

Scientific American.

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Steam versus Water Power.

Various correspondents have made inquiries respecting the relative value of steam and water power; and one asks:—"Whether an inexhaustible water power or only water sufficient for steam purposes, with an unlimited supply of cheap fuel, are most advantageous to the development of a manufacturing town?"

It is not possible to give a satisfactory reply to a general inquiry respecting the comparative advantages of steam and water power, but we have no hesitation in answering the correspondent (in Iowa) from whose letter we have quoted the above extract. An abundance of cheap fuel and steam power, in our opinion, possesses the greatest advantages for manufacturing purposes. Few manufacturing operations can be carried on without fuel, even where there is plenty of water power; therefore where fuel is scarce and dear, manufacturing cannot be carried on but under a heavy expense.

In giving this opinion we do not forget that most of our manufacturing towns and villages are indebted for their rise to water power. They are built on rivers and creeks where there are falls of water for driving machinery, but when they were first established, timber for fuel and building was plentiful and cheap in their neighborhoods. It has now become a serious question with many manufacturers, using water power, that their supply of water is becoming more unstable every year, as the forests are cleared off; and in many places where water power was exclusively used a few years ago, auxiliary steam power is required during certain portions of the year, on account of a deficient supply of water.

Forests and swamps are perennial feeders of creeks and rivers. As these disappear, and the soil is spread out to the direct rays of the sun, rapid evaporation takes place after falls of rain, and thus it has occurred that many streams once flowing with power for the miller are now only water-worn channels. The ruins of grist and saw mills are now to be seen on the banks of dry creeks, where forty years ago the merry clatter of the hopper and hum of the saw mingled from morn till night with the song of the rushing waters. But although this is true respecting a number of places, manufactures have not decreased in our country, thanks to the power of steam.—With a plentiful supply of fuel, steam forms a constant trusty power for driving machinery, and a steam factory can be erected independent of rare natural localities, like water-falls. It has thus great advantages over water power. It requires 180,000 cubic feet of water per hour on a 13 feet fall, to produce the same effect in driving machinery that can be obtained with 50 cubic feet of water and 300 lbs. of coal, by a steam engine. While the power of water for manufacturing purposes is growing weaker and weaker in our country, that of steam is growing stronger and stronger. We have read a statement that in the year 1800 there were only three steam engines in all the United States; who can count them now? They number tens of thousands. Steam factories can be conducted in or near cities and commercial marts, and thus effect a great saving in transporting raw material and goods. There are various manufactures, however, which need considerable water to carry on, such as calico printing, bleaching, carpet-weaving, woolen cloth making, &c. The scouring, washing, and dyeing require much water, but then with steam such factories can be heated, the goods boiled and dried, and taking the expense of keeping dams and water wheels in repair, we are of opinion that steam power, where fuel is cheap, is to be preferred in nearly every case to water power. At any rate, there can be no doubt but steam factories must increase in or near our coal regions, and ultimately these will become the great seats of American manufactures; just as the coal regions of England have become the centers of

manufactures in that country. And as we have the largest coal fields in the world, and these scarcely touched yet by the tool of the miner, it makes us hold our breath to contemplate the vast manufacturing power—the hundreds of Sheffields, Birmingham, Manchesters, Leeds, and Glasgows—that will yet arise in our country and make it (on account of its cheap fuel) the greatest manufacturing nation on the globe.

To the Public.

There are a number of slothful, inefficient, inexperienced persons, calling themselves patent agents, in different parts of the country, who manage to make a scanty living by circulating falsehoods in respect to us, and our mode of conducting patent business. They tell people that the Scientific American folks do so large a business and are so overrun with clients that they cannot give to each one, that attention or promptness that his case requires.

This is a very plausible and specious story, but we denounce it as untrue, and those who circulate it as falsifiers. Just the reverse is the truth. No Patent Agency in the country possesses better or more abundant facilities for the preparation of patent papers and no other individuals engaged in the business, bestow more professional care or attention upon their clients and cases than ourselves. Each particular subject receives the most careful study and deliberation, and when complete is promptly despatched. In proof of this we point with pride to the extraordinary success which attends our exertions. If we were negligent, inattentive, dishonest, or in any manner slighted the interests committed to our care, we should long since have ceased to possess the confidence of the community, instead of standing, as we now do, at the head of the Patent Agency business in this country.

