

and allowed him for machines furnished the yards and prisons, \$100,000. We learn from testimony given before the arbitrators that "Sir Samuel Bentham prepared a system of machinery for the employment of men without skill, and particularly with a view to utilizing convict labor. In 1793 patents were taken out on these inventions to secure their exclusive use for the prisons." The testimony states that no skill was required in the use of these machines; they were introduced into the dockyards and worked by common laborers. It was claimed that nine tenths of the labor was saved by the use of Bentham's machines, which proves that they were at least effective, which cannot be said in all cases of those of modern manufacture.

The patent of Bentham, issued in 1793, is doubtless one of the most remarkable ones ever issued, both for the importance of the inventions it protected and the clearness with which they and the principles on which they operated are described. Richards, in referring to that section of his patent which relates to rotary tools for woodcutting, quotes the inventor as saying: "The idea of adapting the rotative motion of a tool with more or less advantage, to give all sorts of substances any shape that may be required, is my own, and, as I believe, entirely new."

For those not skilled in nor acquainted with the nature and extent of the various operations in wood conversion which come under the head of shaping with rotary cutters, it will be difficult to convey an idea of the invention here set forth; it includes, indeed, nearly all operations in woodworking, and as an original invention may be said to consist in the discovery of the fact that flat surfaces, or surfaces of any contour, can be properly prepared by the action of rotating tools. It is not to be wondered at that such an operation should not have been sooner discovered, for even at the present time there are few processes in treating material which seem so anomalous as that of planing a flat surface with cutters revolving in a circle of a few inches in diameter.

In reference to planing mouldings, it is said: "If the circumference of a circular cutter be formed in the shape of any moulding, and projecting above the bench no more than necessary, the piece being shoved over the cutter will thus be cut to a moulding corresponding to the cutter—that is, the reverse of it, just as a plane iron cuts the reverse. If a plane cutter, such as that above spoken of for cutting a groove in the breadth of a piece, be made so thick, or, as we might be apt to say now, so broad, or so long, as to cover the whole breadth of the piece, it will present the idea of a roller. This I call a cutting roller; it may be employed in many cases with great advantage to perform the office of a plane."

The cutting roller of Bentham is the present cutter block of England, or the cutting cylinder of America, and after what has been quoted it may be seen that the idea of rotary planing and moulding machines had been fully grasped by Bentham. He goes on as usual to the various conditions which attach to the process of planing, and says further: "if a cutting roller of this sort be placed with its axis horizontal and the bench beneath, it may be made to rise and lower. The bench (machine) may be very readily adjusted, so as to determine the thickness to which a piece will be reduced by being passed under the roller." "To gain time, cutters may be applied to different sides of a piece at once, and such of them as make parallel cuts may be mounted on the same spindle."

These extracts would not be out of place in an explanatory lecture or essay on woodcutting at the present day, and cannot help awakening surprise that they should have been written eighty-three years ago, when there had, so far as we know, been no precedents, nor even suggestions from previous practice.

The foregoing shows that nearly all the fundamental principles, upon which woodcutting by machinery in its present development depends, were familiar to Sir Samuel Bentham, and though his name has been almost forgotten, it may be safely asserted that he gave to the world more useful inventions than any other man of his age. His work shows throughout a constant method and system of reasoning, which point rather to a life of persistent labor than to one of what would ordinarily be called genius. That latter quality he must certainly have possessed in the highest degree, for without it even his knowledge and experience could not have been equal to the work he accomplished. Directed to different ends, his talent and genius would doubtless have secured for him a fame that would live for years, though it does not seem possible that he could have conferred upon the world a greater benefit.

Suicide Statistics.

