at high speed, stopping at regular stations. A road, ten miles long, having on its several tracks 300 cars, constantly moving for eighteen hours, would be supplied with its motive power for $300, while the same road would require 3,000 horses to perform the same duty, at a cost of at least $1,500. Cleanliness of the street incident upon the disuse of that number of animals; reduction of the wear and tear of pavements and lessening of the noise, etc. All these are of small value as compared with that of the increased comfort and facility which would be afforded to citizens.

The details are as follows:—The columns, A, are firmly secured to stone sleepers beneath the pavement, and to the tops of them is secured the wrought-iron tube, B, extending the entire length of the road, filled with compressed air by means of steam engines at the ends of the road. A vertical wrought-iron plate, C, extends internally from one column to the other, to strengthen the tube. This tube has cast-iron hoops, D, around it, firmly fastened to the lower part of it, the hoops having in them a mortise or step for the brace, E; the upper end enters a mortise in the vertical post, F, at the top of which is affixed the rail. To the bottom plate, I, the vertical posts are tied to the cast-iron hoops at both upper and lower ends, by iron rods, G and H, as shown in Fig. 2.

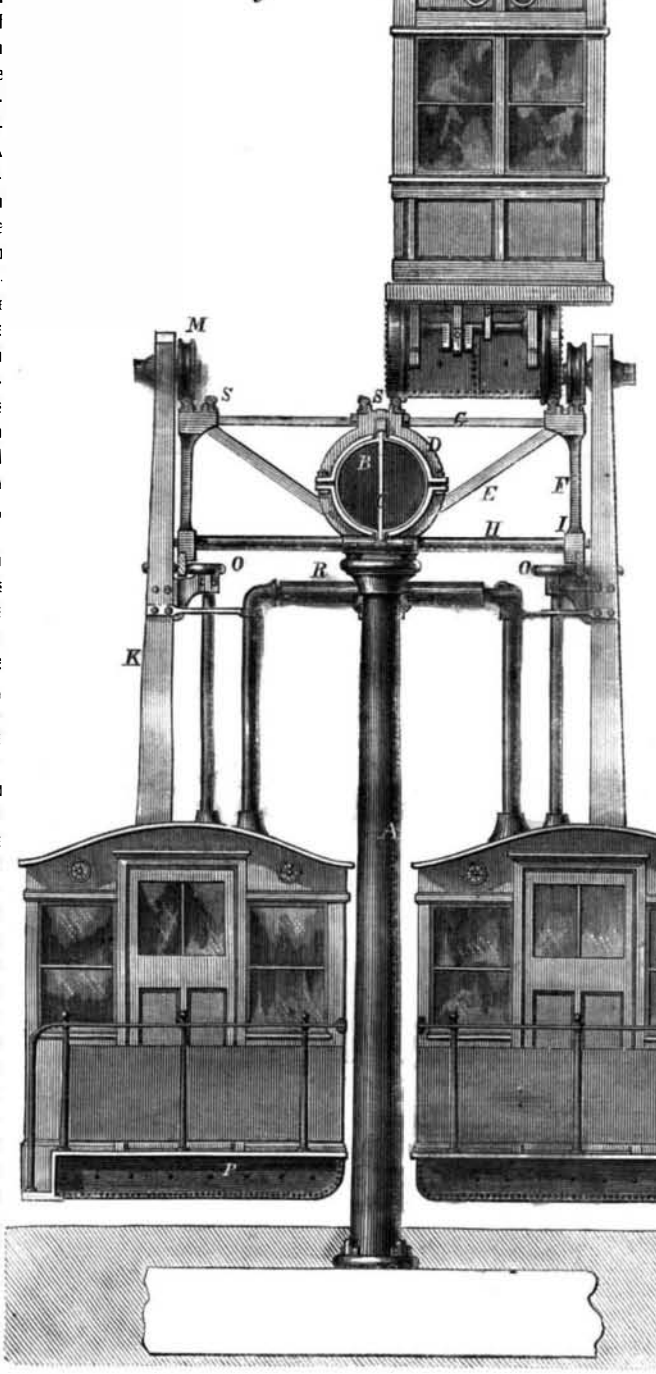
Figs. 1 and 2 represent a car suspended from the rails by means of iron bars, K, between which is an iron frame, L, that slides up and down. Through the frame pass axles on which the wheels, M, that carry the car, revolve. The plate, N, is clamped by the wheels, O—one on either side—the shafts being geared together and driven by engines in the forward end of the car. These are the driving wheels. Beneath the car is a tank, P, for holding compressed air. The main tube is filled with air by means of stationary steam engines at one or both ends. The tank beneath the car as supplied with compressed air from the main tube by means of horizontal pipes, R, attached to a revolving collar, Q, fitted to a casting on the main tube, and containing air passages. These pipes are provided with suitable valves to admit air to the tanks, and are fixed at proper distances along the line of the road, at points where the car stops to take up or set down passengers.

