

CARRARA AND ITS QUARRIES.

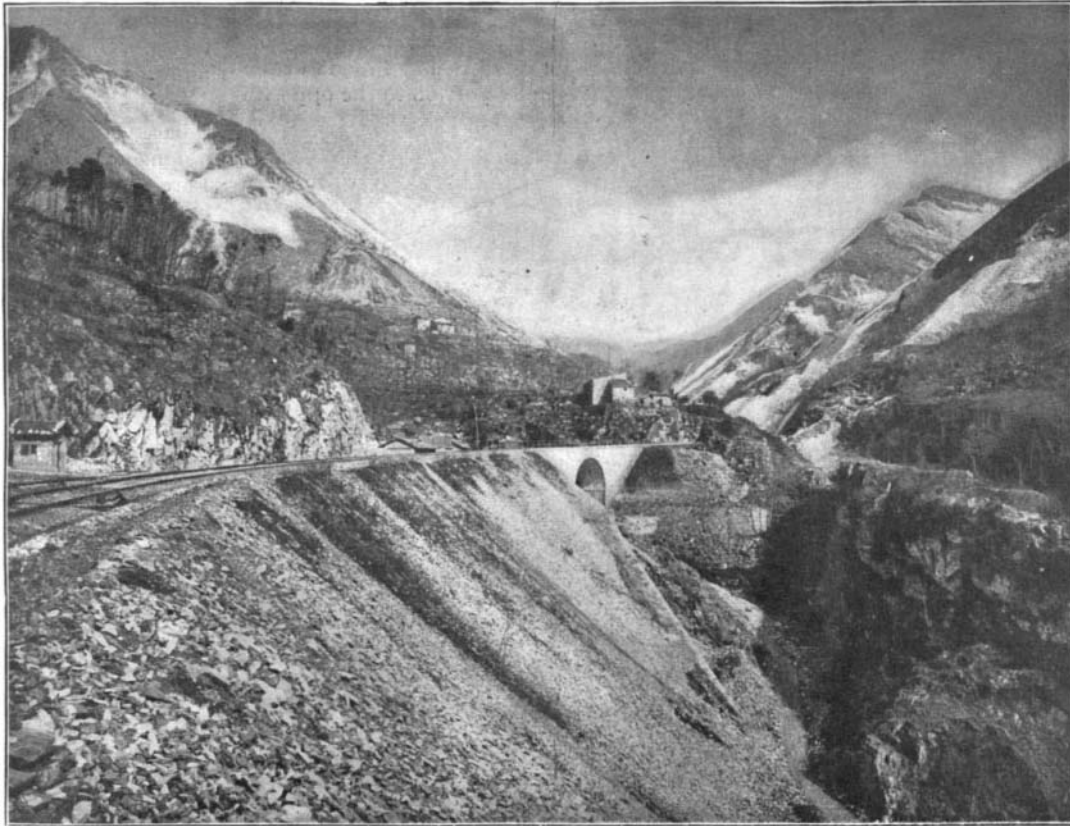
Carrara marble is known throughout the world, yet few of the many tourists who are whirled along the Mediterranean Railway from Rome to Genoa ever stop to visit the spot from which this famous stone is obtained. Carrara lies on the railway between Pisa and Florence, and an excursion to the Carrara Mountains is not difficult. Carrara itself is hardly worth visiting, being simply an aggregation of homely houses on the banks of a muddy torrent at the base of the mountains. The mountains themselves can be seen even from the line of the Mediterranean Railway, the marble cropping out in numerous places. All the inhabitants of the little town are directly or indirectly interested in the quarrying, working, and shaping of the marble, and the glare of marble dust and marble meets one on every side. The marble quarries are entirely different from what might be expected, and in place of craning the neck to gaze down into the bowels of the earth, one only has to admire the long, irregular rift in the flank of the mountain, for the quarrying is all done on the surface and does not require the construction of pits or galleries. The quarries have been likened by one writer to a cascade of water suddenly hardened into stone.

