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Improved Combination Pleasure Velocipede.

A velocipede adapted to the use of all, old or young, large or small of either sex, skilled or unskilled, in which the pleasure of the exercise is enhanced by association, is the one of which we give an engraving. The action and details of this invention are so well delineated by our artist that scarcely any description is necessary. In looking at the picture one is seized with desire to mount and enjoy the exhilarating sport.

This machine is designed for use in private and public pleasure grounds, or to be let by the hour at large fairs and other public gatherings at which we can conceive of nothing more likely to prove remunerative. It combines all the advantages of the circular railway, so popular at Saratoga Springs and other pleasure resorts, with only a small fraction of the cost of such railways.

The way is made of scantlings or planks so arranged as to form a circular course upon which the combined efforts of a party of riders can get up an extraordinary speed. The handles are merely for the purpose of steadying the riders, as the apparatus needs no guidance. Each wheel when manned, either by ladies or gentlemen, is a driving wheel. Brakes can be attached if desired.

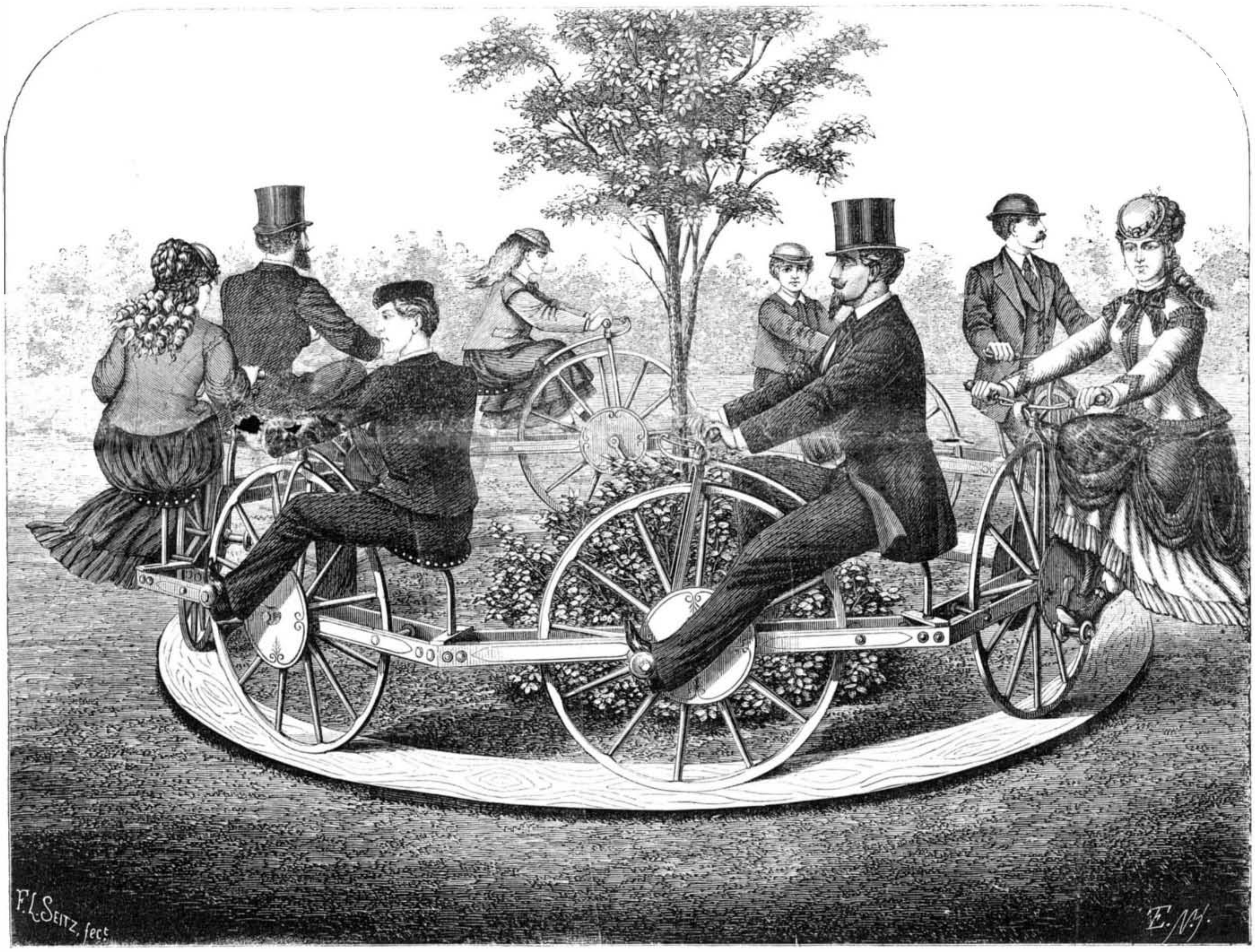
The arrangement of the apparatus in a pleasure ground or courtyard may be made very ornamental, and it will afford inexhaustible and healthful merriment to persons of all ages.

