mound, with all the loose mortar and stones, we stand on a level floor, sixty centimeters below which was a small pile of bones, with one smoke-colored obsidian arrow head, twelve centimeters long, on each side of it. Also fragments of fine pottery, some painted blue inside, the others with vestiges of a design in white.

Though the bones had been completely protected from the air, they were so rotten that we had to handle them with care for them not to fall to dust. They seem to have belonged to a small animal with long and pointed jaws and very pointed teeth. We wrapped each bone in a separate paper, so that later some qualified person might examine them. Forty centimeters below these bones and arrowheads was a concrete floor beautifully leveled and painted bright red, which extended throughout the mound. Below this floor were loose stones without mortar to a depth of forty centimeters, then another floor painted yellow, making the seventh floor from the summit, though the upper floors were not polished like those beneath. Under the seventh floor there were more loose stones, sixty centimeters deep; then solid rock and Mother Earth. We next had the men to open further into the west or rather southwest part of the mound, in which direction the arrowheads had pointed, and after three days, reached a very solid block of masonry. Within it, about a meter and a half west of the center of the mound, was a stone seventy-five centimeters long and sixty-five wide, standing upright, its surface facing east.

The stone is deeply carved with signs that had their meaning among the Maya priesthood, and painted blue, yellow, red, and green. Further south, two other similar stones were found face downward, on the red concrete floor; they were stood up, together, and a photograph made of them. There, also, was another stone with a fish sculptured on it, the fish being surrounded by a fold of a serpent's body. No other object was found in this mausoleum, that seems to have been erected to the memory of a certain priest or wise man, called Cay Canchi, and also to conceal the remnants of some sacred temple that may have been destroyed by a great cataclysm; in which case we may presume that the apish figure was a principal and much respected object in that temple, and the property of the pontiff, since he inscribed his name (Cay Canchi) on the heel of the sandal; for we are not very ready to admit that the figure found is a likeness of a sage and philosopher—a learned man of the highest class, a nobleman among the Mayas.

The great statue that was thrown from the top of the mound and broken may have been a picture of Cay Canchi; we cannot now tell; but no image of him was within the mound. We have found an exquisite stone bust of that individual in Uxmal, but have left it concealed where found, because in Mexico no one would know how to appreciate it, and we are not allowed to carry any stone from the country out of Mexico. Even though we give them being by bringing them to light from the bowels of Mother Earth, we cannot call them ours, neither will the government pay us one cent for our discoveries, that is well able to make its museums the richest, *in American antiquities*, that exist in any country; but it seized the statue of Chaacmol, and refused to defray the expenses incurred in the discovery. Even the Congress at Washington refused to aid Dr. Le Plongeon in the recovery of his expenses, when Hon. George Hoar appealed for protection to the Senate in a paper marked, "*Confidential*. 45th Congress, 2d session. Executive B. May 7, 1878." It seems that in America people who dedicate themselves to science, unless happy enough to be rich, run a good chance of starving, so far as the governments are concerned.

Your most obedient,

ALICE D. LE PLONGEON.

Ruins of Chichen Itza, Yucatan, January 12, 1884.

The Corinth Canal.

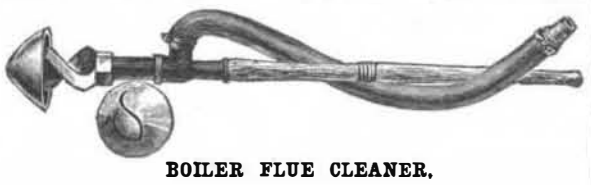
The work of making a ship canal across the Isthmus of Corinth, to connect the Gulf of Corinth with the Bay of Ægina, is now well under way, although, short as will be the route, it is expected that four or five years will be required for the completion of the undertaking. The total length will be 6,400 meters, or about four miles, and the route is on a line where a canal was once projected, and the excavation even begun, by the Roman Emperor Nero. The canal will be the same in section as the Suez Canal, 22 meters in width at the bottom, and 8 meters in depth at low tide, but the total amount of material to be removed is placed at 10,000,000 cubic meters.