The percentage of men who meet horrible deaths in the quarries is very large, notwithstanding the fact that powder and not dynamite is used. Of course many of these accidents are caused by carelessness on the part of the workmen, but these could, in nearly every case, be safeguarded against by proper appliances. When the great blocks are once detached, they either roll down the mountain or are lowered to the desired place by means of ropes and tackle. No machinery is employed, and all the work is done with the crudest appliances. A blast is announced by three long notes on a horn, but little attention seems to be paid to this signal by the workmen, and many terrible accidents result in consequence.

A few years back, when accidents occurred, the cathedral bells were tolled to give warning to the people; but owing to the anxiety and anguish of thousands of poor families on hearing this gruesome sound, the custom has now been abolished, and the workmen all leave the quarries as soon as an accident occurs, in order to assure their families of their safety, and they are allowed their full day's pay. The pay of the workmen is wretched, varying from sixty to eighty cents a day. A blast is very exciting to a stranger, who is usually accompanied by a guide, who contrives to get him in a place of absolute safety during the explosion. The marble is blasted high up on the peak, and the pieces bound or leap downward until they strike some obstruction or the valley below. Formerly all of the immense chunks of marble had to be transported by primitive carts hauled by oxen, but now the railway affords an easy means of transporting to the market, and one of our engravings shows

the roughly shaped blocks being put on the ox carts and unloaded on the flat cars on the railway. The huge trucks are met everywhere floundering along, flinging great clouds of choking white dust in their train or splashing mud which is white in this remarkable locality. Each car is drawn by eighteen or twenty pairs of oxen which are covered with the white dust which is everywhere. They are goaded by their cruel drivers, for the Italians are notorious for their cruelty to animals.

rara marble has been a favorite with sculptors for nearly two thousand years, and to-day it is nearly always used by the sculptor in preference to marble from any other locality. It is also largely used in decorating churches, such as altars, etc. We have already illustrated in the SCIENTIFIC AMERICAN SUPPLEMENT for February 12, 1898, the interesting quarries at Serravezza which Michelangelo exploited by the order of Leo X. The methods of sawing and working the stone at Carrara are very much the same as those described in that article.



THE CARRARA MOUNTAINS, SHOWING RAILWAY TO QUARRIES.

An interesting excursion is to one of the quarries which were worked by the Romans, and the quarries show how primitive were the means employed by men of antiquity. They first marked out the block upon the solid mass, and they actually cut it out by hand labor. In many places one can still see blocks which lie embedded in the rubbish caused in quarrying and shipping them. The Romans split their blocks into slabs by inserting wooden wedges and keeping them continually wet until the swelling of the wood burst asunder the stone. A Roman altar was unearthed some years ago near the quarries, and a few rusty implements have also been discovered.

