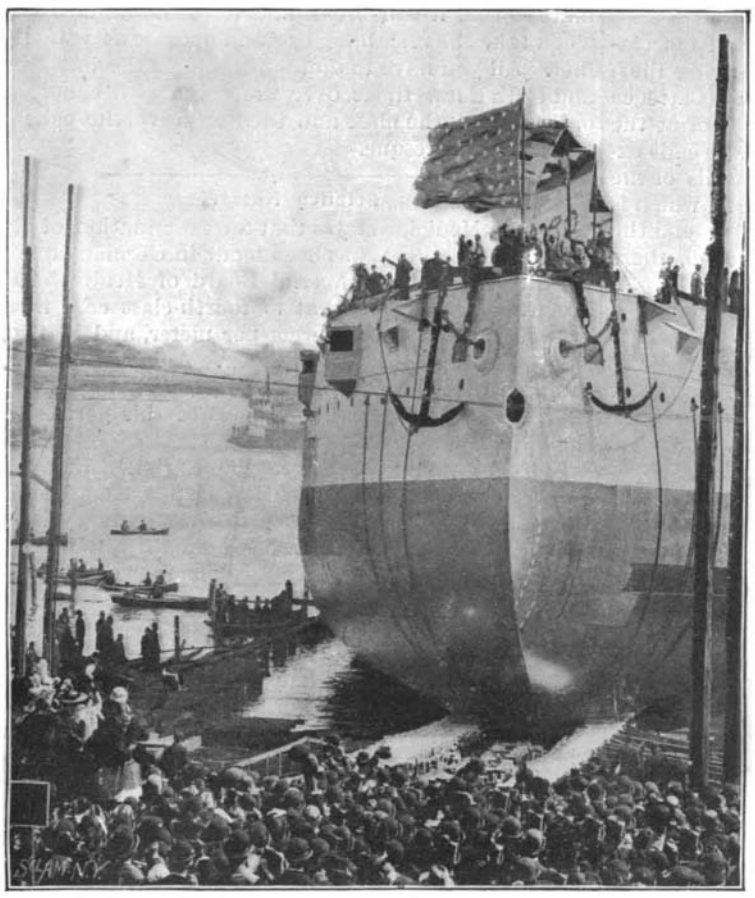

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LAUNCHING OF THE IOWA.

various promenades, drives and gardens are exceedingly fine, and no visitor should miss seeing the botanical gardens and palm tree avenues of Los Molinos.

It is difficult to get an exact estimate of the population or the relative proportion of its different elements. It is broadly divided into the Insulares or native Cubans of Spanish descent, the Peninsulares or imported Spanish element, which is made up mainly of office holders, merchants and speculators, who do not and never intend to make Cuba their permanent home, and lastly the mixed races, such as the mulatto, negro and Chinese. It is roughly estimated that there are 1,000,000 residents of Spanish extraction, 500,000 colored people and 50,000 Chinese coolies.

THE LAUNCH OF THE SEAGOING BATTLESHIP IOWA.

On March 28, at 1:14 P. M., the seagoing battleship Iowa was launched at Cramps' yard in Philadelphia. The occasion was a memorable one, as it marked the most important step in the addition to the United States navy of a ship the first of her class in our navy, and a vessel destined to be one of the most formidable men-of-war afloat. Hitherto she has been officially known as "Seagoing Battleship No. 1," her number indicating the newness of her type. Our battleships up to the present day have been designed for coast service and havebeen designated as coast line ships. But the Iowa, while in armor and armament a battleship, is somewhat lightened and is very materially modified as referred to her predecessors, so as to be capable of prolonged sea service. She partakes of the qualities of such a ship as the cruiser New York together with those of the typical battleship.