Envious and deceiving persons may carp and rail at us to their heart's content, but they cannot alter the fact that the Scientific American Patent Agency is, by far, the best, the most prompt, the most successful, and the most moderate in its charges of any in the country.

The Woodworth Patent.

This odious monopoly expires by its own limitation, on the 27th of Denember next. Congress meets December 1st. The monopolists, we understand, are secretly but actively at work, endeavoring to organize a new combination to press a bill through Congress for another extension of the patent. They hope to have the bill passed between the 1st and 27th of December, for after that date their game will be up. We shall oppose the schemers, as heretofore, and expect to be able to head them off. But we request that all who are opposed to the monopoly will second our efforts, by calling upon Members of Congress, now that they are at home, explain the case, and put them upon their guard.

Recent American Patents.

We omit our usual reports under this head, and give place to extended notices of the varieties at the great Exhibition of the American Institute at the Crystal Palace.

Great Exhibition of the American Institute at the Crystal Palace, New York. FOURTH WEEK.

We have to report still further additions to the stock of contributions on exhibition, consisting of new machinery, engines, &c. The number of visitors has greatly increased. The evening attendance, especially during the three last days of the week was very great. On these occasions the spacious building was, at times, so crowded as to be uncomfortable.

Steam Fire Engines.

Lee and Larnard's engine, of this city, has been placed on exhibition since our last. We are informed that a trial between this machine and that of Silsbie, Mynderse & Co., noticed last week, will shortly take place.

Boiler Incrustation Preventer.

E. W. Sargent, 17 Broadway, N. Y., Stewart Kerr, Agent, exhibits Weissenborn's Patent Boiler Incrustation Preventer. This consists of an apparatus of cylindrical shape, somewhat like a stove, through which the water passes previous to entering the boiler. While passing through the apparatus the water is

subjected to mechanical filtration, and also to chemical action, heat, agitation, and friction being combined, whereby a perfect separation of the incrusting salts and foreign particles is effected, and the liquid perfectly purified. This invention is in use in several parts of the country, and is said to work with entire success. It prevents incrustation in boilers, no matter how highly impregnated the water is with lime or other substances. The salts are deposited in the purifying vessel, and the boiler kept completely clean. Many specimens of the salts and other impurities deposited in the apparatus are shown at the Palace. For engraving and full description see SCIENTIFIC AMERICAN, Vol. XI, No. 15.

Post Boring Machine.

Mr. James Bell, of Birmingham, Pa., exhibits one of I. W. Ward's patent machines for boring slots in fence posts, to receive the ends of the fence rails. Two augers are employed, which are rotated by a crank. The construction of the machine is such that slots of varying lengths may be bored, at pleasure, while the work is done with nicety and expedition. This machine is chiefly intended for use in putting up common farm post and rail fences. It is simple, easily managed, weighs but little, and is strong and durable. Price \$16 and up. The exhibitor furnishes visitors with a handbill containing a poetic description of the machine, which is quite amusing. For engraving and description see SCIENTIFIC AMERICAN, Vol. XI, page 280.

Rope Machines.

Mr. Thomas G. Boone, of Brooklyn, N. Y., exhibits in operation his new machine, for which he obtained Letters Patent July 15th, 1856. It operates admirably. The construction is quite different from other rope machines. Neither the spools that contain the strands, the capstands, or circler revolve in the direction of the twist. A good and even fore-hard is put in with the lay. The machine does about twice as much work as usual, occupies only about one half the ordinary space, requires only half as much power, is simple, more easily managed, etc. Price \$400 and up, according to size.

Mr. Wm. R. Dutcher, of Troy, N. Y., exhibits one of his newly patented rope machines in operation. The improvements are of such a nature as to increase the rapidity with which the rope is made, improve its quality, lessen the number of attendants, power required, &c.

Drop Press.

Milo Peck, of New Haven, Conn., exhibits in operation one of his patent Drop Presses, for stamping sheet metal. It is a strong and effective machine. The main shaft has a constant rotary motion, and lifts the weight.—There is a spring at the top, which holds the weight when it comes up, and prevents it from falling, although the shaft continues to rotate. The weight is discharged by a cord or pedal, which the attendant touches for that purpose. The machine on exhibition works well, and appears to be under perfect control of the operator. For an engraving and full description see SCIENTIFIC AMERICAN, Vol. XI, No. 18.

Parallel Vise.

