

which will look dark, almost dirty, when in contrast with a white or light background, seems light, bright, and delicate when contrasted with a very dark background. No lesson is more strikingly enforced than this in the portraits of Mons. Adam-Salomon, where the prevalence of deep shade in backgrounds is made to give such value to all the lights, and such especial delicacy to the flesh. The very deep-tinted spandril here serves the same purpose, and gives an effect of brilliancy to the lights, and extreme tenderness and delicacy to all the shadows in the image, although the picture is printed sufficiently deep to secure vigour and force.

The effect may be easily tried by all who have the presses used for "diamond cameras," as the only additional requisite would be an oval die sufficiently large for a single image on the card; and all photographers requiring some novelty to stimulate business will find this, amongst others, worthy of attention.

#### THE BATTLE OF ST. FOY.

At a recent meeting of the Quebec Literary and Historical Society, a paper prepared by Dr. Anderson on the military operations at Quebec in the winter of '57-'59, was read by Dr. Miles, of which the *Chronicle* publishes the following summary:—

"The lecturer said that the campaign of 1759 might be said to have closed with the capitulation of Quebec, and as the British Generals had been likewise successful in the west, it was probable, that unless the French were re-inforced in the Spring from Europe, their forces in Canada, estimated at 10,000 men, including 5,000 regulars, would next campaign have to surrender, and the country be yielded to Great Britain—but if a French armament should appear in the St. Lawrence before a British, there was a possibility that Quebec might be recaptured, and the conquest of Canada postponed for some time, if not altogether averted.

"The fortress which was placed in Murray's hands had been truly described by Montcalm, as a 'miserable garrison,' the population was unfriendly—actively hostile—unless where it was under the immediate influence of the army of occupation—his soldiers, though veterans, were unprepared for a Canadian winter. Still, as there were left with him 7,000 men, sustained by the prestige of victory, up to the 26th January he wrote confidently of his position. How completely his anticipations were disappointed, his despatch to Pitt clearly discloses. He writes: 'As I had the honour to acquaint you formerly that Quebec could be looked upon in no other light than that of a strong cantonment, and that any works I should add to it should be in that style, my plan of defence was to take the earliest opportunity of entrenching myself upon the heights of Abraham, which entirely command the ramparts of the place, at the distance of 800 yards, and might have been defended by our numbers against a large army.' He then goes on to show how he had failed to carry out his intention, owing to the severity of the frost, and that the harassing duties which the garrison had to perform, and the scarcity of fresh provisions, combined with the cold, had brought on scurvy, by which he had lost 1,000 men, and that the survivors were so debilitated that on the 28th of April he was only able to lead 2,000 men to meet Levis. His reasons for going out he thus explains: 'The enemy was greatly superior in numbers, it is true; but when I considered that our little army was in the habit of beating that enemy, and had a very fine train of field artillery, that shutting ourselves up at once within the walls was putting all upon the single chance of holding out for a considerable time a wretched fortification, in a chance which an action in the field could hardly alter, at the same time that it gave an additional one, perhaps a better, I resolved to give them battle, and if the event was not prosperous, to hold out to the last extremity, and then to retreat to the Isle of Orleans or Cordes with what was left of the garrison, to wait for reinforcements.'

"The result of the battle is thus given: 'They had sustained with unparalleled firmness the united efforts of the enemy's regulars, Indians and Canadians, till at last fairly fought down and reduced to a handful, they were obliged to yield to superior numbers. Our killed and wounded amounted to one-third of those in the field; that of the enemy, according to their own confession, exceeds 2,500 men, which may be readily conceived, as the action lasted an hour and three quarters.'

"The lecturer then alluded to the great discrepancies among writers as to the numbers engaged in the battle of St. Foy, showing that there was no great difference between the statements of Levis and Murray, the opposing commanders, who ought certainly to know best. Murray says that he led out 3,000, Levis says 4,000, and that he himself had only actually engaged in the battle 4,500. L'Abbe Ferland is content to accept Levis' statement, but Garneau affirms that Murray had 6,700, and that Levis' force was 'almost co-equal.' Garneau, therefore, gives both the commanders nearly double what each said he had.