A correspondent sends us an opinion as to the benefits this canal will confer upon navigators of that portion of the Mediterranean, and estimates that the tonnage of vessels likely to use the canal will be at least six and a half million tons yearly, yielding a revenue, on moderate charges, of about $900,000 a year above charges for running expenses and maintenance. Full details of the work, showing plan and birdseye view of the route, with sectional elevations, may be found in SCIENTIFIC AMERICAN SUPPLEMENT, No. 425.

JOHN E. WOOTTEN, General Manager of the Philadelphia and Reading Railroad Company, who is the patentee of the Wootten dirt burning locomotive, has sold his rights in the patent for a sum estimated between $250,000 and $300,000. The purchase was made by an association of railroad capitalists, who formed a company, of which Mr. Jos. Wharton, president of the Wharton Switch Company, is the leading man.

BOILER FLUE CLEANER.

Keeping the flues clean is one of the most important duties connected with a boiler; when properly performed, it results in a decrease in the expenditure for both fuel and repairs and an increase in efficiency. One of the best tools for doing this work is the cleaner shown in the accompanying engraving, and which is manufactured by the Crescent Manufacturing Company, of Cleveland, Ohio. The form of the cleaner is shown in the cut. A hose connects the cleaner with a pipe that leads to the dome of the boiler, in order to obtain dry steam. The conical shaped head of the cleaner adjusts itself to the ends of the tubes, excluding the air, thereby preventing condensation and insuring a dry current of steam. The steam passes through the auger-shaped passage, which is without obstruction from the induction end to the outlet, and is delivered directly against the face of the tubes in an unbroken sheet, continuing through the entire



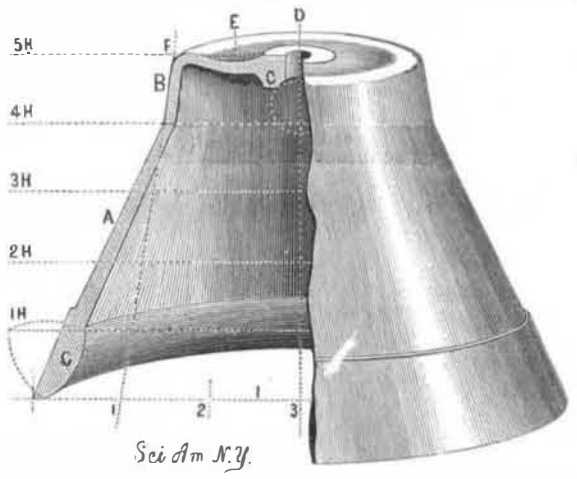
BOILER FLUE CLEANER.

length in a whirling motion, and thoroughly removing all ashes and other foreign matter. The cleaner need be held against the end of each tube only for a few seconds, so that every tube in the boiler can be cleaned in a short time. There are no parts needing attention, and the apparatus is ready for use at all times. For these reasons the tubes can be more frequently cleaned, thereby preventing the formation of scales, improving the draught, and permitting the use of a poorer grade of fuel.

The above mentioned firm also manufactures the "Crescent" steel tube scraper and boiler compound for dissolving scale and preventing its formation.

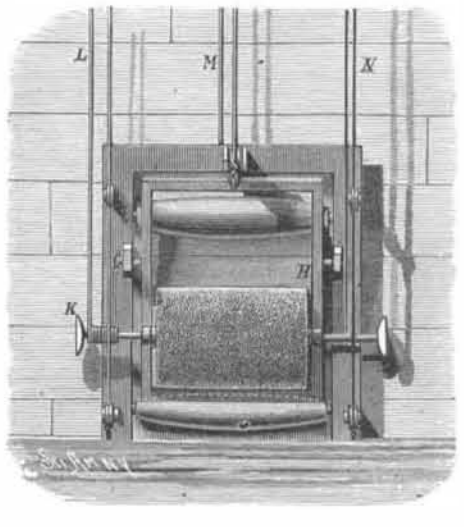
IMPROVED FORM OF BELL.

