The Island of Madeira.

One of the principal drawbacks to Madeira is the difficulty of getting about. There are no carriage roads, and the horse tracks are steep pitches up and down; they are also almost invariably paved with hard pebbles. This renders it impossible to ride anywhere except at a foot's pace, so that the time consumed in going a few miles is very great, and the mode of progression very tiresome. On the other hand, the island ponies, shod in a peculiar manner to encounter the aforesaid roads, are usually sure-footed and good walkers, so that within a certain distance of Funchal pleasant expeditions are to be made if you find the time and strength. Thus the fine mountain scenery of the Grand Corral—a gloomy gorge, into which you look down some 2,000 feet or so from the mountains overhanging it—the Ribiero Frio, and other landscapes beautiful of their kind, can on well-chosen days be visited without much difficulty. To get further afield is not so easy. There are but few tolerable hotels in the country districts, and you never can be sure that you will not find the higher levels wrapped in mist or drenched with rain, even whilst fine weather is p vailing. I am speaking of the winter months; anybody who happened to pass a summer in Madeira could visit all parts of the island readily enough.

The remark that there are few comfortable inns out of Funchal does not apply to Santa Cruz (Santa Cruz in Madeira, I mean). The hotel there belongs to a Senhor Gonzalez, but is mainly upheld by the untiring exertions of a worthy woman called Maria. She is a Portuguese by birth, but speaks English quite well, and is indefatigable in her efforts to please. This quiet inn is a pleasant change from the hot tables d'hotes at Funchal; the village may be perhaps somewhat cooler, and is said to possess a lighter and finer air; it is also well situated as a place to make excursions from. A mile or two beyond it lies the well-known Machicho Bay, where, according to the tradition, Madeira was first landed upon by ' . English-man Machin. The story is that this Machin, an English esquire, incurred the resentment of a powerful family by gaining the affections of the daughter of its chief. He was thrown into prison, but escaped, and then persuaded the lady to elope with him to France. A violent storm drove their vessel for thirteen days in a southerly direction, and at last they found themselves in a small brig on the shores of an unknown island. Here they landed, but the fatigues of the voyage had exhausted the strength of Machin's companion, Anna d'Arfet; she died there, and was there buried. The fragments of a cross erected over her grave are still shown by the Machico villagers. Her lover did not long survive her, and his companions, in their attempt to sail away home, fell into the hands of the Moors. During their captivity they spoke of this island to an old Portuguese pilot, who, on being ransomed, and returning to his own country, suggested and accompanied the first expedition to Madeira, which thus became a dependency of Portugal. Skepticism, of course, has been at work upon this old national tale, but there seems no reason for rejecting the legend, except that it is a legend, and that the fashionable wisdom of the hour pronounces, as usual, anything which has long been a matter of popular belief to be a necessity incredible; otherwise the narrative hangs perfectly well together in all its parts, and, moreover, furnishes a reason why the Portuguese government sent out their expedition a little later to discover the island so reported to them—a reason which otherwise would be wanting. Beyond this bay you can proceed in a boat, along another range of rugged and lofty hills, to the supposed fossil beds at the extremity of the island: these fossils are apparently concretions of lime, which have put on the appearance of branches or roots, as the case may be. An ignorant person would believe that they had formed themselves round real pieces of wood, and that these have decayed, leaving their form to the encompassing stone; but geologists, I fancy, put this opinion aside, and look upon them as being what they are, merely in obedience to some caprice of nature; they are not, according to them, fossils at all, but merely a good imitation of fossils.

Two and a half millions of tropical oranges were received in the past six months at San Francisco from the French islands of Tahiti. They have come in equal numbers every month from March to September, showing that the trees are in perpetual bearing.

The Excavation of Flood Rock, Hell Gate.

The mining of Flood Rock, Hell Gate, in the East River at the northerly part of New York city, preparatory to blowing it up after the manner of the Hallett's Point work, is being pushed forward rapidly. The expenditure last year amounted to $140,000, and a large part of the $200,000 appropriated this year for the improvement of East River will go to this work. Employment is now given to 135 men, divided into three shifts of eight hours each. The central shaft is fifty feet deep.

Running across the river are twenty headings; at right angles to these are eleven cross headings, none of which have yet been extended their entire length. They average seven feet high and ten feet wide, and are situated about twenty feet apart. Near the main shaft, however, where more light and space are required for working, they are larger. Three acres have thus been undermined, or one-third of the whole. It is not intended to enlarge the headings until each one has been carried out to its full length. Then the chambers will be widened and made higher, so that the whole excavation will resemble an immense cave, the roof being supported by the rock pillars which now form the sides of the headings. The thickness of the rock forming the roof will then be about ten feet, varying according to the character of the rock, whereas it is now from fifteen to thirty feet in thickness.

