Correspondence

The Old Red Sandstone of New York.

Hugh Miller has made the old red sandstone of Scotland classic ground for the geologist. His scientific sagacity, and his wonderful powers of description would be amply sufficient to commend to our interest any series of strata upon which they should be expended. It is therefore no marvel that his work should have proved so fascinating when it was directed to the exhuming of an unknown world—the fragments and wrecks of an ancient and unique creation. Many a student of geology owes his first interest in the science to the charm with which Hugh Miller has invested the old red sandstone.

The rock which bears the same name in the New York system has not heretofore sustained the reputation of its Scottish prototype. It was pronounced by the geologists of the State Survey, almost entirely destitute of fossils and the few which were found by them within the limits of the State, were plants mostly of a low grade, and one or two species of bivalve shells.

Their conclusion, however, that the rock contained but few and insignificant fossils, because such only had at that time been discovered, like many similar conclusions in geology, has proved unreliable. It has been known for several years that chambered shells, univalves and bivalves, in considerable variety also the teeth, plates and bones of shark-like fishes, occur abundantly in strata of this period, in the northern parts of Delaware county, New York, about the head-waters of the Susquehanna. Interesting specimens of these various forms from the town of Franklin, have been in the State Cabinet at Albany, for several years.

From some recent discoveries, however, there seems reason for believing that our own old red sandstone may approximate to the European rock in the variety and importance of its fossil contents.

Mr. J. M. Way, a very intelligent mechanic of Franklin, Delaware Co., N.Y., has lately found in that vicinity these fish remains in great abundance and perfection, and what is of more interest, a complete skeleton very closely resembling the Cephalaspis of Hugh Miller.

The importance of this discovery, together with that of the bone bed embracing both fish and reptilian remains, in Phœnixville, Pa., is manifest. The old red sandstone henceforth becomes highest in interest, as it is in geological position, of the strata of the New York system. EDWARD ORTON.

Chester, N. Y., Nov. 22, 1861.

Improvement in Warming Tents.

MESSRS. EDITORS :—I have received four copies of the SCIENTIFIC AMERICAN, and it seems like an old friend. As my subscription had just run out before I left home, and payday had just come, I was bound to have the paper if I did not have anything else. Our Lieutenant will hand me the paper and half a dozen will wish to see it at a time.

I noticed an article in the paper about a camp stove invented by a member of the Fifteenth Ohio Regiment. Our company have had them when on picket at Annapolis Junction. We dug our hole about three feet deep, laid the walls in morter, and made two trenches for smoke flues, so that, in whatever quarter the wind might be, it would not smoke the tent.

I have but two copies of your paper now. The rest are around among the Company and also in Company E. W. H. EARL.

Post Naval Academy, Annapolis, Nov. 25, 1861.

Schuylkill Canal and its Capacity.

MESSRS. EDITORS :—I notice in your issue of the 30th of November, under the head of "Comparative extent of the Canals in the United States," an error in relation to our canal which I think is deserving of correction. You give the Schuylkill canal as 36 feet wide, 3½ feet deep, locks 80 feet long, and 17 feet wide. The above was correct in 1840, but our canal has been enlarged, and now is 50 feet water surface, 6 feet depth of water, lock 110 feet long, and 18 feet wide; canal 108 miles long. About one-half of the navigation is pools when the water surface runs from 200 to 400 feet wide, and depth from 7 to 20 feet. There was shipped over our navigation, of coal alone in 1860, 1,356,687 tuns, our boats are 102 feet long, 17 feet 6 inches wide, 8 feet high midships, and carry from 175 to 200 tuns according to age of boat, so you see we are not the small potatoes represented in the paragraph noticed. I find the same mistake has been made in the new Encyclopedia of Appleton, which I think is inexcusable in a work making the pretensions it does to being up to the times.

THOMAS P. KINSEY,
Supt. Mech'l Dept., S. N. Co.

Reading, Pa., Nov. 25, 1861.

[The statistics respecting canals referred to by our correspondent were obtained from a source supposed to be reliable.

An old correspondent in Auburn, N. Y., also sends corrective information respecting the New York and Erie Canal. Its present locks are 18 by 180 feet. They will admit boats 17 5/12 feet beam, and 97 feet long, drawing 5 feet 6 inches of water. These locks are double with one exception, and the boats on this canal carry over 200 tuns of freight. Our correspondent regrets the locks were not made 150 feet long, as boats of 300 tuns could then be admitted that might have been propelled with steam engines at the rate of four miles per hour.—EDS.