An improved construction of farm, factory, church, and other bells, whereby greater vibration is secured for the upper portion of the bell, a more powerful tone is obtained,



BOWERS' IMPROVED FORM OF BELL.

and the bell is less liable to break from strain of metal in casting, has been patented by Mr. M. M. Bowers, of 29 Camden Street, Baltimore, Md. The body of the shell is in the form of a truncated cone whose height from 3 to 4 H is equal to half its base, and its top also equals half its base. The head portion is one-fourth the height of the cone. The base line of the cone is divided into six equal parts, and from 1 and 5 are drawn upwardly converging lines to and through the top circle. This gives the proper slope of the head. The exact form of the upper part of the head is clearly shown in the engraving. The whole height of the shell of the bell is divided into five equal parts as shown by the dotted lines, 1 H to 5 H. The hammer swell is made wholly within the shell, and its length is limited by the first of the five spaces. By concaving the top of the head,



COOPER'S NEW SHIP CLEANER.

greater ease is secured for the vibrations of the shell, and there is less strain of the metal in casting. The form of the hammer swell and its arrangement within the shell, instead of outside, have a greatly improved effect.

Canned Goods and Adulterations.

A bill was recently proposed in the New York Legislature requiring all canned goods sold in the State to be stamped with the date of packing. The proposition was vigorously opposed by those interested in the canning interest, and did not become law. The annual production in this line in the United States—in fruit, meat, fish, and vegetables—is placed at 500,000,000 tins, or about ten for every man, woman, and child in the country, and such a law, it was claimed by the manufacturers and dealers, would seriously check if not destroy a now prosperous business.

It is not strange, however, considering the many forms of adulteration and sophistication in articles of food which have grown up in a few years past, that people are very open to suspicion, and sometimes propose severe remedies. A great deal of glucose was sold in sugar and sirup and as honey before people suspected it, and the war between oleomargarine and butterine and dairy butter seems now to be further than ever from a settlement, on account of the passage by the Legislature of a law generally deemed unconstitutional. The latest of these most conspicuous adulterations has been found in the recently discovered adulteration of green coffee by New York and Brooklyn dealers. The cheap Maracaibo and Guatemala coffees differ in appearance from the more valuable Java and some other varieties, the former being of a dull greenish hue and without luster, as compared with a glossy yellow color in the Java. Thence was started a practice of treating the cheaper coffees by rolling the former in heated cylinders and sprinkling with gum arabic water, to polish the beans and give them more the appearance of Java. After this came the use of other coloring matters, and the officers of the Sanitary Bureau state that now both arsenic and lead are used for this purpose, as well as chrome yellow, Prussian blue, yellow ocher, umber, Venetian red, and lampblack. The coffee dealers say the injurious articles are used in quantities so infinitesimal that no harm can possibly come of their employment, but this is a statement of which the public may well be highly incredulous; the coloring matters have been used simply and only as a means of palming off a cheaper article for a better, and the health officers have concluded that every cup of coffee made from the colored beans contains one-sixtieth of a grain of arsenious acid, a virulent poison. In buying coffee and many other articles of consumption the consumer will do well to be on his guard.

Brass Driving Boxes.