A section of the road, constructed as above, but disconnected from the main road, and supported by a single column, will be employed as a turn-table; the column, being revolved half round, carries the track and car with it; each end of the road has such a turn-table, which is to be operated by the stationary engine that pumps air into the main tube. The upper tracks, S, are intended for cars moving at high speed and stopping only at regular stations. Each car will carry its own engine and air tank, which is supplied with compressed air in the same manner as the accommodation or suspended car. At stations stairs will be required to ascend to the level of the track, and bridges to pass to the cars. The fare being paid at the stairs, conductors will not be needed, and a large saving will be made in that item.

The inventor of this plan of atmospheric railway is A. H. Caryl, of Forgeville, Groton, Mass.

LUCK is ever waiting for something to turn up. Labor, with keen eyes and strong will, will turn up something.

Fig. 2



A NEW NAVY.

An idea is spreading that we have no navy fit to cope with vessels throwing shot of from 460 lbs. to 1,000 lbs. weight, of which one vessel has just paid us a friendly visit. Eight years ago, we began the reconstruction of our navy, and there is now a prospect that we shall have to reconstruct it again. Never, we believe, were the Admiralty so much in need of the best engineering—as distinguished from nautical—advice as now. Although the defeat of Austrian power has not happened at sea, we have had a lesson, which none who can think for themselves can reject, as to the dangers of resting in fancied security while other nations are doing their best to surpass us in the efficiency of their instruments and engines of war. While we are wondering at the size of the Rodman 15-inch guns, the Americans are preparing to make ordnance to throw 25-inch shot of nearly a tun weight. We are standing still or retrograding, and have not a 13-inch gun we dare take into action. We have failed, with our very best service gun, to destroy even the *Royal Sovereign's* turret, and we know that other nations which have adopted the turret system are now making them of a strength very far indeed beyond that of the *Royal Sovereign's*. We may make what allowances we like for Yankee brag, but we are told that Mr. Fox, the Assistant Secretary of the United States Navy, was ready to let our whole fleet hammer at the *Miantonomoh* for two days, provided we would afterward allow that vessel to work ten hours' havoc upon our ships in return. Let another *Trent* affair arise, and we may have scores of monitors upon us.

For our own part we are bound by no professional prejudices in this matter. We have, before now, criticised the turret ships adversely, but we could only go by such evidence as we had before us. Capt. Powell's experiments upon the Coles shield of 1861 had not been published in detail, nor had the *Royal Sov reign* been under fire, nor had the *Monadnock* doubled Cape Horn, or the *Miantonomoh* crossed the Atlantic. And we have not even yet data from which we can draw conclusions with certainty as to the effect of any other guns or the resistance of any other armor than that we have tried. We have been told that cast-iron shot break up and lose half their energy on striking armor; but we have the testimony of the Americans that they have fired 400-lbs. spherical cast-iron shot, with 60 lbs. of powder, right through a target formed of a large 6-inch plate, made by Messrs. Petin, Gaudet & Co., and backed with 30 inches of oak. The shot was 15-inches in diameter, and had an initial velocity of 1,480 feet per second. "A target, composed of six 1-inch plates, b cked by iron beams 10 inches by 10 inches, was torn in two and thrown down by similar projectiles. Laminated targets, composed of 1-inch plates up to 13 inches aggregate thickness, and backed by 24 inches to 30 inches of oak, have been ruptured and shattered through and through, though not completely penetrated, by the same shot and charges." If we believe these results to be correctly reported, it would be a fatal venture to expose our ships, except, possibly, those most heavily armored by Mr. Reed, to the fire of such ordnance. And the Americans have 20-inch guns, throwing shot of more than double the weight, and which, they repeat to us, will bear 100-lb. charges, while even 120 lbs. to 140 lbs. is said to be within their strength. And not satisfied with these, they have still heavier ordnance in progress. Such shot would, we fear, smash through all our ordinary armor-plating, and the heavier shot would no doubt penetrate any thing we have to set up against them.