A curious and suggestive table of statistics has recently appeared in France, which will doubtless prove of much value in the hands of students of psychology and nervous mental ailments. It relates to suicides; and the conditions, etc., of the people who made away with themselves in 1874 in France are taken as the basis of the figures. In that year, 5,617 suicides occurred, the largest number ever known in any one year in the country. Of these, 4,435, or 79 per cent., were committed by men, 1,182, or 21 per cent., by women. In spite of the careful investigations of the police, the ages of 105 people could be determined. The 5,512 others are divided as follows: 16 years, 29; between 16 and 21 years, 193; between 21 and 40 years, 1,477; between 40 and 60 years, 2,214; exceeding the last mentioned age, 1,599. About 36 per cent. of these unfortunates were unmarried, 48 per cent. married, and 16 per cent. widowers. Of those which con-

stituted the last two classes, nearly two thirds had children. More than seven tenths of the suicides were effected by strangulation or drowning. The crime was most frequently committed during spring, when 31 per cent. of the whole number destroyed themselves; during other seasons the percentages were: in summer, 27; in winter, 23; in autumn, 19.

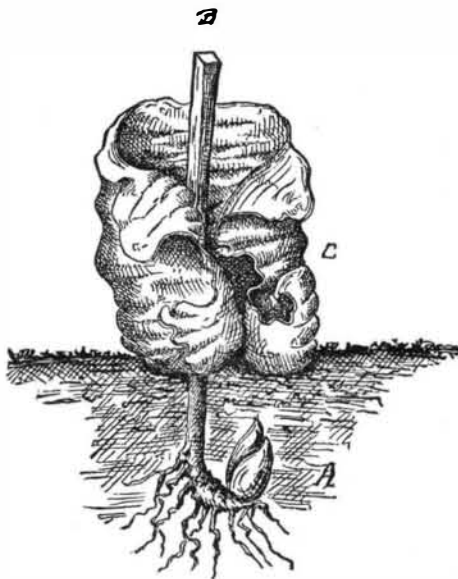
Included in the tables are the results of the judicial inquests, showing the professions and callings of the deceased. About 33 per cent. were farmers, 30 per cent. mechanics, 4 per cent. merchants or business men, 16 per cent. members of the liberal professions, 4 per cent. servants, and 13 per cent. were destitute of any calling. The table even analyzes, in all but 481 people, the motives which caused the fatal act. Thus we are told that 652 killed themselves because of reverses in fortune, 701 through family troubles, 572 through drunkenness, 243 through love, debauchery, etc.; 798 died to avoid physical suffering, 59 to avoid the penalties of capital crimes, 489 for unclassified troubles, and 1,623 were clearly shown to have been afflicted with some mental disease.

Communications.

The Frost Plant of Russia.

To the Editor of the Scientific American:

Mr. Charles Williams, of Wino, Ohio, has written a letter to that veteran botanist, Humphrey Marshall, of Chester county, Pa., on the subject of the abovenamed plant, and my opinion concerning it has been asked for. Seeds of this plant were obtained by citizens of Boston, who had snow brought from the White Mountains and from the coast of Labrador, and who stated that they have "now the most unbounded satisfaction and pleasure of announcing that all signs are favorable to the realization of their fondest hopes." This wonderful plant, it seems, was found amid the perpetual snows of the northern boundaries of Siberia, in 1863, by Count Swinoskoff, the eminent Russian botanist, and it was by him cultivated at St. Petersburg. The account sent me is very vague, and is evidently not from the pen of a botanist. It is stated that it comes forth on the first day of the year, grows to the height of three feet, and flowers on the third day. It continues in bloom for twenty-four hours, then dissolves itself, being of the finest snow; it has a stalk one inch in diameter, and leaves, three in number, $1\frac{1}{2}$ inches wide, covered with infinitesimal frost or snow cones. The flower is of the shape of a star, with petals 3 inches long and $\frac{1}{2}$ inch wide at the broadest part, forming a basketwork of frost. The seeds are like a pin's head. This is about all that can be gleaned from the description, and is by no means satisfactory. Allow me to present my humble views of an analogous discovery of frostwork on December 6, 1856, in a sandy loam in Chester county, Pa., near the Paoli monument. In the *Horticultural Journal* of Philadelphia, then edited by J. Jay Smith (New Series, volume vii., page 73, 1857), an account was published of my observations then. These I have since more fully confirmed. The common dittany (*Cunila Mariana*) is frequently met with in December, with the base of the stem surrounded with shellwork of



