upon this mode of treating irregular teeth were expressed by a number of members. Dr. Watts, condemned metallic bands and India-rubber appliances for such purposes. Flax was more desirable than rubber, as it contracts to a certain point, and then firmly retains the tooth in position, allowing it time to recuperate. Most of the members, however, were favorable to the use of India-rubber bands. Dr. Searle related the case of a Russian nobleman, whose upper (buck) teeth were very prominent, and caused him great uneasiness. After visiting several dentists of repute, to have the deformity corrected, he applied to Dr. Brewster, who undertook the task, stipulating that his instructions should be implicitly obeyed. He applied a pad upon the back of the patient's head with a ligature passing directly over the front teeth. In eight months the deformity was cured, and when the nobleman returned to Russia his friends did not know him, so great was the change and improvement in his countenance.

Filling Teeth.—Upon motion, this subject was brought up for discussion. Dr. Rogers regarded gold as the sheet-anchor of the dentist; yet in some cases tin-foil was the best material for filling and preserving teeth. It was not desirable for front teeth and upon a grinding surface. Dr. J. A. Perkins gave Dr. Wood's plastic metallic filling the preference over the foil. Dr. Smith recently examined the teeth of a lady, in which were good tin-foil fillings of 34 years standing. Dr. Atkinson held this question to be of paramount importance. He did not believe gold was the best filling material under all circumstances.

Cleft Palate.—This subject was brought up for discussion, by motion, when Dr. Kingsley, of New York, exhibited and explained his artificial vellum. He stated that, by means of his invention, he had rendered the speech of patients, whose conversation it had been impossible to understand, so intelligible that any peculiarity would escape detection, except by the professional ear. Dr. Allen congratulated the profession on the results of Dr. Kingsley's efforts; he had attained to a higher point in this direction than had ever before been reached. A vote of thanks was given to Dr. Kingsley for the description of his method of treating cleft palate and for making a perfectly practical artificial vellum: also a gold prize medal.

Laughing Gas in Dental Surgery.—Upon motion, this subject was brought up for discussion, whereupon Dr. J. Allen stated that he did not advocate the use of any anæsthetic agent, but considered nitrous oxide or laughing gas the most desirable of any that had ever been employed. He had ceased to use ether and chloroform, on account of their danger, and considered laughing gas the most pleasant and reliable anæsthetic agent. It was somewhat expensive and difficult to keep, and this was an objection to its employment. Dr. Searle also preferred it. He applies it with a mouth-piece, and prevents the patient from opening his lips during inhalation. It is always uniform in its effect. Dr. White used it invariably, as made from the nitrate of ammonia. He fused the nitrate of ammonia in a glass retort, upon a sand bath, and passed the gas through a quantity of water sufficient to absorb any nitrate of ammonia which might pass over in vapor without being decomposed. The operation required care and intelligence. Dr. Atkinson said there was not a well-authenticated case of death from chloroform on record, yet he never administered it without apprehension.

Mechanical Dentistry: India-rubber Plates.—Dr. Perkins condemned the use of India-rubber for plates, and Dr. Allen thought its merits were far below gold. Dr. Hawes liked India-rubber, and never saw more than one or two patients who would not pronounce in its favor. Dr. Palmer stated that within three weeks he had substituted rubber for gold in his own case; but it excited a disagreeable heat in his mouth and rendered it insensible to cold. Dr. Holmes avoided the disagreeable heating effect of India-rubber, by drilling holes through it and filling them with gold wire. The profession is not a unit upon India-rubber.

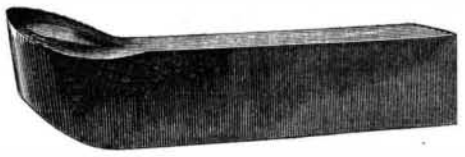
Alveolar Abscess.—Dr. Dwinelle stated that diseases of the antrum are amenable to treatment, when the cause of irritation is removed; its nature is not so well understood by the medical as by the dental profession. In ordinary alveolar abscess, he dries out the pulp cavity, and fills it with creosote dropped from a cotton broach. Dr. Roberts, in one case of alveolar abscess, filled with gold around a pivot of platina, introduced into the root. The operation was performed about six years ago, and the results have been satisfactory.

