NAVAL ENGINEERS

AND THE

COMMAND OF THE SEA.

BY

FRANCIS G. BURTON.

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A STORY OF NAVAL ADMINISTRATION.

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FRANCIS G. BURTON,

AUTHOR OF "ENGINEERING ESTIMATES AND COST ACCOUNTS," ETC., ETC.

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TO

THE RIGHT HONOURABLE

Lord Charles William de la Poer Beresford, C.B.,

CAPTAIN IN HER BRITANNIC MAJESTY'S NAVY,

WHO,

WISE IN COUNCIL AS GALLANT IN ACTION,

HAS SERVED HIS COUNTRY BEST

BY AROUSING THE NATION

TO A SENSE OF THE DEFECTS IN, AND NECESSITIES OF,

ITS NAVAL DEFENCES,

THIS STORY IS,

WITH HIS LORDSHIP'S PERMISSION,

RESPECTFULLY DEDICATED

BY

THE AUTHOR.

PREFACE.

We are so accustomed to think ourselves invincible at sea, if not on land ; we glory so much in recollection of the victories of Hawkins, Drake, Rodney, Howe, Jarvis, Duncan, and Nelson ; we are so proud of our majestic battleships and their unequalled crews, that we are apt to overlook the great change which has resulted from the introduction of steam as a motive power. We have, in the evolution of naval architecture, abandoned our tapering masts and spreading sails, and substituted for them paddles or screws ; we have forsaken the equipment of the frigate, and reverted to one analogous to the old galley sweeps : we have discarded the sailing master for the gang driver, only that the slaves are now the steam boilers, and their driver the engineer, with his hand on the throttle. But just as in olden times, first the gang driver, and after the sailing master, were most necessary for the navigation of the galley or frigate, so in present days the engineer, down in the depths of her hold, is indispensable for the working of the modern ironclad. Indeed, he is more necessary than were the old drivers or masters, since the modern war vessel has become a floating mass of complex machinery, which can only be kept in proper order, and worked to the utmost advantage, by men specially trained in the methods and use of varied machines.

Unfortunately, the growing importance to the navy of highly-trained engineer officers and skilled mechanics has not yet been sufficiently recognised by the authorities, and the result has been

a deep feeling of discontent throughout all branches of the engine-room staff. It is in order to direct public attention to this discontent, which threatens serious disasters to us in the event of war, that the following pages have been written.

I am deeply indebted to the writings of many previous and more competent authors: to Admiral Sir R. Vesey Hamilton, G.C.B., for his admirable work on "Naval Administration"; to Fleet Engineer Reginald C. Oldknow, for his treatise on "The Mechanism of Men-of-War"; to Mr. W. Laird Clowes, for his useful "Naval Pocket-book"; to the late Mr. James A. Longridge for his artillery researches; and to the files of the *Times*, for the numerous letters and reports on naval administration which have appeared therein during many past years. To the influence and guidance of such authorities as these must be ascribed any merit to be found in my story: the faults are wholly my own.

FRANCIS G. BURTON.

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CHAPTER I.

My commission and appointment to the sloop Acorn.—First experiences of life on board a warship.—Officers and crew. Speculations as to our destination.

AT LAST. I had passed through the ordeal of competitive examination, the workshops at Keyham, and the discipline and schooling of the Royal Naval College, at Greenwich; I had learned the gradations of rank of the combatant officers of the navy, the relative ranks of surgeons, paymasters, and engineers, and the proper method of saluting my superiors when I met them on shore or on quarter-deck, and the exact amount of courtesy to be paid to each, from the admiral of the fleet down to the sub-lieutenant. I had been drilled into the mysteries of the devolution of command and the apportionment of responsibility, as well as the management of marine and donkey engines, dynamos, water-tight doors, torpedo tubes, and all the thousand and one machines and fittings which go to make up a modern man-of-war. Now I had received her Majesty's commission as an assistant engineer, and was permitted to don her uniform, buckle on her sword, and fight her battles in any part of the globe to which I might be sent. All the delight of the graduate was mine, for my examination was passed,

my apprenticeship ended, and my career in life now commencing; but to this delight was added the joy of service in the navy of my Queen, of duty on board some of those majestic ironclads I had so often admired during my tutelage at Devonport.

I was at the "Dolphin," at Southampton, when my commission reached me. My father, who was rector of Brierley and canon of Exeter, had come over to congratulate me on my successful final "exam.," and furnish me with funds for my outfit. The few days of leave which I could obtain would not enable me to go home, and so I was to receive the parting words of paternal advice, and the paternal blessing, within sight of the waters so soon to be my home. We were sombre in our conversations during these days, for the political outlook was stormy, and the clouds of war were gathering round our country. Young though I was, I could hardly help feeling sobered when I thought of the possibilities of death to myself, and of the certainty of suffering and death to thousands of my fellow-countrymen, which war would entail. To my father and mother the prospect was even more sad. They had but three sons: my eldest brother was major of a crack cavalry regiment, at present in India; my second, captain in the Rifle Brigade, at Aldershot, which formed part of the first army corps; whilst I was just joining the navy, in pursuance of my own desire and ambition, as a naval engineer. I was so absorbed in admiring my newly-received commission that I did not, until my father drew my attention to it, notice a foolscap letter enclosed with it. This was a communication from the Admiralty, directing me to report myself immediately to the admiral commanding at Portsmouth for duty in H.M.S. Acorn.

It is unusual for an assistant-engineer to be posted to a ship immediately he receives his commission. He has

generally to do duty for a time on some guard or harbour ship, watching the cleaning of machinery, and making himself acquainted with those details of discipline and methods of working which he has not gathered in his workshop or Greenwich experience. But, as I said, the war clouds were gathering, and our Admiralty officials were displaying an unwonted activity in the fitting out of ships, and the appointment of crews thereto. The Acorn was a composite sloop, built some years before for service on the African coast and the Indian Ocean, and she had been kept pretty busily engaged, though without any actual war experience, ever since. When last paid off she had been placed in the steam reserve, and both executive and civil officers imagined she would never emerge therefrom. However, she was a contract vessel, built under the supervision of the most Draconic of Admiralty inspectors, and therefore unusually well finished in all respects. She was therefore considered too good a vessel to be left in the Portsmouth Harbour, and was ordered to be prepared for sea, so that she might replace some newer cruiser on distant station, and thus permit the better vessel to join one or other of the fighting squadrons. I was aware of her re-fitting before I went on leave, but had then little notion how much the work was to affect me personally.

I reached Portsmouth, reported myself, and, obedient to instructions, took a boat from the Hard to the Acorn. I found her in a state of great confusion, taking on board stores of various kinds, and at the same time coaling from barges moored alongside. My first experience on board of ship life was therefore very different to what my inland readers would imagine, and all the trim smartness and cleanliness which they would associate with a naval ship was entirely absent. I picked my way as well as I could (after duly touching the peak of my new cap, first to the lieutenant

on watch, and next to the commander of the sloop) to the ward room, forward of which I discovered the engineer's cabin. Into this I plunged, to make the acquaintance of my chief, and receive from him instructions as to my new duties.

Mr. McPherson, the engineer, was a short, florid man, with a decided inclination to *embonpoint*. His rating as an engineer was much lower than it should have been from his years of service, but, as I afterwards learned, an unfortunately noisy wine party had caused his appearance before a court-martial, and he had been placed at the bottom of his list. He was now climbing up again, instead of being in his proper place in charge of the machinery of a first-class cruiser or line-of-battle ship. I had never before been brought into contact with an officer who, through any misadventure, had been reduced. All our instructors were extremely proper men, who never indulged in bacchanalian or other orgies, and my student friends were a very quiet set, whose ambition was directed to mastering the principles of their profession rather than qualifying for young bloods. We had orgies, it is true, but it was the "feast of reason and the flow of soul" which inspired us, and not the wine cup. My introduction to the navy under McPherson exercised a powerful influence over my future life. It forcibly impressed on me the folly of riotous living, and made me resolve to so rule myself as neither to disgrace my profession nor lose the prizes thereof. He was not by any means a bad fellow, nor a self-indulgent one, but he unfortunately entered the navy at a time when the chief engineers had risen, by seniority rules, from the class of Scotch engineers, or foremen fitters, who had been so largely entered in the navy on the first introduction of steam. Some of them made reputable officers enough, and some, indeed, distinguished themselves in their profession; but the majority never became anything better

than leading workmen, capable of driving, or even roughly repairing, their machinery, but unfitted to the end of their lives for association with gentlemen. The influence they exerted over the youngsters under them was frequently pernicious, and the baleful memory of their character and habits still sticks to our profession. Poor McPherson was a gentleman by education and habits, but his early naval associations had rubbed some of the bloom off his perceptions, and rendered him less careful of boisterous manners and associates than are his successors of to-day.

He greeted me cordially, and even kindly, and informed me I was to share his cabin. We were to mess with the executive officers in the ward room. Hitherto there had only been one engineer on the ship, and the arrangement by which he was admitted to the general mess was not to be disturbed now that he had been provided with a colleague. I asked if he knew our destination, and the reason for a second commissioned officer being appointed to the engine-room. To the first inquiry he was able to answer that he believed our destination was Egypt, but the second was beyond his solution. The ways of the Admiralty are mysterious, and the only idea he could form was that, for some reason or other, the sea lords desired a few additional engineer officers ready at hand with the Mediterranean fleet. Our ship, he said, was a very pretty craft for a sloop, a good sea boat, and with ample engine-room space, being in this respect much better provided for her size than many iron-clads. He told me she was pretty full of cockroaches, even after the recent refitting she had undergone, during which most of her lining had been taken out. I had ample evidence of their existence when I retired to bed at night, for they covered bed bunk, walls, and ceiling, and I wondered what sort of condition the ship must have previously been in if any had been exterminated during the

recent cleaning. It was my first ship, dear reader. I am not fond of cockroaches at any time, and these ship ones are such fully developed monsters, you will hardly feel surprised that on this first night I felt home sick, and longed for my sweet-smelling, white-covered bed at the Devonshire rectory. I think we had more than our share of the pests, for our cabin was next the engine-room; but the other officers assured me they had quite as liberal a supply as they desired, whilst some, whose quarters were over the steward's stores, had more than their share of rats. Our officers consisted of a commander, three lieutenants, a surgeon, a paymaster, the engineer (in lieu of chief), and myself. I was therefore the junior officer in rank on board, assistant engineers having the relative rank of sub-lieutenants, and being senior only to the midshipmen and paymaster's clerks carried on the larger cruisers and line-of-battle ships. We also carried a gunner and boatswain, who, although warrant and not commissioned officers, would take command of the vessel, and in such circumstances take precedence of the officers of the civil branches. I am by disposition and early training ultra-conservative; but this arrangement for command appeared to me somewhat of an anomaly before I received my commission; it appeared much more anomalous after I had served on board for a time, and observed the education and attainments of the two classes of men.

We were allowed little time for loitering at Portsmouth. Stores and coals were hurried on board with a rapidity I had never seen equalled, and which even astonished the older salts. I had hardly time to make myself acquainted with the engines before we were off to sea, and under orders to make the most rapid passage we possibly could. We were to call at Malta for telegraphic instructions, and, if none awaited us there, to proceed to Alexandria with all speed. Let me draw a veil over the next few days. I had never

been at sea before, and an engine-room, hot, stuffy, redolent with the fumes of oil, is a hard experience for a novice. The chops of the Channel sent me helpless to my bunk, whence not even black beetles could drive me, but the storms of Biscay roused me to my duty. I turned out for watch, from which my chief and the good-natured surgeon had excused me, and went forward into the engine-room, where our 850 I.H.P. engines, at natural draught, were propelling the ship through the water at about nine knots an hour. Her calculated speed was ten knots, and this she had exceeded by a point or two on her trial trip, but the several years' hard service she had since had, and the present condition of her bottom, made her nine knots quite as satisfactory as the commander expected. Our boilers were in good condition, and the engines had been hurriedly overhauled at Portsmouth before I joined. As though to modify the effect of this overhaul, however, the engine-room crew was an entirely new one, whilst the engineer, Mr. McPherson, had himself only been transferred to the Acorn after her arrival from the West Coast. But though a new set of men, new to each other in many cases, and in all new to the ship, they were just as fine a body as I ever desire to see. They were all old sailors, who were accustomed to the rolling and pitching of a vessel, and the heat and oppressive odour of the engine-room did not prevent the efficient discharge of their duties. These men were for the time under my orders, and were to take their instructions as to running and care of the engines from me, although they had had far more practical experience than I had yet gained. When I first stood on the engine-room platform, fresh from my attack of sea-sickness, I felt the force of the protest made by some of the French naval officers against the substitution of harbour and college work for actual service at sea. In our own navy, as in the French, it seemed to me there was so "much of chemistry,

steam, law, electricity, pneumatics, hydraulics, hydrostatics, dynamics, metallurgy, to say nothing of naval literature, modern languages, modern history, and modern politics," as to leave little room for practical seamanship or practical engineering. Maturer experience convinced me that this judgment was wrong, and that the Greenwich course, though it may possibly err on the side of over intellectual cultivation, trains the man for prompt and effective decision and action in unforeseen emergencies.

The Acorn was an old-fashioned and out-of-date sloop, and in her best days was never intended for service in the Mediterranean, or to meet the warships of any European power. Her timber sides would not resist the impact of modern shell, and would afford too ready fuel for the devouring element under that form of fire. Her officers, from commander to boatswain, were therefore puzzled by our orders, and many speculations were indulged in as to our ultimate destination, and the duties upon which we should be employed. The Red Sea, and chasing Arab dhows, was the general conclusion; but whether our commander had any private intimation of more arduous work, or was merely impelled by professional *esprit de corps*, he was unremitting in his endeavours to bring his ship into the highest possible state of efficiency. Of course these endeavours entailed on the engineers' department a considerable amount of additional work. We had no Whitehead torpedoes on board, and so were spared the labour of testing their mechanism or that of the air-compressing machinery; but we carried eight 5 in. breech-loading guns, as well as Nordenfelts and Gardners, and these had all to be dismounted, re-mounted, and ascertained to be in perfect working order. Our gunner had to train the seamen in handling the pieces and taking proper aim with them; but the non-combatants—the idlers, as we were sometimes called—were held responsible for the

intricate mounting, training, and breech mechanism being in proper working order. Watch-keeping was no mere engine-driving, as I soon discovered, but a continuous inspection of gun mountings, pipes, pumps, lifting gear, and all sorts of machinery which had nothing whatever to do with the propelling of the ship, and much of which was not actuated by the boilers thereof. We had to keep in efficient readiness every item of mechanism on board, although the actual users thereof would be the bluejackets, the fighting men, under the command of the executive officers. There was thus no idle time either for the engineer officers or their crew; every minute of the day was as fully occupied with them as with the seamen, and the fact of its being below deck rather added to than detracted from the irksomeness. But our crew were a splendid set of men. We had a full complement of engine-room artificers, all of whom had served some time at sea, whilst our stokers were all rated first-class, and were well seasoned to the work. No one who has served below decks, and who knows the difficulties daily encountered by the naval engineer, can fail to appreciate the immense value of an efficient body of assistants.

CHAPTER II.

Arrival at Malta.—Preparations there.—The Black Watch mess.—Rumours of war and opinions thereon.—Deficiency of trained officers and men for the navy.—Strategical problem for solution.—Position of English fleet.—Arrival of Majestic and Edinburgh.

We passed Gibraltar without stopping, merely exchanging signals with a guardship we found stationed there, and proceeded on our way to Malta. When we reached there we found the Terrible and Powerful, two of our latest and most

powerful cruisers, busily engaged in coaling, and evidently preparing for sea. No armour clads were in harbour, but a crowd of torpedo-boat destroyers of the Havock and Sparrow-hawk class, on board each of which considerable energy was being displayed, as though some urgent orders were expected. Our commander went on shore to receive instructions from the admiral, and on his return we also were plunged into all the excitement of hasty preparation and coaling. Almost as soon as he returned the coal barges arrived alongside; the double string of Maltese coal carriers, one in and one out, were soon at work on each side the ship, whilst our stokers were stripped to their waists and hard at work stowing it in the bunkers. We were informed that the ship was to be filled with coal to her utmost capacity, and to keep her fires banked up ready for sea at a moment's notice. The rapidity with which the work progressed was marvellous, and, though I have since been in all the quarters of the globe, I have never witnessed coaling more expeditious than in the harbour of this little "military hothouse." There was small chance of leave for shore under such conditions, and we could gather no news from either coal bearers or their superintendents. We commenced the coaling about nine o'clock in the morning, having cast anchor about seven, and before night all the bunkers and every other available inch of space were crammed, and the decks, &c., cleaned down. I am not quite sure our skipper would not have invaded the ward-room and cabins with the black lumps, had he not feared for the trim of the ship. His own cabin could not have been made use of, as it was on the main deck, under the poop. But the next day brought us a visit from some of the officers of the Black Watch, then stationed at Valetta, and from them we learned some very startling intelligence, which threw some light on these hasty preparations.

Before we sailed from Portsmouth there were rumours of difficulties between our own Government and the French, and sinister hints at the arbitrament of war being necessary for the restoration of a proper understanding between the two countries. The English papers were boastful of the power we possessed in our battleships of the first line, such as the Illustrious, the Prince George, and the Magnificent; whilst the French press were exultant over their fleet of torpedo boats, and as certain of the destruction these wasps would inflict as they formerly had been of the untried fire of the mitrailleuse. But rumour is more often false than true, and boastful speeches and bellicose leading articles had in those days become so usual a phase of the political atmosphere that we had paid little heed to them, even after the sudden sailing orders of the Acorn. However, the telegraph wires had conveyed to Malta news of grave further developments, and with the news, it was stated, orders to the naval and military authorities to be prepared for immediate war. Whether these orders had really been transmitted or not, the activity in every branch of the dockyard, ordnance, and commissariat departments was evidence that the officers did not intend to be caught quite unprepared. The news conveyed to the public by the press was that remonstrances had been addressed from the Elysées to St. James' in no very measured tones against the prolonged British occupation of Egypt, and that these remonstrances had even reached the stage of an ultimatum demanding evacuation within a given and very limited time. The rumour of this ultimatum might or might not be true, but if it had been sent as alleged, it was evident we were on the immediate verge of a big war. The French nation would hardly withdraw from such a demand if made, nor could England abandon her position in Egypt under stress of such a threat. She had vast interests and responsibilities in the country, and must

maintain them whether she offended her neighbour or not; whilst, on the other hand, the shouts of the *gamins* of the boulevards would constrain their Government to pursue the action to the bitter end. All this, with various comments and speculations, we heard from the Black Watch officers, and as the news spread through the ship it was discussed in various ways, and with devious knowledge and understanding, but with one unvarying conclusion, from the senior lieutenant to the youngest steward-boy, that every ship in the Royal Navy, including even the out-of-date Acorn, would acquit herself creditably in the coming conflict, and uphold the honour and glory of the race which rules the waves. I had been reading, just before I left home, a work by M. Paul De Rousiers, in which he contends, and very ably, too, that the great advantage the insular Briton has over his Gallic competitors lies in his education, by which, from his earliest youth, he is trained to self-restraint, obedience to authority, and reliance on his own individual inventiveness and prowess in time of difficulty; and that the *morale* of the Englishman—the result of this free and hardy training—is infinitely more valuable to him than any mere technical knowledge could be. As I watched the faces of our officers and crew, calm and determined, but with plenty of latent valour—brutality, if you like—ready to spring into action on due provocation, I felt that De Rousiers' conclusion was true, and that men trained as ours were would be more than a match for his countrymen in the day of battle, though possibly inferior in mere technical knowledge: for, strange though the confession may seem, coming from an engineer, the most essential thing in a warship is not the armour, the gun, or machinery, but the men who fight her; and this essential is ours, for the bulldog courage and rapid adaptability to circumstances which gave our seamen victory at Dominica, the Nile, and Trafalgar,

still exist in their successors. The ships have altered, and we now propel them by power from coal instead of the wind, but the men who fight them have the spirit of yore.