The Crank Motion.

MESSRS. EDITORS :—Would it be any great advantage to do away with the crank motion of an engine, and substitute a different motion whereby the power of the engine would be the same throughout the revolution of the wheel, still retaining the present form of piston, &c.? If so, I think I can accomplish such a change without any great additional expense in the first cost of an engine. E. P. F.

Saint John, N. B. Nov. 20.

[The crank motion is, in some respects, beautifully adapted to the reciprocating engine. It causes the piston to start at the beginning of the stroke with a slow motion, which is gradually accelerated to the middle of the stroke and then gradually diminished to the end. This avoids all blows and shocks, and is very important, indeed absolutely essential, in the rapid working of a reciprocating engine. There are serious objections to the reciprocating engine, but as long as it is employed, we can conceive of no better device for converting its motion into rotary than the crank.—EDS.

Loss by the Crank Motion.

MESSRS EDITORS :—In your issue of the 16th inst. I notice an article on a subject which has exercised my mind greatly for a long time, and I may be able to give you some data which will throw a little light on the subject in question, viz., the loss by the crank motion.

In the county of Cornwall, in England, the pumping is performed by engines which may be termed direct acting, inasmuch as they operate the pumps without the intervention of a crank, and as a very strict account is kept of the duty performed by all the mining engines in the county, some direct acting and some with a crank, we can therefore easily compare the relative merits of direct acting and crank engines. From Browne's "Engine Reporter" I extract the following data. In the year 1860, the pumping engine doing highest duty was one at Par Consol's which performed a duty of 94.7 millions of pounds raised one foot high by consuming one cwt. of coal, while the highest duty preformed by a crank engine was a stamping engine at Great Polgooth mine which performed a duty of 50.1 millions. This would seem to show pretty conclusively the practical loss by the crank motion, which I think results entirely from friction. So much for the loss. The next consideration which would naturally present itself, would be the means of preventing it.

It appears to be a self-evident fact that at each end of the stroke the power derived from the pressure of steam on the piston is entirely absorbed by friction, and that the least amount of friction is at two points at or near half stroke, or, in other words, the least amount of friction is when the course of the transmission of power from the piston to the crank is at right angles to the latter. Hence if we can by any simple contrivance transmit the power at right angles to the crank throughout the stroke, we shall have a reciprocating engine, working with the least possible amount of friction.

My reason for supposing that there is no theoretical loss in the crank is, that I hold it a fundamental mechanical principle, that (friction aside) by whatever means you produce the change, in exactly the same ratio as you increase the speed you decrease the power, and *vice versa*.

My motive for sending this communication is that I believe I have discovered the desired combination, and wish by discussion through your columns to ascertain if my hypotheses are correct.

THOS. PETHERICK, Jr.

Belfast, Maine, Nov. 25, 1861.

The Pinion Gear of a Water Wheel.

MESSRS. EDITORS :—Does it make any material difference where the pinion gear is set on a water-wheel? That is, will it take more water or less, if the pinion is set nearly on top of the wheel, or nearly on a level with the shaft or center of the wheel?

There is some dispute on the question among practical men. Will you give your opinion in the "Notes and Queries," and oblige J. R.

[The only difference that it makes is through the influence that it has upon the friction. If the pinion gear is set at a level with the axle of the wheel and on the side opposite to the full buckets, the pressure of the machinery will be added to the weight of the water to increase the friction upon the main journals. But if the pinion is set on the side of the wheel that takes the water, the weight of the water will come directly upon the pinion instead of prying across the axle, and the friction will be diminished. Morin's elaborate experiments showed that the friction of journals is in direct proportion to the pressure. By doubling the pressure we double the friction—other things being equal.—EDS.

Philadelphia Items.

