explosion of Oxygen.

M. Sébère, of St Brienne, has been in the habit of storing his oxygen in a large gas holder of galvanized iron holding a hundred liters and sunk in water. After being about half full for several weeks he was about to make use of it by carrying a jet of the gas to a flame, with the result of the whole violently exploding. An investigation proved that no carelessness was at the bottom of the matter, the explanation being of a most simple nature, and one that theory would have predicted. A galvanic action had been set up between the iron and the zinc, and hydrogen had been liberated, an explosive mixture of the most powerful character being thus manufactured in the middle of the laboratory. M. Sebère's arm was broken, the place was deluged with water, and considerable further damage resulted. In order to prevent a similar accident, for the future M. Sebère will always keep the interior of his gas-holder well varnished.



THE "NEW YORK WORLD" STEREOTYPE PLANER.

RECENT INVENTIONS.

In the ordinary method of laying out ship timbers the hull is first outlined by strips of wood, named 'ribbands," and then moulds or patterns are made, which are strips of board made to conform in the curvature of their edges to the curvature of the sides of the hull, and which moulds are then laid upon the timber, and the ribs, knees, and frame pieces cut in accordance with such patterns. In this method of shaping the timbers errors in measurement are likely to be exaggerated, and a great amount of time, labor, and material is expended in the construction of the moulds. Mr. Charles E. Osenburg, of Baltimore, Md., has patented a device which he calls a "conformator," which permits the work to be accurately and quickly accomplished, and dispenses entirely with the use of moulds and their attendant expense. It consists in two bars held apart at their ends by filling blocks and tie-bolts, which main bars have two independent series of adjustable arms crossing the same, which arms may be adjusted so that their outer edges conform to any shape of a ship's side, and which shape, when fixed in the conformator by means of set screws, may, together with the bevels, be directly and exactly transferred to the timber to be cut.

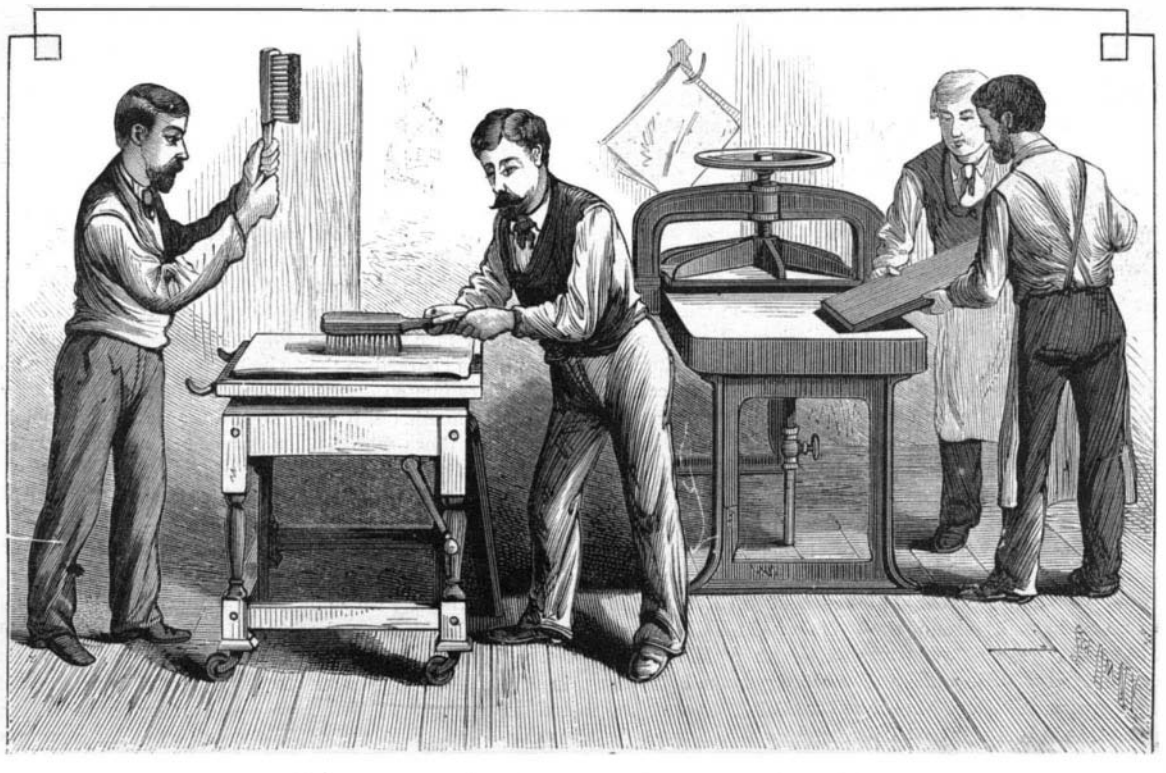
An improved machine for grounding wall paper has been patented by Messrs. Ira Robbins, of Camden, N. J., and David Heston, of Philadelphia, Pa. It relates to improvements in machines for grounding wall paper before printing.

