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THE ENGINEER, March 29th, 1889.

TO CORRESPONDENTS.

Registered Telegraphic Address "ENGINEER NEWSPAPER, LONDON."

**** All letters intended for insertion in* THE ENGINEER, *or containing questions, should be accompanied by the name and address of the writer, not necessarily for publication, but as a proof of good faith. No notice whatever can be taken of anonymous communications.*

**** We cannot undertake to return drawings or manuscripts; we must therefore request correspondents to keep copies.*

**** In order to avoid trouble and confusion, we find it necessary to inform correspondents that letters of inquiry addressed to the public, and intended for insertion in this column, must, in all cases, be accompanied by a large envelope legibly directed by the writer to himself, and bearing a 1d. postage stamp, in order that answers received by us may be forwarded to their destination. No notice can be taken of communications which do not comply with these instructions.*

S. B. (Blackheath to Fen).—*If you will send a sketch showing the elements of your valve gear, with a brief description, we will give you our opinion on its merits, in confidence.*

R. A. B.—*The displacement is settled by the lines—in other words, by the shape of a ship, as well as by her length, breadth, and depth. The Italian ships are no doubt somewhat "leaner" ships than the proposed English vessels will be.*

WIRE STRANDING MACHINES.

(To the Editor of The Engineer.)

SIR,—Will any of your readers tell us the names of makers of wire stranding machines? C. B. AND N.

SLATE MACHINERY.

(To the Editor of The Engineer.)

SIR,—Will any of your correspondents kindly send us full particulars, prices, and best trade terms for machinery for sawing and planing "argillons" and slate stones for roofs of houses and for flag paving stones, &c.? SLATES.

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THE ENGINEER *can be had, by order, from any newsagent in town or country at the various railway stations; or it can, if preferred, be supplied direct from the office on the following terms (paid in advance):—*

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Letters relating to Advertisements and the Publishing Department of the paper are to be addressed to the Publisher, Mr. Sydney White; all other letters to be addressed to the Editor of THE ENGINEER.

MEETINGS NEXT WEEK.

THE INSTITUTION OF CIVIL ENGINEERS.—Tuesday, April 2nd, at 8 p.m.: Ordinary meeting. Paper to be further discussed:—"The District Distribution of Steam in the United States," by Dr. Chas. E. Emery, M. Inst. C.E. Paper to be read, time permitting:—"Armour for Ships," by Sir Nathaniel Barnaby, K.C.B. At this meeting the monthly ballot for Members will take place. Friday, April 5th, at 7.30 p.m.: Students' meeting. Paper to be read:—"Moulding and Casting Cylinders for Marine Engines," by Mr. R. J. Durley, B.Sc., Stud. Inst. C.E.; Mr. John Donaldson, M. Inst. C.E., in the chair.

SOCIETY OF ENGINEERS.—Monday, April 1st, at the Westminster Town Hall, at 7.30 p.m.: Ordinary meeting. Paper to be read:—"Fire-proof Floors," by Mr. G. M. Lawford, Assoc. M. Inst. C.E., of which the following is a synopsis:—Roman floors—Invention of pugging—Development of the concrete and iron joist floor—Objects of fire-proof flooring—Detailed descriptions of the floors now in vogue in English practice—Other systems, including the French and American floors—Fire-proof plasters and paints—Merits and defects of the different floors, and types of construction—Leading features to be considered—Conclusion.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—Wednesday, April 3rd, at the Westminster Palace Hotel, Westminster, at 7 p.m.: Ordinary meeting. Paper to be read and discussed:—"The Roadstones of Somerset and Wilts," by Mr. James Bateman.

GEOLOGISTS' ASSOCIATION.—Friday, April 5th, in the Mathematical Theatre, University College, Gower-street, at 8 p.m.

SOCIETY OF ARTS.—Monday, April 1st, at 8 p.m.—Cantor lectures: "Instruments for the Measurement of Radiant Heat," by Mr. C. V. Boys, A.R.S.M., F.R.S. Lecture II.—All instruments of an electrical character require a thread suspension—Properties of wire, spider, glass, and quartz threads—Silk and quartz compared—Details of the manufacture of quartz thread, and instructions for preserving and mounting them. Tuesday, April 2nd, at 8 p.m.—Foreign and Colonial Section: "The Argentine Republic," by Mr. F. K. Smythies. Wednesday, April 3rd, at 8 p.m.—Ordinary meeting. "Fruit Growing for Profit in the Open Air in England," by Mr. W. Paul, F.L.S.