"The lecture thus concluded.—'We have now seen how widely conflicting are the accounts of the battle of St. Foy. We cannot think that justice has been done to either of the parties engaged. We believe that as a battle it was more severe, and its results nearly as important as the battle of the previous year, but the death of the two distinguished and chivalrous commanders attached so much romance to that battle, that the world has been carried away from the consideration of the other important features which it presents; but we can now look at both dispassionately, and we are at once struck with the fact that the battle of 13th September was decided in eight or at most in fifteen minutes, with a loss to the victors of 57 killed and 600 wounded, and to the vanquished of 500 killed and 500 wounded. The battle of the 28th April was the most severely contested action of the whole war; it lasted, according to Murray, one hour and three quarters, (according to Garneau, three hours), with a loss to him of a third of his whole force, and to Levis of 2,500 men. After having given the matter our best consideration, and divesting ourselves of prejudice as far as we can, we may safely say that of the victory of St. Foy, the French might well be proud, and the British have no reason to be ashamed. The monument of St. Foy is only a just tribute which their common descendants have paid to the brave men who fought and fell there, and to their heroic commanders, Levis and Murray.'

Photography has arrived at something like perfection, for it is announced that a discovery has been made—viz., the printing of photographic pictures in permanent pigments or ordinary printer's ink, at an ordinary printing-press. This has been accomplished, and very successfully too.

#### MINERAL DEPOSITS.

[Lecture by William T. Brigham, before the Boston Society of Natural History.]

The deposits of minerals, the extraction of which forms the subject of mining, are found in two forms; beds originally more or less horizontal, and veins. The form in which a mineral is found is usually the same; thus coal is generally deposited at the bottom of fresh water and appears as a bed. The only other mineral of importance, if we except rock salt, found in this form, is bog iron. This ore is one of the best oxides of iron, and is frequent in the United States and Sweden. The position of coal beds is usually determined by the dip of the stratum at its outcrop. These beds are often divided by intervening strata of limestone or shale. Augers similar to those used in boring artesian wells are employed to find the depth and thickness of these beds. This mode is extensively practised in France. It is only within a little more than a century that coal has attained a commercial value, and within that period the scientific college of France sanctioned its use, declaring it not to be a poisonous fuel. Its consumption has now reached such a degree, that in a single year over a hundred and seventy millions of tons were quarried, and of this quantity England produced one hundred millions of tons.

By far the greater number of minerals used in the arts are found in the second form, viz.: that of veins, which are as definitely placed as beds. Where an eruptive rock has been forced upwards, breaking a series of strata, a vein is formed in the fracture, and also smaller veins are formed in the surrounding cracks. Accidents and faults occur in veins as in strata, and are caused by disturbances after the deposition of the metallic veins. These accidents are so various, and the veins so intricate, that science is sometimes at fault. This places geologists in bad repute among practical miners, and this feeling was so strong at the time of Prof. Silliman's visit to California, that he was refused admittance to many of the mines. Veins are often heterogeneous in their composition, and a section of a certain Spanish vein exhibited the following substances in the order of their enumeration: Partially decayed rock, or gossan; a brown iron ore; galena, or sulphide of lead; gray sulphate of lead; white sulphate of lead; pure white metal; iron with patches of ochre; barytes with patches of galena; galena in large grains; sulphate of lead; and lastly, the surrounding gossan. This is an extreme example, but veins are seldom simple.

A conformation not frequent is that of a large vein termed *Vena Madre*, or mother vein, accompanied by smaller contiguous and parallel veins. This may extend for a hundred miles with a veritable width of from six to one hundred feet. Of this character are the celebrated Washoe and Comstock lodes, which latter produced from 1862 to 1865 inclusive metal equal in value to forty-eight millions of dollars, two-thirds being silver and one-third gold. Lodes are sometimes of such definite width, that miners may and do divide them by the length, each owning a certain number of feet. Thus a vein is worked at several points. The surrounding medium is often quartz, in the fissures of which are found scales of gold. Silver is found in several forms, some of the most noticeable of which are ruby silver, horn silver, and hair silver, the latter being a most beautiful and delicate mesh or net-work much prized for collections.

