compact, and seems to break with equal ease in all directions, and although not so hard as the original rock, is still firm, and especially so when the deformation has been carried out very slowly.

No accurate measurements of its strength have yet been made, but it will withstand a sharp blow, and a fragment of it weighing ten grammes has been allowed to fall through a height of eight feet on to a wooden platform, from which it rebounded without breaking.

When thin sections of the deformed marble are examined under the microscope, the nature of the movement which has taken place is clearly shown. If the deformation has been rapid, that is to say, if a column 40 mm. in length has been reduced to two-thirds of its length in five or six hours, a distinct cataclastic structure can be seen along certain lines of motion, though this is often on so minute a scale that a high power is necessary to make it clearly visible. This cataclastic structure is precisely like that seen in the rocks of many highly contorted districts.

When, however, the deformation is carried out very slowly, as, for instance, in one experiment where the column was reduced from 40 mm. to 35 mm. in height, the movement being very gradual and extending over thirteen days, the cataclastic structure is absent. In these cases the grains still fit closely together and are of substantially the same size as in the uncrushed marble. Well marked strain shadows, indicating a twisting of the grains, are common, with, in some places, an elongation of certain of the grains in one plane. The dull, chalky color of the deformed rock in those cases is chiefly due to a fibrous structure which developed in the calcite and which, in most cases, when magnified, is seen to be due to a very fine polysynthetic twinning, which is often so exceedingly fine that it can be recognized as such only by the use of very high powers. Each individual of calcite, in fact, has changed its shape and relative position, either by twisting or by slowly moving along its gliding planes, the chalky aspect of the granulated rock being apparently chiefly due to this repeated twinning destroying the continuity of the cleavage surfaces of the calcite, thus making the reflecting surfaces much smaller.

The experiments, therefore, show that marble, even when dry and at ordinary temperatures, does under great pressure develop a certain degree of plasticity and can be made to flow, and that this movement consists chiefly in a bending of the constituent calcite individuals or a shearing along their gliding planes. All the microscopic structures present in the rock are found in the highly contorted limestones of many mountain regions; although many of these present, in addition, certain other structures which indicate that the conditions under which the movements in their case took place were not exactly those of the experiment, but that moisture and possibly heat played a part as well.

The experiments are now being continued, a modification of the machine having been arranged whereby the pressure may be applied while the rock is maintained at a temperature of from 100° C. to 250° C. When these are completed, it is intended to try the effect of compression in the presence of steam at a high temperature, and results of great interest to the physicist and geologist may be expected.

LAOTIAN TATTOOING.

Our thanks are due to Prof. Frank T. Adams, who has kindly sent us photographs of the apparatus used in the experiments, and who has furnished us with the above particulars.

TROY, with the ruins Schliemann explored, has been presented to the imperial Osmanic museum of antiquities at Constantinople by the owner of Hissarlik, the Englishman, Frank Calverley.

THE ART OF TATTOOING.

Tattooing has been studied from many points of view. It is very widely practiced, and has various origins. It is due to religious ideas, forms distinctive signs among tribes, is offered as a recompense to the valiant, or, finally, is a true initiation marking the passage from childhood to the adult age.

JAPANESE TATTOOING UPON THE BODY OF A WEALTHY AMERICAN.

It is practiced in different ways: by burns which form scars (as among the Australians); by wide incisions (as among the Africans); or, finally, by fine punctures, and in this case becomes an art. It is from the latter viewpoint that we desire to examine it.

The greater the perfection to which a race has brought its art, the handsomer will be its tattooing. The Australians are acquainted with very primitive drawing only. They trace straight parallel lines or angles upon their arms and their few utensils. They have not reached the conception of the polygon, curve or spiral. They are ignorant of symmetry, alternation, and the various principles that preside over the grouping of ornamental designs. So their tattooing is rude, and composed simply of a few parallel or intersecting lines or of dotted ones. The African worshipers of fetiches, whose art is very crude, trace lines and angles, which the repeat in series; but make very little use of curves.

NEW ZEALAND TATTOOING UPON A FUNERAL STATUE.

Opposed to these are the Polynesians, whose ornamental art is considerably developed. They know how to draw curves and spirals; and they combine geometrical lines in such a way as to obtain harmonious results. So they tattoo very complicated and very beautiful designs. In New Zealand the figures are supercharged with close and parallel curves, which surround the mouth, nose and eyes. In the Marquesas Islands travelers have admired the perfection and fineness of the lines of tattooing practiced there, and in which figures of animals are harmoniously mixed with geometrical designs, upon the human body as well as upon sculptured objects. These tattooing designs, like the ornamental art of the natives, have, according to the testimony of travelers, varied since the discovery of these islands.