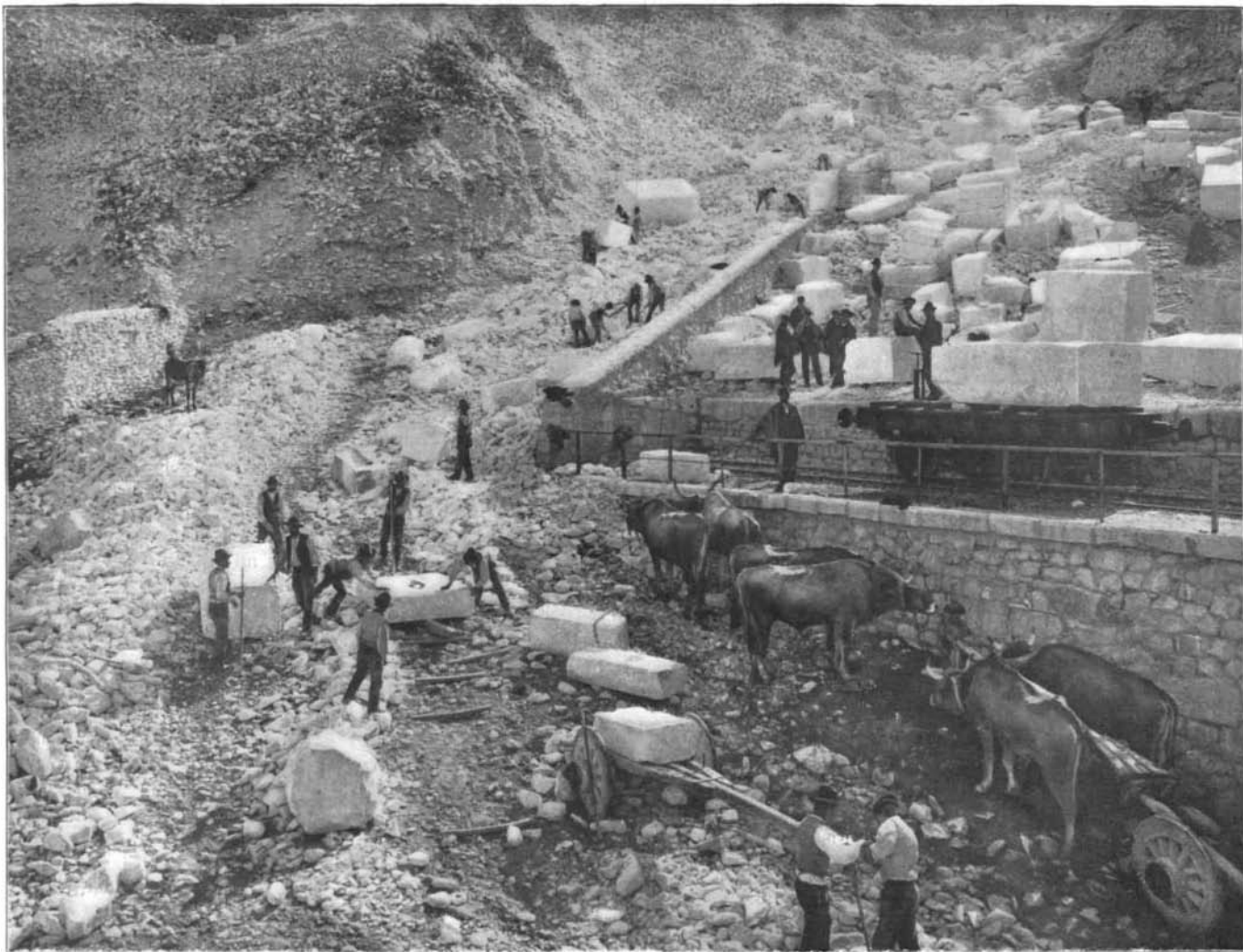
The views from the mountain are superb. To the east lies Tuscany, and to the south, on a clear day, can be seen the blue coasts of Corsica and Sardinia. Car-

mechanical, mining, etc., to public school teachers, to sanitary inspectors of schools and factories, to inspectors of foods, sanitary inspectors of charitable institutions, and to all others who hold official positions which involve any responsibility for public health. It is to be also promoted by laboratory researches and scientific investigations. The public is to be instructed in all sanitary matters by university extension work. It is also calculated to render expert chemical and bacteriological assistance to the Board of Health and to public health officers. A hygienic museum will also be established.

Death of Sir Douglas Galton.

Sir Douglas Galton died recently in London, at the age of seventy-seven. He was chiefly known in connection with his

work in railway engineering and sanitary science, in both of which fields he was a great authority. He also rendered important service in the cause of submarine telegraphy. In 1858, when the Atlantic cable had broken down and the Red Sea and Indian telegraphs had proved a failure, the British government appointed a committee to investigate the subject of submarine telegraphs, and Sir Douglas was appointed chairman of the committee. In 1861 he published a report which is a most valuable collection of facts concerning submarine cables. He acted as General Secretary of the British Association for twenty-five years, and he has also been President of it.



LOADING THE MARBLE; QUARRIES OF CARRARA.

Archæological News and Notes.

Some beautiful frescoes have recently been discovered in the church of the Frari, in Venice. They had been covered with whitewash in the seventeenth century.

Chæroneia's famous lion is to be restored and set up on the battlefield by the Archæological Society of Greece.