Mr. Wm. H. Schofield, Agent, of Yellow Springs, Green Co., O., exhibits Davis' patent Parallel Vise, which appears to be a first rate implement. The long screw is dispensed with, the jaws always move on a parallel line, it is opened and closed in a much briefer space of time than the common vise, is cheap, simple, and durable. For engraving and full description see SCIENTIFIC AMERICAN, Vol. XI, No. 16.

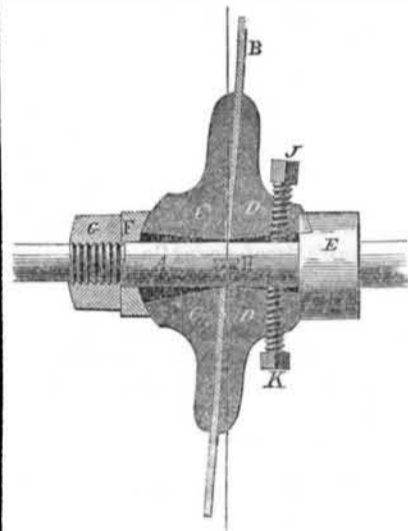
Lathe Chuck.

Messrs. E. Horton & Son, of Windsor Locks, Conn., exhibit samples of their lathe chucks for centering. The jaws are moved in and out from the center by screws, and the latter are furnished with pinions, which gear with a cogged ring, so that when one screw is turned by hand, all the jaws will move. The chuck box or shell is composed of two parts, and when required may be taken apart, and the cogged ring removed. Each jaw may then be moved independently. Price \$20 for chucks of 6 inches diameter, and upwards, according to size.

Portable Saw Mills and Sawing Machines.

Pinney Youngs & Co., Milwaukee, Wis., exhibit, in operation, one of their portable saw mills. It attracts great attention. The saw employed is a circular one, and the arrangement is such that it cuts both forward and back. The setting of the log, after each cut, is done by mechanism, so that the machine is self-acting in nearly all respects. We are told that logs can be placed upon the carriage, and rapidly cut up into boards without labor on the part of the attendant, except to carry away the lumber. It is said that these machines will cut from 2000 to 2,300 feet of siding per hour. This is great speed. The machine is simple, easily taken apart and set up, occupies little space. Price \$1000 and upwards, according to size.

Channeling Saw.—Mr. George Hutton, of Morrisania, Westchester Co., N. Y., exhibits in operation a circular saw arranged for cutting grooves of varying widths and depths, and for other purposes. The novelty consists in a peculiar arrangement for changing the relative angle between the saw and its arbor.



In our engraving A is the arbor, B the saw. The vertical line shows the deviation of the saw from the ordinary position, at right angles with the arbor. C D are two collars which clamp the saw. Each collar is flat on the face touching the saw, and spherical on its other face. These collars may, when desired, be removed from the arbor. There is immovably fixed on the arbor an additional collar, E, one face of which is concave, so as to fit perfectly to the corresponding spherical or convex face of D. A washer, F, similarly concave, is slipped loosely on the shaft, A, so as to fit in the same manner against the convex face of the collar, C. A nut, G, screwed on A, presses against the plane face of F, and by the aid of this nut all the parts may be released or firmly secured, at pleasure. The movable collars, C and D, must have considerable thickness, so that the convex faces thereof will be portions of large and not of small spheres, and also that the center of such sphere must coincide with the center of the saw. The shaft, A, is of such size as very nearly to fill the circular orifices on the plane faces, and also to fill the orifices in one direction on the convex faces, but in the other direction the oblong shape of the last named orifices allows considerable play.

When the collars, C and D, are placed together, the nut, G, being slackened to allow motion of the parts, the saw may be seized by the hand and readily placed square with the spindle, or as readily inclined over in one direction, but it cannot, by any force, be inclined in any other direction, by reason of the peculiar form of the cavities described. This device allows also of adjusting the obliquity of the saw by percussion, which is, in some accounts a superior agency for this purpose. In order to adjust the saw it is necessary to slacken the nut, G, but yet allow it to press so as to confine the parts with moderate force and strike with a mallet against either of the movable collars, C or D. By this means the amount of obliquity desired may be obtained with accuracy, after which the nut, G, must be screwed very tightly to its place. When thus screwed up, the pressure against the parts is sufficient to prevent any change, until the nut is again slackened. When it is de-

sired to set the saw square with the shaft it is only necessary to drive its edge in one direction until it can go no further, by reason of the hole bearing fair along the shaft.