Diseases of the Antrum.—Dr. Atkinson stated that diseases of the antrum were caused by inflammation. It was not necessary to remove a good tooth to get access to the cavity. A perforation should be made between the fangs of the teeth, as between a second bicuspid and first molar. He uses dressings of salt water, glycerine, iodine, and tincture of arnica. Dr. Kingsley stated that his father had lost a large portion of the bony walls of the antrum, and there was an offensive discharge. He used tonics internally, syringing with nitrate of silver, and succeeded in effecting a cure.

Along with much that was useful, communicated in the papers read, and in the remarks made by the members of the Dental Convention, a great many indefinite and high-sounding, notional views were presented. The dental profession undoubtedly have a leaning to the humorous side of human nature. One of the craft in this vicinity has lately affixed an addition to his shingle, on which is the following declaration of principles and practice:—"Teeth extracted without pain by the application of nitrous oxide (laughing) gas."

A GOOD ROUGHING TOOL.

It is believed that the cutter illustrated herewith comprises the most desirable features of an efficient



roughing tool. For work of the kind mentioned, the instrument must be strong and of the proper shape, that will do the most duty without being dressed, tempered or ground too often. It must also cut freely, so that it will not take more power to drive it through the iron or brass than is necessary. This tool is now very generally used on all heavy work in the best shops, and is so far superior to the diamond-point that it is not to be compared with it for a moment; a trial will convince the most skeptical of the truth of this assertion. It is necessary to have right and left-hand tools for long shafts, so that the turner will not be obliged to run the carriage back to take another cut, and in this feature it is not so convenient as some diamond-point tools ground to cut either way. This tool is much better than the latter, however, in that the edge is inclined in the direction of the cut, and the wedge cleaves and does not bruise or force the metal off, as is the case with the round noses, stub-ended diamond-points, and nondescript cutters of all kinds without a name, that many turners are content to use. The strength of the edge and the chip it will carry, is apparent at a glance, and if the belt will drive the work, the whole cutting face may be engaged without digging in or breaking, provided it is properly dressed and tempered.

Such tools as these are continually used on the largest steamboat and marine engine shafts in the country; these have been turned all over, without one dressing and very little grinding. The tool works with less heat than a diamond-point, for reasons previously set forth, and it is believed by the best lathemen we have in this city to comprise the chief requisites of a roughing tool.

The great wine cask in Heidelberg Castle has found a rival in one just completed at Dover, Eng. Eight couples danced on the top, and its cost was about $1,000.

DISCOVERIES AND INVENTIONS ABROAD.

Imperial Ruby Dye.—A patent has been taken out by R. A. Brooman, London, for producing a new aniline color, which is described as follows:—The color (the normal tone of which is a cerise, or its derivative shade) is obtained by the combination of fuchsine and coralline, or any other yellow or orange color extracted from coal tar products. Process—The fuchsine and coralline are dissolved, together or separately, in methylated spirit, acetic acid, alcohol or other spirit. The coralline predominates in quantity over the fuchsine; thus, to obtain the normal tone of imperial ruby, the inventor takes, say, three parts of coralline to two parts of fuchsine. These proportions, may, however, be varied; any excess of coralline in the dyeing bath tends to produce a yellower cerise, while an excess of fuchsine, on the contrary, imparts a more violet shade; thus, by varying the proportion of one or other of the products, all the gradations of shades of cerise and its derivatives may be obtained.

Belgian Artificial Leather.—In Belgium artificial leather is made as follows:—A certain quantity of gum, as caoutchouc or gutta-percha, cut into small pieces, is softened by subjection to a strong heat; then 80 or 90 parts of scraps of hide or leather of any sort are added. Hair of any kind and shreds of woolen cloths may be added, and intimately mixed with the other substances, by an apparatus heated for that purpose. If the artificial leather is wanted hard, sulphur is introduced while the substances are mixing, in order to vulcanize the gum. The thick paste thus obtained is pressed into sheets, while warm, and afterward rolled to the required thickness.