Money is being collected in England to help restore the belfry tower of the cathedral of Ravello, on the hilltop above Amalfi. It is necessary to strengthen and preserve the tower, as it is in a dangerous condition.

"Themis'ocles Phrearios" is scratched on an antique potsherd just dug up in the Areopagus at Athens. This is believed to have been one of the votes cast some twenty-four hundred years ago to ostracize the victor of Salamis.

The men-of-war of the ancient Romans had a crew of about two hundred and twenty-five men, of which one hundred and seventy-four were oarsmen working on three decks. The speed of these vessels was about six knots an hour in fair weather.

A massive silver goblet weighing over two pounds has recently been found at Windisch, the old Vendonissa, in the Canton Aargau of Switzerland. The goblet had been hidden with great care, probably by some Roman soldier. The work shows a warrior in armor with a Mercury and an ox.

It was rumored some time ago that France proposes to sell at auction the picturesque ruins of the walls of Aigues Mortes, the now silted-up port from which St. Louis, King of France, set out on his last crusade. It is said that the government also intends to sell a part of Mont Saint Michel to a company that wishes to build a casino.

An interesting discovery has recently been made in the Palace of the Senators at Rome, usually known as the Capitol. For several days workmen had been employed to remove a wall which showed signs of weakness, and in the course of the demolition a number of mediæval frescoes were discovered, the colors being extremely well preserved.

Naples' Castel Nuovo, the stronghold of the Angevine kings, lying between the royal palace and the harbor, is at last to become visible by the removal of the inclosing walls and shops built up against them. Under the Bourbons the castle was used for a dungeon for political prisoners and many of them were shot in the castle ditch without the formality of a trial.

The first ruins brought to light in the island of Milo are those of an ancient acropolis; there were also discovered the structure of three towns, each built over the other, and two of them, as indicated by the style of the fragments and vases, belong to the Mycænean era. The third lies next to the rock. The acropolis belongs to the island epoch before the introduction and development of Mycænean art. The excavations are regarded as very important.

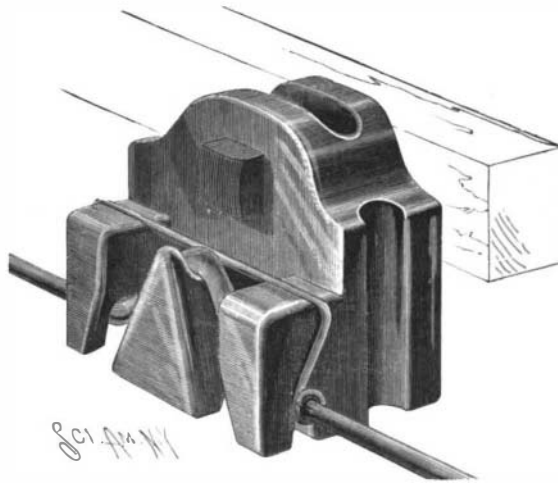
When the English captured the city of Benin, they found and sent to the British Museum some three hundred remarkable bronze castings. These present animals and human figures with various ornaments in relief. The lines are strong and the workmanship of great beauty. The origin of these castings greatly puzzles ethnologists. It is now thought by some archæologists, notably Mr. Read, of the British Museum, that they were the work of some European bronze founders who settled there in the sixteenth century.

A few months ago the Italian archæologist Signor Franceshini discovered in the church of Santa Croce, Florence, Italy, the tomb of Lorenzo Ghiberti, the designer of the famous Baptistery gates. He also found at a later time in the convent church of Sant Ambrose six famous graves containing the remains of the Florentine sculptor Mino, of Fiesole; Andrea del Verrocchio, the Florentine sculptor, goldsmith, and painter, who was the master of Leonardo da Vinci; Simone Pellaiuolo, Andrea Sansovino, the sculptor; Granacci and Leonardo Tasso.