In order to compel the movable collars, C and D, to maintain a proper position relatively each to the other, a projection, H, is made on the shaft, A, and corresponding notches or grooves cut in both the movable collars, also in the saw.

To facilitate a nice adjustment of the parts without percussion, screws J and K are used, tapped through D, and pressing with their smooth rounded ends upon the shaft, A. To adjust the saw by these means the nut, G, is slackened, and one of the last-named screws withdrawn, and the other advanced, until the motion thus produced brings the saw to the plane desired, after which the nut, G, is tightened, as before. When adjusting the saw by percussion, as first described, both the screws, J and K, must first be slackened.

This invention is one of a very useful and practical character. It may be employed for grooving of various widths and depths, the depth of the grooves being altered by changing the height of the table, which is done by a screw. The saw may also be employed for rabbeting, cutting double tenons, squaring, cross grooving, and a variety of other uses that will readily suggest themselves to the operator. At whatever angle the saw is placed it is perfectly balanced. For further information address the inventor, as above.

Tree Sawing Machine.—The Farmer's and Mechanic's Manufacturing Co., of GreenPoint, Brooklyn, N. Y., exhibit some of Ingersoll's Tree Cutting Machines. These are small apparatuses, light, and portable, but very effective. Two men can cut trees or logs of 16 inches diameter in two minutes. It is alleged that this machine effects a great saving of time over hand labor in tree cutting. It is readily applied. Price \$75. For an engraving and full description see SCIENTIFIC AMERICAN, Sept. 27, 1856.

Hazard Knives, 413 Broadway, N. Y., exhibits specimens of his patent saws, the novelty being in the peculiar formation of the teeth. Each tooth acts independently, and cuts its own shaving, as if it were a separate plane. The result is that a great saving of labor is effected, the stuff being cut, instead of rasped or broken away, as by the common saw teeth. The hand-saws shown by Mr. Knowles, appear to possess an important advantage over the ordinary kind. They work easier, cut straighter, etc. A mortising blade, with teeth formed in the same improved manner, also operates well. Saw mills requiring only 6-horse power are made, which, it is alleged, will cut 1000 feet of inch boards per hour.

Burglar Alarm.

Mr. Wm. McLachlan, of No. 76 Hammond street, N. Y., exhibits a curious little contrivance for sounding an alarm whenever a burglar attempts to enter the door of a sleeping apartment. It consists of a small gong-shaped bell, having a spring and wheels within its concavity. This contrivance is hung upon the door key, which is left in the lock, on the inside of the apartment. When the burglar inserts his nippers from without, and partially turns the key, the bell instantly begins to ring, and gives a thorough alarm. Price \$5.

Boot Crimp.

Messrs. Fetter & Co., of Philadelphia, Pa., exhibit one of their patent Boot Crimping machines. It is quite a novelty. The crimp board is divided at the instep, and the two parts are hinged together. Each portion is moved by its own set screw. There are movable nippers which hold the shank corners of the leather. The nippers are moved by a set screw. After the leather has been stretched upon the crimp board, it is gradually screwed up into the proper form, and the crimping is thus done in the most perfect manner. The work of a man, laboring hard for an hour and a half, may be done by a child, in two minutes, by the use of this machine. Boot makers may gather from this some idea of its utility and value. The work done is superior to that executed by hand. It is applicable to all kinds of leather, fine or stiff. The instru-

ment is attached to a small stand, and is so jointed as to be easily manipulated. Price \$11. For engraving and full description, see SCIENTIFIC AMERICAN, Vol. 11, page 289.

Improved Crane.

Mr. B. J. Burnett, of this city, exhibits a large model of his improved Crane, for lifting heavy weights, such as steam boilers, machinery, cargoes, etc. The improvement consists of a frame tower, from which arms or beams project at whose extremities the weight is lifted. The lifting rope or chain runs up through the tower and out to the extremities of the arms. One prominent merit in this invention is, that it is an independent crane. It requires no connection or bracing from surrounding objects, involves no waste or other device that becomes dangerous if any strap or small portion gives way. It appears to be a valuable substitute for common cranes and derricks. For an engraving and full description see SCIENTIFIC AMERICAN, Vol. 11, page 321.

Pipe Coupling, Without Solder.

Messrs. Fetter & Co., of Holmesburg, Pa., exhibit specimens of pipes, coupled together with water-tight joints, without the use of solder. Our engraving illustrates the invention.

