

## DISCUSSION.

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Mr. J. Shirra said he considered the paper a most valuable one, because it put vividly before us here, who sit remote "by the long wash of Australasian seas," the industrial life at the heart of the Empire, for while London may be called the head thereof—the great centres of industry of the north of Britain, and especially the "Second City," fitly represented the heart. It was a new life to most of us. In the "American Engineering Magazine" for last month, we are graphically told of the practice in the marine engineering shops in America 50 years ago—of the want of system—the absence of hurry—the social ethics of the shop—and the rough dragging up the apprentices got. He had seen much the same thing on the Clyde, not much over 30 years since, and he did not know but that it obtained nearer home at this day; but we had changed all that, at least in shops that "keep in front of the procession." Still, he hoped the author's expression "feverish activity" was but a slip of the pen—"healthy energy" would better describe the walk and conversation of the Clydeside shipbuilder and engineer. These modern methods were supposed to be American. There, indeed, industrial and commercial activity seemed to be feverish and morbid, but though their adoption by Uncle Sam had stimulated the spread of them in the United Kingdom, they were really the outcome of British thought and genius.

We had heard much of American shipyard practice—hoisting tackle and so on, but it was a long time since a gantry and traveller were erected over the shipbuilding berths at Linthouse, in the Clyde, before the "Daphne" was launched 20 years ago, anyway, with all her boilers and machinery aboard, only, unfortunately, to topple over when she took the water.

Steam and hydraulic rivetters had been in use there for a generation. Steam ones were obsolete now,

though. Machine tools of all sorts, multiple drills for boiler shells and condenser tube plates, etc., were adopted as soon as invented, and only the conservatism of the workmen prevented greater advances sooner.

Industrial progress obeyed a law like that of a body falling freely—it moved along at a rate increasing with the time; but the sum of its progress, the result achieved, was a some higher power of the time, and soon forced itself on the observation of those who were blind to its early beginnings.

Sometimes, though, a body did not fall freely; a resisting medium had to be penetrated, or, when all seemed normal, by ill chance.

“The strong rebuff of some tumultuous cloud  
Instinct with fire and nitre”

hurried it “as many miles aloft,” and landed us in chaos, where “Rumour next and chance”

“And tumult and confusion all embroiled,

And discord, with a thousand various mouths,”

do their worst to stop the evolution of the Kingdom of God.

But to come back to terra firma. The use of pneumatic tools would be the great feature of the twentieth century engineering, and would doubtless extend to many operations where it was now unsought of. He had often wished for a pneumatic chipping hammer when scaling boilers, that would get into the water spaces and clear the air at the same time; and he thought, while the marble cutting machine we had been regarding was admirable in its new details, its principle, old as that by which the cave-dweller sawed up his mammoth tusks in the year minus 10,000, might be superseded by a pneumatic tool that would laminate the adamant itself.

In ship design, the author remarks on the slight modification within the last ten years of principles or practice. He was glad to say this so-called “turret” cargo steamer had not been much favoured in the Clyde—its design was a distinct retrogression and unworthy of an engineer. For, according to Professor Perry, the engineer was a man who “had reverence and wonder and an eye for beauty of all kinds, for, without these, could no man invent, and because he had these fine qualities

he had also that uncommon gift called common sense." There was no reverence or beauty about a turret tramp, nor common sense in leaving shelves along its top-sides, which were afterwards enclosed by temporary and trumpery wooden structures.

The information given about the use of asphaltic compositions in place of cement was valuable, but we wanted a greater departure from the stereotyped style of the internal finishing of the hull, especially in passenger steamers.

The ship joiner had been supreme too long; he often turned out beautiful work to look at, but his panellings and covering boards were frequently but the whitening of a sepulchre—behind them were dead men's bones and all uncleanness. Rats had been a plague to shipping since Noah's day, but little was done in a systematic way to discourage them, except when a plague scare was on, and the joiner carefully provided convenient runs and breeding places for them, behind his linings, and for other meaner and more obscene vermin, where they were secure and rampant. The wooden framed berths, with their may-be highly polished fronts, but open joints and motrices, where nameless abominations lodged, were in high-class vessels things of the past, metallic ones having superseded them. We wanted the idea carried further—the mass of flimsy woodwork, which prevented examination of the skin plating, and did nothing to preserve it, done away with, and state-rooms and cabins finished in some fibrous and anti-corrosive plaster which would protect the top-sides as the cement did the bottom, and afforded no cover for small game. The decorations lavished on some vessels were small comfort to the squeamish passenger who was awakened by a rat running over his face, and saw, on switching on the light, a dozen cockroaches waving their antennae at him from seams in the joiner-work. This point was intimately connected with sanitation, to which the author rightly gives an important place; we wanted to see it more recognised by everyone. Pipes were hidden away in inaccessible positions as something to be ashamed of; bring them out into the light, and make them features of the decoration itself.

Electric wires were a similar nuisance through the endeavour to have them concealed; run them through stamped metallic casings supported by ornamental and easily removed cleats, and they would look better than useless mouldings or inappropriate cornices. Engineers had long given up useless and excrescent ornament on their productions, and so a well-designed and finished modern engine had a majestic beauty of its own; we wanted similar earnestness and honesty in all constructive work.

If the method of thinking out everything in the drawing-office be adhered to fully, we would get this yet; but draftsmen must be educated up to it, and then they would certainly get fuller recognition, financially and socially, than they now did. And we wanted ships turned out, not all over gimcracks like a Lord Mayor's coach, but fit-looking and noble, like a Glasgow-built express locomotive."

Mr. E. J. Clarkson spoke on piece-work, holding that here this system could not be carried out with the same facility as was done at the large establishments at Home, for the reason that there was a want of continuity of the same class of work; orders changed constantly. He would like to have some reasons found to enthuse the worker for his work, and drew a dismal description of the slow and indifferent manner in which they set to work, and the alacrity they display to knock off at the first stroke of dinner hour. All energy, however, seemed to have vanished when they return to begin work again.

Mr. McAllister in his reply fully endorsed what Mr. Shirra had said, especially as to the wood-work on vessels. The system of piece-work had been in vogue for a very long time, but he agreed here the system was perhaps not quite so adaptable for the reasons stated by Mr. Clarkson.

