spire is 403 feet high from the foot of the tower. Strasbourg measures 468 feet from the level of the sea; but less than 403 feet from the level of the plain. By the clear morning light, the panorama from the steeple of Notre Dame at Antwerp can hardly be surpassed. One hundred and twenty-six steeples may be counted, far and near. Facing northward, the Scheldt winds away until it loses itself in a white line, which is none other than the North Sea. By the aid of a telescope ships can be distinguished out on the horizon, and the captains declare they can see the lofty spire one hundred and fifty miles distant. Middleburg at seventy-five, and Flessing at sixty-five miles, are also visible from the steeple. Looking towards Holland, we can distinguish Breda and Walladuc, each about fifty-four miles off.

Turning southward, we cannot help being struck by the fact that almost all the Belgian towers are within sight of each other. The two lordly and massive towers of St. Gudule's Church at Brussels, the noble fragment at Mechlin, that has stood for centuries awaiting its companion, besides many others, with carillons of less importance can be seen from Antwerp. So these mighty spires, gray and changeless in the air, seem to hold converse together over the heads of puny mortals, and their language is rolled from tower to tower by the music of the bells. "*Non sunt loquellæ neque sermones audiantur voces eorum.*" ("There is neither speech nor language, but their voices are heard among them.") Such is the inscription we copied from one bell in the tower at Anvers, signed "F. Hemony, Amstelodamia (Amsterdam), 1658.

AN INTERESTING SKETCH OF THE DISTINGUISHED AERONAUT, JOHN LA MOUNTAIN.

The following sketch of La Mountain is from the pen of George Demers, of the Albany *Evening Journal*. Mr. Demers accompanied him in six of his balloon voyages:

John La Mountain was not an ordinary man, and his death calls for something more than a passing mention. Though deficient in those advantages which are imparted by early education, he possessed marked natural genius, great resoluteness of purpose, and much inventive ability; qualities that in other spheres might have won him success in life, but which, devoted with enthusiasm to the profession of ballooning, got him fame only as an eccentric and intrepid adventurer.

La Mountain did not become an aeronaut for the purpose of the mountebank exhibitor. His necessities compelled him to make ascensions for public amusement. His higher object was to render aerial navigation of practical use in the great enterprise of modern progress and commerce. He never was a convert to the belief that balloons could be propelled in any direction at will, and in despite of adverse currents, by the aid of machinery. But he early became satisfied that there is a current in the atmosphere corresponding with the Gulf stream in the ocean, and flowing steadily over a very wide belt, from west to east. His own experience and that of others, amply confirm this opinion. He concluded then, that as balloons had been kept in the air for many hours at a time under ordinary circumstances, it was possible, by making one of superior capacity, to mount into this upper current, float with it across the ocean, and land at will, for instance in England, in sufficient proximity to London to make the voyage of immense value, in the saving of time it would accomplish. Acting upon these ideas, he was determined to be the first aeronaut who should cross the Atlantic.

So soon as he could obtain sufficient means by his exhibitions, Mr. La Mountain began the construction of a balloon in which he hoped to accomplish his daring scheme. Everything about it was most perfect. The silk, of extra quality, was manufactured expressly for him, and under his supervision, by the Messrs. Ryle, of Paterson, N. J. The rope for netting he made himself at a factory near Troy, subjecting every fiber and strand to severe tests. Great care was used in oiling and coating the silk. Adroit mechanism insured absolute control of the valves. When the "Atlantic" was completed, it was undoubtedly the strongest and most symmetrical, as well as the largest balloon ever floated in any country.

By way of demonstrating the feasibility of his plan, Mr. La Mountain determined upon a preliminary land voyage of great length. St. Louis was fixed upon as the starting point, and he ascended from that city in the presence of an immense concourse, accompanied by John Wise, the veteran Pennsylvanian aeronaut.

The voyagers remained in the air a little over nine hours, during which time they crossed Lake Erie at its largest part, and traveled far into New York State. Unfortunately, in crossing Lake Ontario, they descended for purposes of observation, and became involved in a tremendous tornado of which they had no knowledge when above. This bore them with frightful velocity to the shore, and left the balloon a wreck in the woods of Adams, Jefferson county. In a little more than nine hours the "Atlantic" had traversed a distance of eleven hundred and eighty miles.