The ornamental art of New Guinea is highly developed, but tattooing is not much practiced. However, the women of the Motu tribe tattoo themselves, and do it with a perfection that cedes in nothing to the art as practiced by the Polynesians.

The Americans have taught us to admire the very original art of the Haidah, a people of Colombia, who represent man and the animals according to regular curves that give them the appearance of geometrical designs. Their tattooing is in every respect like the designs which they sculpture upon wood, and it suffices to see a specimen of it in order to recognize it among a thousand others.

Tattooing therefore constitutes an artistic manifestation, and not one of the least, of primitive races. It even happens that, as regards the Guanches of the Canary Islands, it is the principal art of this race that remains to us. These people did not tattoo themselves in the proper sense of the word (which signifies a puncture of the skin into which a coloring substance is introduced), but printed designs upon the body by means of matrices or "pintaderos." The Museum of Las Palmas (Canary Islands) possesses a fine collection of these matrices in which we can see what was the ornamental art of this race, which has now disappeared. The Guanches were acquainted with polygonal figures, drew the rose ornament, and inscribed figures one within another—the circle in a square, the rose ornament in a circle, etc. They opposed and alternated designs and even knew how to arrange figures according to a double plan of symmetry; but they were ignorant of those complicated figures of which Greek art later on made so excellent use.

In the extreme East, on the contrary, tattooing is not composed of geometrical designs. Sino-Japanese art has abandoned them in our day, although it formerly employed them, as may be seen from some ritualistic vases that have been preserved. The artist now applies himself to a faithful reproduction of animals and of plants, or else conceives fantastic monsters. So the tattooing is purely figurative. Those so handsomely draped women that are found upon the Japanese Kakemonos are observed again in a no less pleasing form in the tattooings. Men, monsters and flowers form the decorative motive.

So, too, the Laotians delineate upon the skin those monsters and fantastic figures that are so dear to the Chinese imagination. Linear tattooing is not practiced.

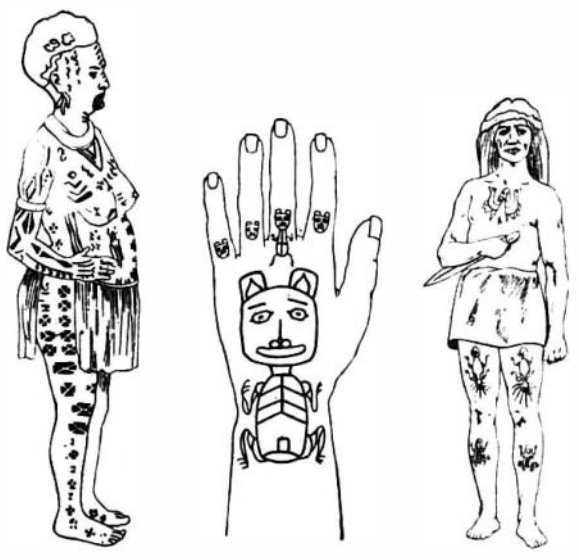
In Burma, the Hindoo style prevails. The tattooing figures are those of men, trees and scenes from life.

Among us, the art of tattooing is left to the lower class; so it is a degraded art. The representations are coarse, and, as a general thing, poorly executed. Sometimes the artist is capable of drawing very fine artistic figures that are the admiration of physicians who have an opportunity of seeing them. But such cases are becoming rarer and rarer, and tattooing has become gross and vile, like every despised art.

We are indebted to the Revue Larousse for the above particulars.

Improved Practice in Surgery.

A report by M. Reclus, in one of the French journals, of several cases of severe injuries of limbs, treated successfully by a novel conservative method, has attracted much attention. Instead of removing a crushed limb, M. Reclus would embalm the injured structures in antiseptic applications and wait for a natural separation of the dead from the living parts, not interfering except to saw through bone, and after careful disinfection of the skin and removal of detached fragments of bone and of loose tendons and torn muscle, the whole wound is forcibly injected with water heated to 140 degrees Fahrenheit. Hot water acts as an antiseptic and increases the activity of other antiseptic agents, and, moreover, when injected into a large and deep wound, it arrests hemorrhage and warms the chilled and collapsed patient. The interior of the wound is next thoroughly disinfected by a solution of permanganate of potash applied on pieces of wool, and finally embalmed by what is called a polyantiseptic pomade, containing a very large proportion of active agents, some of which, being absorbable, such as corrosive sublimate, carbolic acid and iodoform, are in small quantities, while others, which are not so absorbable, as boric acid, salol and antipyrin, are distributed more abundantly. This pomade is spread quickly on bands of tarlatan, which are thrust into all the crevices of the wound. The injured part is covered with a layer of cotton wool, which is firmly bound down to the surface of the limb by bandages. By the end of the third week, it is stated, the dead have become detached from the living structures and the sloughs are quite loose.



