

meaning I must protest, for I still maintain that the No. 4 American dredge can and does raise as much at least of "impacted" (as Mr. Portus terms it) sand as the Newcastle one does or can; and, further, it is guaranteed by the builders to dispose into punts 350 cubic yards, or more than 450 tons per hour, of such ordinary river silt as the other must have had to deal with on some of the selected days. (*Vide* capacity, page 15 of catalogue accompanying this letter.)

In estimating the merits of both systems, that portion of the question which points to the indisputable fact that dredges of the Newcastle type cost, relatively to the American, three times as much to build, and require twice as many persons to operate, must not be overlooked, although it has been systematically ignored or misrepresented by Mr. Portus. If this great outlay of the public funds, raised by loans, and the numerous hands referred to, could have been expended on the American system, we should have heard of fewer complaints of the inadequacy of the dredging plant of this colony.

I would gladly have concluded here, for I fear to weary your readers by dwelling too long upon one subject, however important; but as I perceive that my antagonist has been reinforced, I think it due to the public interests to explode a shell in the combined camp. I forwarded from Philadelphia a copy of the American Company's catalogue, which, as intended, found its way into the Department of Harbours and Rivers, and I imagine it is there still, for had Mr. Portus's quotation from it been based upon a personal inspection, it would not have been necessary for him to refer to photographs that he had seen, because he would have had before him the pamphlet, which abounds in woodcuts, and woodcuts only, of every class of the Company's dredges; and he would thus have learnt to distinguish the class which is adapted for operating in exposed localities from that which is not. And, although he has not been as candid in his admissions as one ought who desires truth more than victory, I scarcely think he would have been so reckless as to hazard the reference to Hall's dipper, if he had been in possession of the book from which he so "jubilantly" quotes the following passage: "Dredges of this class are not adapted for working advantageously in very hard material, compact clay, sand, or gravel, with the ordinary dipper, *the weight of the dipper being mainly relied upon for penetration.*" By a reference to the catalogue quoted from (pages 21, 25, and 29), it will be at once seen that the quotation relates solely to the smaller dredges, numbered 5, 6, and 7, which are equipped with dippers whose measurement capacity is respectively $3\frac{1}{2}$, $2\frac{1}{2}$, and $1\frac{1}{2}$ cubic yards, and therefore not so heavy as that used by No. 4 (the large dredge whose capabilities alone we have been comparing), which has a capacity 5 cubic yards, and which is specially adapted for dealing with hard sand, having the weight that is deficient in the others. The words I have italicized would have warned any one less eager to find a mare's nest, that Hall's dipper was unsuitable for dealing with very hard material, not from its principle, but only when its weight was insufficient; for on page 35 it is stated that this patent bucket has been proved by experience not to be liable to "bending or derangement, even in extremely hard work." How easily may any one, intent upon supporting a theory, regardless of facts, bring confusion on his argument. There was, moreover, less excuse for the inference that the American type of dredge was not equipped for dealing with the most difficult material otherwise than by Hall's dipper, because in the paragraph immediately following the quotation so ineffectually relied upon, it is stated, as I mentioned in my last letter, that "a special grapple (Holroyd's) is furnished independently for operating in compact clay, boulders," &c., and indeed, in all cases, the machinery best adapted to the desired work is constructed.

Further, it may be remembered that I merely referred to Hall's dipper in connection with the excavation of the Suez Canal, which abounds in quicksands. Had the perfected American machinery been in use on that great work, I am confident that over £2,000,000 would have been saved. When I say that American dredges are extensively employed in cutting channels through such flat marsh lands as are on the banks of the Hunter, for draining and diking them, it can readily be understood how useful they would have been on the Suez Canal. In the catalogue referred to above, it is pointed out by those whose character, experience, and self-interest are too great to permit them to mislead, that the Company's dredges, numbered 1, 2, and 3, which are fitted with the scoop-shaped dipper, and only on that account, are not adapted for working in exposed localities where the water is rough, or where ground-swells prevail, causing rolling or pitching, any more than are the bucket scoops of the Australian dredges, Mr. Portus to the contrary notwithstanding. The No. 5 American dredge and the other classes equipped with Hall's dipper are, however, especially adapted for operating in such exposed localities.

Mr. Portus would, doubtless, be delighted to divert my attention from a discussion on dredging to one on orthography, but I prefer to hand him, with his original "the General," over to some public school boy, remarking, however, that I spelt "chute" as Mr. Prindle does, and I still defer to his authority, because I am not aware that any English lexicographer gives "shoot" as a noun in the same sense as Mr. Portus does.

To deepen the channel so that large ships may enter at Baltimore, I have repeatedly said that the contract price was 4½d. per cubic yard for dredging hard sand or whatever might come; and the sneering allusion made to the operations does not alter the facts as to speed and cheapness, nor make a spoon-dredge the best appliance for sand as, in his utter ignorance of the powers of the grapple-dredger, Mr. Portus assumes. And I can only suppose that he must have passed over New York Bay, outside the Narrows, in one of those thick fogs to which that exposed locality is occasionally subject.

Whether the statements that I have made in regard to the merits of the American system of dredging are "scraps of hearsay" only will be fully demonstrated when the public are in possession of the reports of Sir John Hawkshaw and Colonel Rich, R.E., contained in the report of the British Commission to America, which has been laid before the Imperial Parliament. From that report will be learned how Englishmen, the most eminent in their various professions, write of American methods; and the Australian people will marvel even more than they now do, why it is that, while private interests adopt to their great advantage American improvements, the governmental engineers in these colonies, with few exceptions, set their faces like flint against the experience in public works of 45,000,000 of people, mostly of our race, acting under conditions very similar to our own. Engineers from their