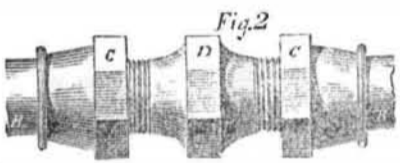
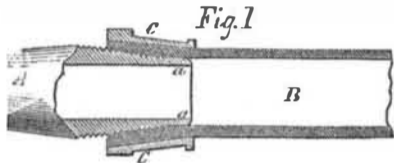


Fig. 1 shows the method of coupling a lead pipe and faucet together, A being the faucet and B the pipe. The extremity of the faucet is beveled, and has a screw cut upon it. C is a conical ferrule, into which the end of the pipe is introduced. The conical extremity of the faucet, A, is now screwed into the pipe, the mouth of which is thus expanded and firmly pressed between ferrule C, and faucet A, as shown. The joint thus made will be perfectly tight and substantial. The tip end of the faucet, at a, is left smooth, without screw thread. This smooth surface prevents burring up of the pipe.

Fig. 2 shows the mode of connecting different lengths of pipes. B are the pipes; C, conical ferrules; D conical connecting tube, with screw thread upon its ends, like the faucet A in fig. 1. The junction is made in the same manner as above. On the inside of the ferrules, C, there are projections which strike into the periphery of the pipe, and prevent the ferrule and pipe from turning and slipping. The outside of the ferrules are made in octagonal form, so as to be easily held by a wrench during the coupling operation. Previous to inserting the screw, a wooden plug is driven into the mouth of the pipe, in order to expand and bind it and the ferrule together.

This is a very rapid, cheap, and convenient method of coupling pipes. Its advantages over the solder joint will be obvious. It requires no fire or heat. Any person may use the improvement. Pipes may be coupled under water, or in situations where solder cannot be used, etc. Address the exhibitors as above for further information. Patented Aug. 19, 1856.

Tree Cutting Machine.

Mr. S. Strauss, of No. 212 Broadway, N. Y., exhibits one of Ehrsam's patent machines for cutting down forest trees. It consists of an iron ring, hinged in its center, so that it may be opened and then brought together again around a tree. It is, in fact, a girdle. The ring carries a cogged rack, which is caused to revolve around the tree by means of a crank and pinion. The rack carries a cutter which revolves round and round the tree cutting inward as it goes. This is a very compact, portable tree cutter, and works well. It is shown at the Palace in operation, an upright log being substituted for a tree. Price

\$35. For an engraving and full description see SCIENTIFIC AMERICAN, Vol. 12, page 1.

Hand Corn Planter.

Fenwick & Boeklen, 77 Poplar st., Brooklyn, N. Y., exhibit a convenient little implement, plain and unpretending in appearance externally, but possessing several really useful virtues. It accurately measures the corn for each hill, and plants and covers it perfectly by the simple operation of forcing its end into the ground and lifting it out again. Covering the corn perfectly is a step in advance, and commends this implement to the farmer in preference to those machines which simply plant seed and leave it uncovered. This implement will be found illustrated in No. 44, Vol. XI., SCIENTIFIC AMERICAN.

Mechanic's Institute Polytechnic Schools.

It has afforded us much pleasure to witness the progressive spirit which has characterized the New York Mechanic's Institute during the past few years, and especially the recent efforts made by its officers and members to carry out the original objects of its charter, by making it a good Educational Institution. To carry out this object, a Polytechnic School on a large scale has just been organized, and placed under the control of Prof. B. Garvey. Mathematics, languages, music, philosophy, engineering, and all the branches of a good education will be taught. A large gymnasium for healthful physical exercises is to be connected with the school—an essential feature—and popular lectures on various subjects will be given. It is also intended to have primary and graduating classes, up to a very advanced stage of instruction. Ladies and gentlemen's classes will be taught, and the instruction will be such as to fit both sexes for a cultivated useful life.

We think well of the objects of the Institute, with the exception of having a primary department, this should be omitted from its programme of instruction. The city Primary Schools are sufficient for instructing children up to a certain limited point, but beyond that more high schools are now required for our city youth. The Institute should rather devote its entire educational energies to found a superior High Polytechnic School, and no other. Such a school is certainly much wanted in this city, and we hope that of the Mechanic's Institute will completely supply the want. The spacious new buildings, 18 and 20 Fourth Avenue are now occupied by the Institute.

Macadamized versus Plank Roads.