Our coaling was complete, and our commander went ashore to report to the admiral the readiness of his vessel to sail, but, to our surprise, he returned with instructions to remain at anchor waiting further orders, without, however, neglecting any precautions which would facilitate our getting away immediately he was so instructed. Leave for shore, under such circumstances, was extremely restricted, though not absolutely refused. I was fortunate enough to obtain permission to dine at the mess of the Black Watch, along with our senior lieutenant. One of the Highlanders knew my brother in the Rifles, and to this acquaintance I was indebted for the invitation. "We do not usually invite naval engineers," he blandly informed me, and though he did not give any reason for the admission, I readily concluded it was owing to the inferior social estimation in which they were held. I had not previously been brought personally in contact with any such snobishness, although I had frequently heard of it from my fellow-students. My father's canonry, and, I may add, very comfortable private income, had opened to me the doors of the most exclusive Devonshire society, and I was by no means uncomfortably oppressed by the invitation to the mess of the Black Watch. Let me do them justice: they were gentlemen, and treated me with as much courtesy as if I had been admiral of the fleet. The war scare was the principal subject of conversation over and after dinner, and it was admitted by both naval and military officers that on the fleet would chiefly depend the issue of the struggle. There was, therefore, considerable discussion as to the respective strengths of the French and English forces, and the probability of any hostile action being taken by the Russian Government. The

general opinion was that the latter contingency would not take effect ; that beyond moral encouragement and sympathetic words the Muscovite would not move, but would await the time when the services of the "honest broker" were required, and then secure as much of the booty for himself as he could by any possibility appropriate. This forecast of Russian policy proved correct, and in the coming war we had to contend with France alone.

Against France unaided the battle was likely to be severe enough, though we were better prepared for it than if it had come a year or two previously. The nation had been aroused from apathy by the insulting demands made by one or two insignificant Powers and the complications arising therefrom, and had compelled the Government to take measures for strengthening our first line of defence. The result was not, it is true, altogether satisfactory. We had additional ships, but were sadly deficient of men for them, and this want of good and sufficiently trained men was the cause of our after misfortunes. At the moment when we in Malta were discussing the possibilities of the coming conflict, and wishing for more ships in commission, we had in our dockyards at home ironclads, cruisers, and torpedo destroyers waiting for officers and crews. Unfortunately, it was not deck hands alone who were wanted : that deficiency would have been disastrous enough ; but when to it was added the impossibility of manning our engine-rooms, the impossibility of finding stokers and artificers to manage the motive power of the ships, the situation became very grave indeed. All writers of authority, all officers of experience, had for years back urged on the Admiralty the vast importance of providing and training men, more particularly engine-room men, not merely in sufficient numbers for ships actually in commission or in immediate reserve, but also to meet such an emergency as was now on us. Their warnings had been

persistent as Cassandra's, and received about as much attention. We were not merely in a position of having engine-room artificers doing duty for engineer officers, but the places of artificers, themselves deficient in numbers, had to be supplied by leading stokers. How these deficiencies were to be remedied was a question I frequently heard discussed on board our little craft, but the anxiety we undoubtedly felt as British naval officers must have been feeble compared to that of the authorities at the Admiralty, who now found their own sins and the sins of their predecessors visited on their devoted heads.

What was the problem for solution? Our navy has been called our "first line of defence," and probably no better definition could be given of its duties. But there are two methods of defence. It is defence of the fatherland to concentrate, as Lord Howe recommended, our ships near home, and in, or near to, our own waters, to meet and fight the invading foe. But this is but poor defence—the kind which the hunted animal makes when he can find no other means of escape; and it certainly is not the kind the kindred of the sea lions should resort to. The strategy our nation would expect, and indeed which it must pursue, is that recommended by St. Vincent, of trapping the foe in his own ports, and keeping him there. A close blockade of the enemy would keep open the great sea routes for our merchantmen, and enable us to get food and cotton and other contributions from our debtors all over the world, with much the same regularity as in time of peace. But to this strategy there is a limitation, a limitation all the greater because our superiority in ships to the French was by no means so great as to ensure an absolutely impassable blockade. The escape of Admiral Bruix from Brest in April, 1799, is an example of the difficulties to be encountered. No better seaman lived than Lord Bridport for marking or

observing an enemy's port, and yet a temporary movement, a mere change of position necessitated by the weather, gave his opponent the coveted opportunity. It is quite true our authorities pointed to the Federal and Confederate war as an example of the enforcement of an anaconda policy, and of the possibility of pursuing it under the altered conditions of war steamships which could defy adverse winds, and hold their position despite ocean currents. But the analogy is delusive. The blockade enforced by the Federals was as effective by land as sea, whilst their preponderance in ships was incomparably greater than we could ever hope ours would be in conflict with any first-class power. We could not crush him with the tightening coils of the serpent: we could only mark and observe his ports, and so prevent his sending out ships unobserved to annoy or destroy our lines of communication. Our *strategy* must thus essentially be defensive, not offensive, though the *tactics* employed would be as aggressive as those which delighted our sailors in the days of Aboukir and Trafalgar.

But all this observation of ports would involve not only a sufficient number of ships, but very present ability to move rapidly on the earliest intimation of the enemy's activity. We must not only be prepared to close Toulon, but must also see that none of the enemy's cruisers escaped from Rochefort, Brest, Boulogne, Havre, or Cherbourg, nor torpedo boats sneaked out of the Loire or Gironde. Along with the watching on deck must be the readiness below; the banked-up fires, the well-oiled engines, the smooth-working water-tight doors and fire apparatus, must all be in readiness for the order transmitted by the engine-room telegraph. The strain on the officer of the watch, pacing the bridge with telescope under arm, must be great on such duty as this, but it must be incomparably less than that on the engineer officer shut down below, watching his sleeping motors, but

aware that the fate of all on board the ship, and far more than that, the issue of the battle, may be determined by the way they acquit themselves when put in motion. It is a responsibility which tends to sober the most reckless of men, which trains them in the silent watches of the night to anticipate any possible defect, and remedy it before any breakdown occurs.

It will be remembered that on our arrival at Malta we only found two cruisers there—the Terrible and Powerful—with a number of torpedo-boat destroyers. The English fleet was, in compliance with instructions from home, massed at Alexandria, which was supposed to be the objective of the French Mediterranean squadron should war break out. This very concentration displayed a weakness in strategical ability which can only be accounted for by the constitution of the board. The constant changes of the sea lords with changing ministries destroy continuity of naval policy, and subordinates professional ability to political control. However, before I had long been in the service I ceased to wonder at Admiralty vagaries, or to expect from those officials a very intelligent appreciation of the difficulties of the task imposed upon the fleet. A week after our arrival the Majestic and Edinburgh came into harbour, after a very rough passage from Portsmouth. Their experience of the Bay of Biscay was far more unpleasant than our own had been. As an old fellow-student was an assistant-engineer on the Majestic, I obtained permission to visit her immediately she cast anchor. She was a very different ship to the little craft I had just left, and in her imposing proportions fully justified her name. She carried a complement of 759 officers and men, had a displacement of 14,900 tons, and engines of 10,000 horse power under natural draught, or 12,000 with forced draught. Eight boilers, fitted in pairs in four separate boiler compartments, supplied her with steam,

whilst of her eighteen boats four were steamboats, with self-contained motive power, available for torpedo warfare independent of the ship. The engines were imposing in appearance, and as a naval engineer I was much struck with their clean and worklike condition, especially after coming through such rough weather. There was not the slightest appearance of hurry or neglect about them—nothing had been left uncleaned, nor any of the moving parts un-oiled. She was as "fit" as she could be made for a trial trip, and this is perhaps the highest compliment I can pay to her engine-room staff. My friend assured me they had worked splendidly, but then they were all continuous-service men, trained in the navy to their duties. The authorities at home were, he told me, at their wits' ends to find stokers and artificers for the vessels still to be commissioned. None were offering, though the service had been thrown open for short-period engagement, and there were some dockyard rumours of impressment should war break out. For war had not yet been proclaimed, although no one now deemed that it could be averted.

CHAPTER III.

The Naval Intelligence Department.—The Admiralty Board.—The Permanent Secretary.—The Engineer-in-Chief.—The Director of Naval Construction.—An ideal Constructor and a succeeding one.—Declaration of War: Where is the French fleet?

A DEPARTMENT exists at Whitehall called the "Naval Intelligence Department," which is supposed to concern itself with the numbers, equipment, and disposition of foreign fleets; the readiness for warlike enterprise of their ships, dockyard, and *personnel;* and the means and method for

mobilisation of our own fleet. It is a purely consultative department, without any administrative duties or powers, and the officers composing it would be deemed guilty of professional impertinence if they presumed to offer any suggestions without first being asked for them.

That a department which, at least to some extent, bears a resemblance to the celebrated "general staff" of the German army, should thus be cabined and restricted in its operations would alone be sufficient to render it valueless for the purposes for which it was instituted, but to ensure its utter worthlessness some wise Lord of the Admiralty conceived the idea of placing it under the supervision of three distinct sea lords, all holding nearly equal official rank, and at times afflicted with jealousy of the interference of each other. Thus the First Sea Lord is the general head of the Naval Intelligence Department, and the officers are required to keep him advised of all matters which will affect the results of a naval campaign, whether they be the position of our own ships, or the distribution and equipment of those of an actual or possible foe. When, however, the intelligence affects the mobilisation of our own fleet, the officers are to report to the Second Sea Lord, and act under his instructions in the preparation of this portion of their records. This, however, is not the end of the division of the supervision. In such matters of mobilisation as relate to transports, the medical stores and officers, coals for the ships, chaplains and naval instructors, and the very important items of certain allowances and table money, they are to study the whims and fancies of the Junior Sea Lord. The Scriptures tell us that it is impossible for a man to serve two masters, but the wisdom of the British Admiralty has decreed that the unfortunate intelligence officers should serve three. The concentration of the English fleet at Alexandria was not, therefore, a very surprising feat of

strategy, for the Intelligence Department was in the unhappy position of being unable to inform the First Sea Lord where the French ships were to be found; to tell the Second Sea Lord where our own ships were lying; or to advise the Third Sea Lord what chaplains were available for service on ironclads without trenching on the supply for the several dockyards. Such was the glorious result of divided responsibility, a division of labour which seems to have been carried to the highest perfection at Whitehall.

I heard some severe criticism of the Intelligence Department by the officers of the Majestic, but the severity of their criticism was mild to that which came from the engineers of the Edinburgh on the organisation and treatment of the engineering department. The work was certainly important enough to demand special recognition at the hands of the authorities, and special recognition was accorded to the officers and men, but not in the way of encouragement. Taking, for example, the engine-room artificers, a body of trained and extremely skilful mechanics, many of whom were in every respect equal to the ordinary engineer of the mercantile marine, the Draconic rules of the service forbade their ambition ever to soar higher than the jacket of a chief petty officer. The boy who entered from the training ship, or the man who joined from the fishing smack, being posted to the seamen's branch, might by good conduct and good fortune rise to a warrant officer's grade, and receive decorations and rewards; whilst the youth who entered the service along with him, although doing more important and arduous duty in the engine-room, would ever remain his junior. We were, consequently, unable to obtain artificers in the numbers required and of the kind wanted; we were compelled to place the more intelligent stokers to do some of their work, and to entrust them with the care of engines, the working of which they imperfectly understood. The

Edinburgh had suffered from an arrangement of this kind, having no less than four chief stokers doing duty as artificers, whilst her complement of stokers was completed with six of the second class—good men in their way, but unfit for the work of such a ship in time of war. Her engines (I saw them later in the day) looked the same pink of perfection as those of the Majestic, but this perfection had been attained by an excessive strain on the commissioned officers, who had not merely to watch the machinery and give intelligible orders to intelligent workmen, but had also to watch the improvised workmen, such as they were, when carrying out those orders. This should not be. An engineer is no more a piece of machinery than is an executive officer; he has certain limitations to his powers; and if his endurance be stretched almost to breaking point in a voyage of mobilisation, what can be expected of him on blockade or in action?

The engineering officers generally contended that many of their difficulties and inadequate position in the service arose from the constitution of the Board of Admiralty and of the executive at Whitehall. Let us consider how it is composed. We have a First Lord, who is always and before all things a politician, either a commoner or peer, who has so distinguished himself in party politics as to be entitled to ask as his reward a position equal to that of the Secretary of State. The policy of the board is invariably determined by him; he is a Cabinet Minister, and from the days of Mr. Childers onward has usually been a sufficiently strong man to enforce his will upon his colleagues. This perhaps is the right method for the supreme government of the navy. In our latter-day wisdom we have resolved that all institutions shall be democratised, and that being so, it is only right that the lord most immediately amenable to the public will should have the controlling voice in the department. It is

true he is a civilian, but he is in immediate contact with the Foreign and Colonial Secretaries, one or other of whom are most likely to call his department into action, and also with that omnipotent Chanceller of the Exchequer without whose aid none of the departments can exist for a day. Moreover, to remedy his deficiency in naval knowledge, he is assisted by three "sea" lords, all of whom are selected from the executive or military branch, and who are generally admirals, full, vice, or rear, and by a controller, who is also an executive branch officer, and usually of flag rank. In addition to these, he has the assistance of a civil lord and a financial secretary, both of whom receive their appointments as rewards for past services to their party, and as incentives to future exertions on its behalf. We do not presume to suggest that the sea lords are also appointed for their political rather than their professional ability, but it is certain that when a Liberal Government is in office we generally find Liberal admirals at Whitehall, and when a Tory Government seizes the reins only Tory officers are found qualified for a seat at the board.

It is only necessary to remember the limited life of a ministry to see that the permanent officials must have a most commanding influence in the administration of naval affairs : they spend their lives in planning the construction of ships, the purchase of stores, or the distribution of forces, and do not lose their employment when a majority in the Commons passes away. The very continuity of the service they so laboriously and ungrudgingly render to an inappreciative country must give them an almost irresistible influence with my lords civil and naval, and render plastic to their suggestions both controller and financial secretary. Of course no one suggests that "my lords" are mere dummies : no doubt they possess opinions, but they have not, during the first few months of office, the knowledge of their

advisers, and during those few months much may be done in moulding them into convenient shape.

The most dignified of the officials is the Permanent Secretary, a gentleman whose principal work seems to be to sign, on behalf of the Admiralty, the shoals of letters sent to him from the various sub-departments. A late secretary informed a committee of the House that he considered it his duty to sign anything placed before him. The present secretary probably exercises a little more discretion, if not in his signing, at least in his description of it, but it must be utterly impossible for him to read and understand the vast numbers of letters which are daily placed before him on such diverse subjects as the purchase of salt beef, the increase of dockyard staff, the stability of a monitor, or the adoption of water-tube boilers. We must not, however, suppose that the Permanent Secretary is merely an automatic signing machine ; he has also to uphold the traditions of the department, and to conserve the manners and customs of naval administration from board to board ; above all, he has to maintain the dignity of the supreme administration, and to represent, both to the service and the outside world, the wisdom and majesty of "my lords." But it is certain that, whether from the onerous oppression of his official honours or the gradual evolution of other functionaries during the substitution of ironclads for old-fashioned frigates and three-deckers, he is no longer of great administrative importance, and he probably counts for much less in naval policy than directors, and chiefs, and superintendents, who ostensibly are junior to him.

There is evidently no hope of assistance in redress of grievances from this eminent official, who is merely the mouthpiece of the board. Nor, if the departments were properly balanced, would it be necessary or desirable. Lest I should be misunderstood in the use of this word "depart-

ment," let me explain that it is employed in a very elastic manner by public officials. It is used both to represent the entire naval or Admiralty department, and the departments of the first, second, and third sea lords, and of the contr oller It is still further employed for the constructor's department, the dockyard department, the engineers', the naval ordnance, medical, victualling, stores, intelligence, marines', and other departments, under directors and chiefs, who are each responsible to one or other of my lords, and included in his department, as he himself is included and absorbed in the Admiralty department of the general government of the country. I am aware that my explanation is no more lucid than my use of the term will be, but lucidity is not a quality to be expected in treating of the circumlocution office.

The sea lords take the supervision of the *personnel* of the fleet, and, as they were past executive officers, there is little risk of the interests of the seamen branch suffering neglect at their hands. The civil departments have the assistance at headquarters of very able chiefs, who have themselves passed through the mill, and appreciate the woes of their colleagues still at sea. The chaplains have their general, the doctors their director-general, and the pay-masters their accountant-general, to keep the board in constant memory of the services they render, and to press their claims for due reward. The engineering branch has also a chief at Whitehall, a chief who knows well the services they ungrudgingly render their country, and the enormous value to the navy of the work they do. But, unfortunately, the position held by this gentleman is not equal to the paramount importance of the engineering department, and the influence he ought to exert is largely discounted by his relationship to another high official.

Whilst the engineer-in-chief, as regards *personnel*, is under the supervision of the Second Sea Lord, he is, as regards

material, under the supervision of the Controller of the Navy. I have already remarked on the permeation of the members of the board with the ideas and policy of the permanent staff. But all the members of that staff have not the same views, and each will certainly hold an exalted opinion of the importance of his own special department, and endeavour to extend and amplify its sphere of influence. The most important member of the board, next to the First Lord, is probably the Controller, since in his department is involved the designing and building of all ships and their engines, and the carrying out of all repairs to them. The engineer-in-chief has far more to do with construction and repairs of engines than with promotions or distribution of officers, and his intercourse with the Controller is much more intimate than it is with the Second or any other sea lord. If, therefore, he is to permeate the board with the views of himself and his comrades, it is through the Controller the process must commence. Unfortunately, the "Lascar and oil can" theory still dominates the minds of most of our seamen, and though they can see a continuity of beauty from the lines of a 64-gun frigate to the lines of an ironclad, they can only find a sad and unfortunate break in the transfer of motive power from tapering masts and spreading sails to the stokehold and propeller. They know that the big "tea kettle," as they first termed steamers, has come to stay, but the knowledge brings with it a sigh of regret. The shipbuilder, the naval architect who designs the hull and its arrangements, obtains their sympathetic attention to his suggestions, whilst those of the engineer are merely tolerated.

Surely it must have been some such feeling as this which secured for the Director of Naval Construction his present preponderating influence. His duties have been officially laid down "as involving responsibility for all matters touching

the design and construction of the hulls of ships and boats, including masting, torpedo and electric light apparatus, and all nautical apparatus ; and upon him chiefly devolve the guarantees of speed, coal endurance, draught, stability, structural strength, sea-going qualities, accommodation, and equipment." It is quite true that in preparing plans for a warship he has to work in conference with the Director of Naval Ordnance, the Assistant-Director of Torpedoes, and the engineer-in-chief, but the mere fact of his duties involving ultimate responsibility for the entire design must give him a commanding position where the requirements overlap, and reduce to a secondary position the designer of the motive power. If the stability of the ship, or the crowding in of magazine rooms, demand that engine or boiler space must be confined, there is little doubt the engineer will have to give way. The designer of the hull will get his model left unimpaired, even if the steaming efficiency of the vessel is risked by reduced bunker space, or by crowded arrangements of boilers and machinery.

