peared, because it would not encumber its jaws, so as to be unprepared for defense while the human eye rested upon it. In experimenting on the non-venomous species, it was found that they, also, would not take their food when any person was present; but that, when alone and secure, they would eat ravenously; one of them, the common bull snake, having eaten nine young birds in a few hours. Profiting by this discovery, a rat, two-thirds grown, was thrown to the rattlesnake, when it immediately struck it twice. The victim soon exhibited signs of dying, and the box being closed and locked, all present left the room. Upon examination fifteen minutes afterward. the rat had been swallowed, and the serpent's thickness proportionally increased.

By this experiment, and others similar, it was ascertained that the rattlesnake does eat food that has been poisoned by its own venom;* and that it is probable that it always captures its victims by striking them, as, unconscious of danger, they pass its place of concealment; the poison of its fangs being a much more efficient agency than the fascination of its eyes.

It may be remarked, in explanation, that, although the poison of serpents, infused into the veins and arteries, is always fatal to the smaller animals, yet it may be received into the stomach without injury, as it is easily digested, and exerts no prejudicial influence upon the system. In the smaller animals, killed by the bite of the snake, no inflammation, no swelling of the body, takes place, as in the case of the larger animals, for the reason that the extinction of life occurs too soon to allow of any such effects.

If, then, the venomous serpents eat as food the animals killed by their own poison, and the non-venomous species can climb almost everywhere that birds build their nests, where is the necessity of any of these reptiles being endowed with the powers of fascination? They possess the means of attack and defense, independent of that power, in a degree fully equal to the necessities of their existence, and, in this respect, are not behind any other order in the animal kingdom. Why, then, should they be given such an advantage as fascination would confer, over the other orders of the irrational creatures? But I need not prolong my remarks on these topics.

*Prof. Pratt, late of Tuscaloosa College, adds his testimony to the above, thus: "The rattlesnake does eat the mouse after killing it with its poisoned fangs. I have seen this done."

ENGRAVING FOR CALICO PRINTING.

It is surprising how much of taste and educated fancy is bestowed on the production of the commonest articles. The love of beauty and the desire for ornament furnishes employment to thousands, and gives additional value to that which would before have subserved its purposes of use or necessity. The common calico prints and muslin-de-laines are cases in point. In one instance the fabric is of cotton, and the other, of cotton and wool, the useful qualities of which are in no wise bettered, if they are not really injured, by the process which makes them more agreeable to the eye. But their decoration with figures greatly enhances their value in the eyes of purchasers and wearers. And a great deal of talent, artistic and mechanical, is employed on this work.

The designing of the pattern is a preliminary to the engraving, as that is to the printing. For this purpose men of artistic tastes are employed, although they are not always required to originate the designs used. In many cases the patterns are copied from specimens sent from France and England, which are sometimes surreptitiously obtained by secret agents, who may be employed in foreign manufactories. We have known of instances where an enterprising manufacturer of cotton prints, by this means, put into the market *fac-similes* of English goods before the first invoice was imported from England, and thus forestalled the market. It is no uncommon occurrence, also, to find prints bearing the name of English or French houses which were spun, woven, and printed here; and so exact has been the imitation, that we remember a case where the wife of one of the most extensive calico printers in Rhode Island, on a visit to New York city, purchased an elegant piece of "French" calico, which had actually been printed at her husband's works not a quarter of a mile from her house.

The design is made in duplicate, or rather there is a "sketch" and a "pattern." The first gives the outlines of all the figures drawn in india ink, without coloring. The design is just as large as the "pattern" proper; that is, it comprises the "pattern" once only, which is reproduced indefinitely on the fabric. The "pattern" is a correct representation of the design, perfectly colored, and frequently more beautiful than the figures after being printed on the fabric. The object of the "pattern" is to guide the engraver as to the depth of his lines and to designate the colors.

