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JOSHUA FIELD, President, in the Chair.

No. 818.—“On the facilities for a Ship Canal communication between the Atlantic and Pacific Oceans, through the Isthmus of Panamá.” By Lieut.-Colonel John Augustus Lloyd, Assoc. Inst. C. E.*

FROM the various notices on this interesting subject in the “*Journal des Débats*” and other papers, it appears that very erroneous opinions are still entertained, as to the real nature of the facilities which are so abundantly available, towards effecting the construction of a canal across the Isthmus of Panamá. Nature has bestowed so many advantages towards this communication, and even concentrated them so nearly at one point, that it will be a matter of wonder, in after ages, why so many generations should have neglected to use them. So little, however, are they known, or so much are they underrated, that if those who have had an opportunity of exploring the country do not attempt to combat these erroneous notions, the accomplishment of a work of vast importance will be postponed to a yet remote period. If, in this nineteenth century, a canal communication, of such trifling extent, had been required through any portion of England, it would have been long since undertaken, and completed, by a few private individuals, or interested landed proprietors.

The advantages of the port of Panamá, the value of the coast in its vicinity as far as Chorrera, and the importance of the unusually great rise and fall of the tides there, seem to be entirely overlooked; indeed, the writer in “*Blackwood’s Magazine*” is evidently so far biased in favour of the railway communication, that he passes over, very lightly, all the superior advantages of a canal communication, from the Atlantic, into a smooth and tranquil ocean. But, previous to making a few remarks on the railway communications, it is necessary to notice briefly some of the paragraphs in the papers already alluded to.

In reviewing the operations in the Isthmus of Darien, the “*Journal des Débats*” states, “that the survey of Messrs. Lloyd and Falmarc was not by any means complete.” It must be re-

* The discussion upon this Paper extended over a portion of three evenings, but an abstract of the whole is given consecutively.

marked, that the lines of level taken by Colonel Falmarc and the Author, were commenced chiefly with a view of ascertaining the difference of level between the two seas. If the writer in the "*Journal des Débats*" had been aware of the interminable and vexatious difficulties, that the officers of engineers employed by General Bolivar had to encounter, in a country governed by a fierce and jealous Biscayan (General Sarda), who was personally hostile to the "*Libertador*," and consequently to them; if he had witnessed the miseries and privations which these officers had to bear up against, refused all pecuniary assistance, suffering from political enmity, and purposely exposed, through the Commandant General's wily machinations, to the murderous attacks of the brigands then infesting the Isthmus, and who had already set the governor at defiance, he would have been disposed to view more charitably the exertions of Messrs. Lloyd and Falmarc. Topographical researches in a civilized country, or levelling along the banks of a canal, are very pleasant things; but to carry on such operations while exposed as a target for "*Cisneros*" and the carbines of his band of brigands, is a widely different matter. It is, however, satisfactory to record, that since that period the French, Spanish, German, American, and English engineers, who, under less disadvantages, have visited the Isthmus, all agree that the operations of Lloyd and Falmarc are entitled to confidence.

The line of levels was taken, as much as possible, along a beaten track, to avoid cutting through the dense forests: this will account for the height of the summit level, which was far above that of the country generally, between the two seas. Throughout South America, from time immemorial, the first explorers, in pushing forward their discoveries, sought some neighbouring eminence, from which to reconnoitre and lay out a track, that has been preserved in after ages, and has become the "*camino real*;" the consequence is, that even across the great Andes, the tracks are generally along, or over, the summits of the chain. M. Morel, one of the French engineers, states that 12 metres is the highest point, in one direction, across the Isthmus of Panamá; although this statement may perhaps never be verified, still it appears certain, that the ground on the eastern banks of the Trinidad will be found so comparatively low, as to offer a very favourable line for a ship canal.

In a recent number of "*Blackwood's Magazine*" there occur the following passages:—"The harbour, or rather roadstead, of Panamá is formed by a cluster of islands, lying about six miles