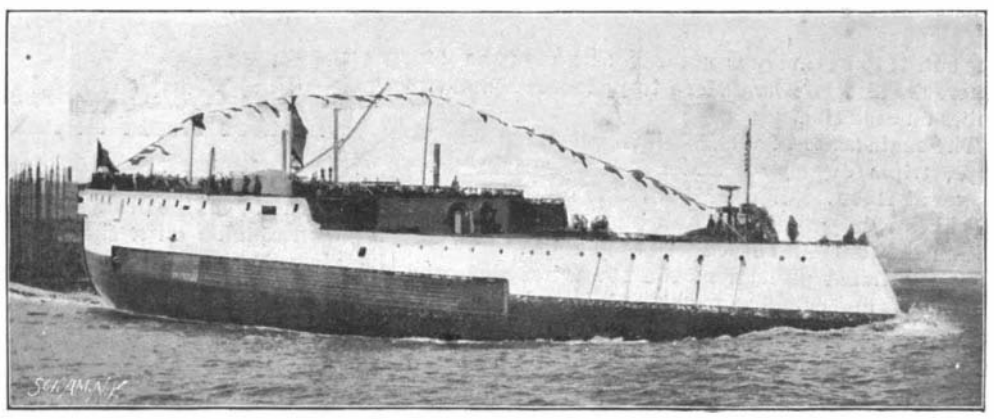
The launch, which was a most successful one, was attended by a very large assemblage, including a party of representative statesmen from the State of Iowa and one from the national capital. Many other distinguished guests were present. At the bow was erected the launching platform, which was occupied by the Secretary of the Navy, the Governor of the State of Iowa, and others. Miss Mary Lord Drake, daughter of the Governor, was appointed to break the traditional bottle of champagne upon the bows of the ship as she started, and to name her Iowa. All went smoothly. Our cuts show two views of the launch. In one the bow of the great ship is toward the spectator and her stern is just taking the water. To the left of the view is seen the party on the platform, among them the lady sponsor of the ship. The other cut shows the side view of the ship as she took the plunge. The wave thrown by the stern is specially to be noticed. On the side is a long dark rectangular space. This marks the protected region of the ship. This area is to receive the heavy side armor of 14 inch nickel steel. Both views are reproductions of photographs taken under unusually favorable auspices. In her descent down the ways the ship is calculated to have made almost exactly her contract speed of 16 miles per hour.

The following are the principal dimensions of the Iowa:

Length on load water line	360 feet.
Extreme breadth	72 " 2½ inches.
Moulded depth	39 " 4⅝ "
Mean draught	24 "
Displacement	11,296 tons.
Indicated horse power	11,000
Coal bunker capacity	2,000 tons.
Speed in knots guaranteed	16

For each quarter knot in excess of the above speed, as shown in a four hour sea trial, a bonus of $50,000 will be paid.

The ship was built under the provisions of the naval appropriation bill of July 19, 1892, her limit of cost being placed at $4,000,000. The contract price was $3,010,000. She is of design furnished by the Bureau of Construction of the United States Navy Department,



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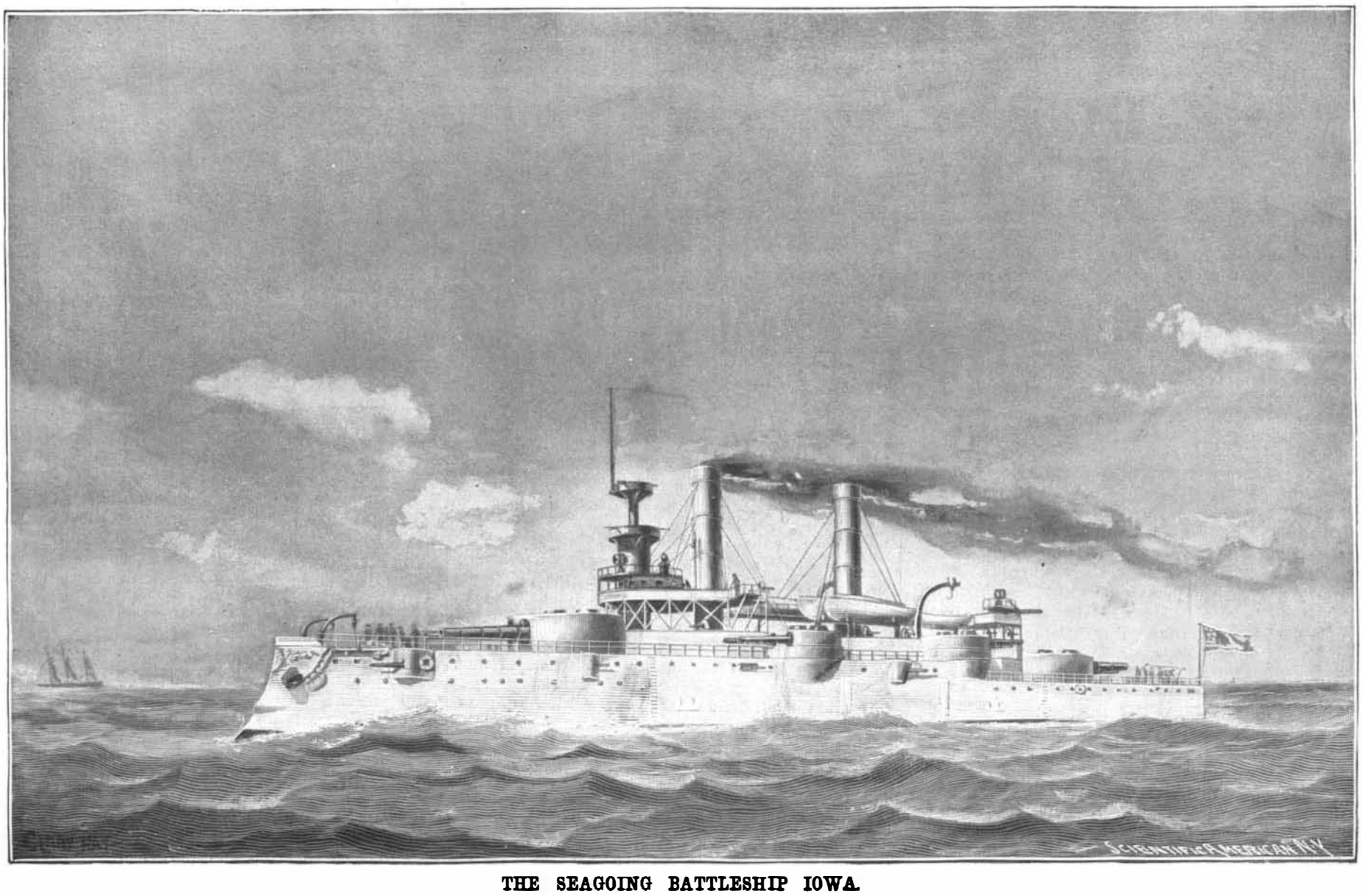
THE IOWA LAUNCHED MARCH 28, 1896.