The design, or outline, being sent to the engraver, he prepares a cylinder of steel, the length of which corresponds with the width of the design, and the circumference with its length. This cylinder is nicely polished and perfectly annealed, being made of the best refined cast steel. It is coated with a varnish of Canada balsam, the sketch being placed upon the steel and rubbed with a hard instrument. The *fac-simile* of the design is impressed upon the varnish, and the engraver begins his work. Now the colored pattern is brought into service. Experience teaches the engraver that for some colors the depth of the engraving must be much greater than for others; as some colors require much of their substance to penetrate the fibers of the fabric, while others seem to have an affinity for the cotton and easily saturate it.

The first "die" is engraved in outline as the "sketch." It is called the "outline die." After being engraved, impressions are taken from it and transferred to similar cylindrical "dies," one for each color and shade, the colored pattern being again called into requisition to guide the workman's graver, as he who is cutting the black must be careful not to infringe on the department of the red or the green, although he has on his "die" the outlines of all the colors. The engraving of these dies is done wholly by hand, and is a work of such nicety that it is intrusted only to experienced hands. Much depends upon the engraver's judgment. If he is engraving a broad leaf, for instance, the bottom of the depression is "cross-hatcheled," that is, scored diagonally twice, like the teeth of a cross-cut file. The intention is to retain by the uneven surface a large amount of color. Other and narrower depressions are scored but once across, while fine lines are not scored at all.

The impressions from the outline "die" are not taken in the same way as that from the paper sketch. The "die" is rubbed over with powdered lampblack, from which the oil has been expelled by roasting at a red heat in an iron vessel. The lampblack remains in the engraving, and that on the smooth surface is removed by the hand. A piece of common white letter paper is then coated with ordinary yellow bar soap, placed, soap side down, on the die, and rubbed with a steel spindle. This transfers a portion of the lampblack in the lines to the soaped paper, which is then placed upon a smooth "die," coated, as the first, with Canadian balsam, and rubbed with the steel. The lampblack outline is, of course, left upon the surface to guide the engraver.

For each color and shade, as before remarked, a separate "die" is used. The figures are in intaglio or sunk below the surface. As these "dies" are seldom or never more than six or seven inches long and two in diameter, they are not suitable for printing the calico from, and other processes are employed before the printing is reached.

The "dies," after being engraved, are hardened. Other cylinders of soft steel are prepared which hold in size a certain ratio to the "die." If the pattern is small the "die" must be small. Some are not more than three-eighths of an inch diameter. The cylinder to which the engraving of the "die" is to be transferred is either exactly the size of the die, twice thrice, or four times its diameter. This cylinder is called a "mill," and has journals or pivots turned on each end. A machine technically denominated "the clams" is the instrument for transferring the engraving of the die to the "mill." It has two parallel rollers, revolving close together, on or between which the hardened "die" is placed and by which it is rotated. Over these are two journal boxes, adjustable, so that the "mill" can be guided by its journals. The "mill" is placed on the die held by these boxes, and by means of a powerful screw is forced strongly down upon the upper surface of the "die," when the "die" and "mill" are made to revolve together. The pressure is not sufficient to produce a perfect pattern of the engraving on the soft "mill," but from time to time it is taken out, the pattern made by the "die" is painted with an "etching ground," composed mainly of asphaltum, and the mill is revolved in a dish of sulphuric and nitric acid and water for a few moments, when the unprotected surface is etched away, or rapidly oxidized. Returning it to "the clams," in connection with the "die," sharpens up the impression, until after repeated operations the design of the intaglio "die" is produced on the surface of the "mill" in bold relief. To insure the rotation of the "mill" in perfect coincidence with the "die" longitudinal scores are cut on its circumference at each end, beyond the pattern, which, by forming corresponding teeth on the mill, actuate the two cylinders as cog wheels.