NEW LARGE IRON-PLATED FRIGATE.—Messrs. Merrick & Sons, Philadelphia, state in a communication to the *Gazette* of that city, that they have contracted with the Navy Department to furnish an iron-plated war steamer of thirty-five hundred tuns, to be completed by the fifteenth of July next. The plates are to be 4½ inches thick, and are being made at Bristol, on the Delaware, and at Pittsburgh. They have received many of the plates, and are now planing them so as to fit the vessel. The foundry of Messrs. Merrick & Sons, presents a busy scene at this time. There are six hundred and twenty-five persons employed there, and almost all of them are engaged upon government work. Four boilers are in the progress of construction, for the iron-clad steamship, and two others for vessels to be built or in the progress of construction. For the want of room, the firm has been compelled to give out the manufacture of two boilers. The boilers for the United States frigate, *Powhatan*, are nearly completed, so that the vessel will not be delayed for the want of her machinery. Within a few days this firm placed the engines and machinery on board the side wheel steamer *Miami*.

Workmen have been engaged in reparing the blocking for the sloop-of-war to be built in the small ship-house.

The steam frigate *Powhatan* has been hauled in alongside of the *Tuscarora*, at the south pier. She is being inspected, to asertain the extent of the repairs necessary.

The work upon the sloop-of-war *Brocklyn* is rapidly progressing, and she will soon be ready to go into commssion.

The prize schooner *Mabel*, which was captured on the 15th of Nov., off Savannah, in attempting to run the blockade, arrived at the port of Philadelphia in charge of a prize crew. The *Mabel* had sailed from Havana and was bound to Savannah, Ga. Her cargo consists of seven bales of blankets, four cases of cloths, two cases of saddles and bridles, 120 bags of coffee, one case of pistols, and two cases of cavalry swords, besides other arttcles of small value.

Among the ordnance stores received at the navy yard, was a monster rifled canuon for the steamer *Miami*. It is abont ten feet long, from eight to nine inches in the bore, and wighs 7,960 lbs. This steamer will be ready for service in a few weeks, and will make a valuable addition to the navy owing to her light draft and the size of her battery.

Progress of American Inventions in Europe---Boot and Shoe Machinery.

Some few weeks ago, says the *Coventry Herald*, we noticed a new and greatly improved sewing machine, the invention of Mr. Salisbury, an American gentleman, and we intimated at the same time that a company was about being formed in Coventry for the manufacture and sale of these machines. Within the last few days our attention has been called to another patent sewing machine, and from what we could see of its action, and the work it is capable of performing, there is little doubt but that it will effect as great a revolution in one department of the boot and shoe trade, as the ordinary sewing machine has done in the other. The machine is known as "Blake's patent sole-sewing machine," and is, we understand, the invention of a young man from the late United States. It is large and imposing in appearance, standing beside the little modest-looking ordinary sewing machines like a Triton among the minnows. The machine is made upon an entirely distinct principle to that of any other sewing machine yet invented, inasmuch as it sews with one thread only, and of course the action is obtained in an entirely different manner. When seen at work, one feels no doubt as to the quality and strength of the sewing. With each revolution of the wheel a formidable looking needle, holding a good thick waxed thread, descends with a sharp thud into the substance to be sewed, and by some legerdemain that we failed to perceive, loops itself underneath and comes up again with a snatch that tightens the stitch much more effectually, and altogether puts into the shade the old scientific turning out of the elbows, leaning forward of the chest, and desperate final jerk with which the knight of the stall was in the habit of forcing home the soling stitch, and clenching an argument with any friend who might happen to be present during the process. The material being sewn at the time of our visit was two pieces of sole leather just cut from a dry hide; the two measured three-eighths of an inch in thickness, and from the ease with which the needle went backward and forward through this substance, there was not the slightest doubt but that it might be made to go through double the thickness if required. The seam is along a channel that is afterward closed up so effectually that it is difficult to see the stitches, and the old channel-sewn sole is again produced as perfect and even much more perfect than it used to be by hand.

In the making of boots and shoes by this machine the sole is arranged for the "upper" to come between the inner sole and the outer one; the boot is then placed under the machine, and without the necessity of a welt, the whole is fastened together by stitches that go through the entire thickness of soles and upper, yet so neatly as to leave no ridge to irritate a tender foot on the inside, or expose the sewing to the wear of the pavement on the outside. When it is added that a pair of soles can be sewn on and completed in three minutes, it will be seen how completely impossible it is for human labor to compete with this machine. When the machine was first invented, only the sides were sewn up, and the toes and heels were left to be pegged or nailed; now, however, by a very beautiful contrivance, the machine can be made to sew round the toe and heel of the boot with the same ease as any other part. It is calculated that a woman could superintend one of these machines, and turn out 100 pairs of boots per day on an average. We were shown a pair of ladies' boots made by a machine of this kind, and for neatness and finish they excelled any hand-made boots we have ever seen. Some shoes of a stronger description were also shown, and these were equally excellent. If arrangements can be made for securing the machine for Coventry, there seems no earthly reason why Coventry should not become as celebrated for the manufacture of machine-made boots and shoes, as it has hitherto been for ribbons and watches. The machine patented by Mr. Salisbury is acknowledged to be a superior machine for light sewing to any at present in the market; this can be employed for preparing the tops, while Blake's sole-sewing machine would complete the boot; and under these circumstances, the home trade would in all probability be the least part of the demand that would spring up.