The practice of the Baltimore & Ohio road in the matter of solid brass driving boxes presents some advantages, a knowledge of which may be useful to other roads that have brass foundries and make their own brass castings. These boxes are charged upon this road at 16 cents a pound, which is the ordinary rate for all brass work, and the old brass is received back by the foundry and credited at 11 cents per pound. The boxes can be finished up at about half the cost of finishing cast iron boxes, and being solid no labor is expended in fitting a brass into the box. It has been found that these boxes, when made of the right mixture, will wear as long as combination boxes. When an accurate system of accounts is kept, with a knowledge of every source of waste in the foundry, there are many parts of an engine which can be made from solid brass more economically than from a combination of brass and iron. The loss in remelting being known, together with the cost of the raw material and of the labor expended in the process of making and turning out, it is easy to determine what iron castings can be economically replaced with brass. But if the attempt is made to substitute brass for iron without an accurate knowledge of the details of expense, it is easy to make mistakes that will be wasteful instead of the contrary.

A NEW SHIP CLEANER.

The construction of the ship cleaner recently patented by Mr. J. L. Cooper will be plainly understood from the accompaning engraving. A steel brush, whose shaft is journaled on a movable frame, H, which is pivoted in blocks projecting from the main frame, is made to revolve by means of two ropes wound in contrary directions upon the ends of its shaft. These ropes may be operated from any convenient station—either from the deck, the dock, or a float. From the sides of the main frame project four arms, each of which is furnished with two wheels, between which pass the tightly drawn guide ropes. These ropes can be carried down one side of the ship, under the bottom, and up the other side. The frame is kept a short distance from the surface to be cleaned by rollers. The apparatus can be readily raised or lowered, or moved sidewise, so as to bring the brush against any part of the ship's surface. By the aid of a rope attached to the upper cross bar of the movable frame the pressure of the brush against the ship can be regulated. With this device the sides and bottom of a vessel can be quickly gone over, and barnacles, rust, paint, etc., removed.

Further particulars concerning this useful invention can be obtained by addressing Mr. James O. Cooper, No. 165 Fourth Street, Portland, Oregon.

ON his way to the Cape, Captain Gordon landed at the Seychelles Islands. There is a curious grove of palms there which grow in pairs, side by side. If one is cut down, the other dies. Gordon at once indicted an official dispatch to say that he had discovered the original Garden of Eden, and that trees of good and evil were still flourishing in it.

Inhalations of Oxygen.

For several years past numerous experiments carried out with the view of ascertaining the influence of various gases on the system have occupied many distinguished physicians. Baths of compressed air for asthmatic patients are now quite fashionable in certain French and German towns.

The most important investigation of this kind, which has come to light quite recently, is that of Dr. Albrecht, of Neuchatel, the object of which is to determine the exact value of methodic inhalations of oxygen gas in phthisis, or tubercular consumption.

The observations made in this direction are certainly encouraging, to say the least, and no one can say to what beneficial results they may not lead before long.

The author is medical tutor at the Children's Hospital at Bern (the Children's Clinic at the University), and he has already devoted some time to noting the influence of pure oxygen upon nutrition, and especially upon the formation of the red blood corpuscles. In the work Dr. Albrecht gives an account of his experiments made both on men and animals, with the view of ascertaining the effects of methodic inhalations of oxygen gas upon the development of phthisis. He wished to prove whether by increasing the rate of organic combustion by this means the bacterium of consumption (Koch's bacillus) would not be destroyed and eliminated from the system.

In experimenting upon the human subject, Dr. Albrecht submitted his patients to the inhalations of oxygen; they were tuberculous patients, in whose expectoration the bacterium of phthisis had been discovered with certainty on several occasions. Before this treatment was put into operation the patients were submitted to an appropriate highly nutritious diet, such as would not require to be changed during the course of the experiment. The diet consisted of milk and peptone. Twice in the course of a week they were weighed with the greatest care, and the smallest variation in the weight of the body was noted.

One of the first things observed was that as soon as the patients had begun the oxygen inhalations the loss of weight which the body was undergoing day by day was checked, and sometimes the patient's weight was found to have increased. At the same time it was noticed, though not so constantly, that dyspnœa diminished, and the number of bacteria seen under the microscope appeared smaller.

It was quite evident that the improvement noticed in the state of the patient was due to the oxygen inhalations; for no sooner were these suppressed than the suffering and dyspnœa recommenced, even when the body still kept up the weight it had acquired during the previous treatment.