The work of tunneling proceeds very slowly, owing to the hardness of the rock of which the reef is composed. The rate at which it is now going on is from 500 to 600 feet a month, representing an excavation of about 1,500 cubic yards. It is impossible to tell when the whole will be accomplished, even at this rate. Frequently a seam is struck in blasting which stops the work in that heading altogether, on account of the leakage. In such a case it is customary to work around the leak. According to the last report, the work done during the past year was much greater than in any previous year; 24,000 cubic yards of rock were removed, 43,000 blasts made, and 57,066 drills sharpened. The number of blasts made each night now average 150. The rock thus broken up is loaded on scows and dumped in the deep water to the south of the reef. Part of it was also used to fill up the space between Big and Little Mill Rocks, which lie to the north.

Diamond Cutting in New York.

Among the curious and interesting industrial facts brought to light during the census inquiries, not the least is the fact that the recently introduced art of diamond cutting has been so admirably developed here that diamonds cut in Amsterdam are sent to this city for recutting. Hitherto Amsterdam has monopolized the work of diamond cutting; and the aim there has been to remove in cutting the least possible weight of the gem. The American plan is to cut mathematically, according to recognized laws of light, so as to secure the utmost brilliancy for the finished stone. The greater loss in weight, as compared with the Amsterdam cutting, is thus more than made good by the superior brilliancy of the product. From the inquiries made by chief special census agent, Chas. E Hill, it appears that the average increasing value given to diamonds by New York cutting is $5,000 for each person employed for twelve months; also, that our dealers are receiving the best Amsterdam-cut gems from abroad to be recut here and returned.

The lines of railway in the five divisions of the earth cost, in round numbers, $16,000,000,000, and would, according to Baron Kolb, reach eight times round the globe, although it is but little over half a century since the first railway worked by steam was opened between Darlington and Stockton, Sept. 27, 1825, and between Manchester and Liverpool, Sept. 15, 1830. It is shown that in France, previous to the existence of railway, there was one passenger in every 335,000 killed, and one out of every 30,000 wounded, whereas between 1835 and 1875 there was but one in 5,177,890 killed, and one in 580,450 wounded, so that we may infer that the tendency to accidents is yearly diminishing. Railway travelling in England is attended with greater risk than in any other country in Europe. A French statistician observes that if a person were to live continually in a railway carriage and spend all his time in railway travelling, the chances in favour of his dying from a railway accident would not occur until he was 960 years old.

A New Safety Sail Boat.

To the Editor of the Scientific American:

"Don't trust yourself in that craft; you'll be overboard sure." Such was the warning of a professional boatman at the barge office on the Battery, as I stepped upon a frail boat on a "fresh" afternoon. I think I know something of boats myself, and but that I knew this one to be provided with means intended to overcome the very danger against which the honest boatman warned me, I should have more than hesitated. But the pursuit of science must be deterred by no dangers, and, moreover, my pursuit in this instance was in behalf of the whole world, as represented by the *Scientific American*.

The Jane was an especially dangerous looking craft, 18 or 20 feet long, whose bottom and deck formed the sharp V-shaped edge which proclaim an entire want of bearing power, while her immense sails, main and jib, were ample for a boat of twice her dimensions. Her captain was a New Zealander, whose motions were the reverse of safety-inspiring. My own conception of the care needful under the existing circumstances had no place with him, and, but for entire faith in my ability to swim, I should never have ventured.

As the Jane shot beyond the pier head, her huge sails were struck by a blast more than sufficient for instant destruction. Involuntarily I made ready for an impromptu bath, and the boatman tauntingly called out, "What'd I tell ye?" but *only the mast yielded*. The boat came to her bearings and moved on as steadily as though impelled by the mildest zephyr. The triumph was already complete; but more was to come. Presently we were in a large seaway, and, with our good speed, a large inflow of sea water over the low and sharp bow was a matter of course. In that, also, I was agreeably disappointed. The boat, instead of carrying the weight of the wind and being thus forced *through* the sea, rose to it and she glided easily *over*. Again it was the mast that yielded—yielded to the motion of the boat as easily as before it yielded to the force of the blast. The surplus force of wind, instead of racking the boat and making misery for her passengers, was simply "spilled" over the top of the sail. The motion was free from the thumps and jars usual under the same circumstances.

How all this was accomplished may be difficult of explanation without the aid of an engraving. Instead of being "stepped" in the usual way, the mast was held in a rocking shaft at the deck, and to the keel, on either side, springs were attached, having their opposite ends secured under the deck. Thus the mast, in the absence of pressure, remained upright, but under pressure yielded on either side. The amount of pressure needful to compel this yielding was regulated by nuts and screw on a guide rod inside the springs. A second pair of springs, placed longitudinally under the deck, were connected by pulleys with the shrouds, and these aided to stiffen the mast while they yielded to its movements under pressure.