ROYAL INSTITUTION.—Friday, April 5th, at nine o'clock, the evening discourse will be given by the Rev. Canon Ainger, M.A., on "True and False Humour in Literature." Monday, April 1st, general monthly meeting, at 5 p.m. Afternoon lectures at three o'clock:—Tuesday, April 2nd, "Before and After Darwin. II. Evolution," by Mr. George J. Romanes, F.R.S. Thursday, April 4th, "Houses and their Decoration from the Classical to the Mediæval Period," by Professor J. Henry Middleton, M.A. Saturday, April 6th, "Experimental Optics—Polarisation; Wave Theory," by the Right Hon. Lord Rayleigh, F.R.S.

DEATH.

On the 22nd inst., at his residence, Cottingham, Westwood, Southampton, THOMAS SUMMERS, M.I.C.E. and M.I.N.A., in the 64th year of his age; late of the firm of Day, Summers, and Co.

THE ENGINEER.

MARCH 29, 1889.

THE RELATIONS BETWEEN LOCAL FORTIFICATIONS AND A MOVING NAVY.

IN a famous pamphlet, written some half-century ago, the great master of logic, Archbishop Whately, proved most conclusively that there were no rational grounds for believing that Napoleon Buonaparte ever existed at all. By a similar process of reasoning, or *un*reasoning, Admiral P. H. Colomb has sought to convince an audience at the Royal United Service Institution that the existence of a more perfect system of defensive works around the coasts of the United Kingdom would be practically useless in the event of war, and that powerful fortifications would be positively detrimental to our foreign possessions, such places as Malta and Gibraltar being a source of weakness and not of strength, the danger attaching to their existence increasing in the same ratio as the works themselves progress towards final completion. With all due regard for the gallant admiral's opinion, it is impossible to avoid the conviction that he has endeavoured to prove a little too much. That he holds remarkable views as regards the value of strongly fortified positions is well known to all those who have listened to his able speeches upon the subject of naval strategy and the science of blockade, in which last subject he is so peculiarly at home; but we do not for a moment believe that Admiral Colomb was seriously propounding a genuine conclusion when he finished a paragraph in his paper with the following statement:—"I conceive we have established the fact that, before a country can employ such fortifications *at all*, she must have surrendered the command of the sea, and, if such command has been necessary to her empire, *she must have abandoned empire.*" The italics are our own.

No, no. Admiral Colomb penned these remarks in righteous indignation at the audacity of Captain Stone, who, as he says, "made a sort of excursus into the domain of naval action and policy" when discussing the employment of "quick-firing guns for fortress defence." It will be remembered that in the columns of THE ENGINEER we recognised that very important "side issues" on naval questions were raised by Captain Stone; but, regarding the lecture as only a dissertation upon quick-firing guns, we did not review his opinions under the head of naval operations. It is, we consider, a proceeding to be deprecated when scientists of one profession plunge recklessly into dogmatic expressions of opinion upon the policy which should guide the conduct of other professions. The ancient aphorism in regard to the cobbler and his last is too frequently forgotten or set aside in these days of general adaptiveness. Hence, we conceive that it was somewhat unfortunate that Captain Stone should have permitted himself to be carried away from the legitimate aim and object of his most valuable paper upon quick-firing guns, into side issues, or, as Admiral Colomb calls them, "primary issues," of so vast a significance as high naval policy; and we cannot but regret that, at a time when the question of completing the chain of fortified links which engirdles the British Empire, and which is declared by experts to be essential to its coherence, comes upon the *tapis*, and is, so to speak, hanging in the balance, that any voice should be raised in the endeavour to embarrass those who are urging on the undertaking. We will not follow Admiral Colomb into all the intricacies of history which he has unravelled in support of his argument, further than to say that Colonel A. Parnell, in a recent number of the *Army and Navy Gazette*, discounts their value very considerably, by looking at the events from a landsman's point of view.

But, having dwelt shortly upon what we regard as merely the argumentative element in Admiral Colomb's lecture, let us now glance at the really important points which he so clearly enunciates. The most salient of these is the imperative necessity that for the preservation of our empire we must ever hold the command of the seas; and this condition involves supremacy, not only in the great seas, but unbroken command of the lines of communication all over the globe. At such a time as the present, when the contemplated increase of seventy battleships, cruisers, and gun vessels to our Navy, so as to make it equal to the navies of any two other Powers, is under consideration, the weight of Admiral Colomb's opinion is most judiciously thrown in on the side of her Majesty's Government. Looking at the matter from this point of view, the utterances in the lecture command more than ordinary interest, more especially as they were dictated by one who was ignorant of the intentions of the Admiralty, since communicated to Parliament. But one of the most valuable of all hints adduced by Admiral Colomb is that in which he professes to give the line of policy sketched by Colonel Maurice, as applicable to concerted action of the army and our fleet. Instead of shutting up the former in detached garrisons dispersed throughout the empire, he would employ it for embarkation under convoy of, and disembarkation under cover of the Navy, for *offensive action* against independent parts of the enemy's shores. Here we think that the weak point in all our policy has been probed. One hundred years ago we never assumed a defensive *rôle*. We carried our arms into the enemy's country at once, and swept down upon his ships and harbours with our squadrons. Admiral Colomb is altogether right when he indicates our true policy as an active one. Hence the great principles of his paper deserve to be printed in letters of gold.