An improvement in oil pumps has been patented by Mr. Alfred J. Lewis, of Barnhart's Mills, Pa. The object of this invention is to provide a vacuum pump for oil wells which shall be adapted for agitating the oil, to keep all passages feeding or supplying the pump free from the accumulation of sediment, paraffine, salt, or other obstructions, and to dispense with the ordinary inlet valves, which are liable to get out of order.

Mr. John B. Craig, of St. Louis, Mo., has patented an improvement in police nippers. This invention is an improvement in the class of nippers which are employed for seizing and holding the wrists or arms of prisoners, and curved jaws are so connected that the movement of one of them in opening or closing it will cause a like movement of the other. The jaws are S-shaped, or constructed with reversed curves; their upper ends are connected by means of toggle levers, which serve to open and close the jaw and to hold them closed when in a certain position.

Mr. Seth H. Fountain, of Amite City, La., has patented an improvement in mills such as are usually turned by hand for grinding coffee, spices, and similar things. It requires less power to operate it than those of ordinary construction, and there is no loss of the material passing through it.

Mr. Wm. E. Brown, of Irving, Kan., has patented an improvement in gutter hangers. It consists of a wire rod gutter hanger secured at one end to the roof of a build-



MAKING THE PAPER MATRICES.—"NEW YORK WORLD."

ing, and passing thence over and around and under a gutter, and having its opposite end secured to the roof, and a brace attached to the fascia at its inner end and secured to the opposite sides of the hanger above the gutter, so as to prevent lateral movement of the latter.

A New Plan to Attain the North Pole.

A Canadian engineer, Mr. Okill Stuart, has devised a plan of approach to the Pole by means of a chain of sled-huts from Chesterfield Inlet, which is 1,565 miles from the pole. He says:

Now, from Chesterfield Inlet to the north end of Lake Winnipeg, where supplies could be delivered by boat, is but 600 miles. This distance I would overcome permanently by building a system of relay stations twenty miles apart and connected by a through telegraph line to Winnipeg City at a cost of $120,000 This work would be carried out by government and would eventually pay, connecting, as it would, Churchill Harbor, mouth of Nelson River and west coast of Hudson Bay, where, in the future, will be the great emporium of the north, thus neutralizing this expenditure by the great advantage of a telegraph system for the purposes of emigration and trade. These relay stations of block huts would be stored with all necessary supplies for the undertaking, together with sleigh, dogs and men in charge, for purposes of transportation from Lake Winnipeg to Chesterfield Inlet, which latter place would be the headquarters of the expedition, in daily communication with the outer world. These sled-huts would be constructed of paper board, of the lightest design and frost proof; each sled would be about six feet wide and ten feet long, neatly rounded at the top and about five feet high, with a hole down through the center for a signal pole or anchor, to avoid drifting while resting in a gale. Each sled would be steel shod, shaped somewhat like a toboggan, rounded up at either end. Each sled would contain a kerosene stove, oil tanks and lamps, as well as a complete supply of preserved food, medicine, axes and ice shovels, sufficient for six men for six months, together with fur trappings and other clothing. When complete each sled-hut would weigh one thousand six hundred pounds, or a little more than two hundred and fifty pounds per man. Thus equipped we would commence the forward march by moving ten sleds at a time, manned in the following order: To each sled one practical engineer, one doctor, and four able bodied men, all thoroughbred Canadians; thus ten sleds would comprise sixty men. These would advance in order at intervals, all keeping the due north course, and any deviation would be reported by a halt from the advance sled. All the sleds would be advanced in this order until a complete chain of communication was established.