Admiral Sir Vesey Hamilton, himself once a first sea lord, says: "There is, however, no reason to feel surprise that differences of opinion should exist where work is complex and progress continually suggests further developments, nor that some friction should arise. I cite this matter not to the disparagement of the Admiralty system, but to illustrate the fact that the Admiralty system must depend very largely upon the wisdom of individuals, and it is unnecessary to disguise that wisdom, as in former times, has in some instances been denied to us." There was once on a time a chief constructor of the navy of wide and liberal sympathies, a man who, confident in his own supreme genius, courted suggestions from all around him, and lent kindly attention to any criticism of his designs. With him the naval architect and naval engineer were kindred spirits, brothers

in a profession which was covering the sea with machinery, and conquering winds and waves by its operations. With him there could be no petty jealousy, for his glory and ambition was to construct a navy, and not merely to climb the paltry steps of the official ladder. But another Pharaoh arose, of different type and more selfish ambition, in whom became concentrated the entire constructive machinery of the Admiralty, even when Parliamentary committees of investigation had reported that centralisation was destructive of efficiency, and Admiralty minutes had appointed additional functionaries with distinct and independent duties. Little by little the absorption of power went on, in virtue of his responsibility for bringing together in one ship, so far as possible, all the qualities demanded by the board, subject, of course, to data given to him by the engineer-in-chief and the Director of Naval Ordnance. As on him devolved the guarantees of speed, coal endurance, draught, stability, structural strength, accommodation, and equipment, it is evident that in any dispute between the directors the dictum of the ultimate one must prevail. My lords have emphasised this by appointing the Director of Naval Construction to be also Assistant Controller, in which capacity he acts in the absence of his chief, with all the delegated authority of that chief, in all matters except ordnance and torpedo material. "The Admiralty system must depend very largely upon the wisdom of individuals," and my fellow-officers, at all events, were not content to see wisdom in a series of changes which had rendered their chief at the Admiralty practically subordinate to, though theoretically independent of, the chief master shipwright.

"Kissing goes by favour" with the fair sex, and favour goes by departmental seniority and importance at Whitehall. The engineer-in-chief is in such close and constant relationship to the Director of Naval Construction, that the appoint-

ment of that officer as Assistant Controller must of necessity deprive him of importance. The director, the head of the shipbuilding department, when consulting with the engineer-in-chief, nominally an equal head of department, has merely to rise from his chair, and sit down again, when lo! he is transformed into the representative of "my lord" the Controller, and the undoubted chief of all constructive and mechanical departments. It is with the brand of this inferiority upon him—a stigma fixed in the department of the lord with whom he is most immediately in contact—that the engineer-in-chief approaches the Second Sea Lord with recommendations and suggestions for the numbers, appointment, and promotion of naval engineers. What consideration his suggestions as to *personnel* receive we can well imagine. He has been tacitly degraded in his relative position, and the degradation undoubtedly extends to and affects the whole of his fellow-officers.

Where was the French fleet all the time we were discussing our grievancies, and the probabilities and possibilities of war? Our intelligence officers were unable to find it, and this was not very remarkable, seeing that it had a short time before left Toulon, with an imaginary destination at Alexandra or Port Said, and had since been quietly wandering about in remote corners of the Mediteranean. We were not yet at war, and it would have been deemed a breach of international courtesy and diplomatic usage to shadow our neighbour's ships. It is not by any means certain that they would have been equally careful in their observance of such etiquette; indeed, they probably knew from merchant captains, and the crews of coasting vessels and fishing smacks, as much as we knew ourselves of the distribution of our ships. We gathered from the mail packets that Marseilles was destitute of men-of-war beyond two coast defence vessels and a few torpedo boats, but we were unable to

obtain any information as to the number of war vessels at Toulon, that harbour being jealously guarded by the French authorities against inspection. I afterwards learned that at this particular moment the bulk of their fleet was not there, but cruising in the open sea, and it was only by a fortuitous accident we afterwards discovered them massed in that harbour. We were not, however, to remain long in this state of ignorance. Three days after the arrival of the Majestic and Edinburgh, the telegraph advised us that we were at war with the Republic of France.

CHAPTER IV.

Searching for the French fleet.—Naval strategy.—Speed and obsolete craft.—End of the Acorn.—Etiquette and class distinctions.—My *beau ideal* of a Naval Engineer.

WITHIN a week of the declaration of war the Commander-in-Chief for the Mediterranean Station arrived in the Harbour of Valetta with the greater portion of his fleet. He had swept the sea from Alexandria to Malta without meeting any French cruisers, and, after filling his coal bunkers afresh, he was to make further search for them. The Terrible and Powerful were signalled to proceed at once to sea, and endeavour to discover the position of the enemy.

We were safe now against blockade. The Admiral had in the harbour, including the Majestic and Edinburgh, twelve first-class line-of-battle ships, and three second-class, whilst attached to the command, though many were at present away on search duty, were four first and six second class cruisers, besides torpedo-boat destroyers, gunboats, sloops, and other small craft of various classes, for duties outside the

actual line of battle. This was a much stronger force than is frequently attached to the Mediterranean command, but our Intelligence Department had determined that the French attack would be on Egypt, and the sea which had been the scene of Roman and Carthagenian conflicts, of piratical atrocities and Hospitallers' valiant defence, would once more resound with the battle of the nations of Western Europe. In this they were right. The national vanity of the French nation had been hurt by our occupation of Egypt and improvement of its material condition. They remembered the glories of the great Napoleon's invasion; they imagined revenge for their defeat at Aboukir; and their *gamins* clamoured as eagerly to be led to the Nile as, a generation previously, the *gamins* of that day had shrieked for a march to Berlin. But the very correctness of judgment in this instance had exposed us to a great danger. Acting on the information supplied by the Intelligence Department, on the vapourings of the French press, and the nature and disposition of the preparations reported by our ambassador, the Lords of the Admiralty had given instructions for the concentration of the fleet off the coast of Egypt, leaving the important naval station of Malta unprotected by any ships beyond two cruisers and a number of torpedo-boat destroyers, all of which were unable to meet ironclads in line of battle, with, later, the addition of the Majestic and Edinburgh. If, therefore, the French commander had so determined, he could, at least until the arrival of our commander-in-chief with his additional force, have enforced an effective blockade of our most important base of operations.

Why was it that he did not take advantage of this weakness in our strategy during the four or five days when it was possible after the declaration of war? Why was it that, having had his ships collected for the special object of obtaining the command of the Mediterranean Sea, he had

not employed them to keep the English fleet severed and blocked up in two separate parts? It is still as true as when the axiom was first propounded, that victory in war inclines to the side which makes the fewest mistakes. The English had committed a grave blunder in concentrating their fleet at the far end of the Mediterranean, leaving that sea practically unprotected from Gibraltar to Cyprus; the French had committed a far greater one in failing to take advantage of it. Why?

I am not in the secrets of the French Navy, and can only judge of the reason for the movements of their fleet from the results thereof, and from analogy to our own blunders, combined with such details as were at the time common newspaper knowledge. The short cruise had revealed defects in some of their ships, which the Admiral deemed it wise to have repaired at the dockyard. It was contrary to the traditions of the service to divide his squadron in the neighbourhood of an enemy, and so he put back into Toulon, and was there repairing and re-coaling when war was declared. He missed a great opportunity, but he did so in strict conformity to the rules of scientific warfare, and displayed the extent of his military knowledge by not risking a disaster in the endeavour to snatch a victory. More sea training and less college cramming might have produced a different result; but then the result would have been as contrary to all the rules of the schools as were the victories achieved by the great Frederic when he substituted winter marching for comfortable winter quarters.

Our scouts brought us news of the French fleet in Toulon harbour, and the admiral at once set sail with all his force to blockade it there. If we could keep the major part of their fleet in harbour, the inland sea would be free and safe for our commerce. We should have that "command of the sea" which was essential for our naval supremacy.

The sailing speed of a squadron is determined by its slowest ships, and these varied in our present fleet from 9 or 10 knots for our precious Acorn to 16 or 17 knots for the latest ironclads, and 27 knots upwards for torpedo craft of various kinds. Our Admiral solved the problem thus presented by sending forward the swift torpedo and scout vessels to scour the sea, and take up such a position as would enable them to watch the harbour mouth, whilst he followed with the stately flotilla of line-of-battle ships, who were eventually to enforce the blockade. The mere tubs were to follow at such speed as they could make, and join him off Toulon as soon as possible. I need hardly say the ironclads very speedily vanished from our view, and both lieutenants, engineers, and bluejackets were lost in speculation as to the object of the Admiralty in keeping in commission such vessels as the Acorn.

Speed is largely a question of engine power and boiler suitability and capacity, and these are matters on which naval engineers should be in a position to advise "my lords," both as regards economy in working and tactical fitness for service. For whatever the Whitehall officials may think, there can be no doubt in the mind of any engineer that vessels of this obsolete class, with small power and low rates of speed, are perfectly useless in war. The displacement of the Acorn is 970 tons, and her I.H.P. with natural draught 850, giving her a speed of 10 knots, with forced draught 1,200 I.H.P., giving her an estimated speed of 12 knots. Her complement of men and officers is 138. The Circe, one of the torpedo-boat catchers completed in 1892, has a displacement of 810 tons, but with natural draught she develops 2,500 I.H.P., giving her a speed of 17·75 knots, and with forced draught 3,500 I.H.P., increasing her speed to 19·25 knots. The complement of the Circe is 85 officers and men only, and her armament

inferior to the former ship, as she carries two 4·7 in. quick-firing guns and four 3-pounders, against eight 5 in B.L. of the Acorn. No naval officer would, however, class the former ship as so effective a weapon of war as is the latter. She is equally, if not more, unfitted for the line of battle, for she is built partly of teak, as against steel; and is still more unqualified for scouting purposes, since she can hardly overhaul a decent ocean tramp on a stern chase. For a few years longer she might frighten Arab slave traders in the Red Sea, or do duty as a guardship in the Golden Horn, but for any European warfare she is absolutely useless, and her crew of 138 men as completely locked up as if they were in barracks in the centre of Warwickshire, only in greater danger of an unhappy and inglorious death.

The lesson is obvious. Such obsolete craft should be drummed out, and their officers and men placed on vessels where they will be of some service to their country. And in the future the gunnery officers and engineer should be asked to specify their requirements as to armament and motive power, before the ship designer commences his plans. A war vessel is a mass of compromises, but her speed is so essential to her power of offence or defence, that the department on which that factor essentially rests should have a controlling voice in her design. My friend McPherson was of opinion that the proper officer for the post of Assistant Controller of the Navy was the engineer-in-chief; but then he was suffering much perturbation of spirit during our voyage from Malta, and very wroth at the danger of our being left out of any fighting which might go on.

There was no such danger, as it happened. Our Admiral had his fleet arranged in lines stretching right across the entrance to the harbour, but as yet the French had left him unmolested. One or two of their torpedo boats had ventured

out to reconnoitre, but an exchange of shots at long distances had sent them under the shelter of their batteries. So far as the warships in Toulon were concerned, we were effecting our purpose. They were shut up in harbour, and could not emerge without a fight. So long as they refused the fight the command of the sea was ours.

I was transferred from the Acorn to the Terrible the day after our arrival. I was sorry to part company with McPherson, and indeed with all the officers, for they were as nice a set of shipmates as I met in the whole of my career, and I entertained for them the friendly feelings which are so easily aroused by the companions the seaman meets on his first ship. Alas, I never met them again. She was sent home shortly afterwards with sick men, and to bring back reliefs. Crossing the Bay of Biscay, she encountered the Latouche Treville, an armoured French cruiser, more heavily armed, and able to steam at 17 knots with natural draught. The unfortunate Acorn could neither fight successfully nor run away. The combat was not a long one. The quick-firing guns of the Latouche Treville soon settled the matter by pounding a hole in her side, and setting her on fire in three or four places. She was a teak-planked vessel, it will be remembered, and her decks were of crown deals. She went down, with over 150 men aboard, including invalids, a sacrifice to the absurd arrangements of the Admiralty in sending to sea an obsolete and useless ship. Some few of her crew were picked up and made prisoners by the cruiser, but none of them were engine-room men or officers. These, as is usually the case in naval actions, were at their duties below, and died unflinchingly at their posts. They had none of the pomp and circumstance of war to encourage them—nothing but the stern sense of duty ; yet they did their work as calmly and collectedly as their brothers in arms on deck.

My transfer to the Terrible was a total and not altogether

agreeable change in my experience. Her engineers were sufficiently numerous to form a body apart from the executive and other civil officers, and mixed less with them than on the Acorn. A professional tinge affected their conversation, and professional jealousy their judgment on events passing around them. Debarred from any extensive social intercourse with their brother officers of the deck, they became less cosmopolitan in their ideas, and cherished the foolish notion that the ship was built for the purpose of carrying machinery, rather than that the machinery existed for the mere purpose of working the ship. I do not wonder at this professional narrow-mindedness, with the later experience of naval manners and etiquette, but it certainly impressed me unfavourably in the first instance, and caused me to form a much worse opinion of my companions than they deserved. In this professionalism we see one of the worst results of class distinction, and it probably lends more force than any other consideration to the utopian dreams of modern social reformers.

There can be no doubt that a spirit of antagonism to environment is engendered in any class which, by merely social or political distinctions, is kept outside the pale to which the individual attainments of its members entitle them. And this antagonism gives them an unduly exalted opinion of their own importance, and of the value of the services rendered by their profession to the world. In pure self-defence they incline to exaggeration of their own work, and depreciation of that of others, on the principle that the world accepts a man at his own valuation. The adage is a false one, for it is founded only on isolated instances, where the natural ability of the man justifies his arrogance, and does not apply to collections of ordinary men; but it derives its force and practical utility from the courage it imparts to the ostracised class to fight the battle for recognition. The

world will not always take them at their own valuation until they have by persistent service proved its truth, but will certainly not take them at more than the estimate they fix on themselves. In the meantime, whilst the fight is going on there is a loss of power for combined action between the several classes, and the force which they should use against a mutual foe is wasted in internecine bickerings.

However, the change of ship was an extremely instructive one to me, and none the less so from the strictness of discipline maintained on board. Discipline we, of course, had on the Acorn, as on the smallest torpedo boat in her Majesty's service, but the character of it was different, and the external exhibition less pronounced. In the great French war of last century we had line-of-battle ships, frigates, brigs, and gunboats, and the officers and crews of the frigates were noticeable for their smart and rapid movements beyond any other ships of the fleet. In those days it was degradation to be transferred from a frigate to a ten-gun brig, whilst an officer or seaman trained on a brig found himself sadly lacking in smartness when sent to a frigate. In the present day our cruisers answer the purposes of the frigate, and in perfection of discipline copy them closely, whilst such craft as the Acorn, Mariner, and Racer are the modern substitutes for the old-fashioned brigs, and perpetuate many of their defects.

But it was not in discipline alone I gained advantage. The completion of my professional education was now possible. At Keyham and Greenwich I had been instructed in the construction, repair, and use of many and varied machines, but repair and use on land is a vastly different matter to what it is on sea, and the machinery of my first ship was so limited, both in character and quality, that I could gain little additional education or experience whilst in her.

My new chief of the Terrible was one of the best officers in the service, and from the first moment of our meeting formed my *beau ideal* of the naval engineer. He was a singularly handsome man, of slight but powerful physique, which rendered him noticeable even among our distinguished naval officers. At college, in the workshop, at sea, he had equally worked hard, bringing to his immediate task not merely the quick eye and skilful hand of the mechanic, but the finely-cultured mind of the scientific student. He was a good all-round man, not in the sense of a jack-of-all-trades, but as equally trained in all his capacities, mental as well as physical. There were few such men in the service as Edward Haddow, and the qualities which rendered him so valuable to his country—for valuable he undoubtedly was—would in a more favoured branch have landed him in high honours. He was free from the narrow professionalism of the other engine-room officers, and without undervaluing engineering services, fully recognised their limits. Whatever ability I afterwards displayed in my work, whatever of truth there may be in this estimate of naval administration, whatever sacrifice I may afterwards have made to the highest and noblest sense of duty, were the result of his pattern and teaching. He was, it is true, only an example of the modern engineer officer, but he was the brightest and noblest example of them all.

CHAPTER V.

The first battle of Toulon—Appearance of the French fleet—The Majestic and the Carnot—Condition of the sea—The first shot—Effects of gun fire—Close quarters—French coast defence ships—Destruction of the Sultan.

My transfer to the Terrible was to be more than mere tutelage in engine driving: it was to be an introduction to that fearful arbitrament of war, which is as truly the object of the training of the Royal Naval engineer as of the deck officer. Our Admiral had divided his fleet for blockade purposes into three squadrons, the first of which, consisting of ironclads, was under his own immediate command; the second, comprising our cruisers, being in charge of the rear-admiral; whilst the third, or in-shore squadron of torpedo destroyers, was commanded by the very idol of the British Navy, who had already, at the bombardment of Alexandria, displayed the audacity and courage which have always won the admiration and devotion of our bluejackets, both officers and men. His appointment to the Mediterranean Fleet, and to this position in it, was hailed with rapturous approval everywhere throughout the country: for pleasing manners and winning smile, combined with stories of his daring seamanship, had rendered him as popular on shore as at sea. This torpedo squadron was kept as closely in shore as was possible without attracting destructive fire from guns of position; indeed, at times, in endeavouring to ascertain the enemy's strength, one or other of our destroyers, most frequently the one carrying the commodore himself, would run within range, and give the French forts some practice in gunnery, but hitherto, either from steaming speed or good fortune, without suffering any damage.

We had as yet no accurate knowledge of the French force within Toulon, nor of the state of preparation of their ships, and in this respect fully justified the predictions of our critics who had for years past warned the Intelligence Department that we should be caught in a war unprepared with accurate intelligence; but there was no indication that the French Admiral was any better equipped than ourselves with such intelligence. Either influenced by lack of knowledge, from dread of an encounter, or from control of an inferior force, he had hitherto carefully screened himself behind the guns of the naval fortress, and refrained from any attempt at even a preliminary trial of strength. The cause of this inaction was a puzzle to our commanders, but so far appeared to serve the English strategy. Our object was to keep the French fleets away from the high seas, and their Admiral was assisting us in this by the policy he appeared to be adopting. The very convenience to ourselves of his inaction, its very consonance to our aim and desires, ought to have warned our commanders that some danger lurked behind.

One of the greatest mistakes a military or naval commander can make is to despise his foe. Into this mistake our authorities appear to have fallen at this time, since no suspicion of ulterior policy seems to have arisen in their minds.

But inaction cannot continue for ever; fighting ships and fighting men exist merely for the ultimate purpose of brutal battle, and to this battle they must come at length, however it may be delayed. Nor can either side tell when it may come, nor under what conditions its opponent may force the conflict. Whenever, therefore, two opposing forces are in proximity, either on land or sea, the strain of expectant observation is intense, and is increased rather than diminished by evolution of military ability. The cultured warrior,

armed at all points by study and memory of past warfare, will be more courageous than a less fully trained one, for he knows the reserve of power that his studies have provided him; but he will at the same time keep watch and ward with more intensity, and more eagerly seek for indications of his opponent's intentions and movements, because by the same process he has learned the supreme importance of early and apposite counteraction. To many temperaments this watching and waiting is an almost unendurable strain; to all men it rapidly becomes so wearisome that conflict, even under adverse conditions, is welcomed as a relief. The irksomeness of the duty is not diminished by the routine of ship life and the rations of salt beef and pork, unrelieved by fresh vegetables and meat, which have to be endured by the men of a blockading squadron. Both to the English and French sailors, therefore, the opening of the fighting campaign was a relief, if not indeed actually welcome from the inherent inclination of every militant race to indulge in a fight on any reasonable provocation.

