TO CORRESPONDENTS.

*** *In consequence of the pressure of patent matter upon our columns this week, we are compelled to hold over sundry articles in type, and our column of "Notes and Memoranda."*

*** *We must request such of our correspondents as may desire to be referred to makers of machinery, apparatus, &c., to send their names and addresses, to which, after publishing their enquiries, we will forward such letters as we may receive in answer. Such answers, published to catch the eye of an anonymous querist, are in most cases merely advertisements, which, we are sure our readers will agree with us, should be excluded as much as possible from this column.*

CIVIL ENGINEER.—*You are correct in your surmise that it was in* 1781 *and not* 1788 *that Mr. George Stephenson was born.*

A. F. Y.—*The experiments were made, as you have suggested, with gas, and not coal or coke fires.*

AN APPRENTICE (Peterboro').—*The air was exhausted.*

M. HAYGE.—*We have no particulars of your invention. We cannot state that your invention is valuable when we know nothing about it.*

W. B. (Lambeth).—*The Society of Engineers hold their meetings in Exeter Hall (the lower hall), and a letter addressed to the secretary will, no doubt, reach him. We should suppose there would be no objection to show you the drawings. We may mention that this "Society of Engineers" is of modern foundation, and is composed chiefly of junior members of the profession with no small number of intelligent amateurs, and it must not be confounded with the ancient "Society of Engineers," of the existence of which perhaps not half a dozen members of the new society are aware. The "Society of Engineers," or "Smeatonians," is of very old standing, and hold their social meetings at the Freemasons'. Alas! The vacant chairs are fast increasing there.*

NEUTRAL AXIS IN GIRDERS.

(To the Editor of The Engineer.)

SIR,—Can any of your readers give me a more simple "rule" than that given by Mr. Hodgkinson, for finding the "neutral axis" of a girder?

October 19th, 1859. F. H.

FLOW OF WATER THROUGH TURBINES.

(To the Editor of The Engineer.)

SIR,—Perhaps some one of your readers could tell me how to calculate the number of cubic feet of water which would pass in a minute through one of M. Fontaine's parallel flow turbines, when working at its greatest efficiency, the dimensions being as follows:—Diameter of wheel 3 ft., breadth of ring-shaped passage $\frac{1}{10}$ of the diameter of the wheel, constant head of water 5 ft.—what number of revolutions per minute would this head give at its mos efficient rate? F. M. E.

TWIST IN CRANK SHAFT.

(To the Editor of The Engineer.)

SIR,—Can any of your correspondents inform me of any rule how to ascertain the strain or pressure on the crank shaft of an engine, say, of the following dimensions:—Cylinders, 78 in. diameter; stroke, 5 ft.; diameter of shaft in the journal, 16 in.; pressure of steam in boilers, 15 lb. What I want to ascertain is the twist or torsion of the shaft? H. P.

Fulham, 19th Oct., 1859.

SUBMARINE CABLES.

(To the Editor of The Engineer.)

SIR,—Your correspondent, Mr. Hearder, with all due deference to him, seems to fancy he has invented a cable—"Hearder's cable!" One would naturally expect some new principle in construction, whereas it appears to be merely a new notion of insulating a submarine conductor—something the same as usual, but different—like what is adopted at the Gutta-Percha Works, called Chatterton's compound—a mode of interposing a different material between the layers of gutta-percha, a very doubtful proceeding, to say the least of it. You might extend the list and tell us of McIntosh's cable! Hooper's ditto!! and Silver's ditto!!! DIELECTRIC.

October 11th, 1859.

THE WESTMINSTER BELL.

(To the Editor of The Engineer.)

SIR,—I think that the contraction of Big Ben has a great deal to do with its failure. Allowing that for each foot there is about ¼ in. contraction—at the brim it will amount to several inches more than at the waist, which, if not provided for in the form of the bell, must prove fatal to it; the volume of sound also must suffer, owing to the enormous tension of the brim; it should be so proportioned that the contraction will be uniform throughout, otherwise I can see nothing else for it but to fail again. T. T. J.

October 16th, 1859.

BRICK MACHINES.

(To the Editor of The Engineer.)

SIR,—I observe, in your paper of yesterday in Notes and Memoranda, that machine-made bricks are sold in London at a good profit, after having been brought 100 miles by railway; also hand-made bricks lose about one-third, and machine-made bricks about one-sixth, of their weight, in drying and burning. Can any of your correspondents inform me which are considered the best machines for making bricks of strong gritty clay?