Upon these points, we admit, we are greatly in want of further information, but it is time that we set to work in earnest to test the destructive powers of large smooth-bore guns, firing cast or wrought-iron spherical shot. In our attempt to employ large rifled guns, firing elongated projectiles at high velocities, where, in the short-range actions of naval warfare, round shot would be exactly as good if not better, we are working to pressures of powder-gas which no iron can bear. We have been seeking to fire 600-lb. shot with a base for pressure of but 139 square inches, whereas the Americans give 176 square inches for a 400-lb. shot, the consequent pressures per square inch necessary for a given initial velocity being nearly as two in our guns to one in theirs. Now, indeed, the 13·3 inch bore of the 600-lb. gun is to be diminished to 12 inches, and the area for the powder pressure thereby reduced from 139 to 113 square inches. In the new American 25-inch guns, firing, say, 2,100-lb. shot, the pressure per square inch, requisite to generate a given initial velocity, will be less than in our so-called 600-pounder, the weights and areas of shot being respectively, for the American 2,100 lbs. and 490 square inches, and for the 13·3-inch gun, 600 lbs. and 139 square inches. Let our ordnance authorities at once instruct Mr. Fraser to make two or three 20-inch or 25-inch guns to fire round shot, and let the result be known. We are already far behind the Americans in the power and endurance of heavy ordnance, and they have plainly told us that their policy is to always maintain an advantage over us in this respect, if possible.

As for our ships, we fear we shall have to begin again. We can have and must have ships safe against even the 25-inch gun, but we believe that, setting preconceived notions aside, these must of necessity be turret ships. We can plate them for seven feet under water, and four feet above, with even 18 inches solid plates, if these can be rolled, and it is time we should try. We can as easily carry 18-inch plates on a 5-foot backing over a hight of 11 feet, as plates and backing of half the thickness over twice the hight. We are still at the beginning of the art of building invulnerable ships of war.—*Engineering.*

The First Boring for Oil in Pennsylvania.

The Titusville (Pa.) *Herald* has an interesting article on Col. E. L. Drake's first attempt to bore for oil, which was the precursor of a vast business that, in 1864 and '65, yielded a larger revenue than that derived from coal and iron. Col. Drake went to Titusville in 1857, at which time it contained a population of about 125, two hotels, no church, and only two stores. The petroleum was then collected from the surface of springs on Watson's Flats by means of blankets, and bottled for medicinal uses. He conceived the idea that there was a basin or reservoir of oil below the surface, and determined to test it by boring. Having induced some men of capital to assist him, he entered upon his experiments in the spring of 1858.

His first step was to visit the salt wells on the Alleghany and observe the *modus operandi*. Finally, he selected a spot near Ames's Mill, below Watson's Flats, but was delayed till the spring of '59, before he had secured a competent driller and the necessary tools. His supposition was that he would have to sink his well to the depth of 1,000 feet. The same kind of tools were used then as now. The driller charged one dollar and a-half per foot for boring. The enterprise was the subject of a good deal of ridicule in these parts, and many persons made themselves merry at the expense of the pioneer. An instance will prove this. Mr. D. made several contracts with a number of practical drillers, which were successively broken. He at last ascertained that the cause of it was, that his scheme for boring for oil was looked upon as entirely visionary, and that he was regarded as a monomaniac on the subject. He finally resorted to an innocent deception to secure an operator, giving out that he intended to bore for a salt well. A series of annoyances and delays, as we before remarked, intervened to prevent operations till the month of June, '59.

Mr. Drake's assistant proposed to crib to the rock, which was the invariable practice in those days. Mr. Drake advocated the driving an iron tube to the rock —an idea which the miner scouted, but having failed to crib, owing to the water, the tubing was tried and proved a success. This was an entirely new feature then, but is now the universal practice. Indeed, it is now applied to putting down fresh-water wells. Had Mr. D. procured a patent, to which he was justly entitled, for the invention, he would have realized a fortune from it.

The pipe was driven thirty-two feet to the rock, and then the well bored thirty-seven feet and six inches in the first sand rock. Not having any pipe, Mr. D. commenced pumping before he had tubed the well, using a common iron water pump for the purpose, fastening the handle of the pump to the walking beam. Satisfied by this process of the presence of oil in considerable quantities in this well, he then went to Erie and Cleveland for tubing, could obtain none there, nor at Buffalo, and finally ordered it from Philadelphia. After tubing the well it turned out a complete success, pumping twenty-five barrels a day, and continuing, when in operation, to yield about this quantity for about two years.

