### THE U. S. CRUISER BALTIMORE.

This new steel cruiser, built by Messrs. William Cramp & Sons, of Philadelphia, and which was to have been launched August 28, was at last successfully floated on the afternoon of October 6, in the presence of a numerous company of distinguished visitors. The Secretary of the Navy, with many officers of that branch of the service, and of the army, was present, as well as many members of Congress, while a liberal assemblage of interested and curious spectators, the guests of the great shipbuilders, marked their appreciation of the importance of the event by their attendance.

The Baltimore is designed to be the most formidable of all the unarmored ships now under construction for the navy. She is of the same size as the Philadelphia and Chicago, being 335 feet long and 48½ feet broad, with a mean draught of 19½ feet, and a calculated displacement, when fully equipped, of 4,410 tons. Her contract price was $1,325,000, while that of the Chicago was $389,000, but it is expected that the Baltimore will be much the more powerful ship of the two, as it is claimed that she has many important improvements in engine and ship construction, adopted since the Chicago was designed.

The Baltimore has a high freeboard, with poop and forecastle decks and an uncovered gun deck between, with a ram bow, while her rudder is well below the water line. She has an exceptionally thick protective deck, extending from bow to stern, the highest point of this deck amidships being but slightly above the water line, and curving down toward the ends of the vessel, as well as at the sides, where it slopes to six feet below the water line. The crown of this deck is about 2½ inches thick, gradually increasing toward the sides to 3½ and 4 inches, the form of the deck adding greatly to the structural strength of the vessel, while it is designed to afford a large measure of protection to the boilers, machinery, and magazine.

There are numerous watertight compartments above as well as below this deck, which, as well as the many subdivisions in the complete double bottom of the vessel, all have separate connections by which they can be drained by the pumps. The bunkers surrounding the engines and boilers are large enough to afford storage for 850 tons of coal, with which it is estimated the vessel can steam 2,000 miles at a speed of nineteen knots an hour, or 5,000 miles at a speed of fifteen knots, or 9,500 miles at a speed of ten knots.

The motive power is furnished by two triple-expansion engines of the latest type, separated by a watertight bulkhead and operating twin screws. The cylinders are 42, 60 and 94 inches in diameter, with a stroke of 42 inches, and the screws are three-bladed, 14½ feet in diameter. The engines are designed to develop 10,750 horse power, with forced draught, which should give a speed of from nineteen to twenty knots. There are two electric light plants, lighting all compartments of the ship, with 400 lamps, from eight to thirty-two candle power each. All compartments are ventilated by two blower engines, which have a capacity of 10,000 cubic feet of air per minute. Natural ventilation is also secured wherever possible.

The vessel has short military masts for signaling, which are fitted with circular platforms about sixty feet above the deck, where machine guns will be mounted, while the main battery will consist of four 8 inch steel breech-loading rifles and six 6 inch rifles. Two of the 8 inch guns are mounted on the forecastle, one on each side, on projecting sponsons, which permit firing ahead without interfering with the deck. Two 8 inch guns are similarly mounted aft on the poop deck, firing aft. These guns can also be fired across the bow and stern respectively within an arc of 5 degrees, which gives each gun a sweep of 165 degrees—95 degrees forward of the beam and 70 degrees abaft for the bow guns, and the reverse for the after ones, while they are all from 26½ to 28 feet above the water line. The six 6 inch guns are mounted on the main deck, three on each side, in projecting sponsons 18 feet above the water line. The forward 6 inch gun on each side can be fired directly ahead, and from that line around to 70 degrees abaft the beam—a total train of 160 degrees. The after 6 inch gun on each side can be fired directly astern and around to 70 degrees forward of the beam. The arrangement of the battery gives a heavy fire ahead and astern from two 8 inch and two 6 inch guns, throwing altogether 700 pounds of metal at a single round. The two middle 6 inch guns, one on each side, have a train of 70 degrees forward and 70 degrees abaft the beam, or 140 degrees total.

