

Among the rarely occurring objects are some of a deep green or black brown color, which are called volcanic glass, and are made of obsidian; but to these the ancients added oxide of lead in the form of massicot, so as to make the mass more easily fusible.

Colored glasses have also been found in the ancient Grecian burial places; the yellow colored (which, however, had become almost opaque) contained a silicate of alumina colored with oxide of iron; probably ochre was used in these, mixed with the pulverized glass before the melting, so that the color was obtained after the fusion. A blue glass, which contained streaks of blue of various shades, contained oxide of copper; and in producing this effect the ancients used probably the malachite and azurite (both mineral carbonates of copper) or other green or blue colored copper ores, or the so-called *ceruleum*, which in Egypt was made of copper, sand, and salt, and was used to color the cases in which the mummies were preserved. A specimen of white glass, resembling opal, but showing thousands of cracks, was undoubtedly made of milky half opal, which is found in Greece in the island of Mylos, and which was fused to make objects of the peculiarly colored appearance.

These and other modern investigations continue to prove that the so-called lost arts of the ancients, which some persons grossly exaggerate, trying to make it appear that the ancients surpassed the moderns in knowledge and civilization, did not amount to more than laborious attempts to produce a few of the richer objects which modern industry produces with the greatest ease and in the utmost abundance, placing them, for reason of their low price, at the disposal of every industrious man, even of the comparatively poor laborer, who, thanks to the inventive genius of the present day, enjoys comforts which the working man of ancient Greece would never think himself worthy to enjoy.

MECHANICAL VIBRATION AS A SUBSTITUTE FOR ANÆSTHETICS.

The application of anæsthetics in cases of surgical operations is of comparatively recent date. Dr. Morton discovered that the ethers, inhaled to a sufficient extent, produced a general anæsthetic state, during the continuance of which operations, which otherwise would be most painful, might be performed without the knowledge of the patient. The surgeon availing himself of anæsthetics is enabled to perform operations with greater deliberation and with greater precision, not having to contend with the writhing and shrinking of the patient; but certain dangers which accompany general anæsthetics, whatever the agent employed, have induced experiments for producing the effect locally.

For minor operations, surgeons have had recourse to refrigeration produced by a spray of very volatile liquid, or by the application of freezing mixtures. Intense heat induced by a galvanic current has also been employed, and various other agents have been tried with more or less success; but barring this danger, chloroform and ether stand thus far unrivaled. The desirability of an agent that will produce local anæsthesia cannot, however, be questioned.

Dr. Livingston records a remarkable instance of general nervous insensibility, which, although produced by an undesirable agent, proves that the nerves may be thrown into an insensible state by a means quite unlike the ordinary administration of anæsthetics. He says: "I saw the lion just in the act of springing upon me. I was upon a little height; he caught my shoulder as he sprang, and we both came to the ground below together. Growling horribly, close to my ear, he shook me as a terrier dog does a rat. The shock produced a stupor similar to that which seems to be felt by a mouse after the first shake of a cat. It caused a sort of dreaminess, in which there was no sense of pain, nor feeling of terror, though quite conscious of all that was happening. It was like what patients, partly under the influence of chloroform, describe, who see all the operation, but feel not the knife. This singular condition was not the result of any mental process. The shock annihilated fear, and allowed no sense of horror in looking round at the beast." In describing his injuries, he says: "Besides crunching the bone into splinters, he left eleven teeth wounds on the upper part of my arm."

The often related circumstance of the man who went into a sawmill and tried to see how near he could put his finger to the revolving saw without touching it, and on looking, found to his surprise that his finger was gone—and who, a few moments afterwards, illustrated to the proprietor of the mill how he lost his finger by putting one from the other hand so near the saw that he lost that also—although ludicrous, suggests a principle and a line of experiment which might, if investigated and followed out, result in a blessing to humanity.

The principle seems to be this: That rapid vibration, or a series of sudden concussions, even though slight, and not painful of themselves, will produce, in the part subjected to the treatment, a numbness or insensibility in the nerves, which may be immediately followed by a surgical operation without pain or inconvenience to the patient. The means for carrying out this principle are subjects for experiment. A square stick, having rounded corners, rapidly revolved, will produce insensibility in a finger placed so that it may be vibrated by contact with the corners of the stick. It may be a question whether this effect is produced directly by the rapid vibratory motion of the parts, or whether it is due to a compression of the nerves, the effect of which is prolonged by repeated concussions; in any case, it would appear that experiment might bring out a means for producing local anæsthesia or insensibility of the nerves by causing the parts to be vibrated rapidly by some mechanical device.

CANNED MEATS POISONED WITH MERCURY.