It would seem impossible for the most worn-out man of business to mount one of these seats with a party of spirited young people and not forget for the time that he was other than a rollicking lad in his "teens."

It does one's heart good says our enthusiastic informant, to hear children fairly shriek with glee as the maximum speed is attained. It has moreover this advantage that there is less liability to accident than with many other amusements of which children are fond.

Probably no more durable, useful, and attractive application of the principle of the velocipede than this has been brought out. It is capable of enlargement to accommodate more riders, and contains elements of popularity which will doubtless amply remunerate its ingenious inventor.

Patented through the Scientific American Patent Agency, May 4, 1869. Address for further information G. J. Sturdy & Co., 118 Dorance street, Providence, R. I. State and county rights for sale.



STURDY AND YOUNG'S CIRCULAR VELOCIPEDE.

ANTIMONY.

The story goes that a Benedictine monk, named Basil Valentine, who lived about the time of Luther, at Erfurt, and was fond of scientific researches, gave metallic powders to some hogs, the effect of which was to purge them thoroughly and then to fatten them. He wrote a book called the "Triumphant Chariot of Antimony," in which occurs the following curious passage:

"Let men know that antimony not only purgeth gold, cleaneth and frees it from every peregrine matter, and from all other metals, but also (by a power innate in itself) effects the same in man and beasts. If a farmer purpose in himself to keep up and fatten any of his cattle—as for example, a hog—two or three days before let him give to the swine a convenient dose of crude antimony, about half a drachm, mixed with his food, that by it he may be purged; through which purgative he will not only acquire an appetite to his meat, but the sooner increase and be fattened. And if any swine labor with a disease about his liver, antimony causeth it to be dried up and expelled."

In the kindness of his heart, Valentine thought what a good thing it would be to give some of this fattening powder to his fasting brethren. Unfortunately for the success of the theory, all who partook of it died; hereupon the poisonous mineral was called *anti-moine*, or *antimony*—destructive to monks. There is probably more fancy than fact in this narrative; but as it serves to enliven the tedium of a lecture on this metal, it will no doubt retain its place in our books, and be told to all future generations as a capital joke upon Valentine.

The compounds of antimony were known to the most ancient races, and it was used by the women of the East chiefly for staining the upper and under edges of the eyelids, so as to increase the apparent size of the eye. It is said of Jezebel that she "put her eyes in sulphuret of antimony," as the passage literally means, when Jehu came to Jezreel; and the ancient Greeks called the ore *broad eye*, from this custom.

The alchemists entertained great hopes of the new metal. As they called the acid that could dissolve gold *aqua-regia*, or royal water, so they named antimony *regulus*, or little king, because it so easily attacks and renders brittle, and thus destroys gold. It was also called the wolf among metals, on account of this property of devouring the harmless lambs of the flock. Although the compounds were so long known, the metal itself was not prepared until about the same time as Columbus discovered America. There is something interesting in this coincidence, as the narrative of the great navigator's exploits would have reached but a small portion of the inhabitants of the globe, if it had not been for the invention of movable types, made from antimony and lead, with which to print the story. And to cite another freak of invention, we will state that the shafts of the steamships that cross the ocean, rest in bearings largely made of antimony—and thus commerce and letters owe a great debt to this metal.

We sometimes find antimony in a pure state directly upon the surface of the earth, but this would be too good fortune to be lasting, and in actual mining very little is obtained from such a source. We meet with it in combination with arsenic —in fact, the two metals, arsenic and antimony, appear to have a great affection for each other, and are often found together. Their habits are very much alike, and they are mutually enemies of mankind, as they are violent poisons. The principal ore of antimony is a suphide called stibnite, and from this it is chiefly made. The ore is roasted, and afterward fused with potash and charcoal; and sometimes purified by being dissolved in acid, and precipitated by water, and again fused so as to produce what is, even to the present day, called the regulus of antimony.

The metal is very brilliant, highly crystalline, and can be pulverized the same as a mineral; from which it can be inferred that we cannot draw it out into tubes or wires, or hammer it into sheets, as we can copper and many other metals.

