THE ENGINEERS' BUTTON

BY

THE LATE ENGINEER CAPTAIN EDGAR C. SMITH, O.B.E., R.N.

This article first appeared in the January 28th, 1944 issue of 'Engineering' *and is reprinted here by permission of The Design Council.*

At the end of the war of 1914–18, the total number of engineer officers in the Royal Navy was about 2500, with a somewhat smaller number in the Royal Naval Reserve. What the corresponding numbers are now I do not know, but all these officers, whatever their rank and however much gold braid they have on their sleeves, without exception wear the distinctive purple stripe or stripes, $\frac{1}{4}$ in wide, which have now been in use for 80 years. The purple stripe was introduced in 1863 and, at about the same time, paymasters were given their white, and surgeons their red, stripes. At that time, too, the old navigating officers—masters and assistant masters—wore a light blue stripe, but when the navigating branch was absorbed into the executive branch, this stripe was dicontinued, only, however, to be given to naval instructors in 1879. The 'executive curl' on the cuffs was introduced in 1860 for executive officers. In 1915, it was given to engineer officers also, and in 1918 to all classes.

Though the purple stripe has been the distinguishing mark for engineers since 1863, for a considerable period they were recognisable from their brother officers by the buttons they wore. Commissioned naval officers had buttons bearing an anchor and cable and a crown within laurel wreaths; warrant officers —gunners, boatswains and carpenters—had plain gilt buttons, bearing only an anchor and cable, and it may be presumed that these plain gilt buttons were the first worn by engineers after the issue of the Order in Council of 19 July, 1837,

FIG. 1—THE ENGINEERS' BUTTON
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which gave them warrant rank. By an Admiralty Order of 21 December, 1841, however, it was laid down that, while First-Class Engineers were to wear the same uniform as the gunners, boatswains and carpenters, they were to have buttons embossed with a steam engine and crown, and that, in addition to the eight buttons on the front of the coat, they were to have a larger button of the same kind upon the collar. These buttons were introduced, no doubt, so that the engineers, with their special qualifications and responsibilities, should be easily recognisable from those officers concerned with the routine duty of the upper deck.

In 1841, practically all steam vessels in the Navy had paddle wheels driven by side-lever engines, and it was this type of engine which was shown on the button; but the side-lever engine was already faced by rivals and when the Russian War of 1854–56 led to a great extension of the use of steam and of screw propulsion, the side-lever type became out of date, so, in 1856, the engineers' button disappeared from uniforms. Moreover, in 1847, Chief Engineers had gained commissioned rank, their names were inserted in the Navy Lists, they messed in the wardroom, and the whole branch had made rapid strides in its upward progress. Common enough as they were at one time, the special buttons are now very scarce. The only sample I have seen is a waistcoat button given to me by the late Captain A. Rowand, R.I.M., who was an authority on naval uniforms. [FIG. 1 shows the button in its three different sizes.] The only officer I ever talked with who had worn the button was the late Chief Inspector of Machinery Afloat, Harry Williams, who was born in 1832, entered Portsmouth Dockyard as an engineer boy in 1847, and died in 1930 at the age of 97.

The introduction of the special button was, of course, but a minor event in the progress of naval engineers. The earliest of them served in such small craft as the *Lightning*, *Meteor* and *Echo*. On 4 December, 1827, the first commissions for the command of such vessels were signed by H.R.H. the Duke of Clarence, the three officers being Lieutenants Evans, Bullock and Hay. Then, and for ten years afterwards, there were few regulations about engineers, who were more or less free to come and go as they chose, and were regarded by many as a necessary evil. A glimpse into their early history is gained from a perusal of the note books of the excellent Simon Goodrich (1773–1847), of Portsmouth, a man of many parts and a trusted servant of the Old Navy Board, which was abolished in 1832. In his diary are to be found such entries as these:

'7.5.1827. Send on the report for the removal of Chapender from the Lightning.

'7.6.1827. Recommended Jenman for 1st engineer of the Lightning.

'10.10.1828. Ambrose Kersey, George Oliver, apprentices to engineer on board the African. Signed their indentures on 10 Oct., 1828.

'12.3.1829. John Johnson, 1st engineer of the Lightning complains of the boy apprentices being ordered about other duties belonging to the sailors. . . . The boys are taken even if the engineer says he cannot spare them without his being consulted. Have the officers commanding anything to do with the engineers and apprentices except in as for work as relates to the engines?'