Mr. D. was then in the position of the man who drew the elephant at the raffle, and did not know what to do with it after he got it, oil being comparatively good for nothing. Then there was no home or foreign demand for it, no refineries in existence, and its illuminating and lubricating properties were not then discovered. The parties engaged in the manufacture of coal oil were slow to acknowledge or discover that petroleum possessed equal illuminating qualities. The first refiners who commenced refining petroleum were James McKeown and Samuel Kier, of Pittsburgh.

From this period it came rapidly into commercial use, stimulated development, and rose in value in a corresponding degree. Few can appreciate the delays and difficulties incident to this discovery. It was necessary to go to Erie, and more frequently to Pittsburgh, for everything in the way of machinery. The few stores here were only supplied with tools for lumbering and farming purposes. On one occasion, Mr. D. wanted a pick, two shovels, a chain and some spikes. There were only two stores in Titusville at the time, but their assortment did not contain the articles needed. Mr. D. went to Hydetown, and bought his pick of Charles Hyde (now an oil millionaire), who kept a country store in a tumble-down log cabin in that place; bought his spikes of Samuel Q. Brown (another oil millionaire), at his store in Pleasantville; procured his chain of David Mitchel (another oil millionaire), at his store in Enterprise; but was obliged to send to Erie, a distance of fifty miles for two shovels. Mr. D. engaged in putting down other wells, but failing health compelled him to abandon his undertakings here and return East, before the era of speculation set in, and before petroleum had produced such a revolution in the commercial world, and become the most fruitful source of individual and national wealth that has ever been discovered.

Sweet Corn all the Year Round.

Nearly all the dried corn that one buys has a flavor, when boiled, resembling soda or pearlash—certainly it has but little sweetness and much toughness. Now, there is a way of preserving corn which entirely avoids these results, and which is warranted to give "entire satisfaction."

Select, in their season, fresh, medium-sized ears of corn, strip off silk and husks, then plunge the ears in boiling hot water, leaving them in for only three minutes. Next cut the corn kernels from the cob with a sharp knife and spread them out on flat dishes, taking care not to have the layer more than two kernels thick.

The dishes must then be placed either in a moderate oven (left open) or over the kitchen range on a board shelf which can be arranged over it for the purpose (say 2½ or 3 feet above the top of the range). The contents of each dish must be disturbed occasionally, so as to insure their becoming thoroughly dried. It is well to spread lace or mosquito netting over the dishes to protect them from flies, dust, etc., for sometimes the corn will be two or three days in drying.

When the corn is perfectly dry, tie it up in bags and put it away in a cool, dry place.

In winter, when you wish to enjoy the fruit of this little painstaking, you take out a few handfuls of the corn, wash it well soak it all night, and the next day boil it till tender, in the same water it was soaked in. About twenty minutes before you take it from the fire, add milk to the liquid in proportion to your taste, and when nearly done, add butter, pepper, and salt. A little corn-starch, added as thickening, ten or fifteen minutes before taking the corn from the fire, improves it very much. The corn should not be dry when served, but floating thickly in its own stiff broth, and, my word for it, it will taste as fresh and sweet as any corn fresh grown.

I need not say, that by soaking corn thus dried all night, and also soaking the preserved beans for the same length of time, a delicious winter succotash can be made the next day, as good as any ever eaten in summer.—*Working Farmer.*

Profits on Sleeping Cars.

A correspondent of the Cleveland *Leader* thus adverts to the sleeping-car monopoly :—

"Many of your readers know that Woodruff, Knight, Myers and others, consolidated their patents some years since, and organized the Central Transportation Company, whose cars are found on the Pittsburgh, Fort Wayne and Chicago, Pennsylvania Central, Northern Central, New York and Washington, and other much traveled routes.

"But it is not generally known that their enterprising company have been quietly buying up every patent that could be bought, until now they are able to control the entire sleeping-car interest in the country. A wealthy corporation in Southern Ohio got its master mechanic at work to build a couple of coaches, with instructions to put in nothing that would be claimed by this overshadowing company. He employed experts, and after a thorough ascertainment of all the facts in the case, as he supposed, completed his work. The directors were gratified, and the cars had been on the road perhaps a week, when the Superintendent was waited upon by a very gentlemanly person who introduced himself as an agent of the Central Transportation Company. He was received with courtesy and invited to a seat. After the necessary discussion of the weather and the crops, the polite visitor intimated that he was authorized to contract for the purchase of the new sleeping coaches.