It has a specific gravity of 6·7, and a cubic foot of it weighs about four hundred and twenty pounds. It melts at a low temperature, and when it solidifies from fusion, it expands a little, the same as ice, and takes a perfect copy of a mold. This latter property enables us to employ it in the manufacture of type and music metal. We cannot employ antimony alone for this purpose, as it is too brittle, so we sometimes melt lead, and at other times tin with it. In different countries they use different metals to alloy with antimony to make types. Some English types were found to contain about sixty-nine parts of lead, nineteen and a half of antimony, nine of tin, and the balance of copper. Other specimens have recently been made of seventy-five parts of tin and twenty-five parts of antimony. The manufacturers of types have secrets of their own, which they naturally do not wish to divulge, a great point being to have the faces hard, the impression sharp, and then to be able to cast the very smallest type.

There is a peculiar kind of antimony made by means of the galvanic battery, which explodes like gunpowder when it is touched with a red hot iron. It is even not safe to scratch it with a file for fear of serious consequences. Fortunately, this form of the metal is not commonly met with in the arts, or dealers in the article would be exposed to much danger. Compounds of antimony are used in the manufacture of certain kinds of metals without phosphorus, but the explosive metal has no application for this purpose.

Antimony has been employed to impart hardness to iron, but as manganese is preferable, it is not very popular for this purpose. It is also used with copper and zinc to make brass, where a particular quality of that alloy is required. When we wish to make a pure transparent, colorless gloss, we sometimes use a little antimony.

A very curious fact has recently been observed by Parkinson, that when antimony is combined with ten per cent of metallic magnesium, an alloy is formed which will actually deliquesce and melt away to water in the air. No uses have been suggested for this alloy, but it is worthy of note in the behavior of two metals.

An iron-black powder, used for bronzing plaster casts, papier-mache figures, and imparting a steel color to those and other similar objects, is finely divided antimony, produced by precipitation with zinc.

The beauty and permanence of antimony in the air suggests its use as a suitable coating for the protection of other metals, such as iron and copper.

The butter of antimony is dissolved in alcohol, and clarified with a little muriatic acid, and the bright copper surface is plunged into it for half an hour. It becomes coated with a beautiful bright film of antimony, which adheres strongly, and does not alter in the air. Copper-wire coated in this way can be bent without destroying the thin film.

We can make a powerful galvanic battery by employing antimony at one of the poles, instead of gas carbon. Amalgamated zinc in dilute sulphuric acid is used at one end, a massive block of antimony, immersed in a saturated solution of equal parts of common salt and epsom salts, at the other. This forms a simple, cheap, and powerful battery, suitable for electro-plating.

In England, the best Britannia-ware contains antimony, and the English government harden their bullets and shot with it.

As an anti-friction metal, for the bearings of machinery, for the packing of railroad axles, it is now largely employed.

A beautiful carmine red color, and a fine yellow, are prepared from its compounds. In medicine, tartar emetic, which is partly composed of antimony, is well-known, and for a hundred years no substance has been the occasion of greater controversies, or more extravagant expectations as a remedy in all cases of sickness, than antimony. It was even necessary, at one time, for the government of France to prohibit its use, so great was the excess in its prescription.

Notwithstanding the numerous uses to which this metal is applied, there are not more than one thousand tuns of it produced every year.

We have thus sketched a majority of the popular applications of antimony, and may have beguiled our readers into acquiring information which they did not possess before. It is worthy of note, that the cosmetic which was a favorite of the "broad-eyed" woman of ancient Greece, has not ceased to retain its supremacy in modern times, and the medicine that fattened hogs at the time of Valentine, is now prescribed by the veterinary surgeon as a panacea for the ills of horse-flesh. In fact, antimony plays an important *role* in the ordinary affairs of life, for we drink our tea, shoot our enemies, cure our horses, cross the ocean, travel on the railroad, paint our pictures (not to say our faces), sing our songs, strike a light, harden our steel, coat our copper, purify our glass, print our books, telegraph our messages, and use as a medecine this wonderful metal.—*Professor C. A. Joy in the New World.*

Carbolic Acid as a Preservative Agent.

The *American Naturalist* answers several correspondents who have asked questions regarding the use of carbolic acid as a substitute for alcohol, etc., that carbolic acid in water alone will not preserve animals, but pure glycerin with a very small amount of carbolic acid (say [redacted] or four drops of acid to 2 oz. of glycerin) answers [redacted] for some delicate animals. But the best thing [redacted] most animals is alcohol. The contraction [redacted] put into alcohol (complained of by some [redacted] caused by the alcohol being too strong. All [redacted] put into weak alcohol at first (not over 25 or 30 [redacted] after remaining a few hours should be transferred [redacted] 75 or 80 per cent alcohol. A very fine article for [redacted] the tissues of animals, and for soft animals like [redacted] actinias, worms, insects, larvæ, etc., can be made, [redacted] experiments, of glycerin, a little of the [redacted] and a very small portion of carbolic acid. [redacted] will preserve the colors as well as the tissues. [redacted] fine soap (white castile is the best) put into alcohol [redacted] most colors from fading, unless exposed to direct sunlight.

