

## Science and Art.

## Reduction of Auriferous Quartz.

The following from the London *Mining Journal* will be interesting to many of our readers in Virginia, Georgia, and California:—

"We have had an opportunity, during the week, of visiting the laboratory of the Royal Panopticon of Science and Art, to witness some experiments by Mr. Harris, of Dolgelly, assisted by Mr. Ansell, the professional chemist of the institution, for the economical extraction of gold from its matrix. The process is, we believe, a modification of an old German method, aided by the extensive experience and important chemical discoveries of modern times. The ore is from the Chancellorsville Mine, in Virginia, a quartz deeply covered with the red oxyd of iron; this is first calcined, and reduced to an impalpable powder, which is then placed in a glass retort immersed in a cistern of water, kept up to boiling temperature; this is connected by glass tubes, with a generator, in which chlorine gas is produced by the decomposition of the black oxyd of manganese, acted upon by hydrochloric acid. This gas passing through, and thoroughly saturating every particle of the gold dust, hitherto invisible, converts the same into a soluble chloride of gold. The sand is then well washed, the chloride consequently dissolved, and a stream of carburetted hydrogen being passed through the solution, precipitates the metallic gold in the form of a deep purple powder. In one portion of the apparatus a particle of leaf gold was placed in a glass tube, to show the effects of chlorine on metallic gold, and which was rapidly acted upon by it, being converted into a beautiful green chloride, lining the inside of the tube like a web. The process is expected to be very economical on a large scale."

## Analysis of Certain Pure Animal Oils.

	Sp. gr. at 64° F.	Carbon.	Hydrogen.	Oxygen.
Winter sperm oil	0.87971	0.76490	0.1150	0.11360
Lard oil	0.91146	0.76573	0.10536	0.12753
Whale oil	0.92000	0.77511	0.11430	0.11059

In mixing these oils, and probably all animal oils, no change of volume occurs. The following are the specific gravities observed at and calculated for a temperature of 65°-25 F., equal volumes respectively mixed as under

Mixed Oils.	Sp. Gr. obsd.	Sp. Gr. cal.
Winter sperm x lard	0.89735	0.89735
x whale	0.89905	0.89902
Lard x whale	0.91773	0.91750

If we assume as constant for all the mean of the respective factors of condensation from the original gaseous volumes into the volume of resulting liquid, we can calculate upon the specific gravity of said liquid the proportions of the elements it should contain. The following shows the result of such a calculation for the carbon in each of the above:

Carbon calculated	Sperm O.	Lard O.	Whale O.
do found	0.76115	0.78367	0.75854
	0.76490	0.76658	0.75511

The differences here between calculation and experiment, amounting to 1.2-3 per cent. for lard and whale oils, and 3-8 per cent. for sperm, are attributable, 1st, to certain errors of observation; 2d, to possible error in assuming the factor of condensation as constant in the different kinds of oil; and 3d, to probable physical variations in the constitution of different samples of the same oil. These variations may, however, be taken provisionally as covering the whole margin indicated by the above differences.

[The above analysis of oils is by Professors J. H. Alexander and Campbell Morfit, of the Maryland University. Lard oil is now generally preferred to whale oil for domestic use. It burns with a clearer light, and has not the offensive smell of fish oil.]

## A Natural Electric Battery.

In old Calabar there is an electric fish named *Malapterurus Beninensis*, the electric properties of which are taken advantage of by the natives as a remedy for their sick children. The fish is put into a vessel of water, and the child made to play with it; or the child is put into tub of water in which several fishes are placed. This fish has been described in the *Edinburgh New Philosophical Journal*, by R. Thomson, who has resided for some years in that country.—He states that he had a tame heron, which was fed upon fish caught for it, and upon one occa-