Newport, Monmouthshire, 15th Oct., 1859. C. HANSON.

MR. LEE STEVENS' FIRE-BARS.

(To the Editor of The Engineer.)

SIR,—In your valuable paper of last week, page 280, is a plan of Mr. Stevens's patent fire-bars. I beg to inform you that this is an old invention now patented over again. We had the same sort of fire-bar in use in our furnaces eight or nine years ago, but we had to remove them, for they were of little or no service. The wear and tear over-balanced their advantages. The invention was patented by Mr. Miles, iron founder, Huddersfield, in 1847. HENRY EASTWOOD.

Elland, Oct. 18th, 1859.

[*We shall be happy to see your smoke burner.*—ED.]

THE STEAM WHISTLE.

(To the Editor of the Engineer.)

SIR,—Will you or any of your readers be so kind as to inform me who was the inventor of the steam-whistle, and whether he got a patent for it at the time of its invention? Also, will you please to state what are the qualifications of membership required by the Society of Civil Engineers, as I cannot learn that from your article on the subject of Engineers and Engineering Institutions. JOHN HEATON.

St. Helen's, Lancashire, 18th Oct., 1859.

[*We do not think the whistle was invented (in the usually accepted meaning of the word) by anybody: it was a thing that "growed" like Topsy. Membership in the Institution of Civil Engineers is confined to gentlemen who have carried out or executed some great work, and have been regularly brought up to the profession. Other than these can only be associates.*]

HIGH RAILWAY SPEEDS.

(To the Editor of The Engineer.)

SIR,—In THE ENGINEER of the 14th inst., I observe that it is stated by "A Subscriber" that he was informed that the late Mr. Brunel once travelled from London to Bristol within the hour; he also remarks that he should like to be informed of the date of such an occurrence, and I should also like to know it.

I may remark that I have often done the 53 miles from Paddington to Didcot in 47 minutes, 47½ minutes, and 48 minutes, with the express-train of six or eight carriages, the running time then being 57 minutes; but since the saving system has been adopted there is now no "making up time," so if you start late you arrive late, and the running speed has in consequence been much reduced.

Individual engines on this line have on a few occasions been run at a speed of eighty miles an hour, but no train has been attached.

Mr. Crampton states, in his account of his engine "Namur," that the engine alone attained a speed of "seventy-five miles an hour on a level going round a curve between London and Harrow—the speed was taken by Captain Coddington." This took place in the year 1846.

The distance being 118½ miles to Bristol, I should much like to know the engine, &c., that went there from London in the hour. I know of none that could do it. LOCOMOTIVE.

London, October 20, 1859.

STEAMSHIP PROPULSION.

(To the Editor of The Engineer.)

SIR,—In the last number of your excellent publication is a letter from Mr. Cooke, of Darlington, in which he honours me by stating that the mode of propelling alluded to in my paper on fluid resistance was forestalled by the Hirudine propeller (the invention of Mr. J. H. Pidcock, C.E., *vide* ENGINEER No. 14).

I certainly must confess that my mental capabilities cannot penetrate through the science (?) of *kumanseconomy*, which gave birth to the Hirudine propeller, neither can I understand the relation which the undulatory motion of the Hirudine propeller bears to the mode of propulsion suggested by me, except in their object. Had I made the whole vessel a propelling apparatus, and assumingly proved the principle of the same to be based on a few incomprehensible branch of science, contradicting the established physical laws, Mr. Cooke might have been right in his remark, whilst I would have considered my intellectual faculties in an undulatory motion, to penetrate their own nebulous condition. But you and the majority of your readers will have understood from the paper how I condemned every indirect action, and proved the deep immersion of the propelling surface.

Mr. Cooke advances with his own ideas, roughly sketched and shown to a friend, as bearing upon the priority of the invention. I hear of Mr. Cooke, of Darlington, for the first time, and can assure him that, in the attempt of solving the question of fluid resistance, and deducting the fundamental principles of a propelling apparatus, I was not guided or influenced by the fruits of his labours. For the same reason I could expect some Chinaman or back-wood American claim the priority; having "contemplated the precise method mentioned" some years ago.

Pardon me for trespassing on the valuable space of THE ENGINEER for an insignificant question, which will receive no further attention from me except on a different basis. In conclusion, I will only draw Mr. Cooke's attention to the list of Provisional Protections in No. 197 of THE ENGINEER—and thank you for the insertion of this letter. C. G. G.