We understand that most of the plank roads which were laid down a few years since in various parts of our country, have proved failures; they did not pay expenses. This is not the case with them all, but the majority of them, and some of these in regions where lumber is comparatively cheap. The planks being laid flat on the ground, rot out so rapidly that the expense for repairs amounts to about 30 per cent. of the original cost annually. This is a very large amount for wear and tear, and we do not wonder that many of them should have failed to pay expenses.

In the neighborhood of New York on Long Island, the plank roads laid down four years ago are now being torn up and superseded by good Macadamized roads, and it would be well for the road masters of nearly every town in our country to follow the example. Our common roads are very defective; they do not reflect much credit on our farmers who make them and keep them in repair. They seem to act as if the time they spent in working on their roads was an infliction, hence they shirk the labor, or execute it so slovenly as to merit reproof for want of good sense. If the ruts are annually filled up with mud, so as to make a smooth surface in dry weather, they think they have done their duty; but mud roads never can be made into good roads; they will always be rutty, and dotted over with sloughs of despond in wet weather. Good roads are civiliziers, by promoting travel; and they are economisers, by making travel easier for man and beast. They are avenues of commerce, and as a team can draw twice the amount of load on a good road that it can on a bad one, and travel twice as fast, surely it would be wise for our

farmers in every part of our country to labor hard and incur considerable expense to establish a system of good solid permanent common roads. The making of macadamized roads costs considerable at first, but the cost is principally for labor, not materials, where gravel or stone can be obtained; hence every farmer can do his share in making them without paying money directly out of his pocket. They are also simple of construction, and require no great engineering skill to execute, and when once well made they do not cost much for repairs. We therefore hope that our farmers will give this subject their careful attention, and act upon the suggestions.

Furs.

The *Journal of Commerce* states that on particular inquiry the fur trade in this city will reach \$1,375,000 this year. The price of American furs has lately risen considerably. Mink, which formerly commanded from 30 to 50 cents, is readily bought up by our furriers at \$3.50 to \$4; ordinary Western, which was worth 25 or 30 cents, now brings \$2.50; other furs, too, are much higher.

The *Journal* says:—"We lately saw a box of Russian sable, not more than three feet long, of camphor wood, which contained 400 small skins bearing the seal of the Russian Government, valued at fourteen thousand dollars. Some of the skins cost \$52 each. A lower grade of inferior color are worth \$28, and some not more than \$16. These are commonly sold at a profit of 30 or 33 per cent.—Sixteen or eighteen skins are required to make a full-sized cape, so that the cost of a choice quality garment of this description would be about nine hundred dollars. Adding the cost of making and the profit, such an article could not be procured for much less than fourteen hundred dollars. Hudson's Bay sable cost this year about \$25 per skin."

It may be mentioned that our large furriers employ no other means to preserve their goods from insects, except beating and airing them every three or four weeks.

Gold from Marrow Bones.

"In Australia Mr. Mooney has been delivering a lecture on the origin of gold, concerning which he propounded the following novel theory: He set out by declaring his belief that gold is the petrified remains of matter which was once animate; and accompanied as it generally is by ocean pebbles, quartz, crystal, and other saline and marine debris, he was of opinion that gold is the petrified fat or marrow of a peculiar fish, which once floated over the gold fields when those fields were beds and bottoms of the world's great ocean. In proof of the hypothesis that gold is nothing more than the petrified fat of a peculiar fish, the lecturer showed specimens of quartz in which marine shells were embedded. Mr. Mooney also alluded to the fact that iron exists in the human blood, and argued from that position that gold might be deduced from the marrow of fishes."—*Albany Knickerbocker*.

We wonder if this is the Mr. Mooney who once delivered lectures on various curious subjects in this city about sixteen years ago. He was a native of the Emerald Isle, a droll fellow, and always discoursed on some strange topic.

To Destroy Crickets.

A correspondent of the *London Cottage Gardener* says he has destroyed hundreds of crickets by means of a common white glazed jar, about nine or ten inches high, put in the place they infest, with a slice or two of cucumber in it, and one live cricket as a decoy. They will hop in, and strange to say, have not the power to hop out. It is not well to destroy them daily. When the jar is one-third full of crickets have it filled with boiling water.—This is a simple and effectual method of getting rid of these insects.

English Pottery

Staffordshire, in England, is the great seat of the porcelain and pottery manufactories. No less than 60,000 persons are employed in the works, and the annual value of the porcelain manufactured amounts to about \$10,000,000 per annum—three-fourths of which are exported.