The "mill" being hardened, is now ready for engraving the copper roller which is to print the calico. These rollers correspond in length to the width of the cloth to be printed, and bear a similar relation in diameter to the "mill" as that did to the "die." The rollers are hollow and are sometimes called "shells." A mandrel is thrust through them having journals at the ends, and the roller and mandrel are placed upon a machine horizontally. The "mill," by means of a sliding head-block, is brought in contact with the roller and its relievo figures impressed into the copper by means of a weighted lever in combination with rotation. As the "mill" transfers its pattern to one section, it is moved along the roller a distance corresponding to the width of the pattern, when the operation is continued, until the roller is covered with the engraving. Sometimes, to aid in this process, etching is resorted to. The surface or unengraved parts of the roller are covered with the "etching ground" and the roller revolved in a trough of diluted acid. This rapidly eats the copper and assists the operation of "milling." As in the "dies" and "mills" the rollers must equal in number the colors required. After being engraved the rollers must be ground, as a burr has been thrown up all around the edges of the figures. For this purpose hollow stones are employed, or rather blocks of stone hollowed to fit the segment of the roller's diameter are used, by being held on the roller as it revolves in water. The surface being polished, the rollers are ready for the printing machine. A description of the process of machine-printing we reserve for another issue.

Recipe for Curing Meat.

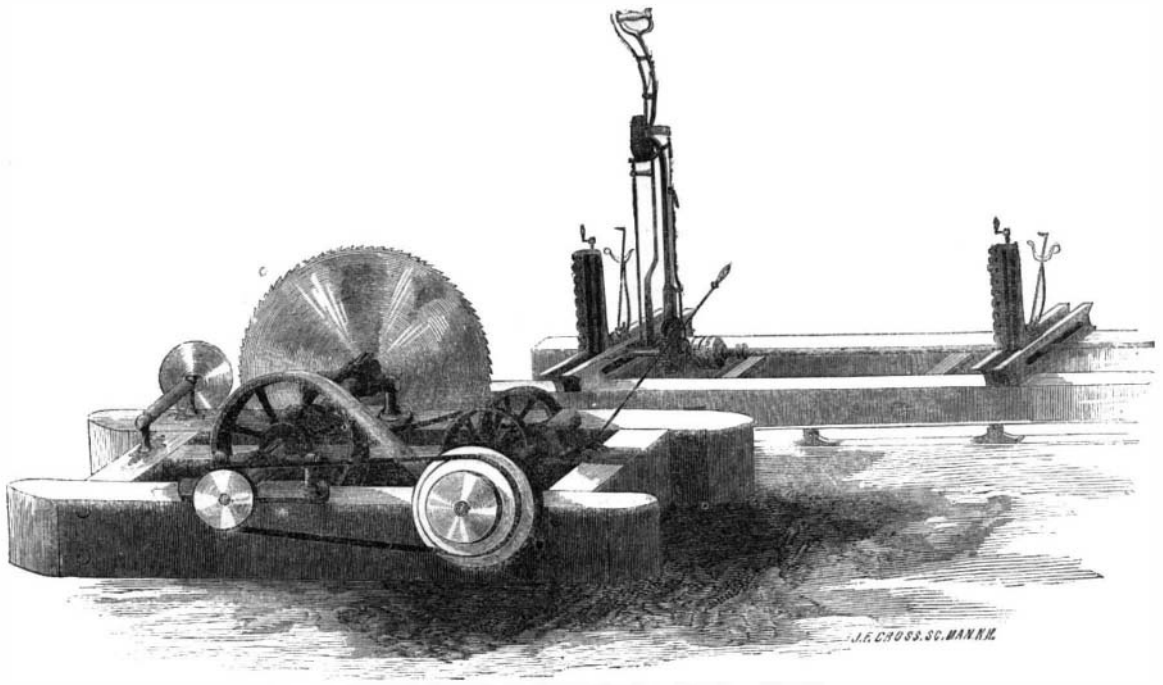
To one gallon of water, take 1½ lbs. of salt, ½ lb. of sugar, ½ oz. of saltpeter, ½ oz. of potash. In this ratio the pickle to be increased to any quantity desired. Let these be boiled together until all the dirt from the sugar rises to the top and is skimmed off. Then throw it into a tub to cool, and when cold, pour it over your beef or pork, to remain the usual time, say four or five weeks. The meat must be well covered with pickle, and should not be put down for at least two days after killing, during which time it should be slightly sprinkled with powdered saltpeter, which removes all the surface blood, etc., leaving the meat fresh and clean. Some omit boiling the pickle, and find it to answer well, though the operation of boiling purifies the pickle by throwing off the dirt always to be found in salt and sugar. If this recipe is properly tried, it will never be abandoned. There is none that surpasses it, if any so good.