Photo-lithographic Process.—M. Morvan has addressed a communication to the Paris Academy of Sciences, containing a description of a new lithographic process. He says:—"Upon a lithographic stone, previously coated in a dark place, with a varnish composed of albumen and bichromate of ammonia, I place the right side of the subject to be reproduced, whether the picture be upon glass, linen, or paper. Papier Saxe is naturally to be preferred. But any other sufficiently transparent substance suffices for this operation. This done, I expose the stone to the action of light, from 30 seconds to 2 or 3 minutes only, if in the sunshine; and from 10 to 15 minutes, at the most, if in the shade. At the end of this brief time, I remove the subject and wash the stone, at first in soap water, and next in pure water, and I immediately pass over it an inking roller. The design is already fixed, for the picture begins to reveal itself in black upon a white ground. Then I gum it and leave it some minutes to dry, and the operation is concluded; we can then pass it through the press and print from it.

"It will be understood that the light fixes the varnish and renders it insoluble wherever it strikes upon it; but that, on the other hand, all those parts of the stone shaded by the lines of the original design, remain soluble, consequently attackable by soda and by acid, in addition to what the substance of the soap contains; the action here produced upon the stone belongs at the same time to engraving and to lithography.

"As to the advantages of the process, they may be summed up as follows:—Simplicity and rapidity of operation; exactitude of reproduction; no need of negative cliches upon glass or paper: the positive model comes positive; absolute preservation of the model, intact and immaculate; permanency; at least equal to that of engraving upon stone; and, lastly, the great economy of the process."

Preventing Sea-sickness.—A patent has been taken out by J. Ashe, of Birkenhead, England, for preventing sea-sickness, by attaching a couch or a chair for supporting a person, to a ball and socket joint, fitted to a vertical standard, secured to the cabin floor. The standards used have each a branch or several branches at or near the top, which bend outward, and from each is suspended the spring chair, or couch, connected by the ball and socket joint. The person sitting in such a chair, or reclining on a couch thus suspended and arranged, will always remain in the same position, nearly; and the rolling and pitching motion of the vessel will not be felt. There is a ship's life berth boat exhibited by T. S. Brown, of Greenpoint, L. I., at the Fair of the American Institute, which is suspended, like Mr.

Ashe's couch, and it is claimed that it will also prevent sea-sickness, upon the same principle. Sailor's hammocks are suspended upon the same system.

New Blue Color.—A patent has been taken out by J. A. Schlumerger, of Bale, Switzerland, for producing a new aniline blue as follows:—He takes rosaniline, and mixes it with three parts of aniline and one and a half parts of acetic acid, adding one part of the carbonate of soda. The mixture is then heated to between 118° and 210° centigrade, and maintained at this temperature until it assumes a blue shade, when examined in a glass tube. The product is then precipitated with hydrochloric acid, being boiled therein, when the color solidifies and may be removed from the vessel with a skimmer. It is next boiled three or four times in water, and yields a blue without any shade of purple. It is then dried and afterwards dissolved in alcohol, when it is ready to use by the dyer. It has been difficult to obtain a pure aniline blue, devoid of a shade of purple; this blue, it is stated, has no purplish tint by sunlight or artificial light.

Improved Magenta Color.—Intense activity is manifested by European chemists, at present, in the production of improved aniline colors. Dr. Dawson, of Huddersfield, England, has obtained a patent for producing magenta, or aniline purple, as follows:—Equal parts of aniline and arsenic acid are mixed together, with about 23 per cent of boiling water. This is placed in a strong iron cylinder capable of withstanding a pressure of 200 pounds on the inch. The lid of the cylinder is now bolted on and the temperature of its contents raised to 350° Fah; and maintained at this heat for twelve hours, when the desired color is obtained. The product is then taken out, washed with water, and is ready to be dissolved in alcohol, in which state it is fit for dyeing. The production of a pure black on silk and wool, with aniline, is much desiderated. It is stated in some of our foreign exchanges, that J. Lightfoot, of Acrington, England, has produced such a black dye, but the particulars of the process have not been published in full. It is only stated, that a salt of aniline is mixed with certain oxides (probably the oxides of iron) as a mordant.