Our in-shore squadron was under peculiar disadvantages during the night watches, since the torpedo catchers and destroyers were liable to be made into targets by both friend and foe. No warship of the larger type—that is, no ironclad or cruiser—can afford to permit any boat to approach her within the range of a torpedo without first receiving the most positive proof of her friendly character. The loss of an ironclad is so much greater a calamity than the loss of a torpedo boat, that a prudent commander would not for a moment hesitate to fire on any approaching boat of whose intentions he felt the slightest doubt. He might in the dark possibly sink a destroyer attached to his own ship; but it would be a far wiser and more prudent act to risk the sacrifice of his own comrades, few in number and limited in offensive power, than to endanger the existence of one of those ships

on which hang the fate of the great naval battle. At nightfall the cruisers drew further away from the entrance to the harbour, whilst the battleships moved further in, so as to be prepared for immediate action if the French should attempt to steal out during the night. The unfortunate in-shore squadron remained, however, in its ordinary position, with the happy prospect of being subjected to the most incessant fire from both friend and foe in case of a night attack.

Fortunately for our torpedo-destroyer crews, the attack came in daylight, when there was, at first at least, no difficulty in distinguishing the flags and other marks of the various vessels. Our line-of-battle ships had not yet retired from their night watch when a torpedo destroyer arrived with news of movements in the harbour indicating the egress of the French fleet. The commodore in command of the in-shore squadron was already risking fire from the forts in pressing towards the mouth to watch the movement, and he had so arranged his vessels as to keep the Commander-in-chief constantly advised of its progress. The Admiral was flying his flag from the Majestic, having transferred it to that ship since her arrival, and he was, therefore, prepared to lead the line in a man-of-war fitted to encounter any emergency, and with all the most efficient defensive and offensive appliances the skill and forethought of her designers could provide. She had a rough encounter that day, and bore herself bravely through it, a credit to her builders, but a far greater credit to the officers and crew who manned her.

Our ironclads, led by the Majestic, and in line-ahead formation, steamed slowly out to sea to gain more ample room for manœuvring, whilst the cruisers were directed to keep to seaward of the line-of-battle ships until such time as opportunity presented itself for their active participation in the fray. The catchers and destroyers lingered as long as possible

near the shore, seeking for a stray chance of firing a torpedo, but without finding one. As the French ironclads emerged cleared ready for action, and with loaded guns, the in-shore squadron boats were compelled to use their utmost speed. A few ineffective shots from quick firers were fired at them from the leading ships, but through some inexplicable want of judgment these were not followed up, and the little craft got safely away to the shelter of the line.

The movement of the French fleet was a slow but majestic one, revealing to us at length thirteen ironclads of various kinds, some at least of them being coast defence vessels. Our fleet was therefore superior to the enemy in line-of-battle ships, without counting our cruisers, but the French ships were accompanied by a perfect flotilla of torpedo boats, of the Torpilleure de Haute Mer class, including amongst them the celebrated Forban. They steamed towards us in a direction to cross our bows, in indented line ahead, the leading ship being the Carnot, an ironclad launched at Toulon in 1894, and on which had been expended the utmost skill of the French naval architects. She was, however, inferior in size, and, our naval officers contended, in fighting power, to many of the English first-class ships, but she represented a type which some of our reformers desired to make the outside limit of size for our own man-of-war, and which they predicted would in increased handiness make up for deficiency in armament or armour. As she was in the course of the day opposed to the Majestic, it will be well to compare some of the more salient points in the two ships.

The dimensions of the Majestic are: Length, 390 ft.; beam, 75 ft.; mean draught, 27 ft. 6 in.; giving her a displacement of 14,900 tons. Her engines with natural draught gave 10,000 I.H.P., with forced draught 12,000 I.H.P., her estimated speeds being under the former condition 16·5 knots, and under the latter 17·5 knots. Her coal capacity on

normal displacement is 900 tons, giving her sufficient fuel to steam for 3,500 miles at 10 knots per hour. The Carnot has—Length, 380 ft. 6 in.; beam, 72 ft. 2 in.; mean draught, 26 ft. 2 in.; and a displacement of 11,986 tons. Her engines with natural draught give 13,000 I.H.P., with forced draught 15,000 I.H.P., the respective speeds being 17 knots and 18 knots. Her coal capacity is 800 tons.

The Majestic is protected by a 9 in. Harveyed belt 16 ft. broad and 220 ft. long. Her bulkheads, barbettes, and forward conning tower are protected by 14 in. armour, the barbette shields by 10 in. armour, and 12 casements by 6 in. armour, whilst the after conning tower has 3 in. plate only. She has a protected deck ranging from 2·5 in. to 4 in., with overhead splinter nets, whilst for additional security she is divided into 180 water-tight compartments. Her ends are, however, imperfectly protected. The Carnot has a complete steel belt, 10·8 in. to 17·7 in. thick and 8 ft. 3 in. broad, whilst her upper works forward are protected by 3·9 in. armour. The primary turrets have 14·6 in., and the secondary turrets 3·9 in. armour, whilst over the vital portions of the ship there is a protected deck 2·7 in. thick.

The armament of the Majestic is as under:

Four 12 in. 50-ton (wire-wound) B.L. guns;
Twelve 6 in. quick-firing guns;
Sixteen 12-pounder quick-firing guns;
Two 12-pounder boat guns;
Twelve 3-pounder quick-firing guns;
Eight ·45 in. Maxims;
Four 18 in. torpedo tubes, submerged;
One 18 in. torpedo tube above water in stern.

The Carnot carries:

Two 12 in. breech-loaders in separate turrets, fore and aft;

Two 10·6 in. breech-loaders in separate turrets, one on each beam;

Eight 5·46 in. quick-firing guns in pairs in turrets, one on each quarter and one on each bow;

Four 9-pounder quick-firing guns;

Sixteen 3-pounder quick-firing guns;

Eight 1-pounder quick-firing guns;

Eight 1-pounder Maxims;

Seven torpedo tubes.

Her guns are worked by hydraulic power.

Finally, the crew of the Majestic is 757, whereas that of the Carnot is only 625. It will thus be seen that whilst the Majestic was a more powerful vessel than the Carnot, the latter had in some respects advantages over the former, and was certainly not by any means so generally disproportioned to her as to be unable to make a good fight.

The intention of the French fleet appeared to be to cross our bows and head us back, but the speed of our ships was adjusted so as to defeat this endeavour. When, therefore, the two forces were within striking distance, the Majestic was opposed to the Carnot—Admiral to Admiral.

Strange though it may appear to the landsman, the condition of the wind and sea has a most important influence on a naval fight—an influence which modern conditions have rather increased than diminished. It is quite true we are quit of the disturbing element of adverse winds, but instead we have the increased range at which our guns are used, and therefore the greater necessity for a steady platform from which to fire them. Instead of fifty guns of small power discharged at pistol range, we have now one or two of immense power used at a distance of 2,000 or 3,000 yards. Again, we have invented since Nelson's days a new weapon of offence—the locomotive torpedo—which, however deadly it may prove when it favourably strikes its object, is yet

singularly liable to deflection from its course in even a moderate sea, and utterly unreliable, if not indeed dangerous, in a rough one. I have already mentioned the number of torpedo boats the French Admiral had with him, and the hopes the French authorities entertained of the destructive action of these little vessels. We had torpedo catchers and destroyers of equal or superior type, but in numbers inferior, and in this department of our armament our opponents had an advantage over us.

What, then, was the condition of the sea? I have said that the Acorn and vessels following her had encountered rough weather in the Bay of Biscay, but it had since then moderated, and during our blockade had become quite calm; indeed, the day before the French attack there was hardly a ripple on the water. A slight breeze came up at daybreak on the morning of the attack, and increased in intensity as the day went on, until there was a decided swell on the water at the moment of opening the battle. Having regard, therefore, to the guns carried by our ships, and to the relative proportions of torpedo boats and their antagonistic destroyers, the conditions of the weather were in our favour.

Neither fleet seemed eager to commence the action at long ranges, but rather inclined to reserve the fire from their big guns until it could be supplemented by that of the quick firers. It must be remembered that the fleets were sailing courses which constantly decreased the distance between them. The first shot came from one of the Majestic's 50-ton guns, which, though well aimed, passed harmlessly over the Carnot, and fell into the sea far away beyond. This was immediately answered by a double shot from the French Admiral, neither of which hit the Majestic. The distance was about 3,000 yards, and the slight initial error in elevation, an error really due to the rolling of the ships, would at

such distance cause the shot to miss its object. For a little longer time after these sighting shots the fire was reserved on both sides, until the two leading ships were distant about 2,000 yards from each other. Then the whole broadside of the Carnot flashed into fire, and all the glasses in the fleet were eagerly turned on the Majestic, to see the effect of the discharge.

It is not my intention to write a treatise on naval tactics, nor even to deal with strategy more than I am compelled in order to show the influence exercised thereon by naval engineers. All the advantages of a favourable wind, all the benefits of windward position, are now the possession of the ship having the best steaming power; and this possession does not depend exclusively on the latest and most powerful engines, but also on a crew able to maintain them in an efficient condition, and work them to their utmost capacity. So far, then, as strategy comprises the disposition and concentration of fleets, or their ability to move from one point to another, it comes within the scope of my record; so far as tactics depend on speed at a supreme moment under fire, they are influenced by the technical skill and loyalty to duty of the engine-room staff; but beyond these very narrow limitations of naval warfare I do not intend to travel. Much of my information was obtained from my brother engineers, and much from combatant officers. I set down nothing in malice, but I cannot claim the knowledge of scientific manœuvres, or the ability to judge of their respective merits, which the deck officer has. More is required to win a battle than merely to drive a set of engines at their highest speed, or even to keep air cowls and water-tight doors free of coal-dust. The engineer is no better qualified than the navigating lieutenant for the *role* of Jack-of-all-trades. Each has received his training for his own specific duties, and will

best perform his work in the world by confining himself to them.

But no one can pass through such a battle as this of Toulon without, either by observation and report, obtaining some idea of what passes, and I should hardly complete my task without endeavouring to describe it. The fire from the Carnot had evidently not disabled the Majestic, for it was almost immediately answered by every available gun on that ship. The cannonade was taken up by the following ships all down the line of each squadron, and the battle thus became general. It will be remembered that the French fleet was in indented line ahead, the consequence of this formation being that the ships at the tail of the fleet were further removed from their opponents than those at the head, but as the conflict proceeded this was gradually altered by the steering of the French ships, until the two lines became almost parallel, with a constant tendency to decrease the distance separating them. On the side of both combatants there was an endeavour to get to close quarters, and thereby facilitate the employment of their torpedoes, and also of their rams, if suitable opportunity presented itself.

The first broadside from the Carnot did no material damage to our flagship, but it destroyed all her pretty appearance. Deck cowls and arrangements were sadly damaged, and certainly did not look so trim as they are expected to do in an admiral's ship; the discharge of her own 50-ton guns helped the destruction. At the bombardment of Alexandria the boats of the Inflexible were shattered by the firing of her own guns. True, they were 16 in. muzzle-loaders, against the Majestic's 12 in., but then the Egyptians were but little skilled in using their weapons, and succeeded in obtaining more than an average of misses, whereas the French gunners were adepts in their art. It

will not, therefore, excite much surprise when I say that before the battle had long proceeded the boats, as well as deck fittings, were rendered useless on most of the ships in line.

Yet the early effects of the firing were much less destructive than some of the more ardent gunnery officers predicted. Our own Admiral Colomb anticipated (obtaining this deduction from results of recorded trials) that only from 20 to 150 shots out of every 1,000 would take effect; or, as he generalised, about a maximum of 10 per cent of the shots fired would find their mark. Allowance must, moreover, be made for the state of the sea, on which there was too great a swell to obtain in the ships a steady platform for the guns, and for the excitement of the seamen in this their first battle. Accurate aim could not be expected under such conditions, and I fear there was so much anxiety on both sides to obtain a first hit with their big guns as to lead to neglect of the precautions needful to secure it. The leading ships had therefore reduced the distance between them to 1,500 yards before the big guns made a hit: then a shot from the Carnot struck the Majestic on her forward barbette. The glorious uncertainty of war was now shown. Had the hit been a fair one, the 14 in. of Harveyed armour, undamaged by former firing, and with its backing unshaken, would probably have offered successful resistance for the moment, but the impact would have weakened the barbette against a second blow. However, the hit was not a fair one; it struck the armour at an angle, and glanced off without causing any material damage. The terrific pounding effect of these big guns is undoubted if they obtain a fair hit, but if it is not fair and true, the effect is very largely discounted, and we must remember that a battle is not mere gun practice. The officers and men are working at their very highest tension, and the ship affords just as steady a base as

the weather permits, and no more, whilst the object fired at bobs up and down in a manner sufficiently perplexing when there is plenty of time for consideration and aim, and hopelessly so under such excitement. The very "din" of battle, the firing of the ship's own guns, the crash against the sides of an enemy's shot and shell, the constant ringing of the mechanical or electrical telegraphs, combined with the high-pitched voices of officers seeking to make themselves heard, and the shrieks and groans of the wounded, certainly contribute to produce unsteadiness in the combatants. I do not by unsteadiness mean "funk" or terror: that is an element which is never seen on a British man-of-war, and seldom on a French one; but just that high nervous tension which, in a land battle, impels the desperate charge, the forlorn hope, as a relief from the patient endurance of adverse fire. It is in this respect that the human element behind the gun or torpedo so powerfully affects the issue. Discipline, habits of implicit obedience, reliance on the judgment of his commanders, render the average Briton, with his naturally undaunted, yet cool and self-possessed temperament, the grandest fighting man in the world. We have not lost the Viking spirit yet: we have only altered its manifestations, whilst the reality of it still remains with us to brave the world and conquer, just as in days of yore.

The Majestic endeavoured to steam ahead, the other English ships increasing their steaming to follow her, so as to cross the bow of the French line, but being inferior rather than superior in speed to the leading enemy's ships, she was unable to effect her purpose. The endeavour, however, caused a diminution of distance between the combatants, whilst at the same time it resulted in an increased sailing speed under which the battle was fought. Both conditions affected the accuracy of fire, but inversely. Decrease of distance enabled the gunners more frequently to get a true alignment, whilst

the more rapid movements of the vessels, not being exactly in parallel lines, demanded greater care and skill in the allowances made when training the guns. The effects of the firing certainly became more distinctly marked, showing that the reduced distance more than counterbalanced the increased speed. On the upper works of the Carnot, above her armour belt, gaps and fissures began to show themselves, whilst the unarmoured ends of the Majestic gave undoubted signs of the pounding she was suffering. Shortly after the increase of speed a 12 in. shell penetrated her plating above the water line, just in front of her forward barbette. The effect of the explosion was terrific. The interior fittings were completely wrecked, whilst the deck above was upraised, shaken, and torn. With a gaping hole in her fore part, she could hardly keep up full speed, and had therefore shortly again to reduce it. On the other hand, a 12 in. shot from the Majestic struck a beam turret of the Carnot and disabled it. One of her 10·6 in. breechloaders was thus put out of action, except at a very limited angle. Other shells from the quick-firing battery had penetrated her below decks, and rendered her a horrible scene of carnage, but as yet without inflicting any vital wound. Without being in any sense a wreck, she had been as effectually shorn of her smart and trim appearance as had the Majestic.

In our own line, the Prince George and Hannibal immediately followed the Admiral's ship, to which they were sisters, whilst on the French side were opposed to them the Jauréguiberry and Charlemagne, which in many respects were the same type as the Carnot. Like her, they had a complete armour belt extending from stem to stern, leaving, however, unprotected some of the upper works which are armoured in the English Majestic class. The Charlemagne had in addition to her main armour a narrow upper belt of 3 in. steel, extending five-eighths her length amidship, whilst the

Jauréguiberry was strengthened by armoured coffer dams. Both had protected decks, and provision had been made against shell fire, more particularly on the Charlemagne, by splinter decks and screens.

The firing between these ships, and indeed all along the lines, commenced at the time the flagships were distant about 2,000 yards from each other; the distance was somewhat greater in the after part of the line in consequence of the French indented formation, but as the battle progressed this was altered. Neither on the French nor English ships was better gunnery practice made than on the leading vessels, and although the destructive effect of shell fire, which could not entirely be kept out, caused great carnage on board many of the ships, none on either side had sustained any vital injury up to the time the fleets had approached within about three cables of each other. Up to then, it is true, the French ships had suffered most, partly through inferiority in armament and armour, but chiefly through the advantage of the English in numbers of line-of-battle ships. The French had endeavoured to neutralise this inferiority by more extended intervals between some of their vessels, but although they prevented, by this device, absolute outflanking, the rearward vessels suffered severely from having to sustain the fire of more than one adversary. They were also inferior in size to their opponents, the French commander having placed his coast-defence vessels in the rear of his line. After the endeavour of the English Admiral to head his opponent they were at a greater disadvantage than before, for, being unable to steam at so high a speed as the rest of the fleet, a gap was speedily developed. Thus it came about that three coast-defence ironclads, of about 7,200 tons displacement each, were confronted by four English ships, three of which were also of the second class, but superior in many respects to the

French. The French coast-defence vessels were, however, by no means despicable fighting craft. They were protected by a complete compound armour belt, 13 in. to 19·6 in. thick, reaching 5 ft. below and 2 ft. 6 in. above the water line, whilst a protected deck and armoured barbettes and ammunition hoists afforded further security against shells. For offensive purposes they carried two 16·5 in. breech-loading guns, which developed a muzzle energy of 17,750 foot-tons, and would penetrate 27 in. of iron plate. They were, moreover, assisted by numerous torpedo boats, which would now be able to take an active part in the battle with less danger to themselves than hitherto, the distance during which they would be exposed to the fire of quick-firing and machine guns being so very short. Undoubtedly, the French had suffered more severely than the English during the early portion of the battle, but probably the proximity of the fleets, and their preponderance in torpedo craft, had at this juncture restored them to some approach to equality.

The first ship to suffer destruction was at this very point, and was an English one, the Sultan. She had been reconstructed in 1895, and was practically a new ship, although not of the latest or most improved type. Her eight 10 in. muzzle-loaders constituted a formidable battery on the main deck, and on the upper deck she had a useful battery of four 9in. muzzle-loaders. The Caïman had already suffered severely from her broadsides, and gave abundant evidence of punishment by gaping rents above her armour belt. Both her military masts were broken down, and cumbered her deck, whilst her funnel had been riddled through and through by quick-firing and machine guns. The English captain looked forward to speedy victory, and counted on the first flag being struck to the Sultan. But he counted without the torpedo boats, or possibly despised their efforts, since he had hitherto defeated them. Attack after attack had been made by these

little craft unsuccessfully ; the quick-firers had been trained upon them with sufficient rapidity to cause them to abandon their attempt for a more opportune moment, or, in two instances, to suffer the penalty of destruction for their temerity. Nor did the torpedoes when discharged usually reach their object. The swell on the sea was quite sufficient to deflect their course, and though many were fired both at the Sultan and her consorts, they were all failures. The same miscarriage characterised them in other parts of the battle, and for a long time neither English nor French torpedo officers had much reason to boast of their success. However, persistent effort generally meets with reward, and after many fruitless attempts a torpedo was planted under the bottom of the Sultan, below her armour line, and exploded almost immediately under her boiler-room. The rest who knows not. It was the Forban which planted the successful missile, and her speed, aided by clever navigation, enabled her to escape unscathed behind the protection of the line-of-battle ships.