THE London *Lancet* says:—"Among the uses to which the Atlantic cable has been put is one which would hardly be anticipated. A correspondent communicates to us a telegram which he received from a patient who, being seized with a renewed attack of illness, from which he had suffered in this country, and for which he had been successfully treated, telegraphed to his old medical attendant for directions. These were returned by the same channel, without delay, and we hope they have prospered, and that the proper remittance will follow by an early packet. This prescription will rank among the curiosities of telegraphy."

Improved Upright Saw-mill Set.

The annexed engraving gives a perspective view of Stanton's patent lever set for securing logs in circular-saw mills, which is now extensively used, giving entire satisfaction. Its peculiar advantages are, that the knee heads may be moved simultaneously, or separately; that they are operated by means of a lever, pawl, gear, rack, and ratchet, which give a great lateral motion instantly; that the weight of the log is partially removed from the ways, reducing the friction; that it dispenses with the services of one man, and obviates the necessity of turning the log.

The uprights traverse slotted iron beams placed transversely across the carriage, and are worked by means of a shaft, with pinions which mesh into a fixed rack on the lower portion of the transverse beams, and, also, with similar racks formed on the base of the sliding uprights. The shaft is operated by an upright lever working a pawl on the shaft, which gives a uniform motion to each upright. These uprights can be connected or disconnected at will by another lever which moves sliding clutches. After the log has been sawed the blocks may be thrown back instantly to receive another log, thus saving the time usually required where the blocks are operated by screws. An indicator, directly in front of the operator, is graduated so that he can determine at once how much set forward to give the log for any required thickness of lumber. The log is held by the usual dog, and, in addition, a pointed screw, which is set by a hand wheel into its substance. Screws passing upright through the knee blocks carry spurs which "take" into the lower part of the log, holding it partially free from the carriage so that there can be no friction by dragging.



STANTON'S LEVER SET FOR SAW MILLS.

It is not liable to get out of order, and is claimed to save in time and lumber thirty-five to forty-five dollars on every 100,000 feet sawed, as there is no loss of time in setting, and both ends of the log are moved exactly alike, thereby preventing waste from imperfect sawing.

It was patented through the Scientific American Patent Agency, May 1, 1866, by J. M. & S. F. Stanton, of Manchester, N. H., to whom apply for machines or for additional particulars. Stephen Heald & Sons, Barre, Mass., manufacture the machines.

POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The Association held its regular meeting at its rooms at the Cooper Institute, on Thursday evening, Oct. 25th, Prof. Tillman in the chair.

Previous to the regular subject, a discussion was carried on, questioning the expediency of using the beam engine on sea-going vessels. The work for which Watt employed the first steam engine required this particular form of construction. Introduced, a wide-spread prejudice has since existed in favor of this style of engine in preference to any other form. However strongly braced, the strain on the beam and gallows frame must tend to weaken the vessel in a heavy sea. A portion of the works must be entirely exposed to the weather, and the deck can never be closed, hence the danger of swamping when heavy seas are shipped.

DISINFECTANTS.

Prof. Tillman introduced this subject, the regular topic for the evening's discussion, in an article defining the signification of the term, and enumerating all the more valuable disinfectants now in use. This class of substances should not be regarded as synonomous with those chemical agents known as deodorizers, for the difference is essential; the latter may act as a palliative, or simply overpower, dissipate, or disguise the gaseous products arising from that which constitutes the cause of disease, while true disinfectants attack and destroy the very roots of the evil. Taking the four elements of the ancients as the type of division under which to rank the generally received disinfectants, we note, under the first, that the soil is capable of absorbing indefinitely, injurious vapors. This property, possessed by porous bodies in general, is held by charcoal in a remarkable degree; for not only does this absorb, but also, by bringing the particles into close contact, it hastens decomposition. Second, water, as a solvent, removes the source of disease, and, in connection with the soil and the air, constitutes the grand disinfectant of nature. Third, no better purifying agent exists than a plentiful supply of pure air. Amongthe gases, chlorine is the best known, which, chemically combined with lime, has been extensively employed. All the bleaching agents are also disinfectants; among these ozone is said to be the best. Sulphurous acid has, in all ages, been used and highly valued; it acts as a deodorizer, and by its antiseptic qualities impedes fermentation. Fire, lastly, is acknowledged as one of the best disinfecting agents known.

