capacity of railways might have been modified by the knowledge of what is done on the volunteer field days in this country, while his opinions on the uselessness of railways in an enemy's country are apparently inconsistent with the experience of the last American war.

In that war railways and steamboats were found of inestimable advantage. The reports of General Parsons, chief of rail and river transportation for the United States, show that he considered the application of steam to transport had modified the art of war as much as the pursuits of peace; and he stated in 1865, as the result of his experience, that "it is now practicable, on twenty-four hours' notice, to embark by railway, at Boston or Baltimore, a larger army than that with which Napoleon won some of his most decisive victories, and landing it within three days at Cairo, 1,200 miles distant, there embark it on transports, and within four days' more time disembark it at New Orleans, 1,000 miles further." In January, 1865, in the depth of a severe winter, the 23d army corps was wanted for General Grant's operations before Richmond. After four or five days' notice this force, consisting of 20,000 men, with all its artillery, and over 1,000 animals, was started from the Tennessee river, and moved nearly 1,400 miles in an average time not exceeding eleven days. The distance was about equally divided between water and railway transport, along rivers obstructed by fog and ice, and over mountains during violent snow storms, with various interruptions, including thirty hours' detention from fog in the river, and at one point the unexpected delay of transferring the troops to boats of a smaller class, the railroad, meanwhile, being in the bad condition unavoidable in the severe winters of North America. Within seventeen days from the embarkation of the first troops on the Tennessee, General Parsons had the satisfaction of seeing the army quietly encamped on the banks of the Potomac, as fresh as when they started from Tennessee.

During the war, 611 miles of railway in Virginia, Maryland and Pennsylvania, 293 miles in North Carolina, and 1,201 miles in the military division in the Mississippi, giving a total of 2,105 miles, were more or less occupied by the United States authorities as military railways, under the direction of General M'Callum, the government staff carrying on all the working of these lines, and repairs of works and rolling stock, and to some extent the rolling of rails and the construction of new lines. At an early period a number of workmen, under competent engineers and foremen, were formed into a "construction corps," and stationed in detachments along any railway exposed to hostile attack, and stores were established at intervals to furnish the necessary supplies of rails, fittings, sleepers, and bridge timber.

HOW THE YANKEES BUILT BRIDGES.

This corps became at last very experienced in the work of repairing damage. General M'Callum's reports state that the Rappahannock river bridge, 625 ft. long and 35 ft. high, was rebuilt in nineteen working hours; that Potomac creek bridge, 414 ft. long and 82 ft. high, was built in forty working hours; that Chattahoochee bridge, 780 ft. long and 92 ft. high, was completed in four and a half days; that between Tunnel Hill and Resaca twenty-five miles of permanent way and 230 ft. of bridges were constructed in seven and a half days; and near Big Shanty thirty-five and a half miles of permanent way and 455 ft. of bridges in thirteen days. The last of these remarkable operations took place on the line by which General Sherman was connected with his base, in his advance from Chattanooga to Atlanta; and that the Military Railway Department, almost entirely through a hostile country, should have kept pace with the march of General Sherman, constructing and reconstructing the road in his rear, and ultimately have maintained the supplies of an army of 100,000 men and 60,000 animals from a base 360 miles distant, along a single line, exposed at all times to the attacks of an active and resolute enemy, is indeed a wonderful example of forethought, energy, patience, and watchfulness.

EDITORIAL CORRESPONDENCE.

NAPLES, Jan. 28, 1868.

Vesuvius—A Novel Spectacle of Neapolitan Life—Herculaneum and Pompeii.

Naples, apart from the extraordinary beauty of its situation, its rich museum and splendid churches, does not possess many objects to long detain a tourist; but in the number and variety of its excursions east and west, it offers more attractive features than any other city in Europe. From my youth up I have cherished a desire to visit Vesuvius, Pompeii, and Herculaneun, and to have had that wish gratified fully repays me for all the toils of a journey of four thousand miles. I have seen Vesuvius by dull star light, with its cone all on fire, vomiting streams of red-hot lava, which flowed down its sides like rivers of fire, and casting its dense clouds of smoke and its lurid light upward to the sky; again, on the second night, the appearance still more brilliant and the volume of lava considerably increased, but grander still was the effect of a visit to the mountain by night. Numerous parties go down every afternoon in carriages, as far as the village of Resina, which stands above the spot where Herculaneun lies buried eighty feet below the surface. Here we engaged horses and a guide, and some torch bearers, and thus provided made our way up the mountain near to the crater of the terrible eruption of 1858, which continued nearly three years. The afternoon being clear and still, we were favored with a fine view of the city and bay of Naples, the Castle of St. Elmo high above it, the isles of Capri and Ischia in the bay, and a range of the snow covered Appennines far to the north, while just above our heads rose the awful volcano, with its overflowing streams of liquid fire, and as often as every thirty seconds would a shower of stones be thrown upward hundreds of feet into the air, the shower succeeded by a heavy, rumbling sound, like the distant fire of artillery—certainly a grand and terrifying spectacle. We proceeded on horseback as far as the guide would permit, with sticks in hand, "to try the lava," as the people say when they urge you to buy them. We made our way up one of the principal streams by passing for some distance over the blackening crust of fresh lava, which but three days before was moving down the mountain like molten iron running from a furnace, and was still red hot underneath. At this point, and under cover of the night, we could take at one view not only the eruptions from the crater, but also the several channels through which the lava was working its way down the sides of the mountain, already covered with the blackened masses of former eruptions. We happened to see Vesuvius in one of its most angry moods, and I do not think any of our party will ever forget the sight, and yet no one seems to fear this burning mount. The inhabitants of Naples, and the towns along the base of the volcano, live, eat, and sleep, regardless of the fate of cities that lie buried under its ashes.