Root-bud and frost-flower of the *Cunila Mariana* (Maryland Dittany). A, the developing or budding root. B, the old stem of the previous year. C, the congealed vapor or hoarfrost, forming the first flower of various shapes.

ice, of a pearly whiteness. Dr. Darlington, in his "*Flora Cestricea*," published in 1853, page 199, under the article *cunila*, observes: "In the beginning of winter, after a rain, very curious ribbons of ice may be observed, attached to the base of the stems, produced, I presume, by the moisture of the earth rising in the dead stems by capillary attraction, and then being gradually forced out horizontally, through a slit, by the process of freezing. The same phenomenon has been observed in other plants. See observations on *helianthemum*, page 27." Had the doctor given a more extended investigation, I fancy he would have agreed with me as to the cause. I found hundreds of diversified specimens. I am not aware that it was after a rain, but I took up a number of the plants, and always found a vigorous scaly root bud, undergoing development at this early season under ground, to produce a new stem the following spring. I came to the conclusion that, as the temperature was below freezing and snow was on the ground, the expanding bud, in close proximity to the surface, gave out sufficient caloric or warmth to generate vapor from the moist soil. This

vapor rising around the stem of the plant, and attracted by it, becomes congealed into what we term hoar-frost, in numerous forms; some like shellwork, others like tulips, with radiated petals, variously contorted, and often as symmetrical as snowflake crystals.

That plants in germinating have the power of generating heat was proved by Mr. Hunter and by Lamarck. Experiments of Hales and Du Hamel show that vegetation is not wholly suspended, however cold it may be; and that there is a regular and gradual progress till the returning warmth of spring gives a greater degree of velocity to the juices, rendering their development more vigorous and apparent. If the crystallization takes place when the air is calm, the crystals will be regularly formed; otherwise, when windy, I have seen them like a shell within a shell, very thin, of a pearly whiteness. Professor Tyndall has shown in a very beautiful manner that ice is but an agglomeration of snow crystals: the transparency of the former being due to the expulsion of the air, entrapped in and causing the whiteness and opacity of the latter. There is a formation called the snow plant of California, which arises to some height, and has been compared to various things, a fountain convoluted and enlarged above, a crystallized small bushy shrub, etc.; but on closer inquiry, I have failed as yet to get any definite ideas to its true character. Some bulbs in the soil might cause such formations by the congelation of vapor deposited successively upon itself, or the stems of the previous year's growth yet remaining, and thus give them a sheathing of frosting.

The shape of a star is common in snow crystals, which we all know assume the most beautiful forms, and which are illustrated in various publications. The eminent botanist Count Swinoskoff should give us some clue as to the genus or character of the plant, the flower of which, we are told, melted away on being touched, and as to the stamens, the diamond seeds like a pin's head, etc. The whole needs further explanation.

I trust those Bostonians who are in such hope will edify the public as to the final result of their experiment. What has that veteran in botany, Dr. Asa Gray, to say about it? Let some one well qualified tell us more about this frost flower of Russia.

J. STAUFFER.

Lancaster, Pa.

Patent Matters in Washington, D. C.

To the Editor of the Scientific American:

From the report of the Commissioner of Patents, just issued, it appears that its surplus revenue for the past year amounts to over one hundred and five thousand dollars, and that there is nearly a million dollars in the United States Treasury to the credit of the Patent Office; and yet, notwithstanding that this enormous amount is lying idle, our pseudo-economists at the Capitol refuse to grant the Office sufficient of its own funds to carry on its business promptly. So much is the work behindhand in some of the departments that, as the Commissioner states in his report, some of the attorneys who require certified copies of papers have been obliged to employ their own clerks to do office copying, and then had to pay the full legal rate of ten cents per hundred words, the same as though the Office had done the work. This style of *economizing*, by making inventors pay two prices for their work, may be "reform" in the eyes of the average Democratic Congressman; but speaking for myself, as one of those who have had to pay twice, I would prefer to dispense with this style of "retrenchment and reform," and therefore ask you, Messrs. Editors, in behalf of the inventors of the United States, to so stir up our legislators that they will allow the Office sufficient of its own funds to do its work properly, and not delay the work of the inventor—work that he has to pay for in advance—and so prevent the discouragement and trouble which these delays always cause.