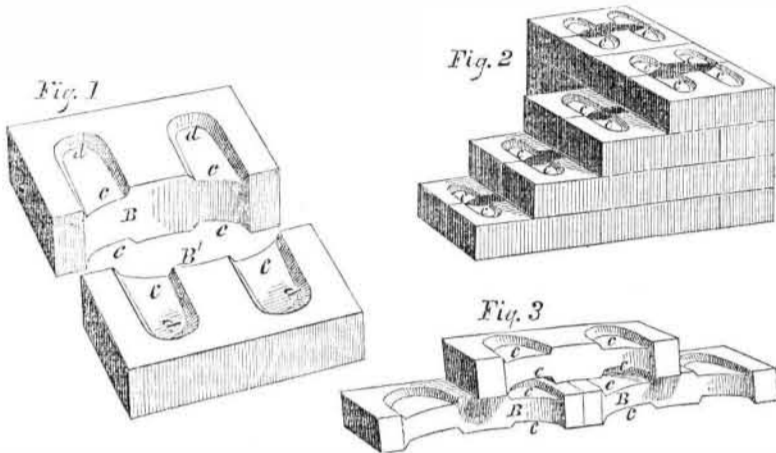
sion he swallowed a newly caught electric fish, which was no sooner down his gullet than over went the heron on his back. He had swallowed a natural electric battery, and was prostrated by the first shock. The fowl recovered, but never could be induced afterwards to dine upon *Malapterurus*.

## Mortality at Different Periods of Life.

In an essay on the physiological law of mortality, Prof. Buchanan makes some peculiar observations. It is stated that the mortality is greatest in the first year by 40-2 per cent. The security of human life is greatest at thirteen—that is 5 in 1,000 die. In the first month of life 90 in 1,000 die. The mortality does not increase in a regular ratio, but from inter-

fering causes. The mortality is very great at twenty-four, much greater than it is for some years after. M. Quetelet admits this, and sets the subsequent mortality at twenty-nine, and attributes this to the persons who are most violent at that age. The cause of increased mortality about twenty three and twenty-four is probably the anxieties, fatigues, and dangers attending the entrance into life and the obtaining of a livelihood; and the mortality amongst this class is far greater than amongst those who have succeeded in making provision for themselves. The security of life amongst the laboring classes of provident habits, judging from the results by investigations, is shown to be greater than among the higher classes, who are comparatively destitute.

## IMPROVEMENT IN BRICKS.



Mr. Edgar Conklin, of Cincinnati, Ohio, has lately obtained a patent for an improvement in the form of bricks, which promises to be of some importance. The accompanying engravings are illustrative of the invention.

The objects of the improvement are to secure greater beauty in the exterior appearance and finish of fronts, and also to render brick walls of all descriptions more secure than they are at present. This is done by a peculiar formation of the bricks which facilitates the use of grouting, cement, or soft slush mortar as a binding, in place of the common rough mortar. Grouting is a thin, watery kind of mortar, which, in time, becomes exceedingly hard and firm.

In the annexed engravings, fig. 1 shows the form of the improved bricks separately; fig. 2 exhibits their appearance when laid in a wall; fig. 3 is a section of wall.

The inner edges of these bricks, B, are made a little concave. The surfaces are formed with cavities or depressions, c, the back parts of which at d are the deepest. Except the depressions named, the surfaces are made flat in the usual manner, and come in contact, when put together, like ordinary bricks. In wall laying, the top surface of each course is to be washed over, by means of a white wash brush, with a thin coat of grouting or cement, or a thin stratum of slush mortar may be laid on. Grouting is then poured into the interstices, which in consequence of the openings formed by the cavities in the brick, has abundant opportunity to circulate among them, and as its nature is to solidify it forms the strongest kind of a binding. It is to be particularly observed that the grouting is confined within the wall, and, therefore, is not, like common mortar, exposed to the weather. In putting up house fronts, no pointing is required to be done, and no disfigurement, to be covered up with paint, is occasioned; on the contrary, the front ever presents the same unbroken smoothness and beauty.

The inventor thinks that walls may be laid in less time with his improved bricks than with the common kind, and that in addition to the gain in time, there will be a saving in the expense of mortar; the latter article may be used, however, if found desirable. He also believes that by reason of the greater strength in the mode of binding, an important saving in the number of bricks will be effected, since walls necessary to sustain a given pressure will not require to be built so thick as at present. It is conceded by some masons, that a 12 inch grouted wall is equal to one of 16 inches mortar laid.