and has exceeded her required dimensions by some 2,000 tons, while the bid for her construction came nearly $1,000,000 under the legal maximum of cost.

The water line is protected for 196 feet of its length amidships by a belt of armor 7 feet 6 inches wide. This belt has a maximum thickness of 14 inches, on 12 inches wood backing. Belts of armor 12 inches thick run across the ship, connecting the ends of the side



THE SEAGOING BATTLESHIP IOWA.

belts. At the forward and after ends of the citadel formed by this armored structure circular barbettes of 16 inch armor are established, with rotating turrets, each turret carrying two guns with axes parallel. The turrets are of 14 inch armor.

This describes the heavy armor of the ship. Above the water line belt a second citadel of 4 inch armor is built, extending 100 feet fore and aft along the sides and with diagonal segments running to the main barbettes. At each of the four corners of this citadel is a barbette of 8 inch armor, with a revolving turret of 5½ inch armor.

The ship is fought from a conning tower of 7½ inch armor, 8 feet in diameter, and with 7 feet 4 inches head room.

The four breechloading rifles in the main turrets are of 12 inches caliber, and the four upper turrets are armed with eight breechloading rifles of 8 inch caliber, two to a turret. The 12 inch guns in the forward turret and the 8 inch guns in the upper turrets are on the same level, their axes being 25 feet above the mean water line. The axes of the 12 inch guns in the after turret are 18 feet above the water line. This somewhat peculiar distribution can be followed out in our cut showing the completed ship at sea.

The sponsons are to carry 4 inch rifles, of which size of gun there are to be six, and twenty-two rapid firing and machine guns are provided for, to be distributed about the ship and on the fighting mast.

The fighting mast has three tops, and, as shown in the cut, is to be a very prominent feature of the ship. There are also bow and stern torpedo tubes and two tubes on each side.

The engines are of vertical inverted three cylinder type, triple expansion, and developing 11,000 horse power at 112 revolutions of her twin screws. There is a coal carrying capacity of 3,000 tons, giving a radius of action of 16,000 miles at a speed of 10 knots.

As additional protection, the Iowa has deflective steel decks and cellulose packing back of her plating. The armor is all Harveyized steel. Samples were subjected to very severe tests before acceptance, and in our issue of November 9, 1895, we described and illustrated some most interesting ballistic tests conducted at Indian Head proving ground, where a plate, representing the Iowa's armor, was attacked by 10, 12, and 13 inch guns, the largest caliber projectile being the only one which succeeded in penetrating the plate.

One feature of the occasion was the lavish hospitality of the builders of the ship—the Cramp company. In addition to the reception on the special trains, they entertained at a lunch in their establishment no less than 1,300 invited guests. The interest of the occasion is better appreciated when the distance traveled by the guests and their high position in the political and scientific world is realized.

In the stream off the yard lay the ship Massachusetts, and her steam siren sounded as the Iowa went down the ways. It will be many months before the ship can be made ready for commission, and some two years will elapse before the launch of another ship of her type and power. The launch may be ranked as one of the most important that ever took place in this country.