As the Patent Office has been doing a good business lately, there appears to be some attempt at rivalry at the Capitol, as the following list of applications for extension will show:

LIST OF APPLICANTS FOR EXTENSIONS OF PATENTS NOW BEFORE CONGRESS.

Reynolds, power loom brake.
Strong & Ross, scales.
Wm. & W. H. Lewis, photographic plates.
T. A. Weston, differential pulley.
S. S. Hartshorn, buckles.
H. A. Stone, making cheese.
N. Whitehall, cultivator.
J. R. Harrington, carpet lining.
H. L. Emery, cotton gins.
J. Stainthorp, moulding candles.
Walter Hunt's heirs, paper collars.
A. B. Wilson, sewing machines.
S. A. Knox, plows.
Rollin White, firearms.
Aikin A. Felthousen, sewing machines.
H. Woodman, stripping cotton cards.
L. Hall, heel trimmer.
J. A. Conover, wood splitter.
J. Dyson, carding engine.
G. Wellmann, card strippers.
E. Brady, safety valves.
Jearum Atkins, harvester rakes.
John Thomas, re-rolling railroad rails.
Thomas Mitchell, hair brushes.
Stephen Hull, harvesters.
T. R. Crosby, wiring blind slats.
G. W. Laban, mitre cutting machine.
T. A. Whitenack, harvesters.
J. J. Vinton, furnaces.
A. Fuller, faucets.
D. Baker, pitcher spouts and lids.
G. F. Chandler, refining sugar.

- G. H. Nott, boiler furnace.
- William Hall, lightning rods.
- B. F. Rice, paper bag machines.
- S. D. Nelson, shovels.
- E. T. Russell, car springs.
- Hubbell & Conant, steam pumps.
- C. A. Chamberlain, shovels.
- C. A. Adams, locks.
- E. A. Leland, paint can.

In addition to the above, I find the following names as applicants for extensions, but the inventions covered by the patents sought to be extended is not mentioned: S. S. Turner, Arculous Wyckoff, De Witt C. Cummings, Moses Marshall, J. W. Fowler, and Holloway & Graham. Many of the applicants have apparently given up their cases for this session, but they may be only lying back to its close in hopes that in the final rush their "little bills" may slip through easily.

Several bills tinkering at the patent laws are before Congress, and one of these (House Bill, No. 3,370) passed the House on the 30th ult. It has one section that may be made to work great harm to inventors, as it prevents infringers being sued for more than one year's damages previous to notice of infringement being given. By this bill, if it is allowed to become a law, a person will be able to build and use patented machines or processes for years in some out of the way place where the inventor cannot easily find him; and should he be discovered, he can only be sued for one year's damages. There are other sections in this bill which will bear ventilating.

Another bill, introduced into the Senate by Mr. Paddock, provides that all appeals from the Board of Appeals shall be direct to the Supreme Court of the District of Columbia, instead of to the Commissioner as heretofore; and that the fees shall be the same as now paid to the latter official.

Mr. Sampson has introduced into the House a bill changing section 4886 so that it shall read as follows: "SEC. 4886. Any person who has discovered any new or useful art, machine, manufacture or composition of matter, or any new or useful improvement thereof, not known or used by others in this country, and not patented or described in any printed publication in this or any foreign country, before his invention or discovery thereof, and not in public use or on sale for more than two years prior to his application, unless the same is proved to have been abandoned, may, upon payment of the fees required by law, and other due proceedings had, obtain a patent therefor: *Provided, That the manufacture or composition of drugs as a medicine shall not be patentable.*" The change is the addition of the words in italics.