CHAPTER VI.

Progress of the fight—The Commander of the Torpedo Squadron —The Brennus—Commodore Condor's attack—The engineers in action—Another French fleet—The retreat of the English fleet.

THIS, though the first, was not the only loss. The pounding went on, broadside answered by broadside, and torpedo by torpedo. The conflict became one between single ships rather than a tactical battle between fleets. The Admirals had lost control of their ships other than by the lead they gave them in their course, and each captain had to fight his own vessel as best he could, and devise out of his own

prescience the most effective manner in which to damage his opponent.

One officer distinguished himself in this battle where all acquitted themselves well. The commodore of our inshore squadron set the torpedo catchers and destroyers an example of the most effective way in which their little crafts could be fought. The Circe, on board of which vessel he sailed, was continually in and out the line, seeking for opportunity to either destroy the enemy's torpedo boats, or launch a locomotive mine against one of their larger vessels. He strove zealously throughout the day to do his duty to his country, and sought for opportunity to serve her without regard to his own safety or to the best way of advertising his services. His opportunity came at last, and with the hour was the man.

The fifth ship from the Carnot, in the French fleet, was the Brennus. She was thus about the centre of the line after the movement for position had made the gap between the principal line-of-battle ships and the three coast defence vessels. As a matter of tactics, it would perhaps have been better had she been placed last in line, so as to strengthen the flank, for she was in many respects a formidable ship, and throughout the day did yeoman service. Her greatest defect probably was in her twin-screw engines, which with natural draught gave only 7,000 I.H.P., whilst with forced draught they rose to 13,000 I.H.P. Such a vast increase of power when forced draught is adopted indicates conditions which must of necessity be prejudicial to the health and nervous state of the engine-room staff. Nor was the speed obtained that which is deemed essential for a first-class line-of-battle ship at the present day. With natural draught the maximum was only 14 knots, and though it was estimated that with forced draught 18·2 knots might be obtained, it is extremely doubtful whether such result would follow actual trial in

time of necessity. Her armour belt was only 6 ft. broad, instead of the 8 ft. 3 in. of the Carnot, but it afforded very powerful protection to the parts it covered, being of steel, and 17·7 in. thick over the vital portions amidship. There was also a narrow belt above of 4·7 in. steel, and further provision was made against shell fire by a protected deck, splinter screens, and coffer dams. Her two turrets were strongly armoured, the fore one with 17·7 in. steel plate, and the after one with 15·7 in. steel plate. It was, however, in her armament that her chief value lay, for she carried three 13·4 in. breech-loading guns, two in her fore and one in her after turret, in addition to ten 6·3 in. quick-firing guns. She had also 26 smaller quick firers, ranging from 1-pounders to 9-pounders, besides machine guns and four torpedo tubes. Above all, she had behind these guns a captain and crew admirably drilled, and ardently anxious to uphold the honour and glory of their country, and to make the Brennus famous in naval annals. Her commander had, from his first appointment, endeavoured to cultivate that spirit of *esprit de corps* which would, in time of need, make his ship the glory of her squadron and an example to her consorts, and he had succeeded in so doing. The efforts of the British Admiralty and British War Office seem at times directed to the extinction of *esprit de corps*, and to the reduction of all regiments, ships, and departments to one uniform excellence, which, although of high attainment, is not so great as it might be under a more competitive and individualist system.

So she became the terror of her opponents, so far as it is possible for English sailors to feel terror of a foe whom in general they affect to despise. From the opening of the battle her heavy guns never ceased their terrible fire, directed not merely at the ship immediately opposed to her, but also at those fore and aft thereof. These 13·4 in. guns were weapons of immense power, firing common shell 771 lb.

weight, with a charge of 388 lb. of powder, and developing a muzzle energy of 24,900 foot-tons. With a fair hit, nothing less than 28 or 29 in. of armour plate could keep out such a missile, and even then the backing and supports of the plating must be sound and unshaken by previous fire. More than one hit of British ships had been made from these heavy guns, and many from her quick firers, for the firing discipline was admirable, and though the shots were persistent, they were free from hurry, and well aimed. The fickle fortune of war had, however, favoured her enemies, and, whilst inflicting great damage, she had as yet been unable to deliver a fatal wound which would sink her opponent. One or two of her torpedoes had been fired without effect: they failed to reach their destination, not because of want of skill on the part of the torpedo officers, but through deflections caused by the swell of the sea. But although she had not been successful according to her deserts, she was a nuisance and a danger which, at any cost, must be extinguished, and therefore the attacks made on her by the English torpedo destroyers were daring and persistent. One of them had approached within a cable's length and launched a torpedo which only just cleared her stern, whilst a second had not merely unsuccessfully launched her torpedo, but on finding its failure had immediately circled round for a second attempt. Nor was the effort confined to one or two of the destroyers: in the course of half an hour eight or nine had made attacks and equally failed therein. Such daring, however, was not to go unpunished. The quick firers of the Brennus sent two of these little craft to the bottom, whilst a third in her retreat was overtaken by a fortuitous torpedo from one of the French wasps, and returned no more to her consorts to tell her story. On the whole, however, the torpedoes were not too successful in the earlier part of this engagement.

The commander of the inshore squadron, "Commodore Condor," as the bluejackets affectionately christened him, determined to put an end to this state of affairs. He recognised that the Brennus was inflicting far more damage than she received, and that until she could be removed she was occupying the attention of three English ships, which, set at liberty, might be better employed. And in truth they were sorely wanted for other work, for in the near future there loomed a danger, and another struggle, which might prove fatal to the English fleet, sorely mauled as it was by this present one. However, it was not knowledge of this new development, but sheer capacity for fighting, that intuitive grasp of the situation which marks the true leader, that impelled him to the effort. Before him was the ship inflicting damage on his consorts, and crippling the services they could render in the general attack, and that was sufficient reason for making an attempt to destroy her; the element of danger only added zest to the attempt. From out the cover of the English line he steered straight for the goal, exposed to a heavy fire from machine and quick-firing guns. The distance he had to traverse under fire was about 600 yards, but the engines were working at their highest pressure under forced draught, and the time occupied over this distance would be little more than a minute. The machine gun fire was very fatal; the deck of the little craft was swept by them, and two of her smaller guns and one torpedo tube rendered useless. She, however, made no reply to the fire until she was within 150 yards of the Brennus. Then the discharge was made at her amidship, and under circumstances and at a distance which ensured success. The Circe immediately reversed engines and put over her helm to escape the radius of the explosion. It was destructive enough. A gaping hole in the bottom and side of the French vessel admitted the torrent of water into her inside:

the stokehole and engine-room were filled, and secondary explosions of steam pipes and ammunition added to the horror of the scene. Then she settled down in the water, heeled over, and took the final plunge. I am not aware that anyone took note of the time occupied in this encounter; it was hardly likely to be done in the midst of such excitement, but it could only have been a few minutes.

"Commodore Condor" had triumphed. His splendid audacity had hitherto received inadequate reward from the bumbledom of Whitehall, whose repose it disturbed; once more it had enabled him to serve his country, and to render his commander and comrades a service as great as at Alexandria. But his humanity was equal to his courage, and his eagerness to save life as great as his desire to destroy a ship. Instead of retreating to cover of his own line, he remained to pick up as many as escaped of the crew of the Brennus; few only of her crew of 696 men were left struggling in the water, but of those few he picked up as many as possible before he retreated, despite the fire which was poured on him to avenge her loss. In every battle there is an element of chance, of luck, sometimes so astounding as to seem to justify the fatalist's creed; and this luck aided the Circe: she escaped comparatively unscathed.

Henceforth the torpedo boats and their foes, the destroyers and cruisers, played an important part in the battle, though not with all the success expected from them by their advocates, for the conditions were not favourable, yet with sufficient success to prove that there was, under certain circumstances, a very important part for them to play. But in the meantime I shall be asked rather how fared the engineers in their work during action, than how torpedo boats dodged in and out of the battle, or what propitious fate attended their various attempts.

I have already referred to the attendant horrors of steam-pipe explosions when the Brennus went down ; it is not on a sinking ship alone that these explosions occur. The Circe herself was an example of this. She had been working under forced draught all day, and indeed had been hard pressed throughout the blockade. The commodore, as we have already seen, was not likely to give any vessel on board of which he might be an easy time, and her engineer and his staff had had their energies and skill taxed to the uttermost to keep her in efficient running order. She had accomplished her great feat in the battle, and escaped comparatively unscathed from the enemy, but had hardly reached the cover of the fleet when a tube or tubes burst in one of her locomotive boilers, and put her out of action. The engineer in charge of her was killed, and two stokers severely scalded ; one died shortly afterwards, whilst all the engine-room staff suffered injuries of more or less severity. Nor was it alone in the engine-room or stokehole that the engineers' dangers lurked ; their duties carried them all over the ship, and they enjoyed no greater impunity than the deck officers from the bursting of shells or the impact of mitrailleuse bullets. The second engineer of the Majestic was killed in the bursting of the 12 in. shell in the fore part of that ship, whilst few, if any, of the other vessels had escaped without some loss in the below-deck staff.

It was not, however, the immediate dangers of the battle which told most severely upon us, but the additional strain imposed by the nature of our work when in action and its increased difficulties therein. The engine-room telegraphs and firing signals were a constant source of anxiety and trouble on all the ships. The voice tubes became utterly useless immediately the firing commenced ; the mechanical arrangements failed to act in most ships very shortly afterwards, whilst the electrical signals were in many others

utterly unreliable from a very early period. All these difficulties in signalling involved strenuous efforts on the part of the engineer officers and artificers, and efforts none the less persistent because in most cases they proved unavailing. The barbarian method of messengers had in several instances to be employed, with all the dangers of delay or fatality to the messengers. Certainly some improvement in internal signalling is necessary, and the Engineer-in-Chief at Whitehall, or any of our great marine engineers, would confer an immense benefit on his country if he would invent a reliable and workable system. The defects of the present one must not, however, be attributed solely to the engineer-in-chief or the engine builders ; it is the Director of Naval Construction who is responsible for the "torpedo and electrical light apparatus, and all nautical apparatus," and upon whom devolves, amongst other things, the guarantees of a ship's "accommodation and equipment."

The Terrible was outside the battle, the squadron of cruisers being reserved for other duty than standing as targets for armour clads to wrack with shot and shell. Opportunity was to be found for them when the French fleet, dismantled and unmanageable, was endeavouring to retreat into Toulon. The opportunity for their services came sooner and in other guise than was thus expected.

Long before the Brennus went down, before even the Majestic and Carnot had engaged in duel, a cloud on the horizon, which might possibly be smoke from large steamers, had attracted the attention of our Rear-Admiral, and the Terrible and Powerful were despatched to reconnoitre, the other cruisers following at such intervals as would keep up a chain of communication with the main fleet. It would appear that some indistinct idea of coming disaster, some change of conditions which might render the struggle a desperate one, at this moment entered the mind of our

immediate commander, for he signalled for the two cruisers to use their utmost possible speed.

The heat in the engine-room in the Mediterranean is always great. On the present occasion I can testify to its intensity on the Terrible, with every boiler fired to its utmost capacity, and the machinery working at its highest possible number of revolutions. As I stood on the engine-room platform I reeled for a moment with faintness, and would fain have escaped into the air had duty permitted it; but just by me stood my chief, with calm face and sparkling eye, watching the operations of his staff. Sometimes by a kindly word, sometimes by an approving gesture, he encouraged them in their work. This was his way of treating them—this the means by which he won from them the utmost service their physical capacity would permit. A glance at his handsome face, a sound of his cool, commanding voice, was sufficient to restore my self-control. I was content to remain at my duty, and take my share in the action down here in the depths of the ship, amidst the heat and steam and constant noise of the pounding engines. "Full speed ahead" was the indication on the engine-room telegraph, and full speed ahead we were most assuredly driving, every artificer in the ship at some point or other watching the working of the engines, pouring oil on the bearings, or anxiously looking for any appearance of a defect. Chief-Engineer Haddow had a horror of useless expenditure of either power or stores; his mathematically-trained mind ever sought to adopt the means employed to the end: to "suit the punishment to the crime." And so, steaming as we were at our highest engine speed, and in sea sufficiently rough to demand all our power, there was no wasteful lubricating expenditure—none of that "swimming in oil," which American engineers so complacently appear to consider the acme of engine driving. There was sufficient, and a small margin over, but no

wasteful sprinkling of the floor and sides of the engine room with grease which would serve no end, save rendering the work of the men more difficult, and their footing more uncertain. The "Lascar and oil can" could have been seen at work on the Terrible this day in highest perfection, but it was a perfection of detail, an adaptation and economy of means, of which the gallant admiral who invented the insulting phrase could have no conception. To appreciate the discharge of any task some little understanding of its difficulties is necessary, and when this understanding is wanting there is neither praise nor blame in the judgment passed upon it.

Forty-eight Belleville boilers, in eight separate engine-rooms, were at work to supply the steam; whilst eight air-compressing engines discharged air over the fire through small nozzles, which divide it into thin streams. In each engine-room an artificer was stationed to watch the stoking and the working of the air engines, with orders to report immediately any defects therein. Stokers, whether leading, ordinary, or chief, were only relied upon by Mr. Haddow for routine duties: he was aware that their loyalty and devotion could be depended upon, and, indeed, he had more than once in his career been indebted thereto; but he was also aware that neither loyalty to country and profession nor devotion to chief could compensate for deficiency of strict mechanical training. The difficulties of the engineering staff were, however, by no means confined to the main engines; every auxiliary machine had to be examined and watched, to see that either they were properly working or were ready and efficient for working when so required. The *Times*, in 1892, wrote: "When we consider that in the Sans Pareil there are no fewer than fifty-eight auxiliary steam engines on board, and that of these there are some whose failure would mean the disabling for an uncertain period of the ship itself, it

cannot be wrong to urge that the utmost care should be experienced by the inspecting officers, to see, according to their lights, that these small engines are as scientifically constructed, and as accurately fitted in place as are the large ones. There is no direction in which ingenuity could be more profitably applied than in devising small engines for use on board ship that shall practically never break down; and the first step towards success is to recognise that the cause of nine out of ten breakdowns is flimsiness." There was no reason to complain of flimsiness in the Terrible, but the breakdown of an auxiliary engine from any other cause might render her for the time helpless; the anxiety of the men in charge of them was therefore great, although it might be somewhat relieved by the confidence which an operator feels when he knows that his machine is initially trustworthy.

Our race towards the south-west, guided by the cloud or smoke, was a fast one, especially when it became evident, as it very shortly did, that smoke from steamers, and not cloud, was the origin of the alarm. It could evidently be no one ship, but several, and in due time we received confirmation of this. Six large steamers came in view, whether merhantmen or war vessels we could not at the first moment determine, although the fact of so many being in close company raised more than a suspicion as to their peaceful character. When it became evident that they were war vessels, and of large size, too, the anxiety was intensified, for the question of nationality and intention became of supreme importance. They were evidently making for Toulon, steering a course which would bring them in close proximity to, if not actually in contact with, the present scene of conflict. If they were friends, they would complete the defeat and destruction of the French fleet; if foes, they would probably compel the English Commander to raise the blockade and retreat, if, indeed, they did not inflict more signal

injury. The nationality could not be determined until we were well within range of their guns: then, with the hoisting of their flags came a shot from the big gun in the bow barbette of the leading ship, a shot which passed unpleasantly close to the Terrible. For two cruisers to fight six line-of-battle ships was a feat too Quixotic even for English jacktars. We turned tail, and trusted to our speed rather than our 9 in. guns for protection. If the race outwards was a trying one for the engine-room staff, the return was still more so. We had lost distance in turning; we were, and for some time would continue, within range of the enemy's fire. Above all, it was needful our commanders should have the earliest possible information of the extent of the new danger threatening them. We had run our engine at "full speed" on the outward journey, and could not hope now to make better way, but it was at least most imperatively necessary that we should not do worse. The heat down below was intense; it had been increasing as the day went on, and the fires were stoked and engines worked to their full capacity, and there was now some difficulty in keeping the stokers at work. To assist them in obtaining coal from the bunkers, and keep the stokehole clear of ashes, a detachment of blue-jackets had been sent down. It was only by the most imperious supervision on the part of engineers and artificers that this hybrid crew could be kept at their duty.

We escaped unscathed from the shot and shell which followed us—another proof of the accuracy of Admiral Colomb's forecast of the uncertainty of naval gun fire; but the rest of our fleet had not been so fortunate with their opponents, owing to the closer distance at which shots were exchanged. Our splendid ironclads, so late the glory of our navy—the admiration of the world—were now battered hulks, with riddled funnels, shattered boats, dismantled cowls and deck erections: not quite wrecks, but affording

plenty of ingress for shells and balls from quick-firing and machine guns. The proportionate carnage was increasing, owing to the destruction of some of the protective appliances, but the shots on either side were becoming more intermittent as the men were mowed down. The state of our opponents was even worse. Their line-of-battle ships were generally inferior to our own, whilst the torpedo boats on which they had relied had proved far inferior in value to their anticipations. It is true, an English ironclad had succumbed to a torpedo attack, just as a French one had, but the loss of one ship in a fleet, awful though it is in the destruction of life and material, does not decide the fate of a battle. So far the English guns had inflicted the greatest damage ; but with six undamaged ironclads threatening him, with crews in them undismayed by losses from adverse fire, and unwearied by previous exertions, our Commander-in-chief was unable to longer continue the fight : he must accept the arbitrament against him, and retreat to refit his ships. No base had been seized and prepared for such emergency near Toulon, nor was the fleet accompanied with a sufficiently-equipped workshop or depôt ship to deal with repairs so extensive had harbour room been available. There was no alternative but to retire to Malta, and seek the aid of the dockyard there.

Our opponents were in sad plight enough, but close at hand were docks and repairing shops, ready to assist them. Their retreat thereto was assured and unmolested, for the appearance of the six new vessels was quite sufficient in its threat to hasten the departure of the English fleet. Our cruisers, inadequately equipped though they were both in armour and armament for such duty, were formed up to protect the retreat, whilst the torpedo-boat destroyers and catchers which were left assisted in covering the disabled ships against attack. The pursuit was not a long nor persistent one, and we escaped in much better order than we

hoped. But it was an escape: it was a retreat of English ships before the foe; it was a defeat of our proud and powerful Mediterranean fleet, and with that defeat a loss for the time of that command of the inland sea which is essential for the maintenance of our empire.

We did not know the names of these additional French ships at the time, but afterwards learned that they were the Hoche, Magenta, Marceau, Neptune, Admiral Baudin, and Formidable, ironclads which, both in defensive armour, engine power, and offensive armament, were splendid vessels. We knew they had not been in Marseilles harbour, and they certainly had not come out of Toulon. Whence, then, had this bolt from the blue suddenly been sprung upon us?

CHAPTER VII.

The Difficulties of the British Admiralty—The Engine-room Artificers.

