HISTORICAL EXTRACTS

From a pamphlet written circa 1843 by Mr. Alexander Gordon to Their Lordships

MY LORDS

PERMIT me to solicit your attention to the following remarks upon the steam marine of the Admiralty . . .

. . . It is neither consistent with your Lordships' time nor with my duty to write mere compliments to, or to make complaints of, persons; and I take leave to say I should deeply regret that any expressions in these remarks (written as they are in honesty of purpose) should pain any officers of the Admiralty or any contractors under it . . .

. . . One favoured London house got orders for 1400 out of 2100 horse power in the year 1840, and the same returns shew at least a probability that part, if not all, of these engines were one-fifth of their time incapable of performing their work by reason of repairs . . . whilst one pair of engines of a Scotch house were only one twenty-fourth part of their time incapable by reason of repairs.

. . . In days of yore the Admiralty had at least a wholesome fear of suffering from new inventions: an honest care that the public money should not be squandered in untried schemes. It is true their fears were often unfounded, but their care of the public money was at all times praiseworthy. The Admiralty, being the highest mark for a mechanical schemer, has always been, and always will be, aimed at . . .

. . . The puff of novelty, and all the dust the puffers may throw in the eyes of the executive officers, such as a small engine-room, light engines, pretended small

consumption of fuel, and all the fallacies about short-stroke engines and short connecting rods, though bolstered up by the name of a distinguished *astronomer* must soon come to nothing. . .

. . . and there is no doubt that had the expansion gear been used in those of Her Majesty's ships properly fitted with the same, when not in haste, they might have saved *many thousands per annum of the public money* by only dropping their speed about an $\frac{1}{8}$th. Strange to say many of the largest steam-ship owners do not know the difference between mere throttling of the steam and working expansively. . .

. . . The alarming inefficiency of so many new steamers as appears on the Parliamentary returns is due to one of six causes.

1st. The novel principle of construction of engines thought necessary for accommodating them to the limited engine-room.

2nd. The attempt to have light engines in ships which must afterwards have ballast to keep them upright.

3rd. Defects in the material and workmanship.

4th. Incompetency of ship's engineers appointed by the Admiralty.

5th. "Quarter-deck" interference.

6th. Some unavoidable disaster.

. . . to attempt to account for such heavy repairs and loss of service by the fourth and fifth, and to lay the blame on engineers afloat and officers in command, would only shew a bad selection of the one, and an inexcusable interference of the other . . .

. . . Permit me here to make a few remarks upon the engineers afloat, an indispensable class of men, upon whose judgement, foresight, coolness, and skill the ship and all on board so often and so entirely depend for safety. . . . And the intimate acquaintance I have with the habits, studies, associations, feelings, motives, principles, attainments, industry, and ultimate prospects of many men I have known in the workshop and met at table, even with commissioned officers of the navy, enables me to assert that if the chief engineer's rank were raised, so as to place him in the position of a gentleman (not rated below an inferior mechanic, the carpenter), and his assistants encouraged with hope of such a step in course of faithful and useful service, without any additional pay, the Admiralty would soon have a change in the present men, and obtain in future a better and more respectable class of engineers.

It must be little known at the Admiralty how many respectable gentlemen's sons, having found professions overstocked, or commercial enterprise doubtful; and how many of nature's gentlemen, with master minds, are within the moleskin jackets, which are seen within the best of our engine factories.

. . . The commander of a steamer can, in truth, no more reasonably be expected to supersede or direct the engineer, than he could be expected to supersede or direct the surgeon in his operations . . .

. . . Would not the light of a Watt, a Woolf, a Maudsley, in such circumstances under a pennant, have been liable to extinction by some quarter-deck 'lack beard?'

All that has been done in the navy for this indispensable class of men is to pay them, stamp an engine on their uniform buttons, and allow them to mess together . . .

I shall be happy to wait upon your Lordships, if desired, that you may make the truth or fallacy of this Letter apparent.

I have the honour to be, my Lords,
Your Lordships' most obedient humble servant,
Alexander Gordon.

From 'The Autobiography of a Naval Engineer'

Matthew McIntyre: born 1838*; died* 1931

The story begins in 1854 with my apprenticeship which lasted till 1859 . . . five years and a bit of pretty hard work and long hours—6 to 6, Saturdays to 2—and when to that I voluntarily added Evening Lectures, there wasn't much spare time left.