Goodrich retired in 1831, but his own apprentices in Portsmouth Dockyard had included three boys, Thomas Brown, John Dinnen and Thomas Baker, whose long and successful careers entitle them to be regarded as the 'Fathers' of naval engineering. Brown, by his long period of lecturing at the Royal Naval College, Portsmouth, was the forerunner of the professors of marine engineering at Greenwich. Dinnen was the first naval engineer to use his pen for the benefit of his brother officers and the first naval engineer officer to be employed at the Admiralty; while Baker did good work in various posts and was the second naval engineer to be awarded the C.B. Another boy known to Goodrich, Thomas Lloyd (1803–75), was destined to hold higher office than either Brown, Dinnen or Baker. From 1819 to 1826, Lloyd was a student at the first School of Naval Architecture and for the first few years of his active career was employed in the

design of ships. In 1831, when Goodrich retired, he was directed by the Admiralty to make a special study of the steam engine, and after two years spent in superintending the wood-mills and the famous block-making machinery at Portsmouth, he was gazetted Inspector of Steam Machinery at Woolwich. Fourteen years later, he was transferred to the Admiralty and became the first Engineer-in-Chief. Two other appointments in that period were those of Peter Ewart (1767–1842) as Chief Engineer at Woolwich and of Captain Sir Edward Parry (1790–1855), the famous Arctic explorer and hydrographer, to the Admiralty as Comptroller of the Steam Machinery. Ewart was already too old to influence the progress of engineering, while Parry, excellent man as he was, was but an administrator. Naval engineering owed far more to Lloyd than to either Parry or Ewart.

By 1843, there were probably about a hundred steam vessels in the Navy, and they were found on every station abroad. They had proved their value in several operations and there was no longer any question as to the tactical superiority possessed by such craft. For the constructors of marine engines, the period was one of experiment and expansion. At that time, on the Thames, John Seaward was busy at Millwall, building his direct-acting engines, of the 'Gorgon' type, so called after H.M.S. *Gorgon*, which Seaward had engined; John Penn, at Greenwich, was beginning the construction of his beautiful oscillating engines; at Limehouse, Joseph Miller was making horizontal direct-acting screw engines after the designs of John Ericsson; and Maudslays were fitting their first double-cylinder engines, known as the 'Siamese' type. The name resulted from the popular interest shown in the Siamese twins, Chang and Eng (1811–74), who were joined together by a band, described by a surgeon as 'formed superiorly by the xiphoid appendix and by some of the cartileges of the ribs, and presents inferiorly the cicatrix of the umbilicus: the cavities of the two chests do not communicate, but the abdominal cavities do. . . .'

Boiler practice at this time was very simple, and many engineers looked with disfavour on steam pressures of even 15 lb or 20 lb. On the other hand, there were experiments with surface condensation, largely through the inventions of Samuel Hall, and experiments with the new propeller, of which F. P. Smith was the great advocate. The *Dwarf*, the *Fairy* and the *Rattler* were often seen at Woolwich, and it was from there that the latter set off again and again on that long series of trials, beginning in 1843, which led to a revolution in the propulsion of warships.

The engineering staff at Woolwich Dockyard in 1843 consisted of Thomas Lloyd as Chief Engineer and Inspector of Machinery, Andrew Murray as Assistant, and John Kingston and John Dinnen as Foremen. Their respective salaries were 650*l*., 400*l*., 225*l*. and 225*l*. The office in which they foregathered, the steam factory they directed, and the Dockyard Terrace, or 'Harmony Row', where Lloyd lived . . . [were shown in the original article by photographs copies of which I have been unable to obtain. Ed.] Murray had come to the yard when Fairbairn closed down his iron ship-building yard at Millwall, where over 100,000*l*. had been lost. From Woolwich, Murray was sent in 1846 to Portsmouth to get the new steam factory into operation, and, during the next 20 years, did work second only to that of Lloyd. Dinnen, of course, was Goodrich's old apprentice; Kingston was a mechanic from Portsmouth, who, by his invention of the 'Kingston' valve, caused his name to be found in all text-books on marine engineering. Between 1847, when Lloyd was transferred to the Admiralty, and 1869, when Woolwich Dockyard was closed, there were three Chief Engineers—Charles Atherton, Edward Humphrys, and John Trickett. Atherton served there from 1847 to 1849, and again from 1851 to 1862. The only Cambridge Wrangler to belong to the Engineering Branch of the Admiralty, Atherton, was a versatile and prolific writer, and he probably made a record in engineering literature when, in a paper 'On Steamship Capability', he compiled a sentence of over 380 words,

containing 34 commas, four semi-colons, and two colons! A sentence of this length, it may be noted, would occupy half a column in this type*. His first successor, Edward Humphrys, left Woolwich in 1851 to found the well-known firm of Humphrys and Tennant, of Deptford; while John Trickett, an ex-apprentice of the Butterley Works, did excellent work at Devonport, tradition having it that his favourite author was John Bourne.