"The Superintendent grew a bit reticent, and responded somewhat curtly that the Company which he had the honor to represent was under no necessity of parting with any of its rolling stock, having a comfortable balance in the bank.

"Whereupon the gentlemanly agent proceeded to intimate, in the most delicate manner, that other contingencies than a reduced bank balance sometimes operated to make transfers of property profitable to the seller.

"This brought the Superintendent to the issue without further skirmishing, and he bluntly informed the gentlemanly agent that the cars belonged exclusively to the railway company, had been built without infringing anybody's patent, and would be run without asking anybody's leave.

"Whereupon the gentlemanly agent smiled coldly, bit his lower lip slightly, and responded frankly: 'Perhaps your Company had better sell its cars while there is a market. We will pay you what they cost and run them for you; but you can neither own them nor run them another day, sir!'

"The Superintendent grew tractable, and in fifteen minutes was satisfied from documents exhibited that it was well to sell 'while there was a market.'

"Suit has even been commenced in the United States Courts against Mr. Pullman, the party who, a few weeks since, gave so grand an excursion to celebrate the completion of nine elegant coaches built for the Michigan Central, Burlington and Quincy, and Northwestern Railways, costing from $15,000 to $21,000 each.

"The public have occasion to regret this combination for one good reason, if for none other; and that reason arises out of the fact that the Central Transportation Company seem to buy the best patents for the sole purpose of suppressing them.

"The railway companies, as we have already seen, have for once found a greater than themselves, and are as helpless as children in the hands of the 'sleepers.' They must have 'sleeping cars on all night trains,' or they might almost as well not run night trains. The patentees control the cars and dictate the terms upon which cars can be had, which are these: The patentees will supply the cars, and keep the upholstery and bedding in repair and in order for use. The railway company shall furnish the motive power and keep the car in repair. And the agent of the patentee shall collect such fees for the use of berths as the owner of the car may decree.

"The railway company is thus saved the cost of an ordinary car, which the passengers would require, and the Central Transportation Company, or whoever else may own the sleeping car, makes money at a somewhat comfortable rate.

"Take, for example, the route of the Pennsylvania Central:—

Prime cost of a car	$5,000
Annual salary of a conductor	600
Annual salary of porter	300
Washing	1,500
Incidentals	500
Total	$7,900

"An average of rentals would be, in six sections and three state rooms per night, for 300 nights in the year:

Six sections at $3	$18 00
Four state rooms at $3	12 00
Total	$30 00

"Three hundred nights, at $30, make $9,000. "Deduct running expenses, $2.900, and the dividend is $6,100, upon a capital of $5,000, or more than one hundred and twenty per cent. On some routes, however, the profits are much greater, amounting in some instances to over 300 per cent per annum."

A USEFUL CHART.—Mr. Charles Kinkel, of this city, has published a diagram for ascertaining the width of belts to drive any given machine. This diagram is accurately drawn and is accompanied by an explanation of its use. From it any one can tell by simple arithmetic what size of belt he requires to do his work.

American Cast Steel.

The manufacture of American cast steel has, within the last five or six years, assumed a rank and importance among the great manufacturing industries of our country, that its just claims to be considered as an element of national wealth cannot be reasonably ignored, and it should therefore receive its full share of the fostering care of the Government for its support.

That we possess all the appliances, and the ability to produce in this country steel of every description, from the lowest grade to the very finest quality imported, made exclusively from American stock, is now an established fact; demonstrated beyond the possibility of dispute, upon testimony from which there can be no appeal, and which we are prepared to furnish in overwhelming variety and quantity.

Among the severest tests of the comparative quality of English and American cast steel, it may be stated, that the celebrated fifteen and twenty-inch guns manufactured by Messrs. Knap & Co., at the Fort Pitt Works, are all bored and turned with tools made exclusively from American cast steel. These gentlemen inform us that its strength is so much greater, that much heavier cuts are taken upon large ordnance than any English steel will stand. The sabers which have been furnished to our armies by the great establishment of C. Roby & Co., West Chelmsford, and of the Ames Manufacturing Co., at Chicopee Falls, Mass., and others, are likewise made of Pittsburgh steel, in preference to all imported steel.