The machine gun battery will consist of six six-pounder rapid-firing Hotchkiss guns, six Hotchkiss revolving cannon, and four Gatlings, mounted in broadside, on the rail, on the bridge, and aloft in the tops. Two of the six-pounders are mounted under the forecastle, firing ahead, and two under the poop, firing astern. There are, therefore, sixteen machine guns of different sizes.

In addition to this battery, the vessel will be fitted with five torpedo launching tubes, two in the bow, firing ahead, one in the stern firing aft, and one training tube on each side. The vessel has also a conning tower, built of three-inch steel plates, on the after part of the forecastle deck. It has all the fittings necessary for the captain to maneuver the ship and control the fire of the battery. The tiller ropes and shafting lead straight down from the conning tower and then along under the protective deck.

The Baltimore will be fitted as a flagship. The captain's cabin and staterooms are under the poop, while the admiral's quarters are below on the berth deck, at the stern of the vessel. Forward of the admiral's quarters is the wardroom, with accommodations for sixteen officers. The junior officers have ample room forward of the wardroom, while the remainder of the berth deck and the forecastle deck give ample space for the crew. The complement will be 300 men and 32 officers.

Messrs. Cramp & Sons were also the constructors of the Yorktown and Vesuvius,* and are now building the Philadelphia and Newark, the time for the completion of the contracts on which has been extended, so that it is not expected they will be launched until early in 1889.

### The Right to Naturalization.

Two decisions have lately been rendered upon applications for naturalization which are likely to attract attention. One of these decisions was rendered by Judge Daniels, of the New York Supreme Court. Upon a close examination of an applicant for naturalization before him, and the usual witnesses, the fact was brought out that the applicant was in the habit of becoming intoxicated at no great recurring intervals of time, and while in that condition of abusing his wife and family, and that he had on several occasions been arrested and punished therefor. Judge Daniels refused the application for naturalization on the ground that the applicant was not proved to have behaved as a man of good moral character, well disposed to the good order and happiness of the United States, as required by the United States Revised Statutes. He said:

"This privilege of citizenship has been provided as a reward for good behavior and demonstrated attachment to the principles of free government. The design of the law is, in great part, certainly to induce and secure the co-operation of all the persons residing in the United States in supporting the laws and Constitution of the country. But this fidelity to its interests and progress is not to be expected from and will not be supplied by disorderly and dissipated persons. Reliance cannot be placed upon them for the support of the principles of free government or the enforcement of good order or the laws enacted to secure and promote it. They cannot, therefore, be held to be persons who have behaved themselves as persons of good moral character, and without that they are not permitted by the statutes to become citizens of the United States."

In another case, which came up in the Philadelphia Court of Common Pleas, the applicant, a Hungarian, when asked to take the oath of allegiance declared that he did not believe in a deity of any kind, and that he neither swore nor affirmed. His application was refused. Both these decisions seem to manifest a tendency on the part of the courts to scrutinize more closely the qualifications of foreigners for naturalization.—*Bradstreet's.*

### A Near View of the Sea Serpent.

A dispatch to the Associated Press from Charleston, S. C., states that Capt. Hubbard of the steamer Planter, plying between Charleston and Georgetown, reports that the sea serpent was seen in Georgetown harbor on Thursday, August 20, half way between the port and bar. The tug Henry Buck passed within 200 yards of the monster, and the captain examined it carefully with his glass. He says he made out nearly its entire shape. It seemed to be resting or sleeping, the head and body being more or less exposed to view as the waves rose and fell about it. The mouth appeared to be beak-shaped, the head oval and quite large. The body looked to be as thick as a flour barrel, and lay upon and in the water in the curves common to snakes while swimming. The tail was not at first entirely visible.