Successful Experiment in Draining Swamps.

In a letter from Atlanta, Ga., to the N. Y. *Sun*, a correspondent relates the result of some experiments recently made by Col. John P. Fort, on the draining of swamp lands in the southwestern portion of Georgia.

The great drawback of Florida, Louisiana, the rice sections of South Carolina, and Georgia has been the fact that white men could not live there on account of brackish drinking water and malaria, inseparable from floods and swamps. Several years since, Col. Fort, who owns much property of this description, conceived the idea of sinking artesian wells, holding that when a certain stratum was reached pure water could be obtained in abundance. His efforts were crowned with such success that every town in southern Georgia is sinking artesian wells. The water is perfectly clear, sweet, and pure as the best to be found in the highlands. This success led Col. Fort to try the experiment of draining stagnant ponds by running them off through subterranean passages that are known to exist at a distance of from 70 to 100 feet below the surface.

Col. Fort's experiment was made on his hickory level plantation, in Dougherty County, and the pond upon which he experimented is situated about 200 yards from his pioneer artesian well. The pond covered an area of about two acres, with a depth of 10 feet in the center. To drain it thoroughly an outlet must be made in the deepest part. To accomplish this, Col. Fort bound four substantial pieces of timber together, floated them over the center of the pond, and upon this foundation built his raft or pen, which sank as it was added to. When the raft had been built, the foundation resting on the bottom of the pond, the platform was placed across the top, and on this platform a derrick was set up. To this derrick boring apparatus was attached. At first a pile driver was used, but when the pipe had been driven down through the bottom of the pond to a depth of 30 feet, it rested on solid rock, and then the work of drilling and boring was begun.

At a depth of 50 feet below the bottom of the pond the drill struck an opening, and at once the water commenced to sink with a roar through the big pipe, the top of which was only a few inches under water. The drill pipe was drawn out, and the pond commenced to empty itself as fast as the orifice that the drill had made through the rocks would permit the water to flow. When the water in the pond was level with the top of the pipe, a reamer was attached to the drill pipe and sent down to open the way for the big pipe to be sunk deeper. In this way the pipe was sunk until a joint of two sections was almost level with the bottom of the pond, and there it was unjointed.

Col. Ford will have a square pit dug around the pipe, and the pipe will then be driven down to a level with the bottom of this pit. The top of the pipe will be covered with wire to keep trash out, and the pit will be filled with rocks, and thus the drain will be kept open. This strange scene of emptying the pond into subterranean channels has been witnessed by hundreds of people, who see in it the reclamation of the millions of acres of swamp lands in the South. Thus, within 200 feet of each other were two pipes—that of the artesian well throwing up the purest of drinking water, and that in the middle of the pond sucking stagnant water into the bowels of the earth and carrying it away. The experiment cost only $75, while there was gained from it over 2,000 tons of compost soil.

The Progress of Pisciculture.

Of late years, no feature of fishery economy has excited more attention than the progress we have been making in what is called "pisciculture." Fish eggs are now a common article of commerce—the sales of which, and the prices at which they can be purchased, being as regularly advertised as any other kind of goods. This is a fact which, a century ago, might have been looked upon by our forefathers as something more than wonderful. Such commerce in all probability would have been stigmatized as impious, as a something "flying in the face of Providence."