Experiments on Heavy Ordnance.

The following conclusions, deduced from experiments on heavy ordnance, are given in the Report of the Ordnance Committee, presented to the Senate February 15, 1869:

1. That no more heavy guns should be purchased for mounting in the fortifications or use on shipboard until such improvements are made in methods of fabrication as will insure more reliable endurance than has heretofore been exhibited.

2. That the Rodman system of gun making, while partially successful in smooth bores and small calibers, has so far failed in rifles of large caliber as to show it to be unworthy of further confidence. Recent improvements in defensive works and armor plating render heavy rifled guns the most efficient means of attack, and no system of fabrication which does not furnish such guns should be adopted or continued. The principle of initial tension, which is the basis of the Rodman system, appears to be of doubtful utility, as applied by General Rodman, especially for rifled guns. This tension, it is admitted, gradually disappears from the gun with age, and in time is entirely lost.

3. That guns cast solid, in the manner practiced in the navy under the direction of Rear-Admiral Dahlgren, while exhibiting satisfactory endurance as smooth bores with small charges and hollow projectiles, have not the requisite strength for rifles of large caliber. This mode of casting seems to be defective in principle, as the tensions inaugurated in cooling have a tendency to aid the powder to rupture the gun.

4. That experiments should be at once conducted for the purpose of ascertaining the real cause of the bursting of heavy guns, and of determining upon some method of fabrication that will secure uniform endurance.

5. That every encouragement should be given to inventors, and a full and fair trial accorded to all devices offered to the Government that promise a solution of the ordnance problem.

6. That more efficient means for harbor defense should be adopted. The late war demonstrated that sand was the best material for defensive works, and that forts of masonry, such as we have now mainly to rely upon for the protection of our seaboard cities, are inefficient to prevent the passage of armored, or even wooden vessels. The destruction of such defenses is only a question of time to ordinary guns of heavy caliber. It was also demonstrated that forts alone, of whatever character, cannot resist the entrance to harbors of powerfully armed ships if the preponderance of guns on the assailing fleet is sufficient. In the opinion of the committee, obstructions must be largely relied upon for harbor defense, in connection with properly constructed fortifications.

7. That no officer of the army or navy should be allowed to receive a patent for any article required, or likely to be required, for use in those branches of the public service, or to be in any way interested in the manufacture or procurement of such articles. It should be the duty of Congress to recognize in suitable rewards the services of such officers as might make inventions of especial value to the Government.

8. That the Ordnance Department of the army can be entirely abolished with great advantage as to economy, and without detriment to the good of the service. The duties now performed by officers of that corps could be performed by officers detailed from the artillery service, under the direction of a chief stationed at Washington. In this manner the whole expense of the ordnance establishment would be saved, and artillery officers, who have not only scientific training, but practical experience, would have a voice in the selection of the guns and ammunition they are required to use.

The committee are of the opinion that, for the reasons shown, the interests of the public service demand a change in the system of procuring ordnance and ordnance stores, and the manner of conducting experiments with a view to determining the value of the same. The present system has failed to answer the purpose for which it was designed, and the United States is in the position to-day of a nation having a vast coast line to defend, and a large navy, without a single rifled gun of large caliber, and a corps of ordnance officers who have thus far failed to discover a remedy for the failure of the guns, or to master the rudiments of the science in which they have been trained at the public expense. The importance of an immediate change is shown by the fact that the Chief of Ordnance of the army asks for appropriations to purchase over 1,900 guns to arm the forts, not of a new and better system to be decided upon after more thorough and careful experiment, but of a kind that experience has shown to be inferior in range and penetration to the guns of foreign powers, and unreliable as to endurance.

It is proposed that 65 of these guns shall be smooth bores of 20-in. caliber, 490 of 15 in. caliber, and 600 of 13-in. caliber. The experience of all nations goes to prove that the most effective [illegible]

To return to smooth bores, throwing huge spherical masses of iron with low velocities, is to disregard all modern progress in the science of gunnery, and to go back to the arms in use two centuries ago. Furthermore, the advisability of using guns of such great size is very doubtful, for the slowness with which they be handled and fired makes them less effective than smaller guns delivering a more rapid fire. Two hundred of the guns required it is proposed shall be Rodman 12-in. rifles, notwithstanding all of that class of guns heretofore procured for the army or navy, and subjected to test, have either burst disastrously before the lowest reasonable test has been completed, or have given such indications of failing, after a few rounds, as to be considered unsafe. It is proposed also to purchase 610 10-in. Rodman rifles, although the committee cannot learn that any gun of this class has ever been subjected to test in this country, except the Parrott rifles of that caliber, which are acknowledged failures, having been condemned by both branches of the service.