In the cathedral of Genoa, Italy, is preserved, and has been for 600 years, a vase of immense value. It is said to be cut from a single emerald. It is $12\frac{3}{8}$ inches in diameter and its height is $5\frac{3}{4}$ inches. It is kept under several locks, the keys of which are in different hands, and it is rarely exhibited in public, only by an order of the Senate. A decree passed in 1476 forbids anyone going too near the precious relic. A Genoese antiquary has written a book to demonstrate that this vase was one of the gifts made to Solomon by the Queen of Sheba. It would be interesting to know if this vase has ever been carefully examined by a gem expert of reputation. It seems almost impossible that a single crystal of emerald of anything like the size could be obtained, and that it could be cut. Unfortunately, many of the precious jewels preserved in Italy shrink wonderfully in value when examined by the expert. Thus many of the jewels on the Bambino, in the church of Araceli, in Rome, are practically worthless.

A NOVEL INSULATOR.

To provide a device which will serve both as an insulator and as a bracket for sustaining a wire, and which is adapted both to exterior and interior wiring, is the purpose of the invention illustrated in our engraving. The insulator, it will be observed, has a body portion eccentrically pivoted so that it can swing. The lower and heavier portion of the body is provided with three studs separated by grooves. Of these three studs, the central one is triangular in shape and is undercut to form an overhanging end. The two remaining studs are also provided with overhanging ends. In placing a heavy wire on the insulator, the body-portion may be rocked, and the wire laid in one of the grooves. By rocking the body-portion to the opposite



BLOES' AND HARLOE'S INSULATOR.

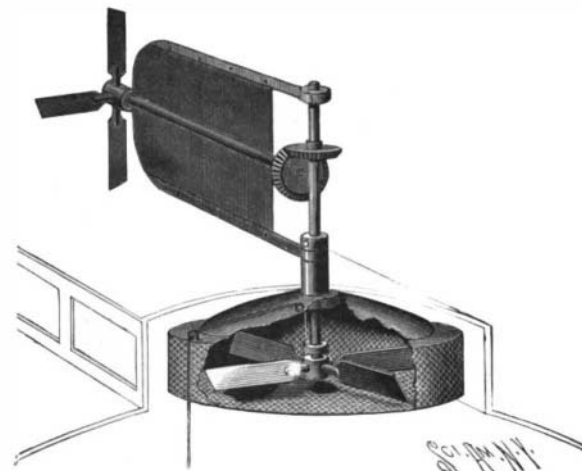
side, the wire may be laid in the other groove and on the triangular central stud. In this manner the heaviest wire may be bent upon the insulator with ease. If it be so desired, the wire may be further secured in place by a fastening, as shown in the illustration; but the use of such a fastening is not always necessary. By mounting the body portion so that it can rock, the insulator is enabled to yield to the sag of the wire and is not readily jarred or broken. The insulator has been patented by the inventors, Wilton S. Bloes and Morton Harloe, of Peckville, Penn.

A SIMPLE VENTILATOR FOR RAILWAY-CARS.

The invention which forms the subject of the accompanying engraving is a ventilator which is designed to produce a thorough circulation of air in a railway car or other vehicle, without admitting dust or cinders. The invention has been patented by Lawrence White, of Dallas, Tex.

The ventilator comprises essentially two shafts, which carry the ventilating devices and which are connected by driving-mechanism.

Of these two shafts, one is vertically journaled in a bearing in the top of the car, and at its lower end is provided with a fan surrounded by a wire cage. Secured to an idler on the shaft above the fan is a cord, by means of which the shaft can be raised if desired.



WHITE'S VENTILATOR FOR RAILWAY-CARS.

At its upper end the shaft loosely receives the two arms of a vane.

In a bearing in this vane, the other shaft is horizontally journaled. This horizontal shaft is provided at its inner end with a bevel-gear meshing with a bevel-gear on the vertical shaft, and is provided at its outer end with a windwheel.

In the operation of the ventilator, the vane will automatically shift according to the direction in which the train is traveling, so that the current of air induced will revolve the windwheel. This motion will be communicated to the vertical shaft by means of the bevel-gears in order to drive the fan within the car. When it is desired to stop the fan, the cord secured to the idler is pulled, thus raising the vertical shaft and throwing the bevel-gears out of mesh.

Science Notes.