To account for the appearance of the second French squadron of ironclads, it is necessary to consider the position in which the Lords of the British Admiralty found themselves placed when hostilities first threatened. Only a short time previously a particular service squadron had been commissioned and collected at the Channel ports, and the operation had been performed with a celerity which astonished and delighted the English journalists. The Admiralty officials and naval officers, however, were aware that there was no reason for excessive jubilation. The squadron had been collected and fitted out for sea, it is true, but fourteen days were occupied in accomplishing this feat, instead of the one day which the Intelligence Department deemed sufficient, and naval resources had been strained to the uttermost in

providing crews and officers for the ships. The particular service, however, was of very short duration; either the threatened emergency passed peacefully away (no one seemed to know what it was), or a sudden fit of economy induced the First Lord of the Admiralty and Chancellor of the Exchequer to seek a reduction in food and coal bills. The ships were laid up in harbour and the crews dispersed; and so it happened that our naval commands all over the world were on a peace footing when the first note of alarm, the first warning of political difficulties, was sounded.

The most pronounced, but not the only, embarrassment was with the republic of France, and a glance at a map of the world will sufficiently indicate the numerous points at which we come in contact with and should have to combat her. However, behind the republic loomed another possible adversary in the Russian empire, whose naval forces in the Pacific had recently been strengthened, and, combined with those of France, were incomparably more powerful than our own. Nor did the dangers end with these two Powers. The Monroe doctrine had been pressed to inconvenient and unjustifiable conclusions by politicians of the United States, and their blustering had emboldened some South and Central American statesmen to indulge in offensive threats against Great Britain. We had troubles in South Africa, little tribal wars in Central Western Africa, Arab foes in Egypt, and impending complications in the far East. The Admiralty could not ignore these threatened dangers, nor leave British interests unprotected in any part of the world. Though the immediate conflict might ensue with the French, no one could prophesy to what quarters of the globe it would extend before peace was again restored. It was therefore necessary to strengthen other fleets besides that of the Mediterranean; to send an ironclad or two to the North American and West Indian station, as well as an additional two or three cruisers;

to send additional and more powerful cruisers to the East Indies, the Cape, and the Pacific stations; and, above all, to considerably add to the power of the China command, not merely in the number of ships, but by sending out ships powerful enough to render good account of any foe they might there encounter.

The immediate danger was a war with France. The anticipated scene of battle was the Mediterranean and Egypt. But the officers of our Intelligence Department at Whitehall remembered that an invasion of England had more than once been threatened, and had, under conditions less favourable than those which at present prevailed, been within measureable distance; they therefore prepared a scheme, in conjunction with the War Office staff, for the defence of the British Islands against possible invasion.

Unfortunately the plan adopted by the authorities was exactly that which, however effective it might be for preventing an actual hostile landing, would not avail to keep the French ships locked up in their own ports. The English Channel squadron was to be concentrated near home, and fight the enemy in English waters, and thus achieve the kind of victory Lord Howe contemplated, and in the manner he recommended. Such strategy might keep the foe off English soil, though even that achievement was by no means certain of accomplishment, but it would not prevent interruption of commerce by stray cruisers, nor harassing of convoys by flying squadrons of quick-sailing vessels. Whilst French transports were concentrating at Cherbourg, and French ironclads amusing the Channel Admiral by successive threats of Plymouth, Portland, and the Solent, French commerce destroyers would have ready access to the Atlantic, and almost equal facilities for return to their own ports to coal, repair, or refit.

The insular position of England, her dependence on

foreign imports for food supplies, and the facile means which steam supplies for the interruption of ocean routes, would thus render her liable to a form of blockade which, if not absolute, would subject her inhabitants to grave inconvenience, and probably to immense suffering. All this must have been patent to the Admiralty and their naval advisers and commanders. For years past both English officers and experts, and foreign military critics, had been pointing out this weak point in our armour; had been insisting on the necessity of our fleets being of sufficient strength to close an enemy up in his own ports, and not merely defeat him when met in battle. Now, a very cursory glance at the services which the French Navy has to discharge in comparison with our own, a very cursory consideration of the colonial development and duties of the two countries, will show that equality, or even superiority in the total number of English ships, will by no means give us superiority, or even equality, in the numbers we can concentrate at any particular point or points. To ensure this we require a considerable margin, and this must be a margin of ships actually equipped and manned, and not merely of those launched and in reserve.

In proportion to their total fleet, the French were able to place a greater number of ships in commission than we could. Their seaboard provinces had to yield under conscription a sufficient quota of sailors to man the entire fleet, and provide a reserve against casualties, and the difficulty with which the republic would have to contend was therefore only the financial one of feeding and paying the men. Nor were the conscripts of a class unfitted for the duties of a man-of-war. Many, or most of them, either followed the occupation of fishermen, or engaged therein occasionally for relaxation, or as a subsidiary means of livelihood. The hardships endured in the fishing boat, and the dangers which

frequently threatened its occupants, rendered them admirable raw material for bluejackets; indeed, they were probably better qualified for the manifold duties and discipline of a warship than the A.B. seamen on board our own ocean tramps would be. The French had, therefore, no difficulty in providing deck crews for every ship they could launch; whilst the same system of conscription provided them with stokers, boiler-makers, coppersmiths, and fitters, for their artificers' department, from the great engine and shipbuilding yards round the coast.

All this, as I have said, was known to our Intelligence Department, or at all events should have been so known, seeing that this is one of the principal reasons for its existence, and for which the long-suffering British taxpayer is mulct to maintain it. It should, therefore, have been apparent to the Admiralty authorities that the entire fleet of the enemy would have to be encountered, and not merely a portion of it; and that, having less trade and transport to defend, a larger section of it would be available for detachment against our own trade and transport. But whatever knowledge the Lords of the Admiralty might possess, they were without the power to mould their strategy by it: whatever ships they might have cumbering the docks and harbours of Devonport, Portsmouth, and Chatham, they had no means of sending them to sea unless some benign providence would furnish crews to manage them.

The difficulty should not have come upon my lords unexpectedly; indeed, it was of their own creation, and the result of a policy they had inaugurated and pursued, despite the remonstrances of men who both loved their country and had the knowledge which enabled them to judge of her necessities. These remonstrances had not only been addressed to the press; they had been made on the floor of the House of Commons, and by deputations who waited on the First

Lord at Whitehall. Unfortunately the official views were persisted in, and it will readily be understood that the strictures could not be pressed to any great extent. English gentlemen must, for patriotic reasons, abstain from exposing too nakedly to envious foreigners the shortcomings of our rulers. It is certainly not desirable to announce to possible foes that the imposing ironclads we are launching will never be used because we have no engineers to move them, and that our most powerful cruisers cannot get out of harbour for lack of sufficient greasers to use the oil cans on board. Yet this was the practical result of the clever administration of successive boards.

The reduction of the engineering complements of Her Majesty's ships occurred in 1892, and the history of the transaction is worthy of recall, not only for the lurid light which it casts on administrative devices, but as an amusing instance of the wide disparity between official veracity and the precise adherence to truth which the conscience of the "Parliamentary hand" requires in his private intercourse. For the moment I will deal only with the junior branch of our profession, the engine-room artificers, since their duties are sufficiently important to render any diminution in their numbers, or reduction in their standard of efficiency, a matter of very grave consequence.

The difficulty of obtaining recruits had become accentuated towards the close of the previous year. Skilled mechanics were loth to enter a service which offered few inducements either in comfort or promotion, and which constrained them to remain to obtain a pension, when they had by entering it forfeited their chances of success in civil life. Those already in the Admiralty service as artificers were soured and disappointed men; and on visiting their homes and former workshops, and in their letters to old friends and companions, they freely ventilated their grievances. Instead of granting

some concession in pay and privileges, the cost of which would have been infinitesimal in comparison with the contentment of the servants, the Admiralty determined to reduce the numbers of the "greasers" and replace them by a newly-created class of chief stokers.

The First Lord was questioned in the Commons respecting the matter, and emphatically denied any intention on the part of the naval authorities to materially reduce the strength of the engine-room staff of the ships of her Majesty's navy: indeed, he quite laughed at the notion of any such suggestion being seriously entertained at Whitehall. A fortnight afterwards this peripatetic lord was at Portsmouth, inspecting works and ships, and witnessing gunnery trials on board the Royal Sovereign. Before he left the dockyard an intimation had been received there from the Admiralty directing that the very reduction which, a fortnight before, he had stated was not even under consideration, should be made on the ships then in that port.

It is just possible that Lord George Hamilton may not have known of this intention when he framed his reply to his interrogator at Westminster, although such ignorance is difficult to understand, or it may more probably be that the intention had not yet emerged from its embryo state, so as to become the subject of official consideration; for however much a matter may be discussed between dignitaries of the militant or civil services, it does not come within official cognition until such time as a memorandum or minute has been written upon it. Thus it frequently occurs that a Minister in the House knows nothing concerning a matter upon which, an hour or two afterwards, he is able to write a long and exhaustive minute. The alteration was not a small one, nor of so little moment as to have escaped the First Lord's memory had it been placed before him in the shape of a memorandum, or minute, or report, instead of

being known only through a verbal communication which, until reduced to writing, was not departmentally supposed to have taken place.

So far from being a trifling alteration, it affected the complements of engineers and artificers in some instances to the extent of 33 per cent, and this in staffs by no means too large for the duties they had to perform. Taking, for instance, the Bellona, a third-class twin-screw cruiser of 6,000 I.H.P.; under the old regulations she would carry three engineer officers, one chief engine-room artificer, and five ordinary artificers, besides seven leading stokers. Under the new regulations she would have one chief and one junior engineer, two chief and three ordinary artificers, with three chief stokers and four leading stokers. In this vessel there was merely a reduction of 22 per cent; but even this was enough to impair efficiency, seeing that the old regulations did not afford sufficient engine-room skilled staff. However, in other classes of vessels the reductions were proportionally greater. On the gunboats of the Speedwell class it was exactly 25 per cent, and on such armoured cruisers as the Galatea, belonging to the Undaunted class, very nearly 33 per cent. As, however, his lordship was actually present on the Royal Sovereign, either at the time the order or communication arrived, or within a few hours thereof, she affords the best comment on the ridicule which he jocosely poured on the bare suggestion of any material reduction being contemplated in the engine-room staff.

The Royal Sovereign is one of our first-class line-of-battle ships, formidable in armament (she carries four 13·5 in. breech-loading guns) and heavily armoured. She has within her no less than 75 auxiliary engines, in addition to her two main propelling engines, and these auxiliaries comprise hydraulic and electric as well as steam machinery. When the First Lord cast contempt on the fears of reduced engine-

room staff, her complement of artificers was eighteen. When he left Portsmouth, a fortnight later, his subordinates had intimated their will that it should be twelve, a reduction of 33 per cent; exactly 3 per cent above the very reduction named in the question addressed to him in the Commons, and which he had contemptuously characterised as a gross exaggeration. When the Royal Sovereign, however, is compared with the Inflexible, and with the complement thought necessary for such a vessel eight years previously, the absurd imbecility of the reduction appears the greater. The Inflexible had low-pressure engines of 60 lb. to the inch, and a total indicated horse power of 8,000. The Royal Sovereign has high-pressure boilers working up to 155 lb. on the square inch, and engines indicating 13,000 horse power under forced draught. The authorities then in temporary power at Whitehall deemed it necessary that the former vessel should carry

One chief engineer,
One engineer of twenty years standing,
One engineer for hydraulic and torpedo duties,
One engineer for the double bottoms,
Three engineers for general duty,
Sixteen engine-room artificers,
One chief engine-room artificer to look after the electric lighting,

or a total of twenty-four skilled engineers and mechanics, against the six engineers and twelve artificers awarded to the Royal Sovereign under the new regulations. The absurdity becomes accentuated when it is remembered that the newer vessel, in addition to her more powerful engines and increased boiler pressure, carries nearly fifty more auxiliary engines, which, scattered as they are throughout the ship, entail even more care and a greater amount of detail work than the main machinery.

Such a revolution in one of the most important sections of naval *personnel* did not escape adverse criticism. The regulations and traditions of the service would not permit agitation on the part of those most immediately interested—the commissioned engineers and the artificers—and the condemnation was therefore the more severe when coming from disinterested parties. The service papers, and such of the general papers as devote space to naval and military affairs, were unanimous in exposing the dangers of the new arrangements, and the utter inability of the Admiralty to change the capabilities of men by an autocratic edict. The *Pall Mall Gazette*, which never fails in smartness, after reciting the blunders which had been made through neglecting the advice of competent engineers, very neatly concluded: "The Admiralty have the power of nominally turning stokers into engine-room artificers, and lieutenants into engineers, if it so please the board; but they will find it as hard to make skilled mechanics out of ordinary lower-deck Johnnies, and scientific experts out of a lot of book-crammed young officers, as to try and turn the chaplain into a surgeon by order."

CHAPTER VIII.

The Engine-room Artificers—The Engineers—Causes of their Dissatisfaction—The French Ships from Brest.

CRITICISM of the action of the board was not, however, confined to journalists, nor was the condemnation of it by the press the most severe which appeared. Mr. Harry Williams, a chief inspector of machinery on the retired list, who for forty years had served in the Royal Navy, wrote to the *Times* earnestly begging for the re-consideration of the edict, whilst Mr. Reginald C. Oldknow, a fleet engineer, in a

carefully-considered letter to that journal, fully endorsed his senior's protest, and added further reasons for it. There is one paragraph in Mr. Harry Williams' letter which so clearly indicates the importance of the engineering department on board ship, and which has been so fully confirmed by my own observation and experience, that I cannot do better than quote it. "For the reasons set forth in this letter I am decidedly of opinion that the late alterations in the engine-room complements are calculated to seriously impair the efficiency of sea-going fleets. In expressing this opinion, I desire to give special prominence to one fact which cannot be disputed, viz., that in these days of mastless ships of war the efficiency of fleets depends absolutely on the engine-room departments of the ships—that is, on the machinery always being in good condition, and, of necessity, there being a sufficient number of qualified mechanics in every ship to keep the machinery in that good condition." The most drastic demolition of the Admiralty position came, however, from Mr. John Penn, himself a member of a firm long associated with the navy as builders of marine engines, who, being unable by the rules of the House to raise a discussion in the Commons, addressed a communication to the *Times*. His eminence as a marine engineer, his practical acquaintance with the machinery of a man-of-war, enabled him to expose the jesuitical subterfuge that equality of numbers implied equality of efficiency. His comparison of the respective staffs of H.M.S. Royal Sovereign and Inflexible with the White Star liner Teutonic must have convinced anyone but an official that the matter required further and broader consideration than it had yet received. The tone of his letter was remarkably temperate, and he concluded: "The present Board of Admiralty have done great and good work. They have dealt with naval problems with energy and with success. They have performed an unprecedented feat

in building, equipping, and trying the Royal Sovereign in the space of thirty-two months, and I appeal to them to re-consider a decision which, if ruthlessly carried out, may land us in something very like national disaster."

The decision was ruthlessly carried out, and so carried out because of the difficulty in recruiting artificers. Mr. Oldknow exactly stated the initial difficulty of the situation when he said: "To diminish or deteriorate the engine-room complements in our fighting ships is folly. The reason why it is being done is because, under present regulations, we cannot induce men to join." The Lascar and oil-can theory was dominant at Whitehall: the wearers of the stripes and curls imagined they could perform the feat against which the *Pall Mall Gazette* warned them, and that by subjecting lieutenants to a four months' Greenwich course in steam, and stokers to a short training under the leadership of artificers, they could provide substitutes for the present technically trained staff, and at one fell blow get quit of the greaser difficulty. Instead of getting quit of the difficulty they increased it. The lieutenants have not yet learned to flatten their thumbs, nor properly to apply the Lascar's oil can, whilst the chief stokers find themselves in the unfortunate position of Mahomet's coffin—a little too good for firing, and far too untrained for mechanical repairs. In the meantime, the artificers became enraged at a device which imperilled their existence and position in the navy, and offended their pride as tradesmen by degrading them to an equality with the handy man. They deemed themselves the more aggrieved because they cost the country nothing for their education; because, after serving an apprenticeship at their own or their parents' cost, in some outside machine shop, they had to prove that they have actually acquired skill in their trade before they could be admitted into the naval service. When they entered, full of hope and ambition, at the dawn of

manhood, they expected that the road to promotion would not be barred against intelligent skill and devoted labour: maturer knowledge told them that intelligence and devotion were not virtues recognised at Whitehall, unless they are specified and tabulated in some minute of my lords, and the financial and ranking value thereof duly stated.

The artificers could not ostensibly combine and agitate. They were permitted, it is true, to petition the Admiralty *in formâ pauperis*, but they must not support the petition by collective action, nor endeavour to win sympathy from the public by open meetings; such conduct would be utterly subversive of that good order and discipline upon which quarter-deck officers lay so much stress. However, neither Queen's regulations, nor local, nor general orders, can prevent grievances from leaking out, nor bind men suffering under them from expressing their dissatisfaction. Most of the artificers were members of one or other of the great engineering unions, and continued their membership after they joined the service. Their civilian brothers-in-trade therefore warned the younger men, who were yet free, against the blandishments of the petty officer's uniform, and the present inducements of the artificer's pay. The Amalgamated Society of Engineers, a society which is pre-eminently the patrician of trade unions, without passing any actual unpatriotic resolution, simply boycotted the navy, because they were unable to see any advantage to their members commensurate with their loss of liberty and subjection to discipline and artificial restrictions. The Executive Committee of the Marine Engineers' Union, whose membership exceeded 10,000, passed a resolution deprecating any of its members joining the Royal Naval Reserve under existing conditions, and suggested a joint meeting of all societies supplying engineers or artificers to the navy for the purpose of taking united action. Nor did the recruiting of

stokers, even with the additional inducement of promotion to petty officer's rank ("one of two hundred"), proceed as satisfactorily as could be desired; it was not many years afterwards that the height of stokers had to be reduced in order to obtain them in sufficient numbers.

I have served with these artificers, and know their value. As mechanics, in their various branches, they are equal to any of their comrades on shore. As servants to their country they are unexcelled by any rank in the navy. Most of them have a fair acquaintance with mathematics, and can use mathematical reasoning as well as formulæ. Some have a good knowledge of general literature, whilst others indulge in chemical, botanical, or zoological investigations in their leisure hours—that is, when they are fortunate enough to be at a home port or on shore. One man I remember well, a chief artificer, who had not only a most sympathetic appreciation of English literature, from Elizabeth to Victoria, and a nice discrimination of the merits of various authors, but who had also drunk deeply of German and Scotch metaphysics. Spencer, Hamilton, Hegel, Fichte, and Kant were familiar friends to him. He was qualified for a Doctor of Philosophy, and the inviolable rules of the service decreed that he should never rise beyond the rank of chief petty officer, whilst the admirals thereof thought of him merely as an assistant to the "Lascar with the oil can." I need hardly add that this chief artificer was not particularly satisfied with his position, nor flattered by the encomiums contemptuously passed upon him by quarter-deck officers as "rather a superior sort of fellow, you know."