No progress toward obtaining better guns is likely to be made while the ordnance bureaus are organized as at present; and the committee deem the best way to secure such impartially conducted experiments as will determine with certainty what are the best arms, and to insure greater economy and regard for the public interests in their purchase and adoption, is in the formation of a mixed ordnance commission composed of officers of high character detailed from both the army and navy, who shall have no interest in patents or devices for arms.

How the Florida Keys were Formed.

Just outside the lower extremity of Florida are a number of islands—the easternmost almost touching the main-land, while the western lie a little farther off.

In consequence of this peculiarity in their disposition, the space left between these islands and the Florida coast, marked on the map as mud flats, is broad and open at the western outlet, but almost close toward the east. It is important to remember the form of this broad intervening space, stretching between the keys and the main-land, because the narrower and more shallow end may easily be filled up with sand, mud, etc. If you will look at the map, you will see, by the flats at the eastern end of this once open channel, that such a process is actually going on. In fact, a current sets toward the channel, drifting into it sand, mud, and *débris* of all sorts.

I hope to show you how these flats, gradually consolidated into dry land, will at last make a bridge between the islands and the lower extremity of Florida, uniting them solidly together, so that the former will cease to be islands and will become a part of the main-land.

Indeed, we shall find that Florida, herself, so far as her structure is known, is only a succession of such rows of islands as now lie outside her southern shore, united together by flats exactly like those accumulating at this moment between the present islands and the coast. These islands are called the Keys of Florida, and are distinguished from one another by a variety of appellations, such as Sand Key, Key West, Indian Key, Long Key, and the like. They are of various sizes; some—like Key West, for instance—are large, inhabited islands, planted with fruit and flower gardens, where cocoanuts and other palms, orange trees, and bananas grow in great luxuriance, while others are mere barren rocks, scarcely rising above the surface of the ocean, washed over by the waves, and wholly destitute of verdure.

Suppose now that in fancy we sail out from the keys on their seaward side, choosing a bright, calm day when the surface of the ocean is still. The waters of that region are always remarkably clear; and under such influences of sky and atmosphere they are so transparent that the bottom may be seen at a considerable depth, distinct as a picture under glass.

Sailing southward to a distance of some four or five miles from the keys, we find ourselves in the neighborhood of a rocky wall rising from the ocean bottom. As we approach it, if we look over the side of the boat, we shall see that we are passing over a floating shrubbery, a branching growth, spreading in every direction, its lighter portions swaying gently with the movement of the sea. It is not green, like land shrubbery, but has a variety of soft, bright hues, purple, rosy, amethyst, yellow, brown, and orange. If circumstances are favorable, and the water crystal-clear, as it sometimes is, we shall have glimpses of bright-colored fishes swimming in and out amid this tangled thicket; or here and there we may discern a variety of sea-anemones, their soft feathery fringes fully expanded.

This wonderful growth, over which we have imagined ourselves to be sailing, is the top of a coral wall. Reaching the surface of the water at intevals, it forms little rocky islands here and there, divided from each other by open channels, through some of which vessels of considerable size may pass. This wall is in fact a repetition of the same process as that which has formed the inner row of keys, though in a more incomplete stage; it is built up by coral animals from the sea bottom. Wherever circumstances are most favorable to their development, there they grow most rapidly. In such spots they bring the wall to the sea level sooner than in others.

This done, however, the work of the coral animals ceases, because they cannot live out of water. But in consequence of a certain process of decay and decomposition, such a wall—or coral reef, as it is called—is surrounded by coral sand and fragments worn away from it by the action of the sea.

Materials of this sort, mixed with sea-weed, broken shells, etc., soon gather upon the top of the reef wherever the coral growth has brought it to the sea level. By degrees a soil is collected upon such spots, raising them more and more above the surface of the water. In this way the islands have been formed which we call the Keys of Florida; and in the same way the little patches now rising highest on the summit of the Reef, will enlarge gradually into more and more extensive islands, though at present many of them are scarcely visible above the water level.—*Mrs. Agassiz in "Our Young Folks" for March.*

FELL'S RAILWAY OVER MONT CENIS.