For pleasure boats, this spring mast is a great addition. It not only insures safety, but gives an ease of motion which cannot but prove especially delightful to those who are timid upon the water. More than this, it permits an unvarying course for the boat, and thus avoids the checks and delays inseparable from "luffing," as also the necessity of unusual skill and care in the management of even a "crank" vessel in a "flowy" wind.

M. S. B.

New York, October, 1880.

[The invention, a practical trial of which is above described, is that of Mr. John McLeod, Hill's Pavilion, Flushing, N. Y. A patent has been allowed. It appears to be a really valuable and practical improvement.—Eds. *Scientific American.*]

Gold in Arabia.

The official journal of the vilayet of Yemen, Sana, announces that a gold mine has been discovered in the Sana district, and, in the usual style of Oriental expansiveness, declares that this mine "is one of the richest in the world." A detachment of soldiers has been sent to guard the place against the attack of Bedouins, and a commission has been appointed to examine and report upon the mineral prospects. A productive gold mine would be a useful acquisition just now to the Turkish Government.

The Hibernian Bible Society has circulated in Ireland, since it was formed, nearly 4,5000,000 copies of the Bible.

The Pocket Handerchief.

We may forget our purse, our penknife, and many other things, says the London *Hatter*, without experiencing any great inconvenience, and even without its being known at times, but to lose or mislay the handkerchief, may be followed by very grave consequences, as we all know. Moreover, we make use of this article in many other different ways. All who make use of spectacles do not remove them from their nose in order to put them very carefully into the case without using the handkerchief, and they use it again before putting them on, wiping the glasses with great care. The majority of people pay by far too little attention to an object so indispensable. Many put it into the same pocket with their keys, their purse, their snuff-box, without troubling themselves concerning the many strange substances with which its tissue will not fail to come in contact in so miscellaneous a company, and which might sully the purity which the handkerchief ought to possess. Does one go to pay a visit? Before presenting themselves to the person they wish to thank or solicit, some have been known to dust their boots with the handkerchief. Does the careful wife see some grains of dust left on her ornaments? She makes them disappear with her handkerchief. Boys in the school room clean their slates with them; in the playground their handkerchief is the necessary attendant of a multitude of games. With this they wipe of the dirt; they strike off the dust. It is used to stop the blood that flows from wounds—always very numerous in the age of leap-frog and prisoners, base; the age also of communism in handkerchiefs. With wounds come tears, and the handkerchief, full of dust, spotted with dirt, with the blood of bodies known or unknown, serves again for wiping the eyes, the nose, or the cheeks furrowed with tears. We do not wish, and we cannot tell here all the strange uses that people make of the pocket handkerchief. And then what signals have been conveyed by it! How many sad farewells, how many cheerful congratulations!! The very method of waving it has a language, as the motions of the fan also have. But no one has hitherto discoursed on the language of the pocket handkerchief. And how useful it often is as a help to the pocket or the hand-bag! How many mushrooms, myrtle-berries, strawberries, and raspberries have been gathered into the handkerchief in young days, and more valuable things in later life! Then there may be evil results traced to it—a number of ailments of which one cannot guess the origin; diseases of the nose and eyes. Fortunate it is for him that incurs nothing worse; diphtheria, for example, which the handkerchief may heedlessly transmit. Let us not use the handkerchief except for its proper purpose; let us devote to it a special place; let us change it as often as possible, and inspire our children with a great disgust for another's handkerchief on account of the disagreeable, nay, dangerous consequences that may ensue. Much more might be said about the pocket handkerchief, but enough has been hinted at to set my readers a-thinking upon its importance, its uses, and its abuses.

Fifty-seven tons of Greek marble have been delivered in London, free of all charges, by the Greek Government, for the Byron pedestal.

The Marquis Robert de San Marzano, who married an American, Miss Helen Gillender, has ordered in this country some things for their baby. A willow cradle has a canopy decorated with draperies, medallions, points of Valenciennes lace, and blue satin ribbon. There are sheets with tucked borders and bands of French embroidery, and others of lawn, with lace enough on them to make the cost $500 for four. An cider down quilt and some exquisitely fine blankets are included in the outfit. There are three dozen dresses in the wardrobe, many of them of lawn, mull, and fine laces. "Young mothers," says a correspondent of the Philadelphia *Times*, "can easily imagine the dainty beauty of the tiny silken socks, the exquisitely embroidered lawn skirts garnitured with the finest of fine laces, the richest of the flannel skirts with silken embroidery, and the handsome tucked, trimmed, and lace-finished petticoats, but it is difficult to conceive of anything so lovely as the robes of real lace, arranged in diamonds, medallions, squares, and all manner of conceits, with applique of embroidery in roses and other flowers, each figure in the Valenciennes lace being punched or upraised until it looks like round point."