experiment upon two cubes of the new stone, each four inches square, and made only ten days before. One took forty-four and the other forty-eight tons to crush it. Mr. John Grant, the assistant engineer to Mr. Bazalgette, of the Metropolitan Board of Works, also made experiments on the same occasion, on the tensile strength of the stone. Specimens having a sectional area of two and a fourth square inches bore, respectively, eight hundred and seventy pounds and twelve hundred pounds. These specimens had been made but five days previously.

The new works of the Patent Concrete Stone Company have been laid out upon a large scale, and admit of easy extension. They are already engaged upon a large amount and a remarkable variety of work, and it cannot be doubted that the excellence and great cheapness of their manufacture, the former now proved by nearly every test known to engineers, architects, chemists, and builders, will rapidly secure for it a vastly wider introduction than it has yet attained.

EUROPEAN NOTES.

By MR. CALEB S. HALLOWELL.

OUR esteemed friend, Mr. Caleb S. Hallowell, having favored us with some valuable notes of places and things met with in his present rapid tour through Europe, we propose to present to our readers such portions as will prove of interest to them, as recording the progress of improvement, or as recalling the memorable works of past time, to which we owe so much of our present knowledge and power. Were our space less limited or our field more general, we should give with pleasure the whole of Mr. Hallowell's entertaining letters, which we are sure would be read with great interest. After some general account of his voyage and arrival at Paris, from which place he started at once for Italy, Mr. Hallowell continues:

"At Lyons we only stopped for the night, and sufficiently long next day to take an outside view of the city. Great improvements are taking place in the way of straightening streets, laying out fine Boulevards, &c., as in Paris. From Lyons we passed directly to Nismes, in the south of France, to examine its antiquities. We all felt it an epoch in our lives, as we gazed upon the grand old Colosseum there, and called to mind the wonderful people to whom it owed its origin. They have disappeared it is true, but not without having *burned* their impress into the very hearts of all civilized nations of the earth. Very costly and extensive restorations are now going on

in the building, under the direction of the French government, which will require a vast amount of cut stone, for their completion.

"We visited, also, with great interest, the numerous other Roman remains, in and about the town. From Nismes we proceeded directly to Marseilles, where we arrived on the 6th of May, stopping at the 'Grand Hotel de Louvre et de la Paix,' a very fine house, the charges in which were just one-fifth of what we paid at the Hoffman House, in New York, and the accommodations greatly superior. Marseilles is the New York of France, and very well deserving of the name. On the afternoon of our arrival, we took a ten miles ride around the harbor and parts adjoining; examined the superb break-water formed of massive blocks of concrete, the great Scriptural looking jars of olive oil, baskets and sacks of the finest oranges, bags of sulphur, cases of bottled oil, bales of skins, hogsheads of madder, wheat from a dozen different countries, and all the other products that go to make up the life of a busy sea-port. An admirable road has recently been made, bordering upon the sea, which is built up with beautiful villas, the high rocks in the rear being dense with matted evergreens. We noticed for sale on the docks, by the fish women, several kinds of muscles, a very small oyster, and a sort of zoophytic looking animal which they called a violet, resembling an oyster in taste. We spent in Marseilles, very improvingly, the half of the following day, and then took rail for Nice, distance one hundred and forty miles, a large part of the route being one vast expanse of olive groves, interspersed with fig trees; of the latter we saw numbers ten and twelve inches in diameter.

"Shortly before arriving at Nice, we had our first view of the snow-clad Alps, and our first scent of the delicious odors of the orange groves. The rivers in these regions are curious looking affairs, being at one time an almost dry bed, and at another a terrific flood, requiring heavy masonry and skillful engineering to confine them within reasonable bounds. They have at Nice a grand promenade (des Anglais), looking out upon the sea, and bordered with elegant mansions. Riding out to Villa Franche, we had an opportunity to see the semi-tropical foliage; donkeys loaded with great packages of the edible pine burr, women gathering orange blossoms, and numberless other operations that served to remind us that we were in a foreign land. We also visited a manufactory of scents and waters, the laboratory of which was laid open to our inspection.

"From Nice we took steamer to Genoa, and the weather being fine,

we had a near and satisfactory view of the entire coast (in fine weather the steamers hug the shore). The railroad is being prosecuted all along the route, but is proving a most expensive work. In tunneling the rocky promontories, lateral holes are run out, through which the excavated material is discharged into the sea. I was astonished to note the number of towns along the coast; at one time there were twelve in view of the unassisted sight. Oil and wine are both *floated* to the entre-ports, in hogsheads, for vessels can only load and discharge where there are break-waters.

"We arrived at Genoa on the evening of the 9th. Many of the streets are extremely narrow. Wandering out after dusk, we were making our way through what appeared to be an alley, when, lo! we came plump upon the Merchants' Exchange, and found ourselves in a crowded street about twelve feet wide, bordered with the most elegant shops. The street was paved with stone slabs. No vehicles were allowed in it; it was brilliantly lighted with gas; the houses on each side were very high, and old and crooked, with coats of arms over the doors, and statues here and there against the walls. The whole scene, involving as it did the red-capped men, the singing girls and the magnificent collection of silver filagree work, exposed under your very touch, was calculated to leave a deep impression on the mind. We visited the churches, palaces and other public buildings of Genoa, and found much to interest us. At the Town Hall we were kindly shown three letters, written to the authorities of Genoa by Christopher Columbus, in one of which he affectionately says, 'Though our bodies are in a distant spot, our hearts are with you.'