The railway over Mont Cenis, which is a temporary method of transit only until the tunnel is completed, is called the American railway, its inventor, Mr. Fell, who built the one up Mount Washington, being styled an American; and we were promised a ride in real American cars. The time of starting was 7 A. M. There was a great crowd of all sorts at the station, a lively fight for tickets at the box office (for the perfect French system has not reached the other side of the Alps), and then we waited till half-past 7 before we were let out to the cars. The train ready to go consisted of an engine and two first-class passenger carriages. The carriages were about half the length of ours at home, with seats on each side, so that passengers face each other as in an omnibus, and with windows at the sides from which it is difficult to see out when one is squeezed in tight on the seat with his back to them. The cars are also very narrow, the track being only three feet six or seven inches gage, so that they are not much more comfortable than an omnibus. The fare, first class, was twenty-five, second class, twenty-two francs, from Susa to St. Michel, the time occupied in the passage being from four to five hours.

The locomotives of these trains are small, compact, and powerful; their trucks, as well as those of the carriages, set well in the middle, so that they can turn very short curves. The track has three rails, one elevated in the centre. Beside its ordinary driving wheels, the locomotive has two horizontal wheels which press this third rail on either side, and it is by this strong traction that the train is pulled up. The carriages have corresponding wheels for the center rail, but their only use is to keep the train on the track. Both cars and locomotive have double sets of brakes, one for the ordinary and one for the central rail, so that they can screw the cars to the track with the grip of a vise, and render it almost impossible for the carriages to run away. There is every precaution against accident; and I should only fear the snow storms of winter, and perhaps an avalanche in some places high up, which are not roofed in.

We began to climb the hill directly we left the station, exactly as a carriage drawn by horses would do. In fact, our track ran parallel to the carriage road all the way, was just as steep, and made the short turns of the latter. Our train seemed to be a huge live reptile with legs and claws, that crawled up by its own power; it literally dug right up hill, and we felt ourselves mounting, and, looking back, we could see the steep incline. On the curves, where the wheels got a good grip of the rail, we moved with ease and more rapidly than on a straight pull, where the locomotive evidently labored more, and we rose more slowly. The steepest grade on the road is one foot in nine feet, but this is only for short distances. The rise of one in twelve is more common; and the least (of which any note is taken) is one in twenty-five. The curves are so short as to be startling. We seemed to turn in a space as small as an ordinary wagon could. The shortest curves are on a radius of only 120 feet; that is, our train would run round a circle only 240 feet in diameter. Our track was all the time in sight, behind and before, running along the steep hillsides, and constantly doubling, like a compressed letter S.

You march up with triumphant ease, rising among the grand snow peaks like a conqueror. The valleys open behind you, with their rivers and brown villages, the great panorama expanding with every revolution of the wheels. You skirt precipices and look down upon nestling villages and green fields; you push your way up among the snow regions, the stone huts of the begging, half naked, dirty peasants, and the refuge houses of the road; are whisked round rocky headlands, through tunnels and covered ways, over deep gullies and tracks of avalanches, rising always higher and higher, as by no expenditure of strength, into a purer air, among peaks of virgin snow, among the silent summits of the enduring Alps.

The day was superb, with blue sky and fine air, and it was so warm, even in the snow regions, that I needed no overcoat. Our view was, for the most part, uninterrupted and magnificent. The summit level is about 6,400 feet above the sea, and before we reached it we passed into a covered way, built of wood at the sides and arched with iron, and were immured in this, in the ascent, descent, and on the level for four or five miles, I should think; dark, unpleasant passages, made worse by the smoke and fumes of the locomotive. These covered ways are absolutely necessary as a protection against avalanches in many places and against the falls of snow for long distances. Through the chinks of the boards I could see the snow piled up high along the way. The summit station is in one of these long sheds, and is gloomy enough.

We made the descent more rapidly than the ascent, swinging round the short bends with considerable velocity. The brakes were jammed hard down until I could smell the odor caused by the friction. On the descent I saw the frowning forts of Brumont d' Essillon, on peaks high above the abyss through which the Arc foams and roars, connected with the road by a thread of a suspension bridge over the gorge, called the Pont du Diable. The forts are being demolished now, under the agreement between France and Italy. Lower down, and about ten miles up the mountain from St. Michel, we caught sight of the rubbish at the opening of the great tunnel, which enters the mountain at Fourneau. It is to be 8½ miles long, and it is expected to be completed in 1871. It is, no doubt, a great and most interesting bore, but if I desired a pleasure trip, I think I should prefer the raid of Mr. Fell over the mountain to this hole through it.