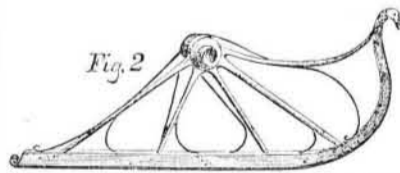
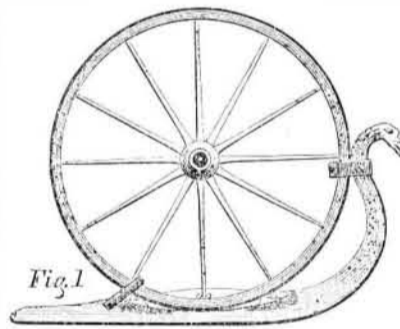
We are told that there is no difficulty either

in the molding, pressing, or burning of these improved bricks, and no increase of expense. If the usual care is taken in sorting out from the kilns, the proper proportion of bricks that are sufficiently true and even for fronts will generally be found.

It is said that exposed walls must be taken down and relaid at least once in a generation, in consequence of the crumbling and destructive effects of the weather upon mortar. Such objections, it is believed, cannot exist where the present improvement is adopted.

We might mention other interesting particulars, but space forbids. Further information can be had of the inventor at Cincinnati. His patent bears date Jan. 1, 1856.

## Snow Shoes for Wheeled Vehicles.



In large cities, and other places where wheeled conveyances are plenty, sleighs scarce, and sleighing times few, it is desirable to have some quick and handy means of adapting ordinary vehicles to snowy emergencies.

Two very simple methods suggest themselves, which we here present with engravings.

Fig. 1 exhibits a skeleton runner or shoe, placed beneath the wheel, and clasped in the manner shown. Attach one to each wheel, and the wagon is transformed into the tallest sort of a sleigh. Each runner might be so extended as to support two wheels. We observe that some of the fire engines in this city are furnished with shoes of this sort, upon which they slide along with great facility. The snow in our streets, at the time of this writing, varies from one to two feet in depth, rendering transportation by wheels a matter of extreme difficulty. Wheels, owing to their narrow bearings upon the snow, cut in and mire. Fig. 2 shows a cheaply made runner, fur-

nished with a hub, the object being to permit the removal of the wheel and the slipping on of the runner in its place; this done, the vehicle is ready for use as a sleigh.

The device shown in fig. 1, or its equivalent, has been often presented to us by different individuals who have invented the same, with inquiry as to whether it was patentable. We presume it has been re-invented by hundreds of people since the last snow storm. To save them the trouble of writing to us, we would state that the plan is as old as Greenland, and not patentable.

We wonder if our neighbors of the Long Island Railroad Company couldn't adapt these snow-shoe contrivances to their cars, with profit to themselves and convenience to the public? This enterprising concern, we are told, has suffered its rails to remain covered up in the snow for about two weeks past, and are now said to be waiting for the spring thaws. Should the season be backward, as sometimes happens, the Islanders will be in a sorry plight.

## Horrible Effects of Foul Air.

The American ship *Waverly* lately sailed from China with 450 Chinese laborers on board, called Coolies, it is said for Peru or the West Indies. The captain having died, the mate put into Manilla to bury him. Some trouble ensued on board, when the mate shot two or three of the Coolies and drove the rest below, then went on shore to attend the funeral of the captain. On his return the hatches were opened, when, out of 450 men, 251 were dead from suffocation. The mate and crew were imprisoned.

## Eclipses During 1856.

There will be two eclipses of the sun and two of the moon this year. A total eclipse of the sun will take place on the 5th of April, and an annular eclipse on the 28th of September, both invisible here. There will be a partial eclipse of the moon on the 29th of April, which will be visible early in the morning; and a similar eclipse on the 13th of October, also visible in the evening.



Inventors, and Manufacturers

ELEVENTH YEAR!

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