"In this quaint old city the principal hotels are all down close upon the water's edge—you land at the Custom House, go through it, and on the opposite side of the street are the hotels. You enter them through rough old archways, said to be of Roman origin. It seems an odd way of entering a hotel, but once in, you find delightful quarters. Indeed, I have rarely found, in any land, a house superior to the Hotel de la Croix de Malta. The building was once a palace, belonging to the Knights of Malta, and is of unusual strength and solidity.

"We left Genoa at 9 o'clock on the evening of the 11th, and arrived at Leghorn next morning. From here we visited Pisa, the trip being accomplished in a half hour, by rail. The country is flat and mostly intersected by creeks that are navigable by small vessels. Pisa is a walled town; the walls appeared six or eight feet thick, and

some twenty feet high, with brick turrets. The Arno is a running stream about three hundred feet wide. We dashed across the stone bridge, and rattled over the elegantly slabbed street, until a sudden turn brought us in full face of the Leaning Tower. There it stood in all its majesty! It felt as an old friend, and yet looked strange and new. It seemed somehow as though it should be further off, or misty, or indistinct. It was more sharp and clear, and solid and white, than I could at first realize. It did not stand over-topping a street either, as I had from some cause imagined. Neither was it so terrible a trial to the nerves to stand under it, as I had anticipated. I experienced peculiar emotions in gazing upon that structure—feelings that can be better conceived than expressed. We reserved our ascent of the Tower for the close of the visit.

“The Cathedral, like all others in Italy, is filled with gorgeous works of various kinds—paintings, sculpture, carving and mosaics; but my whole attention was at first engrossed in the contemplation of the chandelier—the chandelier that is connected with the name of the illustrious Galileo—the germ of all our clocks.*

“In the church service here, illuminated parchment music books, four hundred years old, are used—great ponderous affairs that lock up like a chest. Over the altar is a vast dome of glass mosaic, seven hundred years old, which permits light to pass through something after the manner of ground glass. There is worked in it a stupendous figure of Christ, uncouth enough to betoken any amount of antiquity. The whole affair is wonderful as a work of useless industry.

“In the Baptistry (which is a separate building) there is a splendid ancient font, carved and inlaid to an incredible extent; the diameter is about fourteen feet, octagonal, with the bottom of black and white marble, cut serpentine. It produces upon the eye a peculiar dazzling effect, and when filled with clear water must be striking. But of all the delightful sounds we ever heard, the echo here was the most wonderful. The deep, rich voice of the guide, in singing a few notes, is reflected by the arched ceiling, and prolonged and worked up into the music of the most melodious organ.

“The great old city wall surrounds the Cathedral grounds, and we

* It was an observation of the equality, in time of vibration, exhibited by the chandelier in this building, swinging through longer and shorter arcs, which led Galileo to his discoveries regarding the laws of motion of falling bodies, which laws were demonstrated by experiments tried from the leaning tower.—*Ed.*

went under its shade, and reclining upon the green grass, devoted some time to a contemplation of this Baptistry—a singular structure, a concentration of the peculiar and ornate.

“The Campo Santo, too, is another of the curious buildings of this Cathedral group—it is a tremendous sort of a Westminster Abby of a burying ground, the walls lined with antiquated frescoes, the pavement filled with vaults, and the sides studded with mosaics and ancient sarcophagi, brought from distant lands—a strange medley. The large open space enclosed by the building, contains holy earth, brought from Jerusalem, which is supposed to possess special properties, fitting it for its purpose here.

“We terminated our visit by an ascent of the Leaning Tower. The effect, in winding one’s way around, is singular—the steps on one side being, of course, more difficult to climb than on the other. But to me the soul of the occasion was Galileo—to think that I was actually treading upon stones hallowed by his foot-steps! I loitered behind the others of the party—I went out upon the different stages, and studied the structure of the wonderful pile. In places the stones were clamped with iron. There were also, in many parts, old rusty nails driven into the mortar. I wrenched out one—it may be one that Galileo himself had driven, in the performance of his experiments upon falling bodies. In any event I will retain it as a memento.

“The top of the Tower is not built of pumice or any material lighter than the bottom, in fact there is not the slightest evidence that it was built in this inclined manner.

“The view from the summit was grand, the sea being visible for an extent of many miles.

“As we drove rapidly away from this famed structure, we looked back to see it over-topping the common-place buildings by which it is surrounded, and in taking our last look we experienced something of the feelings of parting with an old and valued friend.

“I will endeavor in a subsequent letter, to give you some account of Vesuvius and the Grotto del Canc.

“I remain truly your friend,

“CALEB S. HALLOWELL.”