In our paper of May 27 we published the statement of Professor Falke, of Manhattan College in this city, to the effect that, on opening a can of cooked corned beef, bearing the stamp of a Chicago company, which he had recently purchased at a respectable grocery here, he noticed some globules of metallic mercury; and on examination of the meat, found additional quantities of the poison in the form of albuminate of mercury. Professor Falke mentioned the matter before the Academy of Sciences, and the can was examined by the members. After some discussion the conclusion reached was that the presence of the mercury was accidental, caused doubtless by the accidental breaking of a thermometer bulb in testing the heat of the can, etc.

This statement having met the eye of one of our esteemed correspondents at the West, he wrote to us, stating that it was common at some establishments in his vicinity to seal the cans with mercurial solder, and that possibly that had something to do with the case in question. We deemed it hardly possible that intelligent parties engaged in supplying the public with canned food would venture to make use of so dangerous a material in such a connection; and we therefore wrote to our correspondent, asking him to send us a specimen of the solder in question. He did so, and we caused the solder to be analyzed at the laboratory of Professor A. R. Leeds, Stevens Institute. We were surprised at the result, showing, as it did, that the solder contains a large quantity of mercury, which is at once liberated under the heat of the soldering iron, and is readily condensed in metallic form. This appears to be a sufficient explanation of the presence of free mercury and of albuminate of mercury in Professor Falke's case; and warrants the conclusion that the many cases of sickness from partaking of canned meats, reported in the papers, may be due to the same cause.

Mercury is mixed with the solder in order, doubtless, to make it run and seal more easily; but it is a dangerous and subtle poison, and its employment in connection with canned foods should be prohibited under severe penalties. We hope our legislators will promptly move in the matter.

In the meantime, we caution our readers to avoid the use of foods that are put up in mercury-soldered cans.

Any chemist or intelligent person, by a few simple tests, can quickly determine the presence of mercury in the solder. In the specimen sent to us, the mercury is revealed by simply heating a bit of the solder in a small test tube over a lamp flame. The metal condenses on the interior of the tube, and a bright globule may be soon collected.

THE CENTENNIAL EXPOSITION.

We noted, not long ago, the excursion of the 4,000 employees of the Singer Sewing Machine Company to the Centennial. The admirable example thus set has been followed by other large employing concerns, and it is to be hoped that parties of working men will be despatched from all our great manufacturing establishments. Employers will find it directly to their interest to encourage these excursions, and to grant the men the necessary holidays. To examine the Centennial, even rapidly and cursorily, is to receive almost insensibly a vast amount of useful information. Besides, as we have already suggested, the advantages thus to be gained will be enhanced if the workmen are required to make some report of what they have seen relating to their own trade, on their return. A suitable reward might be offered for the best report, and thus many might be induced to observe more closely than they otherwise would. Those who stay at home might be constituted the jury for decreeing the reward, and thus, being obliged to hear all the reports, they as well as the excursionists will share in the advantages of the journey.

Of course, the hot weather has kept away large numbers of people from Philadelphia. Still the attendance is reported to be large and to yield remunerative returns. This certainly is encouraging, as no one would have been surprised had the receipts fallen off seriously during the heated term. The rush will probably begin about the first of September; and from that date until the Exposition closes, the buildings will be thronged. Those, however, who saw the grounds just before the present hot weather set in, probably saw them at their best, as the vegetation has been sadly injured by the drought, and the asphalt pavements, becoming melted, have lost their smooth surface.

As a market, the Centennial has proved a great success. Our people have bought out whole foreign departments, and in many sections it is hardly possible to find an object not ticketed "sold." The foreign buyers of American goods have likewise purchased liberally. The New England exhibitors of cotton and wool machinery have found some good customers in the Brazilian staple and fleece displays. The *Boston Commercial Bulletin* reports that probably two large mills, from Yankee plans and Yankee fittings, will be built in Brazil. Over a hundred and fifty thousand dollars worth of pumps, engines, blowers, and drills have thus far been sold to South American buyers. Boot and shoe machinery is also, we learn, meeting a splendid foreign sale; and even in objects of art—notably furniture—the sale of a fifteen thousand dollar suite to a Parisian house shows that American art industry is by no means unappreciated. Those who have made a study of the business aspects of the Exposition predict an enormous trade in the fall; but it is stated that exhibitors manifest too great carelessness in selecting the persons who explain their exhibits. There seems to be almost a dearth of smart salesmen, while all such on hand are said to be succeeding beyond all expectations. There is one manufacturer who exhibits his own machine in a way that may serve as an example for general emula-