American cast steel is extensively used in our public and private armories, for the manufacture of bayonets, pistols, carbines, etc. In short, there is no use to which steel can be applied, in which it does not compete successfully as to the quality of the best imported brands.—*Report of Revenue Commission.*

Cutting Garments by Machinery.

There is in operation, at the establishment of Bernheimer & Newman, No. 87 Chambers street, a machine for cutting all kinds of woven fabrics into garments. The machine consists of an endless cutter revolving on two wheels placed above a table, and a large fly-wheel placed below, worked by hand, and by which it is set in motion. The pattern to be cut out is drawn on the top garment, all being placed in a clamp to keep them in position, and are pressed against the cutter and moved according to the desired pattern.

The number of garments cut out at one time is regulated by the hight of the two wheels from the table. The cutter is sharpened by setting the machine in motion and placing a grindstone turned by hand in contiguity to it. This machine is extremely simple, being at the same time very effective.

Smelting of Lake Superior Copper Ore.

The ore of the Lake Superior copper mines is called "copper rock," and consists of pure copper, with stone, earth, and other adventitious substances, mechanically united. It is usually broken either by hand, or stone crushers driven by hand, to fragments about four or five inches in diameter. Then it is passed through the stamping mill and pulverized to fine sand. A current of water directed through the powdered mass washes out the extraneous matter, which is specifically only one-third as heavy as the metal. This "dressed mineral" contains from sixty-five to ninety per cent of copper, and is smelted in a reverberatory furnace, with lime or other suitable flux. The lighter minerals rise to the top and the copper sinks to the bottom, whence it is drawn and cast into ingots or pigs.

Obtaining Soda from Common Salt.

Mr. Weldon of England has taken out a patent for a process for the above purpose, as follows:—

The new process consists in placing within a vessel capable of resisting the required pressure an equivalent of common salt, and another of carbonate of magnesia, with a small quantity of water, and then pumping into the vessel the carbonic acid formed by causing atmospheric air to traverse coal in a state of ignition. The carbonate thus becomes bicarbonate of magnesia, which dissolves in the water, and then decomposes the chloride of sodium, chloride of magnesium, which remains in solution, and bicarbonate of soda, which precipitates, being formed. The whole process lasts but a quarter of an hour at most, and the cost is only that of the coal used in forming the carbonic acid. A moderate heat drives off the second atom of carbonic acid from the bicarbonate of soda, changing it into carbonate; and the magnesia may be recovered from the chloride by evaporating the solution containing it to dryness, and raising the residue to a temperature below redness.

Necrosis Produced by Tobacco.

A case has recently occurred to Mr. Paget (*Lancet*) in which death of a portion of the bone of the lower jaw was occasioned by the introduction of the oil of tobacco into the cavity of a carious tooth, for the purpose of curing the toothache. The patient was an Italian sailor who used the oil from the stem of his pipe. Mr. Paget, in remarking upon the case after having removed several sequestra, said:—"The case well illustrates a source of danger which is not generally recognized. The practice of smoking is very widespread, and foul pipes and carious teeth are very common. Every smoker of a pipe has been disgusted now and then by sucking into his mouth a few drops of the highly pungent and nauseous product of the combustion of tobacco. In the action of smoking the tip of the tongue ordinarily receives this deleterious fluid, and is very much blistered in consequence. Were it not for the tongue one can readily imagine that hollow teeth would often receive this fluid; with what amount of risk the case before us well shows. It is well known that, for phosphorus to excite the inflammatory action which so often affects the lucifer-match workers, the fumes must be applied to a raw vascular surface in immediate connection with the nutrition of bone. This almost always happens through the medium of a carious tooth. There is no reason to suppose that tobacco oil would set up inflammation except under similar circumstances. It is, however, very probable that some cases of acute necrosis of the lower jaw of obscure origin may have really originated from the accidental poisoning of the tooth-pulp by this liquid, and the possibility of this source of disease should be borne in mind.—*Medical Record.*

A Disinfecting Filter.

It is known to physiologists that the most suddenly fatal of all poisons are those of organic origin. The presence of this matter in water is frequently imperceptible to taste and sight. In the year 1854, a pump from which large supplies of water were drawn, yielded perfectly clear water, which yet killed 500 people in the first three nights of September. Stimulated by this experience, researches were entered upon to ascertain whether all the organic matter in water could be filtered out. More recently a curious property of magnetic oxide of iron has been demonstrated in the preparation of filters. This magnetic carbide is asserted to possess the power of converting oxygen into ozone. The inventor says its purifying property is "due to its power of attracting oxygen to its surface," which there becomes changed into ozone, or at least a body having its properties. But whatever may be the theory of its action, its effects in removing oxidizable and other organic matter from water are undoubted.