The extreme hardness of the quartz, and difficulty of separating the metal, often makes the working of a mine impracticable. But here nature comes to our aid. By the action of water during long ages, the enveloping rock is decayed, and the golden scales and nuggets washed down, and deposited, together with a large amount of foreign matter, in the beds of the streams. These streams have been, by volcanic or other action, covered to some depth with soil. The uncovering of these ancient river-beds, and the washing of the deposits there found, constitute placer mining. This method was first discovered in California by a Mormon, a member of Captain Suter's band, who in digging a race-way for a mill found many small yellow particles, which he supposed were gold. Of these he collected a large quantity, and in the autumn of 1848 sent them to San Francisco, then but a village. They attracted the attention of an old Georgian miner, who declared them similar to the nuggets found in the washings of that State. The news spread, and diggings for the valuable deposit were commenced in all parts of the State. In the spring of 1849 the panic extended to the Atlantic coast, and the memorable gold fever set in. During six months of that year no less than ninety thousand people went to California. As they exhausted the stream-beds found in the valleys, they followed the deposit up the mountain. This gave rise to that system of mining peculiar to America, called hydraulic mining. Rapid streams of water are conducted by elevated troughs, resembling old Roman aqueducts, and with immense pressure thrown against the sides of the mountains, washing down the soil, and uncovering these ancient beds. The matter thus washed down is made to pass over ditches constructed so as to catch the particles and nuggets of gold.

Platinum occurs in little flat grains, in appearance resembling dull silver. From this resemblance it derives its name *platina*, meaning little silver. The metal is unaffected by acids, and will not melt under a temperature of 2,000 degrees. It is chiefly found in the Ural mountains, and is used in Russia as coin.

Copper is found like silver in veins, often mixed with silica and other impurities. It is very difficult to smelt, and this branch of industry is mainly carried on at Swansea, in South Wales. There is also a smelting furnace at Boston. Carbonate of copper gives us two valuable compounds, viz.: blue carbonate, and green carbonate of copper, or malachite. Malachite is largely found in the Ural mountains, and is in common use in Russia. This metal is found pure, in sheets or nuggets, one having been found weighing five hundred tons. It was so ductile that it was found impossible to blast it, and it had to be cut into sections with cold chisels.

Galena, or common lead, is found crystallized into cubes and in veins, running through limestone reefs. Owing to the irregularities of the original coral reefs, large cavities or chambers are found in limestone often filled with lead.

Tin is chiefly found in Cornwall in the form of tin stone. It is also obtained by washing, sometimes transparent, and sometimes of a gray colour, and is called stream tin. Mercury was formerly obtained only at the mine of Almaden in Spain; but soon after the demand arose for it in California, it was found south of San Francisco, and the mine was named New Almaden. These mines are of immense value and extent, but

are in the hands of a gigantic monopoly, which will only produce a limited quantity. This cinnabar was used by the Indians for war-paint, and is sometimes found deposited in pouches like lead. Manganese is of a purple colour, and to its presence the amethyst owes its beautiful hue.

Metals are sometimes found in solution in the sea, and certain seaweeds possess the power of secreting silver. Old copper sheathings also collect by galvanic action an appreciable amount of silver.

The lecturer briefly called the attention of the audience to the providential distribution of the various natural deposits. Coal, wood, and limestone are necessary to the successful working of iron mines, and in all countries where iron abounds, these materials are also at hand. When mining had reached such a stage that works were abandoned from inability to keep the mines clear from the water which collected, the steam-engine was invented and first used only for this purpose. The necessity for an increased amount of appropriate fuel then arose, and was supplied by the discovery and use of coal. Thus science supplies the needs and emergencies of the arts.—*Scientific American*.

#### RAT-CATCHERS IN LONDON.

(Correspondence of the Boston Transcript.)