Correspondence

Harbor Defense.

MESSRS. EDITORS:—As much interest is felt in devising some cheap and effectual means for closing the entrances to the harbors of our great cities, I have conceived the following plan and submit it for public consideration, believing that it will be found superior to any heretofore offered.

It seems to be the settled opinion that chain cables are the most effectual agents for the purpose; and it has been proposed to suspend, or sustain the cables near the surface by buoys. This plan is exceedingly ingenious in my estimation; but buoys would scarcely be sufficient to sustain such an immense weight; they are besides somewhat complicated and expensive, and in the end might fail. A simpler, cheaper, and doubtless a much better plan will now be explained.

Let the chain cables be sustained by attaching them to timber supports placed at intervals, standing on the bottom and reaching to a uniform level near the surface of the water. The chains being attached to the supports, all will raise together, and all lower together, lying flat on the bottom when not in use. The gates or supports may be made by pinning heavy plank to upright timbers; similar in construction to ordinary lock gates. The timbers may be from six to twelve inches thick, and the plank three or four inches. As the gates are to vary in hight according to the depth of the water, they should vary in length correspondingly; from twenty to forty feet long and as many high. If not of sufficient weight the spaces may be filled with stones. It will be best to make the upper or city end of the gates somewhat higher than the lower or seaward end, so as to guard against all changes of tide, and cause the attacking vessels to strike the lower chains first. These gates are to have stout rings fixed on their upper edges, through which to pass the chains and to which to attach them when drawn tight. The gates are to be thus made and then sunk at suitable intervals—say three hundred feet apart—clear across the channel, the distance between being less where the water is deepest. The chains being passed through the rings in the gates which lie at the bottom, are drawn tight by a strong windlass attached to each chain, and then securely fastened to the rings. The gates are now drawn up with the chains, using windlasses as the power (or an engine may be used), until they are almost perpendicular, and the chains are a few feet from the surface of the water, uniform from shore to shore. If the gates are not drawn up entirely vertical, they will all drop to the bottom together with the chain, when the raising power is taken off. If drawn up vertical, a few windlasses will have to be placed at the opposite end to lower them. In either case the chains should be securely fastened to the shores, and the fastenings and windlasses protected from injury. If thought advisable the chains may be linked together by bars at intervals, which would make them much stronger and a pressure upon one would be a pressure upon all. The chains may also have torpedoes placed at suitable distances; and the whole may be placed between revolving iron forts, stone forts, or sand forts, and in all respects be similar to the other proposition except in the support of the chains. The number of chains may be five, ten, or even twenty, according to the depth of the water, and the consequent size of the vessels to be resisted. It will be seen that these gates not only furnish a cheap means of sustaining the chains horizontally, but that they also sustain it laterally against the pressure or concussion of the vessels; and as the weight of the gates together with the chains will be immense, it will be next to impossible to raise the chains so as to cut them; while if one is cut it will scarcely impair the strength of the mass. Altogether this would seem to be the cheapest, strongest, and best mode to block up the entrance to harbors, and it is difficult to see how it could possibly fail. Will the authorities of cities or states, and also the national government give this plan their consideration? The iron-clads building in England may be upon us in a month or two; something should be done, and that quickly.

A. WATSON.

Washington, D. C., 1863.

[Our correspondent and all others do well in urging the importance of this subject, and we are glad to see attention given to it. We must criticise this plan, however, in some features which have been lost sight of by Mr. Watson; and those are that timber is objectionable for the purpose indicated, as it offers no resistance whatever to submarine operations. In the passage around Island No. 10, by Colonel Bissel, his engineers made nothing of cutting off huge trees, the growth of ages; and in other places, as at Newbern, the impracticability of thus defending the rivers and harbors of the country has been made manifest. The cost of one timber support from 20 to 60 feet long and 12 inches thick would exceed that of an iron buoy, when the labor of preparing it, &c., is considered; and the expense of affixing a timber upright in the channel, and attaching a buoy are not to be mentioned together. The gates and timbers would oppose such an area to the action of the tide as to be practically useless, unless of enormous strength, and they would be eaten up by worms when placed in salt water, unless coppered—an additional expense. The greatest evil, however, lies in the fact that, by the arrangement above proposed, a harbor so defended, is wholly blockaded. This is not at all desirable. What is needed is an impenetrable barrier, and yet of such a nature that it may be placed, removed, or lowered, without injury to the commercial interests of the city defended. Massive chains combine good qualities for this purpose, but they require to be rendered buoyant in some manner, and we think the plan spoken of in "Iron Rafts for Harbor Defense," the most feasible one yet brought to our notice.—EDS.