The Smithsonian Institute has sent to Congress a memorial setting forth that the present Institute building is already too small for the vast amount of articles already placed there on exhibition; that at the late Centennial Exposition the Commissioners of various countries presented their entire collection of exhibits to the United States, which had delegated their care to the Smithsonian Institute, and they had no place for them; that the armory building was being fitted up for the reception of the United States Centennial collection, and they therefore asked that a building be erected for the foreign collection, which could be used as a national museum, or otherwise we should have to offend the donors by keeping their valuable gifts stowed away in cellars and other rubbish receptacles.

Mr. Eads, who is now here on the lookout for his pay for his work on the South Pass of the Mississippi's mouth, has received intelligence from the resident engineer at the jetties that the channel through the shoal at the head of the South Pass is now twenty-two feet deep, and that the least width at which twenty feet depth is found is one hundred and ten feet. The principal works to improve this shoal were constructed during the last six months. The low stage and feeble current of the river has delayed their effect until the recent flood from the Ohio reached them, and the problem of deepening the shoal has been fully solved by the rapid scouring away of the obstruction. It is stated that the channel is quite straight and is deepening rapidly. The channel through the jetties at the mouth of the Pass is twenty-one feet deep. The entrance from the sea through the jetties is one thousand feet wide, and through the works at the head of the Pass eight hundred feet.

A recent telegram from Nevada states that the Sutro Tunnel (of which I gave you some particulars in one of my letters) has now progressed a total distance of 15,565 feet and has fairly entered the mineral belt, and will soon help to increase the already vast products of the Comstock lode.

While on the subject of mining, I will state that the amount of quicksilver produced in California has increased so immensely during the last two years that it has attracted the attention of all interested in the article throughout the world. The receipts for the year have been 63,928 and the exports 48,010 flasks. In addition to the receipts there, probably about six thousand flasks were shipped direct from the mines to Nevada, thus bringing up the total production to over 70,000 flasks, a gain in round numbers of from twelve thousand to fifteen thousand flasks over 1875. The exports in that year were 34,844 flasks, or 13,666 less than in 1876.

OCCASIONAL.

TYRIAN PURPLE INK FOR MARKING LINEN.—Von Bele gives the following method for preparing an ink for marking linen and cotton: Neutralize 75 grains of carbonate of ammonia with pure nitric acid, and triturate 45 to 60 grains of carmine with the solution. Mordant the fabric with a mixed solution of acetate of alumina and tin salt, and write upon it, when it is perfectly dry, with the ink.

NEW YORK ACADEMY OF SCIENCES.

On Monday evening, January 29, 1877, a meeting of this Academy was held at the School of Mines, Columbia College, Dr. J. S. Newberry, President, in the chair. Mr. A. A. Julian, A.M., read a paper on the

PREPARATION OF ROCK AND MINERAL SECTIONS FOR MICROSCOPIC STUDY.

The speaker described in detail the various operations, exhibited the different kinds of apparatus employed, showed the operations, and exhibited the finished sections. In some rocks a thin chip can be broken off, others require to be sawn, and for the latter purpose the diamond saw is best. Having obtained the chip, it is first polished on one side, then cemented to a little square of glass, and the other side polished in the same way. The sections must not be too thick, nor too thin; they are usually made from a hundredth to a thousandth of an inch thick. Lathes employed in polishing minerals require to be provided with conical spindles, so that the wear, due to grit and emery dust getting on them, may be readily taken up. The grinding wheel may be either horizontal or vertical; the former has the advantage that the mineral can be held in either hand; with the latter only the right hand can be employed, and that in an awkward and tiresome position. Mr. Julian then referred briefly to the kinds of emery, its preparation by effritration, etc., and cautioned operators against using rouge or tin putty powder in polishing rock sections, although they may be employed in polishing certain minerals and gems. The object of making the rock sections being to study their constituents and determine what minerals enter into their composition, it is important that no foreign substance, liable to adhere to the specimen and to be mistaken for one of its ingredients, be placed on the section while grinding. Lastly, the minerals are mounted on glass, with or without covers, by means of Canada balsam. Square glasses are to be preferred to the long and narrow strips, usually employed, as less liable to break in the center, and more easily revolved on the stage of a microscope.