The road to Pompeii runs along the eastern bay of Naples, and through a continuous line of villages, whose inhabitants appear to live upon macaroni, if one may judge from the immense quantities of this article hung out to dry. Almost every house has its string of macaroni poles hung out in front, and the people who make it are often so dirty that it is almost impossible to distinguish their features. Pigs are sometimes seen walking around under the pendant links, to say nothing of the dirty urchins who are permitted to handle it. I have heard it said that a lazaroni would keep fat on a daily diet of two cents' worth of grapes and macaroni, but it appears now that the latter article is a luxury which the lazaroni don't enjoy in such abundance.

The roadway from Naples to Pompeii was lined with the strangest assortment of men, beasts, and vehicles, that human eyes ever looked upon. Here is a vehicle or go-cart, resembling a long furniture truck, suspended on a pair of tall wheels, upon the platform of which is fastened what very much resembles an old-fashioned doctor's gig, with covered top thrown back, hung upon double C-springs The seat is occupied by a priest and a fat woman; while behind and underneath the top, sitting on the platform, are two old vegetable women just returning from market. Four men, with red caps, dressed in brown duck trowsers, and short sacks or tunics, are standing up behind, holding on to the gig-top. One is a lazaroni, exposing a pair of legs that might serve for an Apollo. In front, beside the driver, are seven men, who are either sitting or standing upon the platform; the whole load being drawn by one little horse, with a fancy top-knot, and carrying upon his back a huge saddle, provided with three long horns most fantastically ornamented in brass—the center horn carrying a turret of bells and a wind vane. The shafts of the vehicle pass obliquely along the sides of the little animal, and fasten to the saddle a little above his back by a heavily stitched leather band, which slides through openings or grooves cut in the top of the two outer horns. Here is another heavy cart, loaded with cabbages; the skeleton form of a large white ox is yoked between the heavy shafts. On one side of the ox is a little horse, a cow, or a mule; on the other, a small donkey, fastened to the cart by ropes and whiffletrees, to assist in hauling the load. Here is another immense load of carrots, macaroni, or salt cod-fish, drawn by a horse, mule, and donkey, working abreast. Here, again, is a small, open, two-wheeled gig, drawn by a donkey, or a very small horse; the rider is a full-grown man, who jogs along apparently indifferent of the cares and opinions of the world. There is a woman trying to drive a black pig, having a rope tied around his body, and is very nearly being run down by an elegant carriage with fine horses and liveried servants, while all along the sidewalks, fronting the houses, and covering church steps, are to be seen lazaroni sunning themselves; women washing, cooking, spinning from the distaff, examining their childrens' heads, or having their own attended too; half-naked boys running after carriage, pounding their chins to attract our notice; and beggars, plenty, old and young, sick and sore—the whole constituting an actual scene of every day life along the shores of the bay of Naples, and no mere fancy sketch of a letter-writer. Beggary is reduced to a science in Naples, and we witnessed many singular and disgusting forms of it which suggested a most wretched form of society.

Herculaneum is still a buried city, and but little is known of its extent, except what can be conjectured by the discovery and partial excavation of a theater of very solid construction, and capable of seating 8,000 people. This structure was accidentally discovered during the process of digging a well eighty feet below the surface, and some fine marble statues were found which are now at the museum at Naples. All hopes of knowing anything more of this buried city of the dead are forever lost, as a modern city stands above it, and this may some day share the same fate.