Brixton, Oct., 1859.

[*In a letter we have received from Mr. Cooke he writes, "I adopted* two *pumps because there should be a constant sucking and a constant forcing action, and* three *troughs because at that time I had the idea of keeping the line of resistance central in a similar way to Stephenson's 3-cylinder engine, by one large in the centre and two small at the sides. Finally, my object was to record the fact of the suggestion not being new, and partly to raise a discussion as to the case for a patent where, previous to publication by another party, sketches without dimensions are made." We may set this point at rest by saying that drawings will not invalidate a patent. There must be* public user.]

MR. HOWDEN'S SHAPING MACHINERY.

(To the Editor of The Engineer.)

SIR,—I cannot refrain from laying before you another instance of the serious want there exists in our patent proceedings, of some easy and effectual way of referring to what has gone before.

In your last impression I see an illustration and description of a machine for shaping and cutting metals, or in plainer words, a rivet and bolt machine. Now, in 1855, I designed for Mr. S. Greenwood, of Sunderland, which he patented and erected for Mr. A. Ray, ironmaster of that place, a machine exactly the same in principle, and almost in every detail, as that invented and patented this year by Mr. Howden, of Glasgow; the only difference there is in detail is that Mr. H. uses levers and cams at the head of the heading rams, while I placed the eccentric directly on the top of the rams, of which there are two. The horizontal die disk with its dies round the surface, the mode of punching out, also the turning the die disc with a ratchet and wheel, are all almost the same. I refer more particularly to Figs. 1 and 2, and that part of the machine which is favoured with a special illustration, the stop-bolt. This certainly did not form part of Mr. G.'s patent, but was added to the machine when set to work in the shop, where it worked for some time, being found necessary to prevent the momentum of the die disc carrying it further than was intended when working at its highest velocity, 140 rivets per minute.

I send you a rough tracing of the outline of the machine, so that you may compare them.

Your putting this in your valuable journal would oblige.

18, Great George-street, Salford, Oct. 19, 1859. JAMES KEAN, Jun.

THE ENGINEER.

FRIDAY, OCTOBER 21, 1859.

REQUIESCAT IN PACE.

WHILE we are writing a remarkable occurrence is taking place. Within the walls of Westminster Old Abbey the grave is preparing for the mortal remains of one of the world's benefactors about to be committed to the earth. He slew no men in war, though from time to time some of his fellows became martyrs in another strife. He battered down no towns nor dwellings of men, to their impoverishment, but only threw down the old where it impeded the progress of the new. He used powder, not to slay men, but to perforate the hills for their free passage through them. He wasted no iron in great guns or cutting weapons, but worked it into tools, and rails, and locomotive engines—all reproductive and progressive implements. He levelled hills and filled up valleys, and made the rough places smooth, and did more for extinguishing cruelty to animals than all the societies that ever joined together. Father and son, these two Stephensons seemed to have come into the world to do an appointed work, and when they had done it their race was ended. No blood lineal shall ever add to, or take away from, their well-won fame. They live in story to become in time a tradition—a myth—the workers of work greater than ever was attributed to Hercules—men who sprang from below the earth like those from the teeth sown by Cadmus, gnomes of the coal mines ready to harness their sprites to the iron horses that thenceforth had to do man's labour, and set aside the races of Araby and Barbary, and of Rouen and Flanders.

A brave man was George Stephenson, albeit dour and quaint. The might of an original man was in him, and he knew it, though struggling painfully to give it utterance. As brave a man was his son, with the powers of utterance won for him by his father's labours. And now within the abodes of our storied dead, of our long line of worthies, by the side of Telford, his mortal remains are to repose and be at rest. It seems as though a new era were about to dawn upon mankind, when the Dean of our old Abbey throws wide its gates, in recognition of the works of peace, to admit some three thousand chosen Englishmen to bestow their last mute tribute of respect to him whom they honoured when living, and mourn when dead. Ay! and one of the few who reaped the reward of his labours while living, and did not wait for death to find his recognition.

This will be emphatically a national funeral. All that the proudest baron could attain—all that could be given to the successful warrior by the church's rites and the people's voice, will follow the pall, drooping mournfully over what was once—Robert Stephenson.

THE FUTURE OF CIVIL ENGINEERING.