Mr. L. H. Landy then exhibited, by means of the gas microscope, several beautiful rock sections, both American and German. The same gentleman also showed the effect of passing polarized light through certain crystal sections, the black cross and rainbow-hued rings revolving like so many wheels as the polarizer was turned.

At the conclusion of this brilliant exhibition, Dr. P. T. Austen made some remarks on

LABORATORY MANIPULATIONS.

The points referred to were the apparently unimportant details which often contribute so much to the ease and pleasure of working. First, the use of square pieces of felt, such as are used under beer glasses in saloons, for setting hot beakers and flasks on to prevent chilling and consequent cracking. Second, in crystallizing substances for examination under the microscope; one watch glass is placed upon another with the substance between them, and the upper glass filled with ether, the cold produced by its evaporation hastening the crystallization. Third, removing precipitates and solid matter from flasks, by heating to boiling, and inverting in a vessel of water. Fourth, crystallization by gradual dilution. Fifth, filter paper without ash. In German laboratories it is customary to dissolve out the mineral matter from white filtering paper by washing in dilute hydrochloric and hydrofluoric acids. Sixth, the use of infusorial silica for drying purposes. Being very porous, it will absorb five times its own volume of water. If a filter paper, holding a wet precipitate, be placed upon a layer of this earth, it will become quite dry in a very short space of time. Mr. Austen also remarked that substances retain their heat for several days when placed in cork boxes. To keep a substance air-tight, it may be placed in a flask, the neck painted with a solution of india rubber in chloroform, and a plate of glass laid upon it. The solvent quickly evaporates, leaving a delicate film of rubber, which holds the glass tightly in place.

The next meeting of the Chemical Section will be held February 12; of the Mineralogical Section, February 19.

ANNUAL REPORT OF THE PATENT OFFICE.

The annual report to Congress of the Commissioner of Patents, for the year 1876, has made its appearance.

The amount received on applications for patents, reissues, designs, extensions, caveats, disclaimers, appeals, trade marks, labels, copies, etc., was \$757,987.65. The amount paid for salaries was \$425,930; other expenses, \$226,612. Total payments, \$652,542.

Number of applications for patents during the year 1876	21,425
Number of patents issued, including reissues and designs	15,595
Number of applications for extension of patents	2
Number of patents extended	3
Number of caveats filed during the year	2,697
Number of patents expired during the year	814
Number of patents allowed but not issued for want of final fee	3,353
Number of applications for registering of trade marks	1,081
Number of trade marks registered	959
Number of applications for registering of labels	650
Number of labels registered	402

Of the patents granted there were to—

Citizens of the United States	16,239
Subjects of Great Britain	511
Subjects of France	104
Subjects of other foreign governments	172
Total	17,026

The number of applications for patents was a little less than during the previous year. The Commissioner suggests that Congress should appropriate \$50,000 to promote the printing of the old patents; that additional examiners be

employed, and more clerks, for the purpose of expediting the business of the office; that the price of the *Official Gazette* be reduced, also the fee for trade mark registration; that the library fund be increased; that more space be provided for models, and for the transaction of business.

In respect to the Centennial, the value of new improvements, and the service of the Patent Office in stimulating discovery, the Acting Commissioner speaks as follows:

"The display made at the Exposition by the Patent Office was creditable in every respect, and excited general attention. About 5,000 models of inventions, representing the leading branches of the arts and manufactures, were exhibited in suitable cases, and properly labeled, the various publications of the Office were displayed, its practice fully explained to all inquirers, and copies of the Patent Laws and the Office regulations and forms freely distributed. The knowledge of our patent system thus imparted to foreigners and all others unable to visit Washington has more than repaid the small cost attendant upon the representation. The exhibits were sent from and returned to the Office with scarcely any damage being suffered.