While looking intently at the monster, something (possibly the noise of the tug) seemed to arouse it, and in an instant it threw its tail into the air, exposing fully fifteen feet of its length, and lashed the water into foam. It swam off in the direction of what is known as Muddy Bay and the mud flats, where it was impossible for the tug to follow. The color of the monster was very dark. The length is stated to be about fifty feet. That portion of the tail lifted above the water was between eight and ten inches in diameter. At the point where it was seen the water is fresh for several miles below, and Capt. Springs thinks the animal was made sick by it. It is thought that the monster cannot get out of the harbor.

As soon as the news was received, an expedition was made up to go in search of it, and it is possible that the sea serpent problem may yet be definitely solved. The monster was seen by the crews of both the tug and the schooner she was towing, the latter being bound for New York.

* For illustrated description of these vessels and their engines, see the SCIENTIFIC AMERICAN for May 12 and May 19, 1888.

## Correspondence.

### On the Detection of Fahlberg's Saccharine in Articles of Food.

*To the Editor of the Scientific American:*

The fact that resorcine, when heated with concentrated sulphuric acid, alone gives rise to products which fluoresce strongly on the addition of alkalies does not appear to be generally known.

This reaction renders valueless the test described by E. Bornstein (page 10630 of the SCIENTIFIC AMERICAN SUPPLEMENT) for the detection of saccharine, based upon the supposed formation of a sulpho-phthalein. Were chemists to search for saccharine by Bornstein's process, they would unfailingly find it in all articles examined, whether actually present or not.

SAMUEL C. HOOKER, Ph.D.

Philadelphia, Pa., Oct. 3, 1888.

### Fast Railway Trains.

*To the Editor of the Scientific American.*

Your correspondent G. H. S. is mistaken in supposing that three fast trains were omitted from the table in the *Railroad Gazette* by some oversight. If he will refer to the table as quoted in your columns, September 8, he will find that only some of the principal trains are given, running between the principal cities, and that in all cases only the trains running in one direction were taken. The trains from New York to Philadelphia are given, while those quoted by G. H. S. run from Philadelphia to New York.

I may observe that the article you quote from a daily paper on fast time on American railroads is somewhat misleading in stating that, in the fast run of the West Shore, July 9, 1885, "426 miles were covered in 7 hours and 27 minutes." The distance from East Buffalo to Weehawken is 422·6 miles, and this distance was covered in 9 hours 23 minutes, including stoppages. The actual time in motion was 8 hours and 17 minutes, giving an average speed while in motion of 51 miles an hour.

THE WRITER OF THE ARTICLE IN THE RAILROAD GAZETTE.

New York, September 28, 1888.

### Doctors should Write Plain.

The *Medical Register* (Philadelphia), under the heading of "One of the Lost Arts," takes the doctors to task for not writing their prescriptions more intelligibly. The writer claims that the druggist is liable to, and frequently does, make mistakes from misinterpreting the writing, and that the life of the patient is imperiled by their wretched chirography. The ordinary prescription is often as undecipherable as Egyptian hieroglyphics written upon papyrus of three thousand years ago, and what is worse, there does not seem to be any tendency toward improvement; the modern belief being that bad penmanship is an evidence of genius. The result is that the patients do not get the medicines ordered by the physician, or that which the physician supposes he orders.

Some years ago, the writer formed the acquaintance of a druggist who said that he did not pretend to follow the prescriptions sent him, because in many instances it would be unsafe for the patient to take the dose, and frequently the chirography was so miserable that it was impossible to make out just what the doctor wanted. He was consequently compelled to treat the patients himself, although to all appearances they were under the care of the regular physician. This plan was adopted after due deliberation and trial, the druggist finding that when prescriptions were returned for correction that was generally the end of the business, the prescriptions being sent elsewhere. Let us call a halt upon this failing, as it is due largely to sheer negligence; and when the writing becomes too burdensome by reason of lack of time, it would be the part of wisdom to employ a competent clerk for the purpose. By this means, it is hoped that we may be able to revive, if not rediscover, one of the lost arts. It will be better for the patient and, furthermore, will cause the druggist no sleepless nights, such as now threaten to drive him to distraction.