I talked with a locomotive driver on our train (by the way an Englishman, as they all are on this road), who insisted that Mr. Fell is not an American. He knew him well, lived near him in the north of England, and said he was not an engineer at all, except so far as this invention was concerned, but a dissenting clergyman. He is certainly a dissenter from the ordinary style of railways. The engineer was an excellent specimen of an intelligent, illiterate English mechanic, with a drawl and nasal twang in his speech that a Cape Cod man might envy; and he gave me a great deal of valuable information about the road, which I might here impart, if your readers cared for valuable information, which I suppose they do not. He was takin' a day h'off for pleasure, he said, and goin' down to see the work on the big bore. 'Twas a nasty bit of work this of running twice over the road daily, as he did, and only getting twelve pound a month for the job, especially in the winter, with the snow and beastly wind. There had been only six days in the past winter when they couldn't run on account of snow, and then the passengers had been carried over the break on sledges. He explained to me the construction of the locomotive, the application of its power, the working of the brakes, and the whole thing, so that I think I can build a road out to West Hartford, over Prospect Hill and to the Tower, if anybody desires, when I return. Sealed proposals, inclosing stamp and photograph, can be left on the Probate steps. I said to the engineer that I supposed it impossible for the locomotive, with three rails, to get off the track.

Well, he said, his machine got off once last winter. The fact was, that the thing got the upper hand of him, and ran away with him. He spoke of it as if it were a horse. He was running with the locomotive alone, takin' her down the mountain, not mindin' exactly, when he found he had got on so much steam that he couldn't hold her. He was goin' down the one in nine, round them ere nasty curves, when she started. He shut off, and jammed down all the breaks, reserve and all, but she only appeared to go the faster. Away she went, like the —— (so he said), whisking round, and at last bounded off and went slam ag'in a rock. "If she'd a gone over the ravine on t'other side, I wouldn't be here to tell ye of it."

It was nearly one o'clock when we ran into St. Michel, and, passing the humbug of a custom house, took comfortable cars for Lyons. *C. D. W. in Hartford Courant.*

NOTES ON SCIENCE AND ARTS.

When the scientific soirées begin, it is a sign that the scientific season is half gone; and now the Easter holidays are over, and scientific investigators are working the harder to complete their self-imposed tasks before summer comes with alluring smile to entice them to the seaside or the mountains. General Sabine, the President of the Royal Society, has held two soirées, in which, as usual, science and art were exemplified in a very interesting way, and ingenious mechanical models were exhibited. Among them, was Bidder's coal-winning machine, of which we have recently made mention; and Price Williams' switch, which entirely does away with the numerous "points" seen at railway junctions, and keeps the main line of rails always unbroken, whereby a frequent occasion of danger is avoided; and Milroy's excavator, which digs equally well on land and under water, and is very useful in digging out the foundations of bridges, or in sinking cylinders. It may be described as a heavy metal ring suspended by chain and pulley, and carrying a number of hanging flaps. These flaps, when the ring is lowered into place, and agitated, act as spades; and when a sufficient quantity of earth or sand is loosened, they can be so regulated by another chain, that they bring it up to the surface, where it is dropped into a truck and carried away. From these particulars, it will be understood that deep holes can be dug, even under water, without sending men down to do the work.

Well deserving of notice is a much improved safety-lamp for use in mines, invented by Mr. Story Horn of Newcastle-on-Tyne. It has long been known that the Davy lamp does not insure safety under all circumstances; it is liable to become choked, the light is dim, and in some conditions it may occasion an explosion. These defects are remedied in Horn's lamp; the light is good; accumulation of soot cannot take place to render it dim; and whenever explosive gas finds its way in, the construction of the lamp is such that it becomes its own extinguisher, puts out the flame, and thereby prevents an explosion. There are other points in its favor; but these we may omit, as in the foregoing brief sketch the merits of this new lamp are sufficiently set forth, and because it has been tested in the severest manner, and proved trustworthy.

F. N. Gisborne, who has for years past made himself conspicuous by his signals for use on board ship, in mines, factories, or dwelling-houses, has now brought out a method which, for simplicity and efficiency, excels all his previous inventions. First, he used galvano-electricity, then pneumatic tubes, and compressible air-chambers, both costly and liable to derangement. Now, with a balance-weight and a chain, he accomplishes all he desires with his system of signals. A captain standing on the bridge of a steamer can, by touching the indicator, send an order to the steersman or the engineer, and see at once whether they obey without changing his position. And that which can be done in a ship can be done in a house, workshop, or mine, and by a simple mechanical arrangement, which can hardly fail to be received with favor. It has been already adopted in the five leading navies of Europe; and the great Prussian iron-clad *König Wilhelm*, now building on the Thames, is fitted with a set of Gisborne's signals, finished in a style which may truly be described as royal.