There is no need for feeling surprise at the intellectual status of these artificers: they are drawn from the class who supply our mercantile marine; man for man they are the equals of those who enter the service of the ocean steamship companies as assistant engineers, and, if permitted, could as

readily pass the examinations for second or even first class engineer as the mercantile men. But when they have once entered on their respective careers the prospects of the two classes are widely different. At twenty-one years of age the artificer and third or fourth mercantile marine engineer will receive about the same rate of pay, but whilst the former during the whole of his service is limited to an advance of less than forty pounds a year, the latter may expect to receive nearly as great an advance within two years, and a further within the next five or six years. At thirty years of age the mercantile man may expect to become first engineer of a large cargo steamer at £202 a year, and at thirty-six of a passenger steamer at £300, a higher salary than is paid to a chief engineer of the Royal Navy for the first six years of his appointment. Nor are his possibilities limited to this very comfortable salary. The chief engineer of a liner has usually some recommendation beyond the mere holding of a certificate, but the recommendation is generally won by actual service, and proof therein of good ability. It is a prize to which any engineer who has entered the merchant service from the same workshops and same working ranks as supply the naval artificers may, after passing the necessary examinations, aspire, and the salary paid to the fortunate candidate is £500 a year, or sometimes even more. Nor do the advantages of the mercantile engineer end with the advantage in pay; in any case his social position is more generally assured, and his social restrictions fewer, whilst if he is inclined to incur the not too onerous obligations of the Naval Reserve, he may become a sort of supplementary or volunteer officer of her Majesty's navy. With such advantages to offer, it is small wonder that the mercantile marine is preferred to the naval artificership by all the youths who take time and trouble to inquire and think before making a choice.

The artificers, however, who were already in the navy felt that the mistake they had made was irretrievable, and that, having sold themselves to Diabolus, they must make the best of their bargain. Very slight concessions would have rendered them content with their lot, and have removed the constant undercurrent of their complaints. They endeavoured to discharge the extra work cast upon them by the 1892 regulations as they best could. They deemed the staff necessary for working a ship and the most economical distribution thereof a matter for the consideration of the central authorities, and not for their own. But they claimed that this increase in their responsibilities and duties merited some reward, and therefore asked that they should be granted promotion to warrant rank, after strict examination and proof of sterling ability. Nor did they press their request in a manner inconvenient to the service arrangements for allotment of space in ships; on the contrary, they recognised the difficulty there would be in providing accommodation for an increased number of warrant officers, and sought to reduce it to a minimum. In the brief or memorandum urging their request for consideration they say: "In asking for their position to be improved from chief petty officers to that of warrant officers, they are fully aware of the difficulties that beset such an arrangement and change; but they submit that they do *not wish* for a separate cabin for each engine-room artificer (similar to the gunner, boatswain, or carpenter), but only for an enclosed mess berth." The request was never granted them, their discontent never appeased, nor the jealous observation of the engineering unions removed. A class of men, which contained many members who by technical skill, general education, and gentlemanly manners were admirably qualified for commissioned rank, was deemed by the autocratic Admiralty unworthy of any higher grade than chief petty officer. The

inmate of the industrial school or reformatory who kept his name out of the ship's black book might rise to a warrant, and enjoy the luxury of a separated cabin, but the artificer to the end of his days would bear the brand of the oil can about with him, and be divided in his mess accommodation from the rudest and most unmannerly bluejackets only by a breast-high partition. The difficulty of recruiting, therefore, increased rather than diminished, and when war was declared the mechanics offering themselves were hardly sufficient to replace the ordinary losses by death or retirement in peace time. There was no reserve, nor any means of creating one.

Whether my Lords of the Admiralty had any prescience of coming troubles, or were honestly impelled by a desire to avoid reductions injurious to the service, I know not ; but they took the precaution of appointing a "manning" Committee to draw up the new scale of engine-room complements. This committee on many subsequent occasions formed a convenient scapegoat when criticism became more than usually severe, and was the more efficacious for that purpose because two naval engineers of high rank were members of it : indeed, one engineer was ordinarily credited with being the moving spirit of the committee, and with having largely influenced its decisions. They had in their day experienced the difficulties the engineering staff encountered in the Inflexible and Téméraire, and must have remembered the times when work had to be continued late into the night, and often into the Sunday. Why, in face of these memories, they should concur in, if not actually suggest, a re-arrangement of staff which would give smaller numbers of trained mechanics on modern ships with increased number of engines and machines, has always been a mystery to their brother officers. Whether they were weak men unable to resist the importunate suggestions of their superiors, or strong

men covetous of ease and promotion, I cannot determine; but that by their acquiescence they inflicted an irretrievable blow on the security and well-being of their country is undeniable.

It will be seen from what I have already said that the year 1892 was as disastrous for commissioned engineers as for their non-commissioned assistants. Only a few months before the results of the manning Committee's deliberations were promulgated the authorities issued a circular directing that "for training and instructional purposes" all engineers were to be watch-keepers. The committee's recommendations rendered this training and instruction virtually impossible. Cruisers of the Phœbe class, for instance, were to carry only one engineer besides the chief, and just sufficient artificers for three watches in the engine-room, the boilers and auxiliary machinery being necessarily left to the watch-keeping of the chief and leading stokers. In such a vessel it is quite evident that the two commissioned officers would have quite sufficient work on hand to keep the machinery in decent running order and maintain discipline in their crew, without either obtaining training and instruction themselves, or imparting much of it to their subordinates. They found themselves threatened on both sides. On the one hand the lieutenants were to undergo a steam course, and thus become qualified for the scientific duties of the profession; on the other the stokers, the handy men drawn from imperfectly trained labourers, were to displace the artificers in the operative portion of the work.

The authorities at Whitehall and the Horse Guards seem to delight to offend against that spirit of *esprit de corps* which wiser rulers, with more profound knowledge of human nature, would sedulously endeavour to cultivate. Sometimes it is in abolition of a regimental designation, sometimes in the removal of a strip of gold lace, sometimes in the grouping and

classification of ships or their crews, that the injury is done; but in every case where such offence takes place there is, for a time at least, a loss of power to the nation which cannot be represented in mere numbers of men, nor estimated by mere consideration of recruiting statistics. The great Napoleon—great in his knowledge of men's aspirations as well as in his consummate strategy—impressed on his soldiers the idea that each of them carried in his knapsack the marshal's bâton. It was, and ever must be to most of them, a delusive expectation, but it was an expectation that lent force and mad courage to their charges at Austerlitz, Jena, and Waterloo.

The Admiralty did not, however, by their orders and reductions crush out *esprit de corps* in our naval engineers: on the contrary, they intensified it until it became a rage, but it was rage which was directed against the service, and which magnified the disadvantages and discomforts thereof. And so the difficulties of obtaining candidates for the training schools at Keyham became greater, and the reserve of unemployed officers reached vanishing point; indeed, it would far have passed it had the ships on commission been properly officered.

Stokers to do artificers' work; lieutenants with a cramming steam course to replace highly-trained and scientific engineers: this was the policy of my Lords of the Admiralty, and the result was that the programmes, and amended programmes, and supplementary projects of successive cabinets were rendered abortive, because the ships built in accordance therewith could not be moved out of harbour. They had throttle valves, but no men to open them.

The British Admiralty, unfortunately, is not alone in imagining that an inferior workman is an inexpensive luxury. It is a delusion very widely spread among all sorts and conditions of men, and the more eagerly hugged in

proportion to the ignorance of its possessors. But the rulers of a great nation have no excuse for such ignorance. If their own mental endowment is not sufficient for the task imposed upon it, they have the assistance of good men and capable advisers. A rejection of the good advice tendered them is due rather to perverse obstinacy than to ignorance. When the builders of marine engines and the makers of marine boilers were urging the absolute necessity of a sufficiently capable staff, sufficient both in numbers and training to take charge of such machinery, it could only be obstinacy and pride, engendered of quarter-deck authority, which could have made them run counter to the advice tendered them. True it is that naval engineers had been neglected by those who ought to have assisted them—had been in a manner betrayed by their chiefs; but those chiefs suffered themselves from belonging to a despised profession, and were, like their subordinates, tainted with the grease of the oil can and the odour of the Lascar.

However, this deficiency of staff for the engine-rooms was the reason the French ports were not closely blockaded, and therefore the reason why they were able to despatch these six ironclads from Brest. The English Channel Fleet commander was not ignorant of their sailing: he was a skilful and valiant sailor, and kept watch, so far as he was able, over every movement of his foe; but they had the start of him by the time he had news thereof, and he was unable to follow them lest he should leave his own precious coast line exposed. The French had both men-of-war and transports at Cherbourg and other Channel ports, whilst the massing of their troops in the north seemed to indicate an attempt at invasion. It was simply a case of our own ships, or such of them as we could man, having more to do than our enemy's, and therefore having to neglect something. The neglect in this instance produced unfortunate results,

but it was not caused by any fault of the immediate commander; it was the result of the policy of his superiors during past years. Once the French were at sea, the rest of their course was a clear one. They could calculate within a few hours the time of arrival at any given point, whilst the lines of telegraphic communication within their own territory enabled exact particulars and time of their departure to be communicated to the Admiral at Toulon. To pass Gibraltar was by no means an impossible feat. Assisted by a few ironclads, or even armoured cruisers to harass the enemy's ships, it would be possible to close the Mediterranean, and hold it a close sea; but without the ships to so assist, the fortress would hardly bar the way against resolute and skilful seamen, with the modern advantage of steam. The blockade of Confederate ports was run by steamers far inferior in speed and equipment to the French men-of-war, and run past floating fortresses which could pursue, and not merely past stationary batteries. Heavily-armed batteries are of great value, and as against ships they possess enormous advantages in actual battle, but after all they are fixed, and cannot give chase to the enemy who seeks to evade or escape from them.

This was how the second French fleet arrived on the scene. From out Brest, because there was no absolute blockade there; past Gibraltar in the dark, despite watch and ward there kept with search lights, because there were no ships to hamper their progress; and into the Gulf of Lyons just in time to turn an English victory into an English defeat. It was a piece of strategy no one had ever given them credit for until after the event, but it was also strategy which, under the existing conditions, it was impossible for the English commanders to circumvent.

CHAPTER IX.

The Arrival at Malta—The News in Paris—The News in London—Interruption of Commerce—The Naval Engineer Reserve.

WHEN two chess players finish with a drawn game, it is very seldom that the respective gains and losses have been equal: they have simply arrived at a condition of affairs when neither party can continue the struggle, but they have differently suffered therein. The first battle of Toulon was a drawn game. The English fleet could not maintain the combat against line-of-battle ships in position after the fresh French ships made their appearance, but they were still sufficiently strong, aided by their cruisers and torpedo craft, to offer a very stout resistance. They had undoubtedly suffered much, but on the whole had sustained less damage than the French ships which emerged from Toulon. A French ironclad had been sunk, the others were battered and mauled, a number of torpedo boats had been destroyed, and the English ships were still able to retreat in effective order; but they were compelled to do this when they had largely broken down the defensive powers of the French ships and rendered them an easy prey to the final attack of the ram or torpedo. The English commanders were compelled to abandon the completion of a victory at the very moment it seemed within their grasp. On the other hand, although the French Admiral had six uninjured ships at his command, he was encumbered with a crowd of severely damaged craft, which must be protected against any "forlorn-hope" attack in the event of a prolonged encounter. He must get them back into Toulon, and repaired and refitted as rapidly as possible. He had thus failed to achieve a victory; he had not annihilated the blockading fleet, but he had still

gained great strategical advantages, and had, for a time at least, defeated the objects of his opponents. He had raised the blockade, he had damaged the English ships so much that they were compelled to retire to Malta to refit and repair, and he had six armour clads with which he could dominate the Mediterranean. The Magenta type had a complete belt of compound armour 12 in. to 17·7 in. thick, armoured hoist and barbettes, and a protected deck with shields over the barbettes. The Terrible had only a protected deck 3 in. to 6 in. thick, with casements for her 6 in. guns, and shields for her other guns. The French vessel had four 13 in. breech-loading guns in separate barbettes, whilst the English cruiser carried two 9·2 in. breech-loaders, these, in both vessels, being supplemented by 6 in. and lighter quick-firers. Between such ships there could be no equality of conflict. Nor were we in a position to say what cruisers might be sheltered in Toulon harbour. The republic certainly did possess cruisers, and wherever they might at the moment be located, they would be available for service in the Mediterranean if they could run the gauntlet of the English Channel Squadron, a task rendered more easy of accomplishment by the imperative duty cast upon it of defending the white-cliffed isle against invasion. There could be little doubt that we had for the moment not merely lost command of the inland sea, but parted with it to the foeman.

A sad appearance we presented when we reached Malta. Our Admiral might have paraphrased Falstaff's words—"If I be not ashamed of my ships, I am a soused gurnet." There had been bustle and haste enough at the dockyard when we were last there, but it was stagnation in comparison to that which now ensued. A fast despatch boat had warned the officials of our straits, and every nerve had been strained to prepare for our arrival. The shipwrights and their officers

were good men, skilful in their profession and zealous in the discharge of their duties, but they had been trained in the piping times of peace, and had no actual experience of the damage which can be done by hostile fleets in half or three-quarters of an hour. Our line-of-battle ships were a perfect revelation to them—a revelation both of the destructive powers of modern guns, and also of the wonderful capacity for resistance which well-built ironclads will exhibit.

Our Director of Naval Construction, who always addressed scientific societies *ex cathedra*, had expressed the opinion that modern ships will not stand more than one well-contested engagement, and his admiring satellites had unquestioningly accepted his dictum. Now, the late engagement had been a well-contested one so long as it lasted, and though our ships were greatly damaged, they were certainly not damaged beyond repair. The eminent director had overlooked one or two conditions of battle which possibly might, and certainly ought, to have modified his view. The first is the uncertain effect of artillery fire between ships, particularly in a sea-way, on account of the difficulty of direct hits. It was found on examination that many, indeed most, of the shots had in this engagement struck the protected parts of the vessel, the armour plating or the protected decks, at angles which deprived them of a considerable portion of their destructive power. In this respect the experience of the battle of Toulon was analogous to that of all recent engagements, from the Confederate rebellion to the Japanese and Chinese war. The second consideration is the possibility of either commander determining to terminate the engagement when both sides are exhausted, but before any fatal blows have been inflicted. The most terrible fatalities occur after this stage is reached. The destruction of the quick-firing batteries then enables the torpedo boats to approach the huge monsters within very short distance and deliver their

attacks under the most favourable circumstances, whilst the damage to propelling and steering apparatus subjects the more injured ships to ramming or torpedoes from less severely damaged opponents. But, with fairly equal initial offensive and defensive ability, the damage on either side will probably be, up to this stage, so nearly equivalent, that in the event of one fleet seeking to draw off, the other will not be in a position to prevent the endeavour without itself incurring undue risks. In the present instance it was not so much inability to molest the retreating English as considerations of ulterior strategy which decided the French Admiral to permit their escape. No doubt his judgment was open to grave question: he kept in mind too much the immediate object he had in view—the clearance of the English from cruising in the Mediterranean—without considering that by incurring a present greater risk he might effect this purpose in more enduring manner.

However, whether it arose through French blundering or our Admiral's skilful management, we had safely reached Malta, and our damaged ironclads and torpedo catchers or destroyers were in the hands of the dockyard authorities for repairs. And now came the most arduous portion of the engineer's work. In that year, 1892, which I have so often referred to, because then was laid the foundation of our present troubles, Mr. Oldknow, quoting the words of a brother officer, wrote: "Executive officers, admirals of the old type especially, are too often inclined to believe that the engine-room staff is only really at work while the engines are under way. Little they know. It is just when the machinery is at rest that the most serious and important work of the naval engineer begins. In the mercantile marine this is not so. Once having reached his port, the ordinary merchant service engineer goes on shore, his engines are overhauled by shore-going mechanics, and he takes them over all fit for his

next voyage. In the navy, on a foreign station, all this has to be done by the ship's own resources." Our engineers were not merely on a foreign station: they were at a foreign station with very inadequate resources for dealing with such extensive repairs and replacements as were now suddenly required, and had to deal with engine-rooms and machinery severely damaged, and in some cases wrecked, by the heavy shell fire of the enemy. Malta dockyard is not overburdened with skilled fitters, boiler-makers, or coppersmiths; indeed, none of the dockyards have any such superfluous staff, but the deficiency at home can be repaired by men drawn from private yards. The Admiralty have always pursued the plan of purchasing their engines and machinery from private builders, and in this, probably more than in any other act of their administration, have displayed wisdom, but this method necessarily reduces the numbers of engineering mechanics whom they directly employ. As there was little assistance to be obtained from shore, our engineer officers had to endeavour to do such repairs as they could, at all events to the machinery, with the men they had on board. And now appeared the disadvantage of the new grade of "chief stokers," and the utter inability of such men to replace engine-room artificers in an emergency like the present. Successive First Lords had so disguised the capabilities of these men under laudatory commendation of their devotion and prevaricating description of their duties, that the general public will hardly understand what they were, or what work they were able to do. A man who knows them well, and who himself once served in the Royal Navy, says: "To qualify for promotion to chief stoker, a leading stoker must possess a good character, have served in her Majesty's navy for at least ten years, be able to write his own name and rating, and read it afterwards, and finally to possess, at least as much mechanical

ability and professional skill as any ordinary street tinker." That is to say, that whilst it is not imperatively necessary that he should know the difference between a slotting machine and a dynamo, though such knowledge might be desirable, it is essential that during the ten years of his service he should not have been caught blind drunk on board ship by the master-at-arms, should have abstained from obscene swearing at his superior officers, and should on all occasions have carried his hand to the prescribed portion of his countenance when passing any officer in a frock-coat with stripes and a curl on the sleeve thereof. Sobriety is desirable, decency of language tends to peaceable life, and respect to superiors is enjoined in Holy Writ, but I doubt if our engineers, in these days of sore straits, thought any or all of these qualifications for promotion equivalent in value to the ability to braze a copper pipe or stop a leak in a feed suction. The leading stokers proved themselves men of sinew, both able and willing to use their brawny arms in cramped and difficult positions, but their assistance was valuable chiefly for rough and heavy work, and was more useful in hauling and raising heavy bars and plates than in handling a file or fitting a screw bolt. However, the holders of her Majesty's Commission of the engineering department took off their coats and decorated uniforms, and in rough working suits displayed even more willingness and ability to work than might have been expected from their training at Keyham and Greenwich. Of course, some were better workmen than others; it is so with all classes of mechanics; but all at least understood what good work was, and all had a thorough knowledge of the science of their profession. Every man who could be spared was sent on board the damaged ironclads, and the result was that the cruisers went to sea for scouting purposes with less than the attenuated complements of the 1892 regulations. I need hardly say that

the increased work thus thrown on the engineers and artificers of those ships was not conducive to good health ; a large number were constantly on the sick list, and gave the doctors practice in other ways than the healing of wounds.

The mercurial French temperament responded eagerly to the news of victory. Senators, representatives, lawyers, doctors, and professors vied with the students and the mob in shouts of joy over perfidious and defeated Albion. All classes demanded the speedy occupation of Egypt, whilst the more sanguine indulged in anticipations of the sacking of London. Nor were such anticipations altogether foolish. The military and naval authorities gave more sober consideration to the intelligence than either the Parliament or the people, but they saw the possibilities which it opened of further and more effective victories for the republican arms. The Mediterranean was now free to their ships, and even transports, under convoy of such warships as they had available, must pass unmolested. The British force in Egypt was small ; only sufficient to repress local mutiny or repel tribal attacks ; against a well-equipped and exultant French army corps it would be helpless, and more than one corps was available for immediate despatch. The French army had been mobilised on a war footing. Nor was the capture and sacking of London an altogether impossible feat ; that the landing of a hostile force was dreaded by the English authorities was evidenced by their strategy. They kept their ships near home, that they might try to defend their shores against attack, from whichever port it might issue. They had been so hampered by this consideration as to permit a portion of the French fleet to escape, and so contribute to the recent victory. It seemed within the range of possibility to so threaten an invasion from different points as to distract the attention of the English Admiral, and force him to let some of the ships pass him. No doubt the

difficulties of such military action were very great. The transport required for one army corps, with its accompanying cavalry, artillery, and baggage train, would be immense, and the collection and disposition of this transport must be subordinated to the attack on Egypt, for the probabilities of securing victory there, and the temper of the nation in regard thereto, were such as rendered Egypt the paramount objective. But the very possibility of invasion paralysed the English fleet, whilst even the landing of a regiment or two on the English shore, if it could be effected, might be expected to utterly demoralise the people and make them eager to treat for peace at any sacrifice. Above all, the Atlantic was open to French privateers, the lines of communication between the sea-girt island and her world-wide farms were threatened, and a practical blockade of great intensity, if not actually anaconda-like, was possible. This was the sober judgment of French experts on the pass to which our Admiralty administration had brought us.