JOHN ERICSSON.

MEN of genius are often over-rated by their countrymen, because they are at once valuable and exceedingly scarce. John Ericsson was in the fullest sense of the term a genius, and in the United States there is manifest just now a strong tendency to rate him at a higher value than he deserved. This amiable weakness does no one any harm, but it is just a little vexatious to find success after success claimed for him at the expense of Englishmen. That Ericsson was an excessively clever man we do not for a moment dispute; we use the word "excessively" advisedly, and of set purpose; none other could so well convey our meaning. Ericsson was too clever, and the fact really impaired his utility. The best way to illustrate this is to glance briefly at some of the events of his life, and to consider the claims made for him, claims, indeed, which he himself would possibly have repudiated. He was born in 1803 in a Swedish mining district, and was made a cadet in the Swedish Corps of Engineers when he was twelve years old. He was soon afterwards employed in taking levels for a section of the Gotha Ship Canal, and it is said that he was so small that a stool had to be carried for him on which he stood to reach the eye-piece of the level. One of his first inventions was a flame engine; what this was precisely we have never been able to learn. It was some form of caloric engine worked with pine shavings. He came to England in 1826, and got into partnership with John Brathwaite, and between them was designed and constructed a locomotive—The Novelty—in which the products of combustion traversed a tube winding backwards and forwards through the boiler; combustion was forced by a bellows worked by the engine. During the memorable Rainhill trials the engine competed for the prize, but the workmanship was so indifferent that the boiler broke down, and the machine was withdrawn. One of the great defects in Ericsson's character as an engineer was manifested here, namely, inattention to details. It appears, indeed, the invariable rule that a mechanical genius shall neglect detail, not only in construction, but in design; yet on detail depends all the difference between success and failure. We use the word, be it remembered, in a very large sense. How large will be understood as we proceed.

Ericsson about this time, and for some years subsequently, produced a host of inventions. It is claimed for him that he was the first man to use forced draught at sea in a steamship called the Victory, constructed in 1828. This ship had no smoke-stack. What was to become of the smoke after it was got overboard he does not seem to have cared. Yet it is sufficiently obvious that nothing was to be gained by suppressing the chimney, whatever might be the benefit of the forced draught. We need scarcely add that the value of the invention as it stood was practically nil. In a second ship, the Corsair, built at Liverpool in 1832, centrifugal fan blowers were employed, and we willingly give Ericsson the credit for an invention with a possible future. Ericsson was one of the first, if not the first, to construct a steam fire-engine, and in 1840 he took the gold medal of the Mechanics' Institute of New York for one. The United States claim that he invented the link motion, and applied it in 1830 to the King William and Adelaide locomotives. There is no basis, however, for the claim, Ericsson's valve gear being in no sense or way identical with that known as Stephenson's. In 1833 he produced his caloric engine. Very great things were expected of this invention, but it came to nothing. In the hands of English engineers the principle has been successfully applied on a small scale. Ericsson was quite unable, from lack of consideration for detail, to see that it could not be made to answer on a large scale. Money was available, however, and on a large scale it was tried on board the Ericsson, a ship 260ft. long, built specially for the purpose. She was fitted with paddle-wheels driven by four cylinders, each 14ft. in diameter, with a stroke of 6ft. The number of revolutions made per minute was nine, and the indicated horse-power of this huge machine was only 300 horses, the effective pressure being, according to Rankine, only 2·12 lb. per square inch. It is said that during the trial trip a man was kept in each cylinder—they were open-topped—and well supplied with buckets of melted tallow, with which he lubricated the sides of the cylinder. He stood on the piston and went up and down with it. It was only a detail that the use of hot air was incompatible with any efficient system of lubrication, and that the fires were lighted under the cylinder bottoms—a way of heating the air as inefficient as possible. The engine, however, notwithstanding its unwieldiness, might have achieved a certain measure of success if only the lubrication could have been managed. The ship was altogether too slow for commercial purposes,