NEW GUINEA TATTOOING. HAIDAH TATTOOING. HAIDAH TATTOOING.

Miscellaneous Notes and Receipts.

To Utilize Old Crumbly India Ink and Aquarelle Piece Colors.—Assort the color fragments, reduce each variety into a fine powder, and after soaking for several hours grind this very fine upon a thick ground glass plate with a glass muller used for grinding colors. Then add enough dilute solution of isinglass or white rock candy or best pure gum arabic, so that the powder can be ground into a paste. The color is then rubbed into shells or porcelain dishes and is ready for use at once and also after drying. To keep it from cracking and peeling off, a little glycerine is added. The paint heaps of aquarelle tube colors dried on the palette may also be regenerated in this manner, leaving out the glycerine admixture. Too much glycerine prevents the color from drying. Prepared with gum arabic, the color becomes more brittle than if rock candy is used for binder.—Technische Mittheilungen für Malerei.

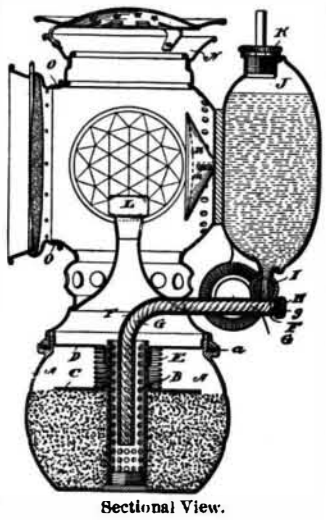
Restoration of Faded Photographs.—Place the picture without removing it from the cardboard in cold water, face downward; after a few hours renew the water, replacing it with lukewarm water. The picture will usually come off at once. When this is done, cleanse the back with a sponge of all adhering paste and lay it into the following solution: Mercuric chloride 2 grammes, kitchen salt 4 grammes, water 100 c. cm. By this treatment the picture will disappear almost entirely sometimes even becoming apparently negative if the ground of the paper is very much faded. When this is accomplished, after about 10 to 20 minutes, wash out thoroughly and blacken the photo. with diluted ammonia. This will cause the picture to reappear quickly with a brown to black tone, attaining considerable strength and deepness. It makes no difference if the picture does not entirely disappear in the quicksilver bath, which happens on account of the photo. being very strongly gilt. The copy is finally washed out for half an hour and remounted. If the prints were naturally feeble, the above operation will not be of much avail. — Dr. Adolf Miethe, Mittheilungen für Malerei.

To Nickel Plate Wood.—If one wants to electro-nickel wood, it is necessary to coat it previously with a thin layer of metal. For this purpose prepare the following three solutions: 1. In 10 grammes of carbon sulphide dissolve 1½ grammes of caoutchouc, adding 4 grammes of melted wax. In another flask prepare a mixture of 5 grammes of phosphorus, 60 grammes of carbon sulphide, 5 grammes of oil of turpentine, and 4 grammes of asphalt powder, and add this to the first solution while stirring. 2. Prepare a mixture of 2 grammes of silver nitrate in 600 grammes of water. 3. One of 10 grammes of gold chloride in 600 grammes of water. Now introduce the object to be nickeled, to which the conducting wires have been attached, into solution No. 1, and dry the whole on taking out. Next pour over it the second solution until the surface has assumed a dark metallic appearance. Rinse off with water and treat in the same manner with the third solution. Through this treatment the wood attains a yellowish color and is now sufficiently prepared for electro-nickeling. The nickel bath consists of 500 grammes of nickel ammonium sulphate, 50 grammes of ammonium sulphate, and 10 liters of water. The liquid must be neutral, which may be attained, if necessary, by adding ammonium chloride until litmus paper is very slightly reddened.—L'Union pharm., 1898, 23, from Le Génie Civil.