But in another country there was buying and selling of fish eggs more than a thousand years ago. The ingenious Chinese people had discovered the philosophy which underlies fish culture, as well as the best modes of increasing their supplies of fish, long before any European nation had dreamt of taking action in the matter. A few years ago, a party of fisher folks from the Celestial Empire, on a visit to Europe, were exceedingly astonished at the prices they had to pay for the fish they were so fond of eating. They explained that in China any person might purchase for a very small sum as much as might serve a family for a week's food. They also mentioned that some fishes which we reject, such as the octopus, were much esteemed by the Chinese, who cooked them carefully, and partook of them with great relish. The capture of the octopus, indeed, forms one of the chief fishing industries of China, these sea monsters being taken in enormous numbers at some of the Chinese fishing stations, notably at Swatow. They are preserved by being dried in the sun; and then, after being packed in tubs, they are distributed to the consuming centers of the country. In the inland districts of China there are also to be found numerous fish ponds, where supplies of the more popular sorts of fish are kept, and fed for the market. These are grown from ova generally bought from dealers, who procure supplies of eggs from some of the large rivers of the country. The infant fish, it may be mentioned, are as carefully tended and fed as if they were a flock of turkeys in the yard of a Norfolk farmer. In the opinion of the Chinese fishermen, who were interviewed by the industrious Frank Buckland, hundreds of thousands of fish annually die of starvation; and if means could be adopted for the feeding of tender fry, fish of all kinds would become more plentiful than at present, and we would obtain them at a cheaper rate. In China, the yolks of hens' eggs are thrown into the rivers and ponds, that kind of food being greedily devoured by the young fish.

It has long been known to those interested in the economy of our fisheries, that only a very small percentage of the ova of our chief food fishes comes to maturity, while of the fish actually hatched a very small percentage reaches our tables for food uses; hence the desire which has arisen to augment the supplies by means of pisciculture. In the case of a fish like the salmon, every individual of that species (*Salmo salar*) which can be brought to market is certain, even when prices are low, of a ready sale at something like a shilling per pound weight; and it is not, therefore, to be wondered at that the proprietor of a stretch of salmon water should be zealous about the increase of his stock of fish.

It may prove interesting to state the prices which are charged usually for ova and young fish. A sample lot of eyed ova of the American brook trout, to the extent of one thousand, may be obtained for thirty shillings; and for ten shillings less, a thousand eggs of the Loch Leven trout, or the common trout of the country, may be purchased. For stock supplies, a box containing fifteen thousand partially eyed ova of *S. fontinalis* (American) may be had for ten pounds. The other varieties mentioned are cheaper by fifty shillings for the same number. Fry of the same, in lots of not fewer than five thousand, range from seven pounds ten shillings to five pounds. Yearlings are of course dearer, and cost from fifteen and ten pounds respectively per thousand. Ten millions of trout ova are now hatched every year at the Howietoun fishery.

The fecundity of all kinds of fish is enormous. A very small trout will be found to contain one thousand eggs; a female salmon will yield on the average eight hundred ova for each pound of her weight; and if even a fifth part of the eggs of our food fishes were destined to arrive at maturity, there would be no necessity for resorting to pisciculture in order to augment our fish commissariat. But even in America, where most kinds of fish were at one period almost over abundant, artificial breeding is now necessary in order to keep up the supplies. In the United States fish culture has been resorted to on a gigantic scale, not only as regards the salmon, but also in connection with various sea fishes, many hundred millions of eggs of which are annually collected and hatched; the young fry being forwarded to waters which require to be restocked. Apparatus for a proper description for the hatching of sea fish has been constructed, and is found to work admirably. Some of these inventions were shown last year in the American department of the International Fishery Exhibition, where they were much admired by persons who feel interested in the proper development of our fishery resources. In the United States, the art of pisciculture has been studied with rare patience and industry, the fish breeders thinking it no out-of-the-way feat to transplant three or four millions of young salmon in the course of a season. In dealing with the shad, the United States Commission of Fish and Fisheries have been able to distribute the young of that fish by tens of millions per annum; the loss in the hatching of eggs and in the transmission of the animal being very small.