Queen Victoria's Crown.

Prof. Tennant thus describes the crown:—The imperial state crown of her Majesty Queen Victoria was made by Messrs. Rundell & Bridge, in the year 1838, with jewels taken from old crowns, and others furnished by command of her Majesty. It consists of diamonds, pearls, rubies, sapphires and emeralds, set in silver and gold; it has a crimson velvet cap, with ermine border, and is lined with white silk. Its gross weight is 39 ounces, 5 pennyweights troy. The lower part of the band, above the ermine border, consists of a row of 129 pearls, and the upper part of the band of a row of 112 pearls, between which, in front of the crown, a large sapphire (partly drilled), purchased for the crown by his Majesty King George IV. • At the back is a sapphire of smaller size, and six other sapphires (three on each side), between which are eight diamonds. Above and below the seven sapphires are 14 diamonds, and around the eight emeralds 128 diamonds. Between the emeralds and sapphires are 16 trefoil ornaments, containing 160 diamonds. Above the band are eight sapphires surmounted by eight diamonds, between which are eight festoons, consisting of 148 diamonds. In front of the crown, and in the center of a diamond Maltese cross, is the famous ruby, said to have been given to Edward Prince of Wales, son of Edward III., called the Black Prince, by Don Pedro, King of Castile, after the battle of Najera, near Vittoria, A. D. 1367. This ruby was worn in the helmet of Henry V. at the battle of Agincourt, A. D. 1415. It is pierced quite through, after the Eastern custom, the upper part of the piercing being filled up by a small ruby. Around this ruby, to form the cross, are 75 brilliant diamonds. Three other Maltese crosses, forming two sides and back of the crown, have emerald centers, and contain respectively 132, 124 and 130 brilliant diamonds. Between the four Maltese crosses are four ornaments in the form of a French fleur-de-lis, with four rubies in the centers, and surrounded by rose diamonds, containing respectively 85, 86 and 87 rose diamonds. From the Maltese crosses issue four imperial arches, composed of oak leaves and acorns, the leaves containing 728 rose, table and brilliant diamonds, 32 pearls forming the acorns, set in cups containing 54 rose diamonds and one table diamond. The total number of diamonds in the arches and acorns is 108 brilliants, 116 table and 559 rose diamonds. From the upper part of the arches are suspended four large pendent pear-shaped pearls, with rose diamond caps, containing 12 rose diamonds, and stems containing 24 very small rose diamonds. Above the arch stands the mound, containing in the lower hemisphere 304 brilliants, and in the upper 244 brilliants; the zone and arc being composed of 33 rose diamonds. The cross on the summit has a rose-cut sapphire in the center, surrounded by four large brilliants, and 108 smaller brilliants. Summary of jewels comprised in the crown:—1 large ruby, irregularly polished, 1 large broad-spread sapphire, 16 sapphires, 11 emeralds, 4 rubies, 1,363 brilliant diamonds, 1,273 rose diamonds, 147 table diamonds, 4 drop-shaped pearls, 273 pearls.

A Solution of the Cotton Question.

A London paper says:—"One of the most plausible suggestions yet made for the settlement of the cotton difficulty, is to impose a high differential duty upon all American cotton, to endure for three years. That would be in fact, a guaranty to the Indian exporter against a sudden return to low prices, and would most unquestionably exempt us at once and forever from our present dependence upon America. Already the Indian cotton market is in commotion, and there is the strongest reason to believe that the supply this year will reach Sir Charles Wood's estimate of a million bales. The shippers once secured against a sudden return to ruinous prices, would be able to double that quantity and to place Lancashire once more at ease. By the end of the three years the Indian railways will be complete, the Godavery canal will be in full work, and India ready to compete on equal terms with the South."