Shortly after my apprenticeship was over, an opportunity offered of entering the naval service . . .

. . . appointed me to the *Archer* which I joined 22nd April, 1860 . . . Her engines were horizontal; jet condensing; geared, so that the propeller made three revolutions to one of the crankshaft, and the propeller was fitted for being raised out of the water when the ship was under sail. There were two rectangular, tubular boilers, fitted with vacuum valves to prevent collapse and safety valves loaded to 10 lb on the square inch. Brine pumps were fitted to reduce the density when necessary, as the pressure was usually too low to blow out. The safety valve load, it is true, was 10, but the working pressure was usually 6 to 3 or less. The pressure gauges were mercury with wooden floats . . .

. . . I was much amused one day when the Engineer-in-Charge asked me to let him know if I found anything wrong, but my difficulty was to find anything right . . .

. . . We had the engines going faster than ever before and the big Cornishman had commandeered all the cook's slush to help the fires, when a jolt, followed by a series of crashes, brought us all to our feet. Of course all the engines were stopped at once, and we were soon all gathered on the platform. We found the big driving wheel had been stripped of most of its teeth, which were of wood, and the ship had perforce to continue the chase under sail. Fortunately we had a spare set of teeth in rough, and we soon had all the available carpenters at work fitting them in place, and shaping them to our marks . . .

. . . appointed in April 1862 to the *Adventure*, a sort of mongrel troop ship . . . early in the commission it was found that the crankshaft and propeller shaft were not in line. So much of a bend, so to speak, was there that a bucket held under the stern gland was soon speckled with particles of brass rubbed off the surfaces of casing and tube at the forward end . . .

. . . The Engineer of the *Adventure* decided one year when at Hong Kong to have a big Christmas dinner, and each of us invited another Engineer of his acquaintance from one of the other ships in harbour. I forget how it happened, but we counted thirteen. That would never do, so we invited the boatswain, a gentlemanly, good looking Warrant Officer, to join us. Our next hitch was mess traps, and we thought the Paymaster would lend us some of the saloon traps, for the occasion, but he, like all of his kind, refused.

Our 'comprador', or Chinese Hong Kong dealer who makes a business of supplying the mess with sundries and who happened to be onboard just then, was referred to. He was told the number to be dined and in a couple of hours or so he had a boatload alongside comprising linen, crockery, glass, silver and everything we could possibly need for the occasion. After that the paymaster could go hang, and I have the 'comprador's' photo still in my box . . .

. . . Density [in the boilers] at that time was pretty much a fetish, not only in the Instructions, but also by most engineers, so the Chief Engineer, knowing that the density had been far above the regulation density, was rather anxious to examine the inside of the boilers, and called me to be a witness of what was there. He had the doors over the furnaces taken off, and on the furnace plating we saw . . . nothing! We looked at each other, and looked again inside, but the furnaces were absolutely clean. I'll leave you to fill in the expletives, but I made a note for future guidance as to density . . .

. . . A Committee, appointed in June 1874, was then inquiring into the cause of the deterioration of ships' boilers, and they were so much impressed by the absence of corrosion in boilers worked on the Perkins' system . . . the essential features of that system were tubulous boilers, high pressure steam, and only fresh water used in the boilers . . . Hitherto my experience had been limited to pressures, ranging from one (or less) to thirty pounds on the square inch, but now I had to deal with a working pressure of 300 and test pressures up to 400 pounds on the square inch . . . There was no doubt that Mr. Perkins was years ahead of his time in high pressure work, and his machinery had worked well in his own factory, but that was altogether a different thing from work at sea, and it was felt all round that a further attempt in that direction could not be recommended . . .

. . . It was obvious from the Reports that zinc properly fitted was an absolute preventive of ordinary corrosion, and it was decided to have it fitted in the boilers of the five Indian troopships, and note the results . . . Concurrently with the trials as to the effect of zinc it was decided to try whether the working density of the water in the boilers could safely be raised . . . the chief engineer of one of the tugs, in which it was decided to try a density of 35 [20 being twice that of sea water], assured me that water at that density would be like soup—I told him to be sure to save some. When I went down to examine that boiler at the end of the period he was pretty well satisfied of the error of his assurances and was prepared to go any higher we liked . . . .