During the recent religious fêtes in Turkey the government sent police officers to all of the druggists' shops to seal up packages of potassium chlorate in order to prevent its use in the manufacture of explosives.

M. Georges Claude has recently made experiments on the explosive power of acetylene at low temperatures. He finds that the solubility of acetylene in acetone increases very rapidly as the temperature diminishes, acetone at -80° C. dissolving more than 2,000 volumes of gas. Platinum wire may be kept at a red heat in this solution without any explosion taking place. Liquid acetylene at -80° C. behaves admirably.

Norway has passed a law prohibiting the sale of tobacco to any boy under sixteen years of age without a signed order from an adult relative or an employer. Foreign travelers are also forbidden to offer cigarettes to boys, and make themselves liable to prosecution if they do so. The police are required to confiscate all the pipes, cigars, and cigarettes of boys who smoke in the public streets. A sliding scale of fines is provided. They vary from 50 cents to \$25.

Word has reached Shanghai from Yachow, in the interior of China, of the safe arrival there of the French explorer and adventurer M. Benin, after many narrow escapes from death on the trip through Thibet. After Mr. Landor's remarkable adventures in Thibet, we do not understand why any other traveler would wish to run the chances of going through the same ordeal. The people of this strange land are certainly within their rights if they do not desire the visits of foreigners, and resent their trespass.

Bonn on the Rhine has been investigating the liquor drinking habits of its small children. Out of two hundred and forty-seven children of the age of seven and eight years in the primary schools, there was not one who had not tasted beer or wine and about one-quarter of them had tasted brandy. Beer or wine was drunk regularly every day by one-quarter of them. Eight per cent received a daily glass of cognac from their parents to make them strong, and sixteen per cent would not drink milk because they said "it had no taste."

The Judge Advocate-General of the Navy has rendered an opinion which has been indorsed by the department, relative to the question of the staff officers of the navy having a title of rear-admiral while serving as chiefs of the Navy Bureau. He has decided that officers of the line, serving as chiefs of bureaus, must be addressed by their actual titles in the line, notwithstanding the fact that they have the rank of rear-admiral while holding an office as head of the bureau. Should a rear-admiral receive such an appointment, he would, of course, receive the full title of his position.

We have often spoken of the danger of contamination of wells by sewage, and a striking confirmation of it was offered when the water works machinery of a Maryland town of three hundred inhabitants broke down. For one day, water from an old well was used. Ten days later there was an outbreak of inflammatory intestinal disorders, and three cases of typhoid fever resulted. The water was tested and found to contain not less than 4,100 bacilli in one cubic centimeter, which is, of course, equivalent to about fifteen drops. The regular water supply contained 80 bacilli to a centimeter, which cannot be considered very satisfactory.

Recently a street car on Lenox Avenue, New York city, was set on fire by electricity and burned, and a car of the Sixth Avenue underground electric line was also burned a few days later. This seems to threaten a new danger to citizens who depend upon street cars operated by electricity as their usual means of conveyance. Fortunately no one was injured in either case, but had the cars been very crowded, it is very possible that serious physical injuries might have been inflicted. Such fires have occurred on electric cars ever since the beginning of electric railroading. Fortunately, they start outside the car, so that chances are given to the passengers to make their escape. It would not be at all a bad idea for all electric cars to carry a small fire extinguisher. This is done on many steam railroads and on the Brooklyn Bridge.

According to the correspondent of The Daily Chronicle, the irrepressible Szczezanik, the young inventor, has presented the Emperor Francis Josef with the first web produced by means of his photographic process. It is about two meters square and gives an allegorical representation of homage to the Emperor. It is said the work contains 200,000,000 crossings, 120 silk threads filling one centimeter. Two hundred square meters of pasteboard cards would have been necessary to produce this web according to the methods now in vogue, and designers would have required many years to carry out the work. It is said the work was done in five hours. Unfortunately, all of Herr Szczezanik's inventions are shrouded in mystery. However, at the coming World's Fair he promises to unbosom himself, and we shall probably have to wait until that time for explicit details of his inventions.