The generally received theory assuming the presence of some specific poison or deleterious matters in the atmosphere, was disputed by Dr. Bradley, who advanced a hypothesis, supposing that malarious diseases are produced not by any specific poison in the atmosphere, generated from decomposition of vegetable matter or miasmatic emanations of any kind, but from a cause negative in its character, viz., the want of the normal depuration of the animal organism. The matters in the human body which have served their purpose and have become effete, must be regularly expelled, or they act as a virulent poison within the system. Free perspiration under the stimulus of heat or exercise being among the most important functions by which the depurative process is performed, in the absence of such stimuli, another auxiliary, viz., the atmosphere, having an affinity for the exhaling matter, is required. In a healthy state of the atmosphere, such affinity is an active positive force of great power, but it may be sated in various ways; this occurs when the temperature of the air and the dew point approximate. An excess of carbonic acid has also a powerful effect in satisfying the power with which the atmosphere is otherwise endowed, of carrying off the effete carboniferous matters. During the spring and early summer, carbon is assimilated by the luxuriant vegetation, and the atmosphere is purified, but later, when plants begin to decline in growth, the air becomes charged in larger proportions with carbonic acid; to this, and to the fact of the greater amount of aqueous vapor in the air at this season, is due the prevalence of malarious diseases during the fall of the year. In crowded hospitals or ships, the atmosphere becomes charged with the refuse matters which have already served their purpose. The deleterious effects of inhaling these matters are small compared with the effects of depriving the air of its absorbing tendency. The conclusion, then, seems evident that malarious diseases are caused by the effete excrementitious matters of which the system has failed to be properly depurated, on account of the lack of an atmosphere having an affinity for such excretions, and the consequent deprivation of this auxiliary in the performance of the perspiratory functions. Any thing, then, that tends to desiccate or dry the air, or to enlarge its capability of absorbing and dissolving the fluids of perspiration, is a true disinfectant. Fire increases the power of evaporation; chloride of calcium and other deliquescent salts, by their attraction for moisture, tend to dry the air, and hence stand so high as purifiers. By the application of water the pores of the skin are opened, and thereby healthy action in the performance of its excretionary functions is stimulated.

The views here presented were enlarged upon by the members, and the remainder of the evening was devoted to the presentation of facts, substantiating, essentially, the above hypothesis.

Important Decision---Does "Cash" Mean Gold?

A decision in the United States Circuit Court (Judge Smalley presiding), of more than ordinary interest to business men, was made on the 24th inst. William Chamberlain and others, in November, 1862, chartered from Lawrence Gladston and others, the British brig *John of Gaunt* to bring a cargo from the Island of Ceylon to the United States, and in the contract agreed to pay plaintiffs $29,000 cash, in consideration thereof. On the delivery of the cargo the defendants paid the above amount to plaintiffs in legal tender notes, and contended that that was a discharge of their obligation. Plaintiffs considered that only so much paid on account, and contended that the word "cash" in the contract meant specie (gold or silver). The question in relation to this point was, from the evidence, left to the jury to decide, which they did, by bringing in a verdict for plaintiffs for $18,066, that being the difference in value between gold and greenbacks at the time of the delivery of the cargo, with interest added to date.

We may remark, in passing, that the ruling of Judge Smalley has caused no little surprise, and the general sentiment of the mercantile community is, that the decision cannot be sustained on appeal, since, by a law of Congress, greenbacks are made a legal tender, and hence, it is claimed, they should be held in law and equity to answer the purpose of coin in the payment of all obligations on contracts made after the passage of the law in question.—*Shipping and Commercial List.*

BALLOONS filled with hydrogen were first introduced in the year 1762, by a professor of physics in Paris. During the same year the first aerial voyage was made in a balloon filled with hot air.

A BOOT-BLACKING machine has made its appearance on the streets of Buffalo.