[We find the above in one of our exchanges. There is no doubt that impure water is a prolific source of disease, and that it would be much better to filter much of the water now used, especially that which is liable to receive vegetable matter from surface drainage. But we do not quite understand the theory of this inventor, who proposes to attract oxygen to the surface of water. The explanation is mixed with some mud.—EDS.

Foreign Cotton.

The report of the Cotton Supply Association, presented at Manchester, England, on the 29th ult., presents some interesting facts relative to this subject. Failing to receive from America the usual supply of cotton after the war, efforts were made to grow cotton elsewhere, and in answer to numerous applications American seed was forwarded to many places, no less than 230 tuns being sent to the Ottoman Empire. The quality and quantity of cotton grown in Turkey induced the supposition that the supply would be very valuable. The efforts of the committee in India made them believe that they would not be disappointed.

Favorable accounts were received from Italy and Brazil, and large numbers of gins and plows had been forwarded in order to better prepare the cotton for market. The chairman stated that owing to the use of better implements and the introduction of larger capital, their prospects in India were better now than at any previous time. He considered that the renewal of cotton planting in America was an important item in estimating the supply, but the duties imposed in the United States left an opening for successful competition from the rest of the world.

Pine's Toning Process.

A correspondent of *Humphrey's Journal* has the following:—

Having had numerous inquiries referring to the bright and clear tone of my prints, and as many suppose I use a peculiar toning bath, I send you herewith the secret of their brightness, which is owing to the prints being thoroughly freed from the nitrate of silver before toning. To accomplish this object, I have recourse to the following method:—

I take the prints just as they come from the printing frames, and immerse them in a solution composed of water, one pailful, common salt, one ounce. The prints are immediately covered with a white powder (chloride of silver), which gives them a foggy appearance. I then lay them, one at a time, on a glass, face upward, and remove the powder by means of canton flannel, wrapped round a wooden roller, a little longer than the width of the print. By passing this roller over the print once, with moderate pressure, the chloride of silver is entirely removed, and the print looks bright and clean. The print is then placed in a dish of clean water, and the operation is continued until all the prints are in the second dish, from which they are placed in the toning bath. I can wash thoroughly five hundred 6½ by 8½ prints in an hour without difficulty.

The advantages of this plan of washing are—

1. Three-quarters of the silver used in printing can be saved, as all of it that is washed off remains in the first dish.

2. The prints are washed thoroughly, which cannot be done by placing them in running water.

3. The prints can be toned with one-third less gold than was formerly used.

4. The prints, being clean, tone quickly, and do not change color in the fixing bath.

5. The fixing is accomplished in less time, and is more thorough, than when the prints are imperfectly washed.

6. Great economy of water: six pailfuls being ample in which to wash five hundred 6½ by 8½ prints.

8. Mealiness in the prints is entirely avoided.

I use an 80-grain silver bath, and float the paper one minute in summer, and two minutes in winter, and tone with a simple solution of chloride of gold and water, neutralized with chalk. I fix the prints in a bath composed of water, 16 ounces, hypo. soda, 4 ounces. If the hypo. soda be acid, I neutralize the solution with carb. soda. Some may suppose the surface of the paper is injured by rubbing it with the flannel, but such is not the case.

A Unique Specimen.

Mons. Valiant, a gentleman who has collected a very fine cabinet of minerals on this coast, a few days since exhibited to us the most unique specimen we ever saw, though we have spent many weeks examining the cabinets of minerals at Paris, London, and Washington. It consists of a mass of calc spar, a crystallized variety of carbonate of lime, about six inches long, by three wide, and two thick, in which are dark layers of malachite, or carbonate of copper, while all over its surface, are masses of native copper, gold and silver in crystals. The gold by assay is found to contain a slight alloy of silver. The silver is very rich in gold, while the copper is absolutely pure. There is not a particle of quartz in the specimen, which altogether is invaluable as a mineral curiosity. If any person in California knows where such specimens may be found, they are more valuable than the same weight in gold. Mons. Valiant has refused $150 for that to which we refer. —*San Francisco Miner.*