I would commence this movement about the 1st of December, or as soon as the ice formed on the more southern rivers. Our route would lie by the west coast of the Gulf of Boothia to Borrow Strait, thence to North Devon and North Lincoln by Jones' Sound, having land the whole distance, except Borrow Strait and Jones' Sound, which would be frozen. At North Lincoln we would be distant from Chesterfield Inlet 786 miles, and from the Pole 780 miles. To North Lincoln we would push all the sleds, except seventy-eight, which we would leave by relays of ten miles, all anchored with signals, so as to form a complete chain of refuge in our rear, and if found necessary, would establish a system of telephone from each sled by means of tripod poles. This would give us daily communication with Winnipeg, and govern our dog transportation trains, which would be in constant attendance throughout the whole line. When this was done we would commence our advance along the third or polar division in the same order as before, only by shorter relays, as we would have 122 sled-huts to station over 780 miles, or about six miles apart, so that each hut could be seen or reached with safety. It might be necessary to have some of these sleds constructed upon a boat principle, in case open water was reached, and could be used for towing others, as they would all be watertight and capable of being floated. But as I do not contemplate finding open water this latter point would not offer any serious difficulty. The only obstacles likely to be encountered are rough and irregular ice ledges, which might have to be leveled or tunneled in places. In this manner I would expect to overcome the whole distance from Chesterfield Inlet to the Pole by the 1st of July, 1884, that being the best season for observations at the Pole. The whole cost of the expedition in this way, not including the telegraph line to Winnipeg City, would be about $70,000.

Value of Mechanical Invention to Civilization.

Mr. Frederic Harrison lately delivered a lecture at the London Institution on "The Real Value of Mechanical Invention to Civilization." No century, he remarked, had ever been so praised as our own for its marvelous mechanical inventions. But after all, our century was undeniably the heir of great and worthy predecessors. For 4,000 years and more men could travel as fast as their legs could carry them, now they were carried by rail. In our days news was flashed in a minute which not so long ago would have taken a year to arrive. Ten thousand shirts were now woven by steam in as short a time as the fingers took to make one. Gas and electricity had superseded tallow and oil. But these and other like achievements of invention were merely signs of material, physical, visible, and external life. Were we so much the happier for these things? The answer must be no. The nineteenth century was not an age of complete achievement, but of expectation and hope. A detailed comparison was instituted between this and former centuries in science, philosophy, and the arts. In summing up the results, Mr. Harrison reminded the audience that we are apt to be bewildered by the vast multiplication of our materials and our books, and betake ourselves to specialization. This often ended in trivialities. Our millions of books and our billions of facts could not help us, and we were shamed by the noble life revealed in Plato's Dialogues and the Odyssey. The moral sores of our age were probed, and though it might be urged that there could be no casual connection between these and our mechanical progress, yet there was undeniably a historical connection. Mr. Harrison felt no sympathy with Carlyle and Ruskin in their indiscriminate depreciation of mechanical inventions, but the worth of such things must not be exaggerated.

Infectious Moulds.