Some writers and lecturers on the natural and economic history of our food fishes have asserted that no possible demand can lead to their extermination or to any permanent falling off in the supplies; but the economy of the American fisheries tends to disprove that theory. In the seas which surround the United States, certain fisheries would soon become very scarce, were the supplies not augmented each season by the aid of the pisciculturists. The fruitfulness of the cod is really wonderful, individuals of that family having been taken with from five to nine millions of eggs in their ovaries. The fecundity of the common herring, too, has often proved a theme of wonder. That an animal only weighing a few ounces should be able to perpetuate its kind at the rate of thirty thousand, is indeed remarkable. But fruitful in reproductive power as these and other fishes undoubtedly are, it has been prophesied by cautious writers, that by over fishing the supplies may in time become so exhausted as to require the aid of the pisciculturist. If so, we believe the mode of action which has been found to work so well in the American seas will be the best to follow. No plan of inclosed sea ponds, however large they might be, will meet the case; the fish eggs will require to be hatched in floating cylinders specially constructed for the purpose, so as to admit of the eggs being always under the influence of the sea water, and at the same time exposed to the eye of skilled watchers. It is believed by persons well qualified to judge, that the eggs of our more valuable sea fishes may in the way indicated be dealt with in almost incredible numbers. We have only to remember that twenty females of the cod family will yield at least one one hundred millions of eggs, to see that the possibilities of pisciculture might extend far beyond anything indicated in the foregoing remarks.

In resuscitating their exhausted oyster beds, the French people have during the last twenty years worked wonders; they have been able to reproduce their favorite shell fish year after year in quantities that would appear fabulous if they could be enumerated in figures. Pisciculture was understood in France long before it was thought of as a means of aiding natural production in America; but our children of the States—to use a favorite phrase of their own—now "lick all creation" in the ways and means of replenishing river and sea with their finny denizens.—*Chambers's Journal.*

New Method of Producing Steel Plates.

Dr. Henry Muirhead, President of the Physiological Society of Glasgow, has recently brought before that body some particulars of a method of manufacturing steel plates for shipbuilding and boilermaking purposes which is of much interest, although its leading feature is not a novel one. It is the invention of Mr. Joseph Whitely, of Leeds, who has erected works for prosecuting the manufacture. Briefly describing the process, Dr. Muirhead said, a hollow metal cylinder, lined with ganister or other brick, revolves at high speed, the axis being horizontal. A gutter or rhone perforated with holes passes into the interior, along its whole length. Into this gutter is poured molten mild steel, which, escaping through the holes, is carried round by the swiftly revolving case, and is formed into an inner cylinder of steel of an inch or more in thickness. This cylinder, while still hot, is drawn, cut across by means of a saw, put into a rolling mill, and rolled to the length and thickness required. In his communication to Dr. Muirhead on the subject, Mr. Whitely wrote as follows: "Suppose I wish a plate for shipbuilding; then, given a mould 5 feet in diameter and 5 feet long, in it I cast a cylinder an inch thick. This when taken out and cut is fully 15 feet long and 5 feet broad. It is then rolled down to half an inch in thickness. Such a plate is then 30 feet long and 5 feet broad. The present mould is 9 feet long and 5 feet in diameter. With it, yesterday (Friday, 7th March) I successfully cast a mild steel shell weighing about 30 cwt."

A New Gelatin Mass for Hectographs.

The French Ministry of Public Works publishes a formula for a hectograph or gelatine pad which is said to produce very satisfactory results. The composition consists of 100 parts of good, ordinary glue, 500 parts of glycerine, 25 parts of finely powdered baric sulphate, or the same amount of kaolin, and 375 parts of water. For the copying ink a concentrated solution of Paris violet aniline is recommended. To remove the old copy from the pad, a little muriatic acid is added to the water, washing it gently with this liquid by means of a soft rag, afterward using blotting paper for removing superfluous moisture.—*New Remedies.*

To Destroy Red Ants.

Grease a plate with lard, and set it where ants congregate; place a few bits of wood so the ants can climb on the plate easily; they will forsake any food for lard; when the plate is well covered with them, turn it over a hot fire of coals; they will drop into the fire, and you can then reset the plate for another catch. A few repetitions will clean them out.