Mumiine or Mummy Brown.—Regarding mumiine (extrait de momie), G. Buchner writes in the Bayrisches Industrie und Gewerbeblatt: As is well known, the Egyptian mummies furnish an article called mumia, much in demand for preparing a color used in oil painting (mummy brown, mumiine). This article, which is also employed as a popular medicine, is becoming more and more scarce, so that it is difficult to supply the demand, for the excavations are now permitted only under official supervision; the good mummies found are preserved for museums, while fragments are covered up again. A few years ago I was occupied in preparing mummy brown for oil painting purposes, and will give my experience with it here. I received a considerable amount of pulverized mummy in the shape of a light chocolate colored powder. On heating the powder turns dark brown black, with a pleasant, resin-like odor of incense and myrrh, then throws out vapors with an odor of asphaltum; it leaves a black glossy coal which leaves behind when burnt 17 per cent of ash with a strongly alkaline reaction, evolving plenty of carbonic acid when sprinkled with acids. In the closed tube vapors of acid reaction are obtained. With hot water a yellow brown solution of neutral reaction is obtained which smells like glue and extract of meat when inspissated, and yields 17 per cent of a yellow brown extract. From the aqueous solution acids precipitate brown black flakes which behave like humus. Alkalies color the aqueous solution darker; alcohol, ether, benzole, oil of turpentine, take up comparatively little; carbon sulphide, chloroform and spirits of sal-ammoniac more; hence the mumia behaved exactly like genuine mumia. The latter (spirits of sal-ammoniac) was used for the purification of the raw product, i. e., for the preparation of mummy brown. For this purpose the mumia was digested with spirits of sal-ammoniac (0·91) and the filtrate dried on the water bath. In this manner I obtained a handsome black brown, glossy, mummy dyestuff, soluble in water, which could not be distinguished from the French mumiine. The yield amounted to 20 per cent of the mumia. In this manner this popular and permanent glazing color may be cheaply and conveniently produced.

THE '98 SOLAR ACETYLENE GAS BICYCLE LAMP.

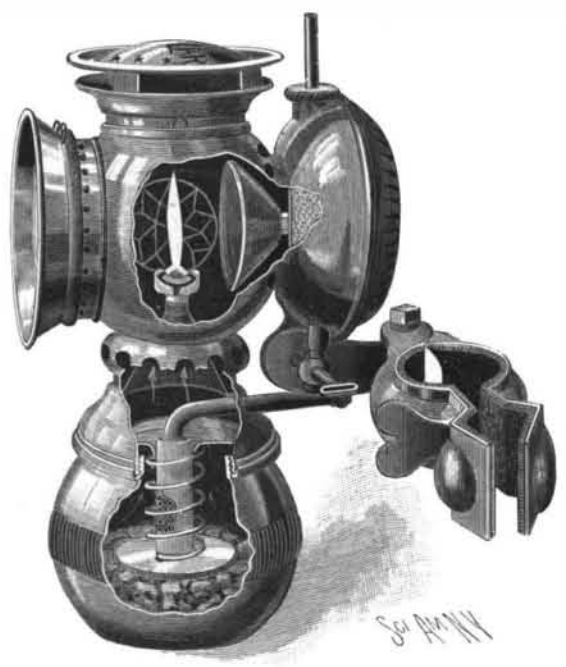
A lamp which cannot fail to attract the attention and secure the commendation of all bicycle riders is shown in the accompanying illustrations. It burns the new illuminant calcium carbide, which, as is now pretty generally understood, produces a light of the greatest brilliancy and steadiness, far exceeding that obtained from any other source, excepting electricity, with which alone it is to be compared. The possibilities of danger in the use of acetylene gas have undoubtedly retarded to some extent its more rapid introduction to general use, but this possibility seems to be entirely eliminated in the lamp herewith represented, and the cheapening of the price of calcium carbide renders the lamp extremely economical. It is manufactured by the Badger Brass Manufacturing Company, of Kenosha, Wis., and we are informed that, although it was not introduced until near the close of last season, many thousands of these lamps have been sold in England and on the Continent of Europe, as well as in this country. The company own and operate a complete, well-equipped factory devoted exclusively to the manufacture of acetylene gas lamps.



Sectional View.

ACETYLENE GAS LAMP.

As shown in the sectional view, the water tank, J, being filled, and the valve, I, being open, the water passes into the tube, F, which is filled with fiber, G, through which it percolates, vaporizing from the end into the screen tube, B, saturating the fiber in contact with the carbide in the tank, A, forming instantly gas which passes out of the tip, L. The amount of gas generated is due to the amount of water supplied. Should the lamp be so severely jarred that an excess of water is forced through the wick tube, thus generating an excess of gas for the moment (by excess is meant more pressure than the one-fourth foot tip, L, can consume), the result is the gas, having but one other outlet, viz., via the water tube, backs through the wick tube, stopping any further supply of water until the pressure ceases, when it is again required. The gas and water pressure being always in balance, we have an automatic water pressure feed generator, which, with the outlet at the top of the water tank, makes it absolutely inexplosive.