tion. The device is a very ingenious safety lock for elevators, and under ordinary circumstances would probably be shown in the model. The manufacturer, however, decided to exhibit the invention on a full sized working elevator; and when the judges came to examine the device, he had everything in readiness. Entering the car, which he had previously loaded heavily with pig iron, he was lifted to a height of about thirty feet; then he coolly reached upward and began to hack at the supporting rope with his knife. Consternation speedily became manifest among the judges. Some implored him to come down, that they were satisfied, and did not want to see him killed. The imperturbable inventor went on hacking at the rope, which suddenly parted. The spectators turned away so as not to see the rash man dashed to pieces; but instead of gratifying their anticipations, the elevator car was instantly caught, and actually jumped up a couple of inches above the marked point for its stoppage. From the expressions of the judges, that exhibitor may expect a favorable report; and as he adopts the same startling plan for attracting visitors' attention, it is needless to say that a crowd always surrounds his exhibit.

So much has been said and written about Japan that her neighbor,

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through the general similarity of the exhibits, has come in for little or no attention. And yet the Chinese display embodies some articles as marvelous in their workmanship as the Japanese lacquers and bronzes. At the entrance of the section is erected a large massive door of a temple, curiously ornamented with Chinese characters and oddly contrasting colors. The same general design is followed in the show cases, which have roofs like pagodas, terminating in graceful peaks and spires. In lacquered ware products, Japan excels; but in the more minute arts of carving and inlaying work, the Chinese are the superiors. Certainly, some of their carvings in ivory and mother-of-pearl reveal a patience and delicacy of touch nothing short of marvelous. Commencing on the west side of the section, the attention is attracted by a large display of ancient vases and ornaments. Some of these are of immense age; and they are of the highest value, as showing, probably, the earliest efforts of Chinese art. The designs, which are strikingly original, consist of strange looking birds, and animals, and natives engaged in various occupations. There is one pair of enormous vases, ornamented with handles fashioned to represent elephants' heads. On the eastern side of the section are shown handsome screens, elaborately ornamented with pictures of Chinese ladies in beautiful costumes woven in silk. Near, there are cases of curious ornaments cut out of ivory; and adjoining are superb displays of porcelain. Then come specimens of wood carving. By this means, the Chinese give us an idea of their habits and customs, as there are a large number of curious groups, in processions and ceremonies, in which all the figures are carved with the utmost minuteness. There is a multiplicity of carved picture frames, brackets, doors, cabinets, and like objects. Perhaps the most prominent article in the entire display is a bedstead, made of fine grained wood, every inch of which is covered with carving of the most wonderful delicacy. The canopy is semicircular, and arches from foot to head. It is made of the finest and thinnest silk—a mere film—and on this are embroidered in silk the most exquisite designs in birds and flowers. It can well be believed that the bed represents the labor of years. Another bedstead, less elaborately ornamented, has been sold for \$1,600. There are, beside, numerous exhibits of work and jewel boxes, made of highly polished and costly wood, together with card and chess tables of every form, inlaid with ivory and mother-of-pearl. The specimens of silks are of the finest quality. The colors, especially orange, maroon, and green, are exceedingly lustrous, while the parts that are embroidered exhibit exquisite skill. The rear portion of the Chinese section is filled with china and lacquered ware in endless variety. The department is always full of visitors, and the people seem never to tire of looking at these evidences of the strange civilization of the Orient.

New Caledonia Nickel.

Through the explorations of M. Garnier, New Caledonia now yields a green mineral, consisting of hydrosilicate of nickel and of magnesia, which appears destined to acquire considerable industrial importance. The mineral is found in the midst of very abundant masses of serpentine at various points of the island, and in association with euphotides, chlorites, amphibolites, and other magnesian rocks. Sometimes this combination of nickel shows itself on other rocks in the form of a fine green covering; at others, it penetrates the rocks and colors them intensely; and again it is found in both filaments and in nodules. As might be expected, the nickel is accompanied by iron, cobalt, and chromium, almost invariably. The metallurgical treatment proposed by MM. Christophle and Bouillet is quite simple. The material dissolved in hydrochloric acid is precipitated by lime under form of a nearly pure nickel oxide. Reduction by charcoal easily gives a metal 99 per cent fine, incomparably purer than that obtained from the sulphuretted and arsenious ores hitherto employed. It is not, however, in the free state that the metal is best used. As combined with copper in the proportion of 15 per cent nickel against 85 of copper, a white malleable and very fine alloy is produced, excellently suited for all metallurgical manipulations.

A rod of brickwork = 272 superficial feet, 1½ bricks thick, or 4,350 bricks average work. One yard of paving = 36 bricks flat or 52 on edge. There are 384 bricks to a cubic yard, and 1,000 bricks, closely stacked, occupy about 55 cubic feet.