### Diabetes.

One of our leading medical journals, which should be good authority on such subjects, copies from *Cassell's Magazine* the following new remedy for the above complaint:

A new drug, of apparently great value, has recently been introduced into the market. It consists of powdered jambul seeds—the seeds of a plant. Syzygium jambolanum or Eugenia jambolana, found in various parts of India, the Mauritius, Ceylon, and the United States of Colombia. It has been well tested by the medical faculty in England, Germany, and the United States, and is said to be a promising remedy in all cases of diabetes. The action of the drug is to prevent formation of sugar in the system and so to stay waste; and cases are on record showing that under its influence the special restrictive diet, so obnoxious to diabetes patients, can be dispensed with.

### Pliable Glass.

A translucent material intended for use as a substitute for glass has been introduced in London. This material exhibits the quality of pliancy in the greatest degree; in fact, it may be bent backward and forward like leather, and be subjected to very considerable tensile strain with impunity. It is almostas translucent as glass, and is of a pleasing amber color, varying in shade from very light golden to pale brown. The basis of the material is a web of fine iron wire, with warp and weft threads about 1-12 in. apart. This is inclosed, like a fly in amber, in a sheet of translucent varnish, of which the base is linseed oil. There is no resin or gum in the varnish, and once it has become dry it will stand heat and damp without suffering any change, neither hardening nor becoming sticky. The manufacture is carried out by dipping the sheets edgewise into deep tanks of varnish and then allowing the coating which they thus receive to dry in a warm atmosphere. It requires more than a dozen dips to bring the sheet to the required thickness, and when this has been accomplished it is stored for several weeks to thoroughly set.

It will be readily understood that a material produced in this manner will not be as cheap as glass in its first cost. If it is to obtain a place in the market, it must be either from its greater advantages or from some saving which it effects in the items of erection and maintenance. It is claimed for the woven roofing that it is economical in every way. It absolutely abolishes breakages; a man may fall upon it or drop a ladder upon it without damage. The large size of the sheets, 10 ft. by 4 ft., renders the joints very few, and these can be made absolutely tight by the useof varnish between the overlapping edges. No glazier is required to apply the material; it can be cut by a pair of strong scissors, and be nailed in place by any ordinary workman. The frames to carry it may be extremely light, and their construction of the simplest. Curved surfaces can be glazed as easily as flat, and if a great amount of light be required, the entire roofing may be made of this material. The sun's heat gets through with difficulty, so that no awnings are needed. It can be seen in London in the Westminster Aquarium, which has been lately reroofed by it, greatly to the comfort of the audience.