Phenomena of Camphor in Water.

MESSRS. EDITORS:—I was much interested in your article with the above caption, on page 149, current volume of the SCIENTIFIC AMERICAN. I had accidentally discovered the fact of the movement in the following manner. Having used a Florence flask in the Berkshire Medical College, to show to the class the method of forming crystals by sublimation of camphor, two weeks after I poured a little water into the flask for another experiment, when a crystal of camphor becoming detached, began to shoot about upon the surface of the water in an almost magical manner; I at once commenced a series of investigations in connection with Professors Ford and Palmer, of the University of Michigan, and Mr. Johnson, of Pittsfield, Mass., who was assisting me at the time. I could find no account of the phenomena until a friend called my attention to your article last Saturday. I believe we had jointly worked out all there stated respecting it. Professor Palmer at once suggested the same explanation given by Mr. Lightfoot for the main phenomenon. Whether this is the true one may well be doubted. Some experiments now going on will throw light upon this. But some additional points I wish now to make. First, the movement is no test of the purity of the water, though it undoubtedly is a test for certain impurities. The experiment succeeded perfectly in my pneumatic trough, in which various salts had been allowed to accumulate for three weeks from the washings of chemical ware. It also succeeded in lime water, the particles of camphor in some cases actually cutting their way through the pellicle of carbonate of lime which forms upon it. It also succeeded well in strong aqua ammonia, and in water colored with litmus. The temperature of the water seemed to have little influence—warm water and ice water both being tried. In other cases, with apparently pure water and with every precaution, the experiment fails. In such a case if the vessel in which the particles of camphor are floating is slowly tipped upon its side, the particles will commence to revolve; especially if it is inclined enough for a small portion of the water to run over. This process evidently breaks the invisible pellicle which prevents the action. The surface on which the particles move soon loses its sensitiveness if many are thrown in, either being saturated with the camphor vapor, or having lost the element which affected it. The particles certainly waste away quite rapidly, so that the process must be one of evaporation or oxidation. If the floating particles are examined with a microscope, minute bubbles of gas may be seen apparently forming upon them, and the movement especially of the large and round pieces, reminds one at once of sodium upon water, or drops of water in the spheroidal state. The most beautiful phenomenon is witnessed when very fine shavings cut from solid camphor are dropped directly upon the water. As the shavings coil by the cutting, they spin like miniature tops upon the water, with great velocity until they disappear. The selection of partners spoken of in the article is probably only accidental: for small pieces of wood will do the same, as is well known; and these particles will also select wood, or dart against the side of the vessel, as though attracted to it. And when two particles of camphor are thus held together by adhesion fiercely agitated by this constant force, they look indeed like miniature monitors in battle, and even like living things in conflict; and it is natural to suppose without careful examination that there must be some force analogous to magnetism. The length of this article prevents me from giving other experiments and theories. I have written this to give such new facts as are needed for success in trying the experiment; for as you remark, the phenomena are really very striking, and well merit more attention than is generally devoted to such things.

C.

Williams College, Sept. 8, 1863.

A FRENCHMAN has discovered a substitute for paint over plaster. A coat of oxide of zinc mixed with size, and made up like a wash, is first laid on the wall, ceiling or wainscot; and over that a coating of chloride of zinc, prepared in the same manner as the first wash, is applied. The oxide and chloride immediately effect a sort of combination, forming a cement, smooth and polished as glass, and possessing the advantage of oil paint without its disagreeable odor.

IRON which has been burned slightly, by careless heating, may be restored by drawing it out under a hammer at a low heat a number of times.