Some of the locomotives on the Great Western Railroad, England, have worked up to 750-horse power over and above back pressure in the cylinders. They have maintained an average pressure in the cylinders of 67½ lbs. on the square inch of piston, when running at the rate of 54 miles per hour.

The Story of the Shells.

The lectures on shell fish, prepared by Philip P. Carpenter, B. A., Ph. D., of Warrington, England, for the Smithsonian Institute, are thus beautifully introduced:—

Who has not admired the beauty of shells?—the rich luster of the cowries; the glossy polish of the olives; the brilliant painting of the cones; the varied layers of the cameos; the exquisite narcre of mother-of-pearl? Who has not listened to the mysterious "sound of the sea" in the whelks and helmets, or wondered at the many chambers of the nautilus? What child ever went to the sea-shore without picking up shells; or what lady ever spurned them as ornaments of her parlor? Shells are at once the attraction of the untutored savage, the delight of the refined artist, the wonder of the philosophic zoologist, and the most valued treasures of the geologist. They adorn the sands of sea-girt isles and continents now; and they form the earliest "footprints of the sands of time" in the history of our globe. The astronomer, wandering through boundless space with the grandest researches of his intellect, and the most subtle workings of his analysis, may imagine, indeed, the history of past time and speculate on the formation of globes; but his science presents us with no records of the past. But the geologist, after watching the ebb of the ocean tide, examines into the soil on the surface of the earth and finds in it a book of chronicles, the letters of which are not unknown hieroglyphics, but familiar shells. He writes the history of each species, antedating by millions of years the first appearance of man upon the planet, the abrasion of the Mississippi Valley, or the roar of the Niagara at Queenston Hights. He searches deeper and deeper into the rocky crust of the globe, still finding the same types in older characters. As he climbs the rocks of Trenton or Montmorenci, he treads on the tide-ripples, the rain drops, the trails of living creatures in the ancient Silurian sea, which he interprets by the rosetta stone of Chelsea Beach or Charleston Harbor; and as he reverently unlocks the dark recesses which contain the traditions of the early ages, between the dead igneous rocks and the oceanic deposits which intomb the remains of life, the first objects which meet his gaze are the remains of a thin, horny shell, so like those now living in the Atlantic and Pacific waters, that the "footprint" enables him to reconstruct a brachiopod with delicate ciliated arms and complex organization, such as is figured in the beautiful works of Owen and Davidson, from dissections of the existing species.

Daguerreotype Anticipated.

C. de Langue writes as follows to the *Photographic News*:—

Dear Sir:—I read in a recent number of your valuable paper "Electric Telegraph Anticipated," and thinking that the above title may also be of some interest to your numerous readers and my brethren photographers, I beg to state that in a French book, "Les fables de Fénélon," which has apparently been written for the education of the Duc de Bourgoyne, grandson of Louis XIV., in an able composition under the name of "Voyage supposé 1690," and among the many wonders of which the fable is made up, we read:—"Il n'y avait aucun peintre dans tout le pays, mais quand on voulait avoir le portrait d'un ami, un beau paysage, ou un tableau qui representât queque autre objet, on mettait de l'eau dans de grands bassins d'or et d'argent; puis on opposait cette eau à l'objet qu'on voulait peindre. Bientôt l'eau, se congelant devenait comme une glace de miroir, où l'image demeurait ineffaçable. On l'emportait ou l'ou voulait, et c'etait un tableau aussi fidèle que les plus polis glaces de miroir."

There was no painter in the whole country (the Island of Wonders); but when the people wished to have the likeness of a friend, a fine landscape, or a picture representing some other object, they placed some water in large basins of gold or silver, then they brought this water opposite the picture they wished to take. Soon, the water in congealing became similar to a looking-glass, where the image of that object remained fixed; they carried it where they wished, and it was a picture as faithful as if reflected from the best polished looking-glass.

How far from thinking, the noble and virtuous Fénélon must have been, when writing the above, that such a fabulous wonder might one day be no longer a fable, but a reality!

How glorious is the art through which such wonders are operated!

Swansea, Oct. 23, 1861.

The Lowell *Citizen* says that it has been decided to start up the entire works upon the Merrimac corporation as soon as the necessary repairs of machinery, now under way, can be completed. One or two mills will probably start up next week, and others in the course of two or three weeks. This corporation when fully under way employs about 1,700 females, and between 700 and 800 males.