Pompeii, of which the world already knows so much, lies buried upon an open plain, and it is estimated that about one fifth of the city has already been uncovered. It is a strange and melancholy sight to walk through its well paved streets, still bearing the marks of vehicles, worn more than two thousand years ago; and amidst ruined heathen temples, amphitheaters, forums, theaters, palaces, houses, mills, tombs, and other structures, which speak of a people who cultivated many of the refined arts and customs of our Christian civilization.

The museum of Naples contains a very extensive collection of objects of art and utility, dug out of this overwhelmed city; and the work is still going on, though slowly, under direction of the government. As I wandered about through the ruins of Pompeii, I could not resist the conviction that all the objects which have been dug up ought to have been kept where they were found, thus forming the grandest and most interesting museum in the world. S. H. W.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Canal Navigation---Steam Power and Enlargement of Locks.

MESSRS. EDITORS:—Having had some experience in building canals in this country and in Canada, and seeing considerable discussion going on in your State Convention respecting the New York canals, with your leave I will venture to make a few suggestions respecting them, not that I am silly enough to suppose I can effect any particular change in their management; but if I should happen to let fall even *one* idea that will benefit the people of your Empire State, I shall feel amply rewarded.

One great obstacle to the expeditious navigation of the Erie Canal is the numerous locks and the great length of time required to pass the boats through them. To obviate this difficulty, I would suggest the lengthening of the locks to eight hundred or one thousand feet by removing the gate at the upper end of the lock, and then extend the lower level by excavating the 800 or 1000 feet, at which point let the upper part of the lock and gate be put in as it was before. It will readily be seen that instead of locking one boat at a time, six, eight, ten, or more, could pass at the same time. Of course the sluices could be correspondingly increased, to give the water the same free passage it now has in the short locks. Wherever the fall is too precipitous, in order to carry out the foregoing, it will only be necessary to extend the length of the canal by a more circuitous route, thus lengthening the grade also.

Another obstacle to expeditious navigation by the canal, is the present method of towing the boats, which is not only slow but expensive. To obviate this, I would suggest the laying of a railway track on the present "tow path," and tow with locomotive engines. If a double track should be thought too expensive, double switch "turnouts" could be put in at each mile, or as often as necessary, which would be short, as only the engine and tender would require to occupy them. It is estimated that a forty-tun engine, with small drivers, will tow thirty boats at the rate of two and a half miles the hour. Suppose one-sixth of the time should be occupied in locking, the engine would take the thirty boats from Buffalo to Albany in about seven days—no small saving of time, to say nothing about expense. At this slow rate of speed, the wear on the track and engine would be scarcely perceptible.

At the present high prices for labor and running such an engine would not be over thirty-two dollars per day. For the seven days it would be $224, or a little less than eight dollars to tow each boat from Buffalo to Albany, and *vice versa*. The expense of towing, in such a case, would be added to the canal tolls; and the freighter would only have to furnish and man his boat.

By running the engines at a uniform rate of speed, it will be difficult to estimate the number of "trains of boats" that could be taken through at the same time.

The "tow path" of the canal being ready for the superstructure, or nearly so, the expense of this method of traction would only be the ties, iron, engines, water tanks, and engine houses.

The plan of lengthening the locks here suggested is a very different thing from "enlarging" them; as, after the excavation is made, the same gates, stone, etc., can be used that would be taken from the upper end or half of the short locks.

I am clearly of the opinion that there is no economy in moving freights on a canal, where horse-power is used, by enlarging the boats, and consequent increase in width of the size of the boat; consequently the horse-power must be increased if the boats are enlarged. As for towing by steamboats or tugs, I believe it is an admitted fact, that in our shallow canals it is impracticable.

According to the foregoing estimate one engine would make two round trips from Buffalo to Albany per month, taking thirty boats, each way, each trip. This would be 120 boats taken through the canal per month. For the seven months of navigation it would give 840 boats as the work of one engine. At this rate 100 engines would move eighty-four thousand boats through the canal once during each season of navigation. Supposing each boat were to carry two hundred tuns of freight, it would amount to sixteen million eight hundred thousand tuns per season.

I am entirely convinced, if this plan of working the Erie Canal were adopted, there would be no necessity for building a ship canal around the Falls of Niagara, on the American side, or the adoption of any other expedient to move the heavy freights from the West to your city as rapidly as they may accumulate. ENGINEER.

The Mysteries of Boiler Explosions and Railroad Accidents.

MESSRS. EDITORS:—"Cause unknown." This is a favorite verdict for a coroner's jury on accidents of all kinds. It has in some sort, taken the place of the old-time mortuary verdict, "died by the visitation of God," and is an easy escape from responsibility and a soothing salve to conscious incapacity or willful negligence. "Nobody to blame" is another comfortable and accommodating verdict in case of accident. These set terms are well enough for whitewashing purposes,