A magneto-exploder, constructed by Breguet of Paris, was shown, which will fire a fuse, and consequently a cannon, at any distance from two feet up to two hundred miles.—And Clerk Maxwell exhibited a "Wheel of Life," containing what he calls dynamical diagrams, and these, when the wheel is set agoing, produce many remarkable phenomena of curves and their intersections. Thus, in the hands of a philosopher a toy becomes a means of illustrating the laws of curvilinear motion. Teachers of geometry and natural philosophy would find it useful.—And N. J. Holmes, who is among the foremost of our telegraphists, exhibited his new magneto-alphabetical telegraph, which is one of the cheapest, if not the cheapest and simplest yet constructed. It comprises two circles of buttons, and the operator has only to touch button after button, and spell out his message as rapidly as he pleases. With this and other instruments before them, government will have a sufficient variety to choose from when they assume control of the telegraphs.

Silver and Co. exhibited specimens of their Norwegian Cooking Apparatus, adapted to different purposes and circumstances, and of different dimensions. One was provided with a thermometer to show the slowness of the rate at which the heat is lost. In one of the small boxes, a pint of water locked up boiling hot at eight o'clock in the morning, was still warm at six in the evening. And in like manner, the apparatus can be used as a refrigerator, and for preserving ice a considerable time unmelted.

Mr. Graham, Master of the Mint, by a singularly ingenious experiment, showed the prodigious amount to which the metal palladium will absorb hydrogen: an amount exceeding by some hundreds of times its own bulk. Two ribbons of palladium, attached to the two poles of a battery, were seen loosely coiled in a water-bath. The current was turned on: the ribbons took in so much hydrogen that they expanded, uncoiled, and stretched themselves across the bath, as if alive. The current was reversed, the hydrogen was thrown off, and the ribbons resumed their coil. They might have been compared to a couple of writhing worms. The sight was amusing; but it exemplified the researches by which Mr. Graham has thrown light on an important question in cosmical science, and led him to the discovery of the new metal, to which he has given the name of hydrogenium.

From all this, it may be seen that a scientific conversazione represents a wide range of the progress of science; while, as we proceed to show, it at the same time, exemplifies the arts. There was a specimen of the first beet-root sugar manufactured commercially in this country; and specimens of the juice as expressed from the roots, and after defecation, and of the waste pulp which finds a ready sale as cattle-food.—There were two or three simple forms of filter which might be carried in the pocket.—There was a model of the viaduct now building across the Holborn Valley.—A piece of inscribed bullock's hide, showing three capital letters and a rude hieroglyph, brought from the south-east coast of Africa, and supposed to be a message from survivors of ship-wrecked crews, now prisoners in the interior of Somali Land.—There were photographs of Mount Sinai and of the surrounding country, taken by the party now engaged in surveying that remarkable land, and very wild and striking prospects do they represent. By and by, a model in relief, made at the Ordnance Survey Office, Southampton, will be brought out, and then scholars will be able to study and follow the route of the Israelites.—Not less remarkable are a series of photographs of Abyssinia, taken during the march to Magdala by the Royal Engineers. The country therein represented must surely be the most rugged and precipitous in the world. Hannibal's march across the Alps must have been a holiday trip in comparison.—Of quite another aspect were the views in the Antarctic regions, which are now becoming important, because from some part of those regions will the two next transits of Venus have to be observed, and astronomers and others are beginning to inquire as to the best place in those desolate latitudes to establish a temporary observatory, and the preparations to be made for the voyage. It is impossible not to wish success to their endeavors, for the settlement of some of the most important questions in astronomical science depends on good observations of the transits.

It is recorded of some of the early Venetian painters that they laid on their colors with palette knives of different widths, and never used the brush. White Warren has revived the process, and exhibits a number of pictures in oil, all painted with the knife, and with marked effect. Land and water pieces, houses, ruins, Gothic towers, and flower-beds present a sufficient variety to test the capabilities of the art and the artist. At present, he appears to be most successful in clouds, landscapes, and gardens.—*Chambers' Journal.*

IT is reported that one day, when Lord Brougham had driven to the House in the vehicle of his own invention, which Robinson, the coachmaker had christened after him, he was met in the robing room by the Duke of Wellington, who, after a low bow, accosted him. "I have always hitherto lived under the impression that your lordship will go down to posterity as the great apostle of education, the emancipator of the negro, the restorer of abused charities, the reformer of the law; but no—you will hereafter be known only as the inventor of a carriage." "And I, my lord duke, have always been under the delusion that your grace would be remembered as the hero of a hundred battles, the liberator of Europe, the conqueror of Napoleon; but no—your grace will be known as the inventor of a pair of boots." "Confound the boots," said the Iron Duke, "I had forgotten them. You have the best of it."