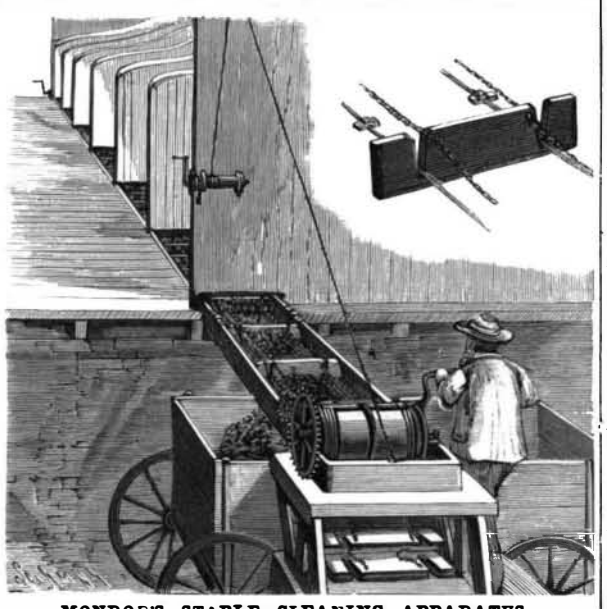
Trolley Road in Japan.

An electric trolley road established at Kioto, Japan, is described and illustrated in L'Energie Electrique. The road has been built by the Thomson-Houston Company, and the current is taken from a central station, which supplies power to a number of silk mills as well as the electric lighting of Kioto. The source of power is a canal from Lake Biwa, which is also used for navigation and irrigation purposes. There are 20 Pelton wheels of about 120 horse power working 12 dynamos, arrangements being made for the employment of alternating currents of from 1,000 to 2,000 volts, and a three-phase system at 2,000 volts, as well as a 500 volt continuous current, the total output being at present about 1,200 kilowatts. One curious feature is an inclined plane 700 meters long, with a fall of 7 per cent, which is used for transporting barges from the canal to the River Ujigawa, and vice versa. This is worked by a cable driven by a 50 horse power Thomson-Houston motor. The electric road is 18 kilometers (11¼ miles) long, and is worked with 26 cars fitted with Thomson motors. It is stated that the results on this road have been so encouraging that the municipalities of Tokio, Yokohama, and Osaka have decided on adopting similar lines.

IT is almost an axiom of the legal profession that the law is clear and certain, and the judges know the law. It is one of the first principles of Blackstone that "the law cannot make a mistake." And yet one of the most eminent of English judges, Lord Mansfield, once said, in deciding a case, "as to the certainty of the law, it would be very hard upon the profession if the law was so certain that everybody knew it. The misfortune is that it is so uncertain that it costs much money to know what it is, even in the court of last resort."

A STABLE CLEANING APPARATUS.

For expeditiously removing manure, etc., from stables, the apparatus shown in the accompanying illustration has been invented and patented by Clarence A. Monroe, Loveland, Col. Sunk in the floor at the rear of the stalls is a trough or trench whose ends extend through opposite openings in the walls of the stable, there being at one end brackets in which is journaled a roller or drum, while at the other end the trough has a hinged section, with open bottom, there



MONROE'S STABLE CLEANING APPARATUS.

being journaled at the outer end of this section another drum. On the drum shaft is a gear wheel meshing with a pinion on a shaft provided with a crank handle, whereby the drum may be rotated. From the outer end of the hinged section a cord or rope extends diagonally up over a sheave on the side wall, and thence down over a roller or windlass, whereby the hinged section may be raised to a vertical position or let down over a wagon in a driveway at the side of the stable, as shown in the illustration. Wire ropes are secured at opposite ends to the respective drums, and on these wire ropes are spaced stops adapted to engage the rear sides of flights, as shown in the small figure, the flights being drawn along in an inclined position in the trenches by the cables. As the flights are drawn over the open bottom of the hinged section they are supported by guide rods, but they become disengaged and fall into a chamber at the forward end of the open bottom of the hinged section.

The flights are connected by chains or flexible connections, and are adapted to be drawn backward through the trench, by means of a handle on the rear drum, the flights being held in vertical position by slides adjacent to the rear drum. When the flights are drawn forward the manure is carried out and delivered into a wagon or other receptacle, the flights being then carried back to their original position by rotating the drum at the rear of the trench.

A CAKE BAKED IN A HAT.

Borrowing a hat, breaking some eggs in it, and taking out a cake is a trick which, although old, is worthy of explanation, and the more so in that the process that we are going to describe has the advantage of being able to be employed anywhere and of producing a complete illusion.