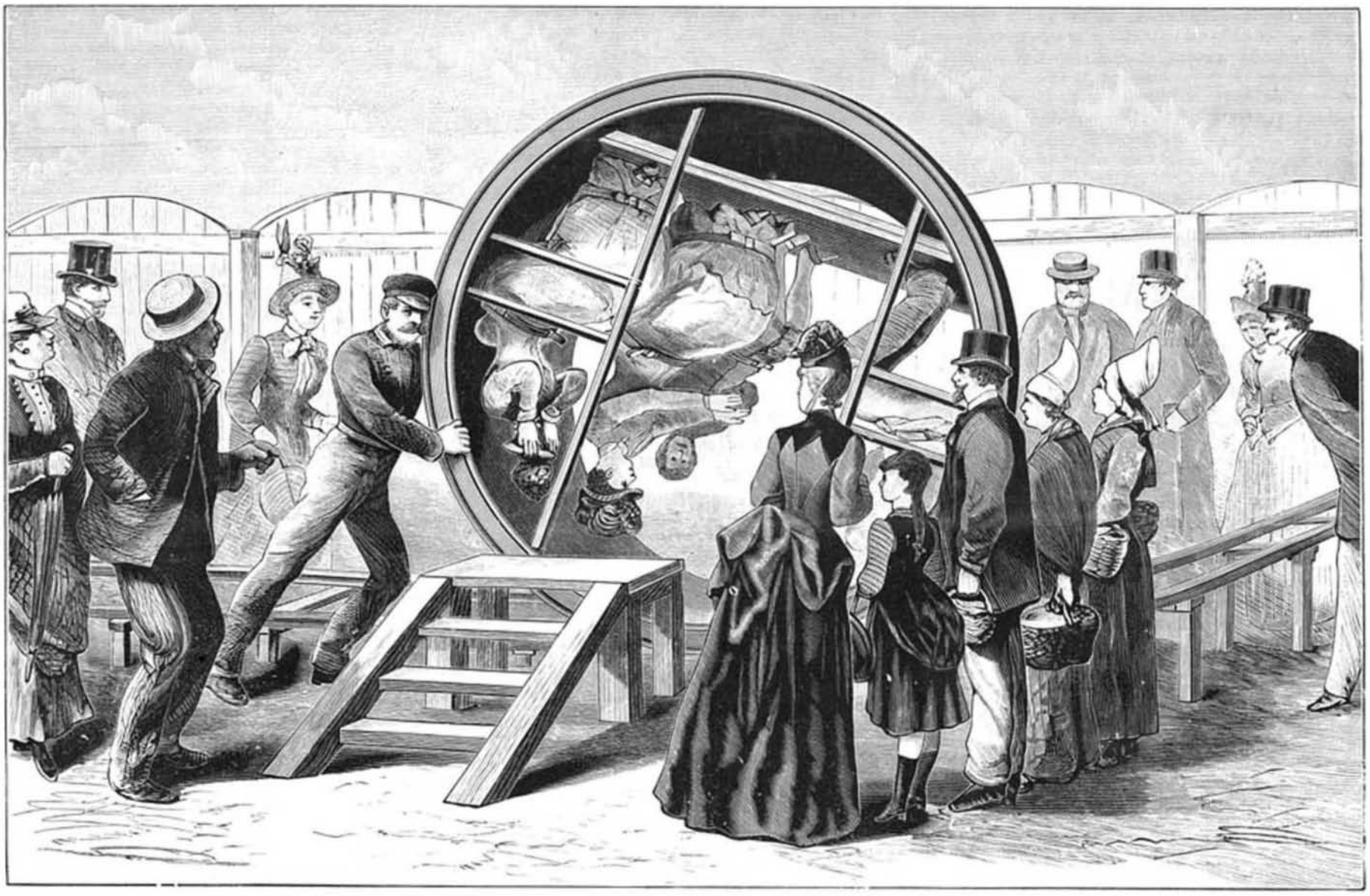
### How to Purify Salt.

Mr. Samuel F. Garrigues, of Ann Arbor, Mich., an extensive miner, refiner, and operator in salt, says, in relation to the purification of the manufactured salt, and especially in freeing it from the sulphates which operate so injuriously against its use for dairy purposes, the end could be obtained in the most perfect and yet the most simple manner by leaching the salt with a saturated solution of itself. In other words, said he, to purify a barrel of this salt all that you have to do is to dissolve a peck of it in cold water to saturation, add a small amount of sodium bicarbonate, and pour this into the barrel, having previously provided an exit by boring a hole in the bottom of the container. The saturated brine runs through, dissolves the impurities, and carries them off, but being saturated with chloride of sodium, it, of course, no longer attacks that substance.

### THE CENTRIFUGAL BARREL.

The most successful part of the present Brussels Exposition is the garden, with its numerous restaurants and saloons, where the characteristic refreshments, wines, liquors, etc., of all nations attract the visitor, whether he is thirsty or not, and give to the whole more the appearance of a scene from a Flemish kirmess *a la* Rubens or Tenier than of an international industrial exposition.