A lively controversy has been carried on in Germany on the subject of the pathogenic properties of a common mould fungus, and to the discussion an addition has recently been made in France by Kaufmann, who has investigated the subject in Chauveau's laboratory, at Lyons. As long ago as 1869 Grohe and Block produced in rabbits a fatal disease by injecting into their veins the spores of two common moulds, *Penicillium glaucum* and *Aspergillus glaucus*. The spores became arrested in certain parenchymatous organs, as the kidneys, liver, and lungs, and grew there, giving rise thus to "foci of vegetation," which killed the animals in three or four days. Grawitz repeated the experiments, but neither he nor Cohnheim could obtain any positive results, and they doubted very much the correctness of the previous conclusions. In 1880, however, Grawitz experimented by successive cultivation of these spores, in the endeavor to acclimatize them to such a soil as the blood. He stated that the mould growing on bread is innocuous, but by cultivation in media gradually increasing in fluidity and lessening in acidity, he succeeded in developing considerable virulence. The initial form of *Penicillium* is unsuited to an alkaline liquid, and if sown in it, is quickly choked by an abundant growth of vibrios. After, however, the serial cultivation has adapted the spores to the alkalinity, either they or the spores of *Aspergillus glaucus* grow freely and hinder the development of the vibrios of putrefaction. By injecting small quantities of the acclimatized spores, or larger quantities of those which are imperfectly adapted to live in the blood, he alleges that he has produced a trifling malady and conferred immunity against the more active virus. Koch, however, has denied the innocuity of the original form of *Aspergillus glaucus*, and asserts that Grawitz really experimented not with *A. glaucus*, but with *A. niger*, the latter being always inoffensive, the former always virulent.

In a mixed growth the former gradually preponderates, and after a series of cultures may exist alone, and hence, it is suggested, the results obtained. Löffler was unable to corroborate the alleged immunity obtained by inoculation. He injected small quantities of the spores of *Aspergillus glaucus* into three rabbits, of which two survived, and three weeks afterward were quickly killed by a fresh injection. The assertions of Koch and Löffler have been indignantly denied by Grawitz, but they are confirmed by the results obtained by Kaufmann. He finds that the *Aspergillus glaucus* grown upon bread causes death when injected into a rabbit, even in so small a quantity as one-tenth of a milligramme, and that its previous adaptation to a liquid and alkaline medium, and to the temperature of the animal body, is quite unessential for its infective property. If such adaptation has any influence, it only very slightly increases its virulence. He also finds that spores exposed to the ordinary temperature of the air for six months do not, in any degree, lose their pathogenic power.—*Lancet.*

A Commercial View of Life and Death.

The London *Sanitary Record* quotes a recent writer on vital statistics who calculates that of ten children born in Norway a little over seven reach their twentieth year; that in England and the United States of America somewhat less than seven reach that stage; that in France only five reach it, and in Ireland less than five. He tells us that in Norway, out of 10,000 born, rather more than one out of three reaches the age of seventy; in England one out of four; in the United States, if both sexes be computed, less than one out of four; in France less than one out of eight, and in Ireland less than one out of eleven, and he adds this significant computation, based on what may be called the commercial view of the vital question. In producing dead machinery the cost of all that is broken in the making is charged to the cost of that which is completed. If we estimated by this same rule the cost of rearing children to manhood, if we calculate up the number of years lived by those who fell with the years of those who passed successfully to manhood, there would be found between the two extremes presented in Norway and Ireland—both, be it observed, unnatural—a loss of 120 per cent greater in the first year of life, 75 per cent greater in the first four years of life, and 120 per cent greater in the years between the fifth and the twentieth, in Ireland than in Norway. In Norway the average length of life of the effective population is 39 and rather more than a half years, in England 35½ years, in France not quite 33 years, and in Ireland not quite 29 years. Thus, again comparing the best with the worst of a scale of vitality, in which both are bad, in Norway the proportion of the population that reaches 30 survives nearly 40 years, or four-fifths of the effective period, to contribute to the wealth of the community; while in Ireland the same proportion survives less than 29, or considerably under three-fifths of the effective period.

New Apparatus for the Determination of Melting Points.

BY C. F. CROSS AND E. J. BEVAN.