One other character we have here, that I never before heard of or met with. A most novel sight he is to see, dressed in a hunting costume, with broad enamel leather band, passing from waist to shoulder, on which is fastened a huge brass rat and the "royal coat of arms," with this inscription beneath: "Rat-catcher to Her Majesty!" Over his back, slung by a chain, is quite a large wire cage, well filled with rats; at his heels follow two or three terriers, who now and anon bark joyfully at their prey. Quite a ludicrous picture he makes, and one that always upsets Yankee gravity. We wonder if this "Rat-catcher to Her Majesty" ever makes his presence known to members of Parliament in the House of Lords? However, this same man can well afford the smiles of the incredulous as to the extent or necessity of his business; for a most imperative necessity he is. Without him London would literally swarm with the destructive pests. The extent of his business may be known from the fact that he is daily in receipt of large orders from all parts of the continent, for supplies of his rats for glove-makers and sportsmen's use. He owns a nice house in the fashionable quarter of London, and as he drives about the park on Sunday afternoon his stylish turn-out is the object of much attention. He yearly pays a small sum for his license, and receives one hundred pounds per annum for keeping St. Catherine's Dock free from rats. He visits all the shipping—his coming being ever looked for with pleasure. One ship was sadly troubled with a kind of rat that he called the Norwegian rat, which he seemed to prize highly, their fur being sleek and black; and so proved the quality of skin as being the finest and most elastic for glove-makers' use. Turning to us with a laugh, he said:—"To-morrow these will go to Paris to the glove manufactory; and who knows but that the lady will wear gloves made from these self-same skins, and wonder at their fine texture and colour." Shaking a cage of gray rats, he said:—"These go to a certain 'pit' where the people's quality will meet to give recreation to their dogs."

A very curious autograph has been discovered by an antiquarian who keeps a little shop near the Temple, in Paris. It is written on the fly-leaf of a manuscript *Livre d'Heures*, which had been in the possession of a shoemaker's family as long as the workman, who is now seventy-five years old, could remember, and he believes that his father obtained the book during the sack of the Hotel Sevigne, in 1793. The book bears the crown and insignia of the Queens of France, nearly effaced, and the letters M and C interlaced in the same manner as they are cut over the columns of the Louvre and the Halle aux blés. There is no doubt that the book belonged to Queen Catherine of Medicis, but the autograph in it is the most interesting portion. It is in the handwriting of Henry, Duke of Guise, and says, simply, "All is arranged for the 24th." It is signed, "Le B." This signature has much intrigued the experts, but it is easily explained as "Le Ballafré," under which name Henry of Lorraine was much known by reason of the scar he bore on his face. His words, no doubt, alluded to the terrible 24th of August, 1572, the day preceding St. Bartholomew massacre. Every one of these letters, perhaps, cost a hundred lives. The book has been sold to a Russian amateur for 3,500 frs.

**FEMALE GYMNASTS.**—The scandal of female gymnastics is exciting the press and the authorities of London. A German female gymnast has been walking on a wire fifty feet above the pit of the Holborn Circus, with her little child on her shoulders. To look up fifty feet at a woman skipping about on an invisible wire was a great delight, but to watch a mother and child in such peril was ecstasy, and the house was crowded nightly. The Police Commissioners wrote to the managers and requested them to leave out the Baby. Blondin and Leotard, and three hundred imitators, drew well for a time, but people got tired of them. Then there were female Blondins and Leotards, and now every music hall in England has its troupe of female gymnasts and acrobats, appearing as naked as so many South Sea Islanders, in the most grotesque and perilous positions, for a little money and much applause. One woman, said to be French, carries her husband and three well-grown children round the stage on her shoulders; another throws herself from the flying trapeze and is caught in mid-air by a man swinging head downward, holding by his toes forty feet above the footlights. Such performances as these, with a crash of music, a glare of tinsel, and a crammed house, filled with the fumes of gin, beer and tobacco, constitute the nightly amusements of perhaps half a million of the enlightened British public.

Madame Patti is said to have discovered behind the scenes of the St. Petersburg Opera House a youthful prodigy. The child in question, a girl nine years of age, had heard Madame Patti several times in the part of Margherita, and imitated her singing to such perfection that once, on making her exit, Madame Patti fancied that the repetition of the notes she had just been singing must be the work of an echo. Finding, however, that it proceeded from a clever and well-endowed little girl, she offered to adopt the young songstress; and, this proposition having been declined by the parents, she procured her admission into the St. Petersburg Conservatoire. The name of this interesting little phenomenon is Adler.