Thus ended, for a time, all prospect of the voyage to England. La Mountain was saddened, but not discouraged. All he lacked was money. To obtain this, he resumed his career as an exhibitor. A small balloon was constructed of the fragments of the wrecked "Atlantic." The citizens of Watertown made him a generous subscription, and he started on a pleasure trip from that place, in company with Mr. John A. Haddock, then editor of the Watertown *Reformer*.

The incidents of this voyage will long be remembered. The balloonists had proposed to be back in a few hours. But days passed, and they did not come. Time lengthened and there were no tidings from them. First was uncertainty then doubt, then despair in the minds of friends. All sorts of wild stories and vague speculations were started. The tragic fate of poor Thurston was then fresh in the public mind, and the belief became general that La Mountain and his companion had met a similar death; although there were some wild enough to believe that the insane venture of crossing the Atlantic in a small and unreliable balloon, had been made. At last the mystery was explained. Having no compass, the aeronauts had lost their bearings, and suffered themselves to be carried far into the dense woods of the Ottawa reservation, in Canada. After wandering in their blank mazes for many days, subsisting upon leaves and berries, they were accidentally discovered when in the last stages of starvation, by some Indian scouts in the employ of Mr. Cameron, a lumberman, and thus saved from a horrible death. Their thrilling story was widely published, and graphically pictured by the illustrated newspapers.

After this second misfortune, Mr. La Mountain did not at once renew his Atlantic project. The war of the rebellion began to assume large proportions, and La Mountain was at different times stationed at Cloud's Mills, near Alexandria, at Fortress Monroe, and elsewhere. So long as the armies were lying in camp, as they did during the early portion of McClellan's remarkable career, balloons were of some value.

We last heard of him in public as making an ascension from a town in Michigan. An impatient and careless crowd cast him off before he was ready, without an overcoat or instruments, and the valve rope tied several feet above the basket. He shot like a rocket up into a cloud of mist and sleet, which congealed his blood and froze the valve board fast before he could control it. His only alternative was to climb, with frost-bitten fingers, up the net-work and tear the balloon with his teeth. The rip extended above the hemisphere, the balloon collapsed, discharged its gas, and fell with great velocity from a hight of nearly two miles. The aeronaut was picked up benumbed, insensible, but not dangerously injured. Undoubtedly, the suffering and exposure endured at this time hastened his death.

The career of Mr. La Mountain was peculiarly one of danger and ill fortune. But he faced hazards without a tremor, and endured disaster without a murmur; never faltering in devotion to his leading idea. We accompanied him six times above the clouds, and saw him twice under circumstances of great peril, when he was as calm and collected as if sitting in a parlor—not a muscle relaxing nor a fiber quivering. His fault was a lack of business practicality. But he made up for this, in a great degree, by intense enthusiasm and earnestness. Notwithstanding the success of the Atlantic telegraph had rendered the question of crossing the ocean with balloons less interesting and important than formerly, we believe he would have made the attempt; and in this day of almost marvelous achievements, it is not wise to say that he would have failed.

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 in 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 practiced 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 tuns were quarried, and of this quantity England produced one hundred millions of tuns.

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 ocher; 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 infrequent 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. This metal is unaffected by acids, and will not melt under a temperature of 2000 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 tuns. 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 color, 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 color, 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.

CEMENT FOR FASTENING INSTRUMENTS IN HANDLES.—A material for fastening knives or forks into their handles, when they have become loosened by use, is a much-needed article. The best cement for this purpose consists of 1 lb. of colophony (purchasable at the druggists'), and 8 oz. of sulphur, which are to be melted together and either kept in bars or reduced to powder. One part of the powder is to be mixed with half a part of iron filings, fine sand, or brickdust, and the cavity of the handle is then to be filed with this mixture. The stem of the knife or fork is then to be heated and inserted into the cavity; and when cold it will be found fixed n its place with great tenacity.

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