It was Parry's appointment to Whitehall in 1837 that paved the way for the organisation of the engineering branch by the Order of July of that year and, from that time, innovation followed innovation. The entry, training and status of engineers naturally were to the fore and, from 1837 onwards, there are records of the service of all engineers. These matters had occupied the thoughts of many writers on naval subjects and, as early as 1831, Lieutenant Robert Wall had published his 'Suggestions for the Establishment of a Naval University with Some Observations on the Formation of a Corps of Naval Engineers'. The establishment of such a Corps, he said, 'would be a measure fraught with the greatest utility in a service so extended as the British Navy'. For his university, Wall suggested the use of Buckingham House—i.e., Buckingham Palace, then the property of William IV, but unoccupied. Another writer, Lieutenant Robert Otway, declared in 1834 that, for the education of engineer officers, 'Government need be at no expense (unless indeed a Lecturer be added to the Portsmouth establishment) as young gentlemen will gladly avail themselves of such an opening to establish themselves in a profession, and will study for that very purpose at their own cost'. Marine engines, Otway thought mighty expensive things, which should be in the charge of properly trained officers.

Though these and other writings undoubtedly influenced the progress of the engineer, the home of engineering training was Woolwich Dockyard, the first yard to have a steam factory. The Order in Council of 1837 had established three classes of engineers and had arranged for the entry and training of engineer boys. Later on, instruction money was paid to engineers, and there were to be as many boys as engineers in a steam vessel. Soon after the establishment of the factory at Woolwich a new chapter was opened; in 1843, the barque *Sulphur* was allocated for the accommodation of the boys. The depot ship at Woolwich was then the yacht *William and Mary*, and to her were appointed both executive and engineer officers for instructional duties. One of these engineers was William Shaw, a Glasgow-trained man who had earned golden opinions while engineer of the *Tartarus*, and who had been awarded the Engineers' Medal, founded in 1842. Shaw retired from the service towards the end of 1843, leaving one of his students, Richard Sampson, to carry on his good work. The record of Sampson ran: 'a young man of high merit, has been found most useful as one of the teachers of the Engineer Boys' School'. In 1843, Robert Roughton's name was placed on the books of the *William and Mary*, and so successful did he prove as an instructor that, though he had so far spent no time at sea, he was recommended for promotion by Lloyd and Commander Smith. Roughton continued to teach for ten years and in 1852 was granted an extra allowance of 50*l.* a year. He retired in 1870 and died in 1885, having been informed, in 1880, that the Admiralty had no objection to his publication of the results of experiments he had made at Woolwich in 1847 on the discharge of steam from orifices of various sizes.

The outstanding position at Woolwich Dockyard as an engineering centre a century ago was due to several things. It was easily accessible from Whitehall and Somerset House; the Thames then has great shipbuilding and marine engineering industries; and communication with the Clyde was slow and difficult. Woolwich yard was noted for its ships and, in the era of the Engineers' Button, launched many fine paddle and screw vessels. The marine engineers on the Thames at this time included Joshua Field, Joseph Maudslay, John Penn,

*The original article was in 8pt type.

Joseph Miller, and John and George Rennie. All of these were associated with the Institution of Civil Engineers and this, no doubt, explains why, in 1839, Sir Edward Parry was made an honorary member of that Institution 'amongst whose members he had rendered himself extremely popular, by the kindness of his manner, and his accessibility while holding the position of Director of Steam Machinery, the duties of which he performed with singular uprightness and skill'.

Lloyd, Murray, Atherton, Humphrys and Trickett were civilians, but there were many naval engineers, wearers of the special button, who were familiar with Woolwich and who rose to distinction. Thomas Baker, to whom reference has been made, was one of these. He began his career afloat in 1831 as second engineer of the *Comet*, then the Navy Board yacht. He then served successively in the *Hermes*, *Flamer*, *Salamander*, and *Devastation*, being referred to by one of his captains as 'everything I could wish'. In 1843, he was chosen as 'chief' of Queen Victoria's new yacht, the *Victoria and Albert*. In the Crimean War, he was sent to the Black Sea and, at Kazatch Creek, established large workshops which proved of great use to both Navy and Army. Many of his tools he obtained himself from Kerch. Soon after his return home in 1856, he was appointed Chief Engineer of Chatham Dockyard, being the first naval engineer to receive such an appoinment in a home yard. He was at Chatham till 1869, being granted his C.B. on retirement. His fellow engineer Inspector of Machinery Afloat, George Gregory Bardin, had been made a C.B. in 1868. Lloyd and Murray received similar honours about the same time. These were the first decorations awarded by Queen Victoria for naval engineering work, although Baker, and Inspectors of Machinery George Murdock and John Henry Langley, had previously been made Knights of the Legion of Honour by the French Government.