The apparatus consists of a small platform of thin ferrotype iron or silver, having an opening for the reception of a thermometer bulb and a small indentation or depression about 1·5 mm. deep and 2 mm. in diameter. A very small quantity of the substance is melted in the little depression, and while still liquid a thin platinum wire, bent like an L and fused into a glass float, is immersed in the liquid and held there until the substance solidifies. A thermometer is then inserted in the opening, and the whole apparatus plunged under mercury. The mercury is gently heated, and the thermometer carefully watched. As soon as the substance melts the float rises instantly, and the temperature is noted. Stirring is unnecessary, the whole of the substance is surrounded with mercury, and the attention can be concentrated on the thermometer.

Preservation of Iron.

A novel way of preserving the surfaces of iron has just been discovered. The treatment is as follows: The iron is subjected to the action of diluted hydrochloric acid, which dissolves the iron, and leaves on the surface a pellicle of homogeneous graphite, which adheres well to the surface of the iron. The piece to be preserved is next treated, in a hydraulically closed receiver, by hot or cold water, or, better, by steam, in such a manner as to completely dissolve and remove the chloride of iron formed. Finally the piece of iron is left to dry in the receiver, from which all liquid has been removed. A solution of caoutchouc, gutta percha, or gum resin in essence of petroleum is then injected. On the essence being evaporated, there remains a solid enamel like coat on the surface of the iron. Instead of previously eliminating the iron salt, it may be utilized in forming a kind of vitreous enamel. For this purpose the iron is immersed, after treatment with the acid, in a bath of silicate and borate of soda. A very pure and brilliant silico-borate of iron is formed, which closes up the pores of the metal. As to the disengaged chlorine, it combines with the free soda, forming chloride of sodium, which remains dissolved in the liquid. Thus the important question of the preservation of iron appears to have been brought another step toward solution.

Silvering Glass.

BY A. A. COMMON, F.R.A.S.

Solution 1.—Nitrate of silver, 1 ounce; water, 10 ounces.

Solution 2.—Caustic potash, 1 ounce; water, 10 ounces.

Solution 3.—Glucose, one-half ounce; water, 10 ounces.

The above quantities are those estimated for 250 square inches of surface. Add ammonia to solution No. 1 till the turbidity first produced is just cleared. Now add No. 2 solution, and again ammonia to clear; then a little solution, drop by drop, till the appearance is decidedly turbid again. Then add No. 3 solution, and apply to the clean glass surface. A film was obtained in forty-three minutes at a temperature of 56° F.

Mr. Common's plate of glass was rather a large one. It was thirty-seven inches in diameter and four and a half inches thick, and weighed four hundredweight.

Phytocollite in New York State.

To the Editor of the Scientific American:

On reading the account of a new mineral from Scranton, Pa. (phytocollite), in SCIENTIFIC AMERICAN of February 11, it leads me to offer you a description of something likely very akin to it found in this locality probably in very large quantities. There being a large tract of bog meadows, the cultivators of which, having only water from the surface ditches for culinary and drinking purposes, or by draining it in cans from the high land a mile away, tried the experiment a few years ago of sinking a well with a well auger, such as is used in sandy localities. At a depth of twenty feet they entered and raised a jelly-like muck, which very closely resembles the description given of phytocollite. It seemed to be in layers of vegetable matter and clay for a depth of ten or twelve feet, then a tough blue clay was entered. I have small samples of the clay from a depth of eighty-six feet, when the undertaking was abandoned.

It was thought by those interested in the undertaking that this same black jelly-like substance was underlying the whole scope of meadows, which is miles in extent. Whether or no this is one of the stages from peat to coal we can only guess, but an excellent fuel has been made from drying the substance taken from near the surface in ditching.

SAML. GREEN.

Florida, Orange County, N. Y., February 11, 1882.

Combustible Shale in Iowa.

An extensive bed of combustible shale is attracting attention in Iowa. It is reported by the Sioux City *Journal* that the shale had been tried in coal stoves and that it worked well. It burns freely in the open air, and trial is to be made of it as a fuel for locomotives. It was discovered in a search for coal, near Fort Randall, at a depth of thirty-six feet. The stratum can be traced for miles along the river bluff. The shale contains petroleum, and has a greasy, gritless look, somewhat like cannel coal.