Before beginning the experiment, take three eggs, and, having blown

Fig. 1.

Fig. 2.

two of them, close the apertures with white wax. Place the three eggs upon a plate.

Within the left hand side of your waistcoat place a flat cake, and then make your appearance before the spectators.

Having borrowed a hat, place it upon the table, and, after secretly introducing the cake into it (Fig. 1), take an empty egg, crack the shell upon the edge of the plate, and, inserting your hands in the hat, make believe empty the contents of the egg into the latter (Fig. 2).

In order that the means employed may not occur to any one, take the perfect egg and let it fall upon the plate so that it will break and its contents flow out. Then take the remaining egg and operate as with the first. All you have to do then is to pass the hat back and forth a few times over the flame of a candle in order to cook the mass and then to serve the cake.—Magasin Pittoresque.

Science Notes.

Modern Medicine states that an examination of the dust of railroad cars has been made in Germany under the direction of the Imperial Board of Health. The investigations showed that in fourth-class cars there were more than 12,000 germs per meter, and in first-class cars one-fifth this number. Animals were inoculated with the dust from the cars. Some died of tuberculosis, showing the presence of this germ with the other microbes.

In notes presented before the Paris Academy of Sciences, L. B. Gustave le Bon claims that he has proved by photographic effects that ordinary lamp light and gas light are transmitted through opaque bodies, and states that the body might be a sheet of copper one-thirtieth of an inch in thickness. His experiments have been questioned, says Science, by M. Niewenglowski, who states that he has obtained the same effects in complete darkness, and attributes them to luminous energy stored up in the plates.

An imperial ordinance was promulgated in Japan on December 28, 1895, establishing a new standard time, as follows: (1) The standard time of the empire hitherto in use shall henceforth be called the central standard time. (2) The time of the meridian of 120° east longitude shall be the standard time of Taiwan (Formosa), Hoko group (the Pescadores), and Taeyama and Miyako groups, and shall be called the western standard time. (3) This ordinance shall come into effect on January 1 of the twenty-ninth year of Meiji (1896).

Portugal is about to celebrate a quadricentenary of its own. At the request of the Geographical Society at Lisbon, the government has determined to celebrate the four hundredth anniversary of the expedition which set out on July 8, 1497, under the command of Vasco da Gama, for the discovery of a route to India around the Cape of Good Hope. The details of the celebration have not been decided upon as yet, but it is expected that special expositions will be opened at Lisbon and that scientific congresses will also be held.

Cryostase is the name of a new substance discovered by a German chemist. It is a remarkable compound substance and has some curious properties, among which is that of solidifying under the influence of heat and again becoming liquid at temperatures below the freezing point. It is the only substance which possesses the property of liquefying when cold and becoming solidified when hot; for although some substances like albumen harden at a slightly high temperature, they cannot be brought back to a liquid state even under the influence of a very low temperature. Full details of the composition are lacking. It is said to be made by mixing equal parts of phenol, camphor, and saponine, to which is added a rather smaller quantity of turpentine.

The Albert medal of the Society of Arts was presented by His Royal Highness the Prince of Wales to Sir Lowthian Bell, Bart., F.R.S., on February 26, in recognition of the services he had rendered to arts, manufactures, and commerce by his metallurgical researches and the resulting development of the iron and steel industries.

The Conseil Supérieur de l'Instruction Publique, of France, has issued a decree which removes the restrictions imposed on American and other foreign students in French universities and gives them a status similar to that accorded them by the German universities. The memorial addressed to the Conseil by Prof. H. J. Furber, of the University of Chicago, called attention to the fact that there were only thirty students at the Sorbonne, while there were two hundred at the University of Berlin. The conditions will now probably be completely changed by the new decree.

By the use of the electric furnace, G. de Chalmot has obtained crystals of copper and silver silicides, which always contain, however, as an impurity, some calcium.

The Russian National Health Society is making great efforts to have the Jenner Centenary celebration, which is due to be held in May, a great success. An exhibition of relics of Jenner and of books, pamphlets, prints, instruments, and all objects relating to vaccination or to Jenner, will be held. Four prizes and a gold medal are offered for the best work on vaccination.

Acetylene gas is now proposed for various special uses. Among these are hospital work, especially for oculists, aurists, throat operations, and the like. The microscopist and photographer are said to find it of value, and for all special cases of difficult illumination it may be used to advantage. One suggestion is to provide signalmen with compressed gas in small cylinders, to be used for long and short flash Morse signals. Its use for bicycles, the gas being stored in the handle bars or tubular frames, must not be overlooked.