IT may be safely concluded that the profession of civil engineering has attained the larger share of its present influence and importance in the development of the railway system. The promoters of this system (which originated in the invention of the locomotive engine) made little or no headway until the practicability and utility of railways had been completely demonstrated. When, however, all questions of a mechanical nature bearing upon the success of such enterprises had been satisfactorily disposed of, the keen instincts of capital at once detected new opportunities for investment, and vast works of a novel character were undertaken, not only throughout this kingdom but in nearly all the civilised countries of the world. Up to the period to which we refer, the profession which has since derived such importance from the labours of our modern engineers was a craft of the most ordinary pretensions. There was no presumption, perhaps, even after railways came into favour, that extraordinary genius was required in an engineer. His sphere was not that of invention nor in profound scientific abstraction. Good judgment, experience, and a fair share of executive ability must have been then, as they are now, the prime requisites. But, however this may have been, the demand for engineers appears, for some time, at least, to have outrun the supply. Not that works remained uncompleted for the want of engineers to undertake them; there has probably been no time within the history of engineering, when matters have come to that pass. But a large number of works, indeed nearly all for which means could be obtained, were confided to a few men who divided the details of their design and execution among a large number of subordinates. None can dispute the excellence of the works thus carried out. In grandeur, capacity, and solidity, they are not exceeded by anything now remaining of the highest period of Egyptian or Roman power. We have indeed had reason to be proud of many of our great monuments of modern engineering, but it is probable that, upon the whole, our pride has been fully satisfied, and that henceforth, so far from boasting, we shall grow critical, and insist upon corresponding practical results from simpler and less expensive means. There are, indeed, many significant indications of approaching changes in the professional position of civil engineers, and in the conditions under which their works are to be executed. Engineering, whether it be considered as a science or an art, is in its nature more progressive than almost any other entering into the common pursuits of life. As practised within the last thirty years, it has been frequently unsuccessful, so far as pecuniary results have been concerned. It is impossible to deny that grave errors have been committed when so many millions of capital are known to have been hopelessly sunk, and whilst the advantages sought to be obtained are as yet only partially enjoyed by the mass of our population. It is not enough to compare our railway system with the old dispensation of stage coaches. Whatever result may be disclosed, the comparison is incomplete until the former has been brought, as the latter is believed to have been, to the highest possible excellence. There is every reason to believe that our railways are now very much farther from absolute perfection than were our mail coaches, considered simply as such. We are not to expect, therefore, the perpetuation of the present standards of engineering skill. They will be essentially modified, and on the whole very much advanced. The results of the engineering of the first half of the present century are—some in the order of nature, some alas! too soon—becoming better understood, and are leading to comparisons and further inquiry. The engineers of the old school are passing away. Some of the greatest names in the profession—names which for many years have been constantly associated with the material progress of the world—and which, such as those of Stephenson and Brunel, have been spoken everywhere in familiar reference to the greatest works of modern times, have become historical. However posterity may pronounce upon the practice of these engineers, the great influence which they exerted in the advancement of engineering will be acknowledged. Nor shall we do any injustice to their memory in endeavouring to improve upon their practice. Of all men, they have given to their successors the best examples of professional progress and of rapid development of engineering conceptions. These tendencies were as apparent, indeed, in the later as in the earlier portions of the respective careers of Mr. Stephenson and Mr. Brunel. As engineers they formed opinions, no doubt, which further experience may show to have been insufficient; and it is even more probable that they rejected many opinions which are destined to govern a more successful and altogether superior practice of engineering. Göethe, we believe, has said that no man receives a new opinion after forty, if it be at variance with his previous notions, and if we can admit the truth of the remark, we as readily perceive that it is founded in natural causes, to which nothing in the character of either of the great engineers under notice—both of whom were in the midst of their professional fame at forty—could be expected to furnish an exception. Certain it is that they were, as other men, not infallible, and both indeed made their mistakes. We must judge these men rightly, therefore, estimating their works according to the circumstances under which they were executed, and losing nothing of our own self-reliance in the future.

The point upon which the engineering of the past thirty years may be most severely criticised, is in the disregard which it has displayed as to the value of money. We for too long a time indulged in hair-splitting upon the matter of railway gradients and curves, and formidable as they made the cost of working undulating and sinuous lines to appear, the interest upon the cost of the magnificent works by which long straight levels were secured was infinitely more formidable — overwhelming indeed. There is no question whatever of the abstract advantages of easy gradients and curves, but there is such a thing as paying much too largely for these advantages. There are corresponding advantages in straight level highways, but if all highways were to be constructed in the best style of road