This impression is heightened by the fact that the large garden is filled with show booths and amusements of all kinds, which, it has been correctly said, resemble a Vienna "Wurstlprater." We find there an open circus, a switchback under the pretentious name of "Montagnes Russes," a "Tonneau d'amour," which reminds one of the "Fasselrutschen" at Kahlenberg, near Vienna, on Leopold day. It consists of a cask which, after the occupants have been firmly secured in their places, is rolled about, the women screaming, of course, when they revolve rapidly around the axis of the cask.—*Illustrirte Zeitung.*



THE BRUSSELS EXPOSITION—THE CENTRIFUGAL BARREL.

### Alteration of Water Colors.

After a discussion of the subject in the English Society of Aquarellists, two distinguished physicists, Messrs. Russell and Abbey, were delegated to study the action of light and air upon water colors. After two years of research, these two gentlemen have just rendered their report.

In order to ascertain the action of broad daylight, the experimenters painted strips of Whatman's paper with all colors and various mixtures, and then inclosed them in thin glass tubes, which they fixed against a wall facing the south—some of them exposed to the full light and others covered with an opaque veil. After twenty-one months, the following colors (given in the order of the extent of the alteration) were changed: Carmine, crimson lake, madder red, scarlet lake, Payne's gray, Naples yellow, olive green, indigo, purple madder, gamboge, Vandyke brown, Indian yellow, cadmium yellow, Leitch's blue, violet carmine, purple carmine, sepia, aureoline, rose madder, permanent blue, Antwerp blue, madder lake, vermilion, emerald green, and umber. The following colors remained unaltered: Yellow ocher, Indian red, Venetian red, burnt sienna, chrome yellow, lemon yellow, raw sienna, oxide of chromium, Prussian blue, cobalt, French blue, and ultramarine ash. As for the thirty-four mixtures experimented with, only three remained entirely unaltered.

Messrs. Russell and Abbey made a second series of experiments for the purpose of determining how water colors and their mixtures behave every day in the ordinary atmosphere of a room. Fifteen colors and eleven mixtures were experimented with. Gamboge, indigo, and Naples yellow were but slightly altered, while all the other colors, as well as the mixtures, faded.

Finally, the two experimenters set out to discover what happens to colors placed in damp air, in hydrogen, in a vacuum, and under the influence of illuminating gas. They found, for example, that Prussian blue and Antwerp blue are totally destroyed by damp air, that illuminating gas has scarcely any effect upon colors, and that broad daylight has no perceptible action upon colors placed in a vacuum.

### The Enormous Results from Natural Gas.

"Few people outside of the natural gas region," said a large owner of gas wells in Washington County, Pa., "have any idea what enormous proportions the gas business has grown to. It may be said to be only about two years old in western Pennsylvania, and more than 200 000 acres of land in Washington and adjoining counties have been drilled with gas wells. Nearly 150,000 tons of iron have been used in manufacturing the pipes through which the 500,000,000 cubic feet of gas flows from the region daily to the places using it. Over $25,000,000 is invested in the business by the fourteen organized companies that produce the bulk of the gas. The land and wells represent an outlay of $17,000,000. The wells now producing are capable of doubling the quantity now demanded for light and heat. Nearly 2,000 miles of pipes are required for conducting the supply to consumers. It is estimated that the use of natural gas has displaced 25,000 tons of coal daily in western Pennsylvania and eastern Ohio alone. Besides the wells controlled by the gas-producing companies, individual owners have wells for the supply of smaller towns, and every village and hamlet in the region has enough natural gas running to waste every day to abundantly supply the same number of towns of 10,000 inhabitants each with light and fuel.—*Light and Heat.*

### Inherited Deficiency of a Tooth.

Dr. Cryer says, in the Philadelphia *Medical Times*, that he has, among his patients, members of the same family, representing five generations, each lacking the left lower lateral incisor tooth. An interesting feature of this remarkable instance of heredity is that one of the members of the same family has a supernumerary lower incisor.