AN ACETYLENE GAS BICYCLE LAMP.

The burner is a lava tip with diagonally opposite orifices, producing a large and brilliant flame, known as the fishtail flame, of very high efficiency. With the carbide compartment two-thirds filled this lamp will burn six hours, the lamp being extinguished by simply turning off the water. The carbide compartment is readily taken off and put on, the grayish ash being thrown out and the lumps retained, and the screen tube being brushed off if necessary. It is a very simple matter to keep the lamp clean and in good working order, and the carbide is furnished in small airtight cylinders which may be carried without inconvenience, no specially prepared or packaged carbide being required. The lamp has a double convex lens, 2½ inches in diameter, 5½ inch focus, readily removable for cleaning, and the bracket employed is a special universal adjustable one, which will fit head, handle bar post, fork, or the dashboard or lamp irons of a carriage. In completeness of detail and beauty of finish the lamp leaves nothing to be desired.

Patents that Pay.

Many inventors complain that "there is no money in inventions nowadays." It is doubtless true that many inventions that are patented fail to return any money to their inventors, but this may be, first, because the patented article is of no commercial use and will not attract buyers, or second, because, while the article may possess very great commercial possibilities, the owner does not possess either the capital or the business tact to push it, or holds it at so high a figure that he drives away all possible purchasers. That patented articles do sell, and sell well, may be seen by all inventors who may look up the business in all its details.

In a recently published paper in Washington, D. C., a compilation of the latest sales of patents showed that one inventor has sold a patented dispensing can for $600, another sold a graining apparatus for $500, and another sold a patent on folding wall shelves for $1,000. The same list showed a patent for the ornamentation of metal surfaces sold for $800, a clamp sold for $5,000, an amalgamating machine sold for $30,000, a clover feeder for $5,000, a sleeping car for $5,000, a fireproof floor for $1,200, a weather strip for $1,000, a boot heel for $500 and another for $1,000, a wire fence machine for $1,200, an automatic ticket holder for $750, a dispensing can for $3,500, a dust pan for $1,082, a coffee-pot for $1,500, a can-filling machine for $600, a plow for $1,000, an auger for $1,000, a printing and card-cutting machine for $50,000, a graining stencil plate for $1,500, a key for $2,500, a machine joint for $1,000, a hydrocarbon burner for $1,700, a gas lamp for $20,000, and an expansion wheel for $1,000. Some other patents sold as low as $100.

Mechanics of the inventive turn of mind may see in such a list a good deal to encourage them. The sales cover only patents. Not one of these inventions had been worked. In each case the sum of money named is paid for the letters patent, and the purchasers make all the investments needed to manufacture and push the articles. One thing to be noted in all the sales is that in each case the article is a practical article. No perpetual motion or mysterious motor sale is recorded. Mechanics should note that it is only practical inventions that can have any commercial value in the estimation of observers. Mysteries do not sell. Fads are shunned. Cranks are avoided. Yet, with all the conservatism that characterizes business men, the investors who have attempted to solve practical problems and to supply practical needs can generally secure a hearing and a customer, provided always their ideas are well worked out and put into the concrete and attractive form of a working model.—The Iron Industry Gazette.

The "Maine" Supplement.

The current SUPPLEMENT, No. 1164, might appropriately be called the "Maine" SUPPLEMENT, as six pages are devoted to the description and illustration of the building of the ship, including its destruction and the official report of the Board of Inquiry. There are twenty illustrations, showing the great frames being lowered into position, the boat on the ways in the erecting shed, the castings for the ram bow and the stern post. The launching of the vessel, the completed battleship, and the awful scenes of wreckage after the explosion are given, followed by reproductions of the official drawings in the report of the "Maine." "The Navy of Spain" is the subject of an article with nine illustrations, taken from government sources. "The Home Modification of Milk," by William L. Baner, M.D., is a valuable article for all who are in any way interested in bringing up children. "Powerful Machinery for Working Structural Iron and Steel" is also illustrated. Among the articles on natural history are "Animals Underground" and "Mimicry in Insects." "The Psychology of Invention" is an article by Prof. Josiah Royce, of Harvard University. It is the first installment of a remarkable paper dealing with the scientific and psychological aspect of invention.

A Balloon for War Purposes.

A balloon for use in war has arrived at Fort Wadsworth, Staten Island, from Fort Logan, Colorado. It is in charge of Sergeant Baldwin, an experienced aeronaut, and will shortly have a trial, should the weather prove favorable. The balloon is made of silk and requires some 14,000 cubic feet of gas to inflate it. The plan is to fit it with search lights and a telephone.