"But the array of models, etc., made by the Patent Office at the Exposition was not needed to illustrate the value of our patent practice. The wisdom of that system was demonstrated in the most practical and triumphant manner in nearly every branch of that munificent enterprise. Not only in the grand display of labor-saving machinery, but in the vast collection of manufactured articles, and even in the department of fine arts, were seen the fruits of that provision in our Constitution giving to Congress the power 'to promote the progress of science and the useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.'

"Whatever persons may do in a 'perfect condition of society' in sharing, without price, the fruits of their labors with others, it must be apparent to the dullest observer that the wonderful growth of the useful arts in this country is due, thus far, to the protection given by our Government to property in inventions—a property as sacred as any other class of property, and whose value is determined by the same general law of supply and demand.

"It may be safely said that two thirds of the manufacturing interests of the country are based upon patents, and the welfare of all such interests are intimately connected with the welfare of the patent system. During the past seven years a larger number of applications for patents were filed and patents granted than during the entire seventy-eight preceding years, reaching back to the enactment of the first patent law. The needs of the Office have advanced in proportion to this sudden and vast increase of work, but have been but partly supplied. Nay, in fact, its already scanty force and accommodations have been actually reduced at a time when most required. If these vast interests, and the future promotion of science and the useful arts are to be encouraged, a liberal recognition must be made of the wants of this Office.

"The Examining Corps, the duties in which are most arduous and exacting, comprises gentlemen of legal, as well as scientific, attainments. It should be re-inforced by more of the same character. They should be relieved, by legislation, of continual embarrassment by reason of meager salaries and fears of removal incident to merely political changes. The Office would then be spared the continual loss of its most experienced and efficient men."

The Iron Trade in England.

The British *Mercantile Gazette* of January 15 states that the situation and prospects of the iron trade have not materially improved in the month of December, but some week or two must elapse yet before trade returns to its regular channels. In the north of England the tone of the market is tolerably cheerful, and prospects, though still vague, are considered encouraging. Makers of pig iron go into the next quarter with a good supply of orders on their books, and merchants and consumers are desirous of buying over the first half of the year. Notwithstanding the great depression which has ruled throughout 1876, there is likely to be a greater production of pig iron by several thousand tons than ever there was before, and the total make must considerably exceed two million tons, which is twice the quantity turned out in Scotland, though in the latter district a greater number of furnaces have been kept in blast. Prices are nominally the same as were quoted last week, but show an upward tendency. The bulk of the mills and forges, foundries, etc., have resumed work, and the finished iron trade is again in full swing. The plate department is well provided with orders, but the rail manufacturers, though rather better off than they were, are still in a poor position. The miscellaneous branches of the iron trade, such as the foundries and tube, wire, and cut-nail manufactures are generally well off for orders, and engineers find plenty to do. The wages agreement in the finished iron trade ends this week, but it is thought that no alteration will be made. In the South Staffordshire iron trade, work has been only partially resumed as yet, and many of the mills and forges will not be started until the quarterly meetings, next week. Orders have rarely been so scarce as they are at this moment, arrears having been pretty generally cleared off before the holidays, and no new ones coming in. Nevertheless, the feeling of the trade is more hopeful than it was a month ago. The number of furnaces in blast in this district is now only 58 out of 153; but should the expected improvement in trade arrive with the quarterly meeting, this number will soon be increased. In the finished iron branch, in which quotations for marked iron contain the basis of \$45 for bars, makers of leading brands of sheets and bars are better off than the manufacturers of cheap iron, who suffer much from competition in the north. Some considerable contracts for girders, bridges, gasometers, etc., are under execution at the works devoted to constructive ironwork; but the merchant iron trade, as a whole, is very dull. Unmarked iron is weak and variable, and to this circumstance may be attributed the reduction, announced this week, in various descriptions of common iron hardware.