The people of England heard of the defeat of their fleet with very different feelings to their continental neighbours. At first the newspapers were discredited, and journalists accused of exaggeration in order to produce startling copy, but the confirmation of the news was too determinate to permit long-continued doubt, and consternation and dread of invasion took its place. With the consternation arose a determination to punish someone for the disaster which had arisen. Unfortunately, the public clamour was, as is usually the case, directed rather to finding a victim than to finding a deserving one.

Lord Macaulay, in one of his essays, says : "We know no spectacle so ridiculous as the British public in one of its periodical fits of morality. . . . Decimation is always an objectionable mode of punishment. It is the resource of judges too indolent and hasty to investigate facts and to

discriminate nicely between shades of guilt. It is an irrational practice, even when adopted by military tribunals. When adopted by the tribunal of public opinion it is infinitely more irrational. It is good that a certain portion of disgrace should constantly attend on certain bad actions. But it is not good that the offenders should merely have to stand the risks of a lottery of infamy, that ninety-nine out of every hundred should escape, and that the hundredth, perhaps the most innocent of the hundred, should pay for all." Macaulay was at the moment referring merely to marital morality, but his scathing words will apply equally to all cases where the public, under the influence of strong emotion, sit in judgment on any unfortunate offender who has been selected for trial. The censors have neither time nor knowledge to properly apportion the blame between existing malefactors and departed sinners. It is much more easy, and on the whole more comforting, to pillory a live offender, than to heap odium on a succession of ministers and officials who have retired from public ken, and possibly gone over to the great majority.

Of course, the first victim selected was the Commander-in-Chief in the Mediterranean. The mighty Thunderer led the attack, and was, with few exceptions, supported by both London and provincial press. If they abstained from suggesting for the present Admiral the fate of Admiral Byng, it was only that they might extol their own clemency, and press with greater vigour the demand for his ignominious dismissal from command and profession. No consideration was given to the difficulties under which he was placed : he had fought a battle and failed to gain a victory, and must therefore suffer punishment meet for such failure. The eloquence expended by the press in proving that he had neglected his duty to his country, and had infamously sacrificed her naval supremacy, was equal to the Homeric

record of Grecian disasters at Troy. Unfortunately, the journalists did not quite understand what they were writing about, whilst Homer, with his acute imaginative vision, actually saw the mimic battles of the Iliad. But a victim was required to satisfy the indignant country—a victim high in authority, whose degradation and punishment would startle the world, and advise our foes that if we could not win battles, we could at least punish defaulting servants. There was no difficulty about the sacrifice. The democracy, so the papers said, demanded it, and the Ministry agreed that if they were to save their own reputation they must provide the victim. And so a brave and skilful seaman, resourceful, loyal, and devoted to the service of his country, was recalled to answer for a disaster which he had been powerless to prevent. It was "the resource of judges too indolent and hasty to investigate facts and to discriminate nicely between shades of guilt." But the sacrifice was not to avail long for the appeasement of public indignation, which was almost daily to be revived by news of fresh troubles and new misfortunes, and thereby be directed with increased severity, and almost equal injustice, against the supreme rulers.

It will be remembered that the unfortunate Acorn fell a victim to a French armoured cruiser, the Latouche Tréville. The French captain did not cease his efforts with the destruction of one poor composite sloop: he recognised that his mission was to capture or sink as many English merchantmen as he possibly could, and generally to damage her commerce; and very ably he discharged it. Lugubrious faces appeared day after day at Lloyd's, as ocean tramps and cargo liners were reported "overdue," "missing," or even whispered of as "captured." On the underwriters many of these losses, if losses they proved to be, would fall with peculiar severity, since the insurances had been effected on

time policies, long before the declaration of war, or before war risks were anticipated and provided for. But most of these missing ships had been coming from South American ports, and the course ordinarily steered by them would render them more liable to capture than a vessel sailing the great Atlantic route between New York and Queenstown. Such cruisers as we could spare from the Channel fleet, and such as the North American Admiral could detach, were employed to keep open this most important route, not by way of convoy, but by cruising thereon and seeking to meet any of the enemy's ships endeavouring to interrupt it. The consternation at Lloyd's, and indeed through the city and country, may therefore be imagined when the Servia, a Cunarder once of no mean repute, was first reported missing, and afterwards, by news received from Paris, as captured on her voyage from New York to Queenstown. The capture was a very simple affair. The Latouche Tréville, sailing without lights at night, found herself, at daybreak, within a few miles of the Servia. The latter vessel steams $16\frac{1}{4}$ knots; the former, with forced draught, about 19 knots. The Servia, which is on the Admiralty list as a mercantile cruiser, had received a supply of ammunition, and her complement of 4·7 in. quick-firing and Nordenfelt guns, but she had no protected deck, no armoured bulkheads, no splinter shields or nets to ward off the effects of shell fire. The Frenchman was not merely encased in an armour belt, with armoured deck and turrets, but he also carried heavier weapons: two 7·48 in. breech-loaders, and six 5·46 in. quick-firers, in addition to lighter guns, and Maxims which would prove especially effective with a merchantman. The fates favoured the cruiser. She overhauled the Servia before any help appeared, and a very few shots convinced the captain and crew of the English ship that resistance was useless. The Cunarder graced her captors' return to port, and

caused fresh shouts of triumph on the boulevards and squares of every city and town in the republic. Nor did the trouble end here. The French had several armoured cruisers of the same class as the Latouche Tréville, whose speed would enable them to overhaul any, except some half-dozen, of the most swift and powerful of the English merchant ships, and the offensive and defensive power of these vessels was sufficient to enable them to successfully resist all but the most powerful war vessels. Almost daily fresh news reached England of ships chased or captured, and underwriters who but a few short months ago were prosperous and contented men now found themselves haunting the offices of accountants and lawyers, whose services they invoked to pilot them through the Bankruptcy Court. The passenger trade between America and England almost ceased for English bottoms. Americans would not trust themselves on board a Cunard or White Star boat, with all the attendant risk of capture, and bestowed their patronage on the American Line of steamers to Southampton. There was a rapid transfer of English ships to neutral flags: the 'cute Yankees made purchase of many of our best steamers at miserably low prices—prices which the unfortunate owners were glad to accept in order to save anything out of the wreck. In the meantime the cost in England of all commodities was rising. Not only was there the present interruption to imports, but there was throughout the country a great and increasing dread that the interruption would be continued, and that trade would only be possible under the adverse conditions of a practical blockade. The only people who gained anything by this state of affairs were the farmers, whose grain and fat stock were in better demand than they had been for years past, but even farmers did not find the blockade an unmixed blessing. They discovered that healthy trade is better than famine prices, and that

sales at nominally good prices do not always produce equivalent gold.

It will be asked why the English cruisers did not follow up the French cruisers, or why the merchantmen, on which our very existence depended, were not despatched under convoy, seeing that we have about double the number of such vessels possessed by the republic. The reason is obvious: we had the ships, but not the men to work them. We were short of lieutenants, lamentably deficient in blue-jackets, and utterly unable to find engine-room staff. The smallest number of engineers required for war time is 1,100; our Navy List contains about 800, and the reserve, which was relied on to supply the balance, contains some 200 or a little more. But when these reserve officers were wanted the Admiralty found great difficulty in obtaining them. It was impracticable to take them away from their ships at a moment's notice; the steamship owners were too powerful in the House of Commons to permit any such vagaries as that; whilst it was very speedily discovered that a large number of the reserve officers were wholly unfit for service in the navy during war time.

The reserve had not been popular with the mercantile marine of late years. The officers complained that they received no training, nor had any opportunity afforded them of learning the special duties required on men-of-war. They knew well enough how to drive engines, and repair them in case of breakdown; the record of many a voyage bears ample testimony thereto; but they did not generally know how to run torpedoes or to test them when recovered from a trial, nor had they the experience desirable, if not absolutely necessary, in naval service for dealing with air-compressing machinery, or with the heavy gun mountings and fittings on the decks or turrets. It is true they were skilled mechanics, as skilled at least as the engine-room artificers who frequently

discharged such duties, and it is equally certain that they would in a very short time have made efficient naval engineers; but at present they were not so, and could not safely have been placed in charge of large war vessels without supervision.

There was, however, another factor which naturally detracted from their suitability for employment. Comparatively few of them had joined in recent years; they were mostly men who had entered in the first flush of the movement, when the *éclat* of her Majesty's commission and uniform captivated their minds, and therefore they were not young men. Now, to a man over forty years of age, running up and down the stairs of the engine-room, and in and out obscure passages and dark corners, is by no means an easy task, and by men of that age is avoided as much as possible. In merchant vessels such avoidence is much more possible than on a man-of-war, and the elderly men of the reserve, with some knowledge or suspicion of such conditions, displayed no undue anxiety to place their services at the disposal of their country. Doubtless in time the Admiralty would obtain as many engineers as they required, for patriotism and love of adventure would have a strong constraining influence, but for the present few volunteers were forthcoming. The advantages offered in pay and promotion were not very enticing, and my Lords of the Admiralty seemed loth to relax the antiquated regulations which they had made in the days when they imagined engineers to be like blackberries, vulgar in their very profusion.

The Naval Engineer Reserve proved, in this emergency, a broken reed, but it was a reed broken through the undue strain put upon it by Admiralty regulations. Just in the same manner as the War Office, by alternate snubbing of and financial concessions to the volunteer movement, has

entirely changed its character, and transformed it from an enrolment of the middle and burgher class into a competitor with the militia for enlistments, so my Lords of Whitehall have treated their volunteer movements as to deprive them of all practical efficiency, and their members of all pride of association with the navy. Of course, such reserve engineers as reported themselves were serviceable; indeed, we should have been in worse plight than we were without them; but their assistance was chiefly valuable in those merchantmen which the Government purchased for transport and store purposes.

CHAPTER X.

The Fall of the Ministry — British Victories — The Officials remain—The Mediterranean Fleet.

THE first victim sacrificed to public clamour was the Commander-in-Chief in the Mediterranean, but this did not long satisfy the demand for retribution on someone or other who must have been the cause of our disasters. The news daily circulated through the press of captured ships, or ships transferred to neutral flags to escape capture, with the increasing distress caused by interruption of trade, increased the dissatisfaction already felt.

The Ministry was a strong one, and numbered amongst its members some of the ablest men in the country, whilst the majority by which it was supported in the House was compact and commanding. In matters of internal policy, the Premier had, despite many blunders in leadership, been able to impose his will upon the country, and in the main had found his administration generally acceptable. But not all the talents of the ministers, not all the discipline of the

party, could long withstand the indignation roused by tales of captured ships and the straits imposed by diverted cargoes. It was not Portsmouth, Southampton, London, alone which felt the pinch of war; Liverpool and Manchester found that the cotton and goods consigned to those ports never reached them, whilst spinners in Lancashire had to stop their spindles through the uncertainty or impossibility of obtaining raw material. When constituents become dissatisfied representatives become critical; members who had hitherto voted as the party whip dictated were now absent from the division lobby, and chiefly made their appearance at St. Stephen's in order to ask inconvenient questions. Some, indeed, "ratted," and did not sustain much obloquy for so doing. There were evidences that a change of Administration could not be far off, and that the usual shuffling of the cards, the usual selection of names from the list of political Tadpoles for submission to her Majesty, would once more be undertaken by the leader of the Opposition.

The crisis came with the capture of the Lucania, the splendid greyhound of the Cunard line, when conveying troops from Queenstown to Canada. The Lucania was one of the most formidable merchant ships subsidised by the Admiralty, for she was not only admirably protected against minor war risks by division into water-tight compartments, but she possessed enormous engine power—30,000 I.H.P.—and had proved herself unequalled in speed. Under ordinary circumstances, and with careful look-out, no cruiser could hope to capture her, and even against several approaching her from different quarters she would have more than an average chance of escape. But an accident, especially an accident disabling one set of engines, is not an ordinary circumstance, and materially modifies the conditions which conduce to the safety of a ship, whether such safety be

attained by her fighting qualities or superior capacity for flight. When about 800 miles west of Queenstown, with 1,000 men of the Scots Guards and Connaught Rangers on board, she burst a main steam pipe, disabling her starboard set of engines, and enormously reducing her speed for a time, until the damage could be temporarily repaired. The casualties thereby caused in the engineering staff were great. Five of the engineers on duty below, and seventeen stokers, were severely scalded · nearly half of them died whilst being removed, or shortly afterwards. This is one of the dangers the marine engineer has occasionally to encounter, and which bring with them no reward in promotion, Victoria Crosses, or Royal Humane medals. The remainder of the staff set to work to repair the damage, but they had not completed the work when a French armoured cruiser made its appearance. The captain of the Lucania was a Briton, his crew were British tars, with those "hearts of oak" of which poets sang, and he had on board both 4 in. quick-firing guns and Nordenfelts. He was carrying British troops ordered on foreign service, and those troops celebrated beyond most others for successful prowess in war. He could not, with such a crew and such a cargo, submit to capture at the first summons, and without firing a shot in anger. His reply was, as might be anticipated, with shot and shell as honestly delivered as his men could manage, and the result of the action was equally what might have been expected. The Frenchman was more heavily armed, protected by armour, and served by trained gunners, whilst her speed was greater than that of the Lucania in her disabled state. Shells plunged through the side of the Cunarder, and, bursting in her interior, converted her crowded lower decks into shambles. Many a gallant Tommy Atkins from sunny Kent, many a brave Paddy from the Emerald Isle, met his death in a battle wherein he had no opportunity

to fire a shot. Such an unequal contest could not long continue, and with the unanimous consent of the military officers the captain lowered his flag. When the leader of the House of Commons announced the capture, he at the same time announced the resignation of the Ministry.

The journalists, commenting on this encounter, grasped its significance better than they did in the battle of Toulon. They discerned that the victory was won before a shot was fired, and was gained when the Atlantic was left open to French cruisers. They demanded additional ships in commission, not to chase privateers in mid-ocean, but to shut them up in French ports and keep them there. Thus they came to understand and re-echo the advice of one of our greatest naval strategists, and to recommend a policy which should determine the strength of our fleet. But at the same time they were visiting the sins of their predecessors on the present board, whilst they gave the Ministry little credit for victories gained in other and more remote parts of the globe.

For victories the British squadrons did win, when the chances of battle were more equal, and our commanders were not handicapped by the paramount necessity of protecting their own coast. A French squadron had been sent to the American coast, for the double purpose of threatening Newfoundland and disturbing the quiet of our occupation of the West Indies. The French Minister of Marine, however, had detached too few ships for this purpose: he had left them inferior in numbers and power to the English fleet on that station, and he had sent them to a quarter where traditions of Rodney's victory still linger to stir English sailors to emulation. The Caribbean Sea once more resounded to the roar of battle, and it was a battle which ended, as all such battles should, in victory for the English flag. In Madagascar English marines and seamen had assisted native levies to

extirpate the usurpers and restore their native queen, whilst our ships had hunted any of the French vessels literally from off the coast. On the China station our admiral had been equally successful, and in one well-contested engagement had crushed the enemy's naval power there. In all these quarters our fleets were equal, or indeed superior, to the French squadrons, and our commanders, being under less stringent defensive restrictions than nearer home, took advantage thereof to hunt up their opponents and capture or sink them, as the manner of their craft has been from the days of Blake down to Cochrane. When I recall the deeds our quarter-deck officers did in those seas—their loyalty to duty, their courageous struggles when occasionally in face of greater odds, their unflinching belief in the ultimate victory of their country, I am compelled to admire them. Occasionally they might treat the non-combatant officers with contempt; at times they might indulge in snobbish assertiveness of their own superiority: these little failings were chiefly the result of their training, but their bulldog courage and determination to win were wholly their own, a glorious heritage left them by those Norsemen of old who first taught men how to ride and rule the sea.

Possibly there was some reason in not placing these victories to the credit of the Board of Admiralty; indeed, we may well assume that they were less the result of Whitehall administration than gained despite thereof. The lessons of failure and victory were, however, not yet thoroughly learned by the nation. The politicians, the figureheads, and talking machines were replaced by new ones, but the permanent officials, the real administrators and their system, still remained. Indeed, to some extent, they were more powerful than before, because the strain thrown on the various departments by the state of war was so great that the First Lord, and Sea Lords, and the other movable Barnacles

were afraid of introducing any alterations or reforms which might possibly hamper the existing system instead of improving it. At all events, they made no changes save with the advice of their directors, and they conveniently turned to the chief of those directors—the omnipotent Assistant Controller—as their ultimate adviser. His department had made blunders, but they were explained away with a sophistry worthy of Gorgias, and whilst nominal chiefs were heckled, the real defaulters found safe shelter behind them.

This is exactly what should happen, according to the traditions of the Civil Service. The English taxpayer is constantly told that he is served by the most zealous, honest, and painstaking officials in the world, and that this zealous honesty of service is the natural result of the permanency of their appointments and entire independence of political factions. Possibly there may be some truth in the boast: it is not a very brave one to make, considering the general character of civil servants throughout the world; but the inability to effectively and promptly punish negligence or incapacity is a heavy price to pay for mere absence of peculation. In the instance of the Lucania, had the officials retired at the same time as their political chiefs, some rather startling disclosures might have been made. The Cunard Company had warned the Admiralty that her engines and boilers were due for periodical overhaul, and that she had been lately doing exceptionally heavy running, with less than the usual harbour rest. No officer of the engineering branch was, however, sent on board her until after her purchase. A rear-admiral, accompanied by satellites from the Assistant Controller's and transport departments, with a deputy-assistant quartermaster-general from the War Office, inspected her, and the place where she afterwards failed was never even looked at by them. It is, of course, possible that

a minute examination by a skilful mechanic might have failed to discover any defect, but it is just as well to take such an ordinary precaution when interests of great magnitude are involved. The disclosure, however, did not come until some months afterwards, and by the time it was made the fickle multitude were in search of "some new thing." Thus it happened that the traditional "continuity of policy" prevailed, and, indeed, became intensified, if I may be pardoned a somewhat illogical expression. Our Whitehall rulers pressed forward the building of additional ships, which were never to be able to fight more than one well-contested battle (so the constructor said), but they paid little attention to the more rapid production of guns or the speedy provision of the much-needed engine-room complements.

The main interest of the war, however, continued in the Mediterranean, which sea was even more dangerous for English ships to traverse than the Atlantic. In the ocean the danger was only from solitary cruisers, or groups of two or three cruisers, which, although overwhelmingly powerful against merchantmen, or even armed passenger ships, were unable to attack a line-of-battle ship, or make any very determined attempt at captures with one in the neighbourhood. In the Mediterranean the French had, however, not only a momentary preponderence of cruisers, with numerous and well-equipped torpedo boats, but they had six very powerful line-of-battle ships, perfectly unharmed, to which the English Admiral could not oppose one equal vessel. Had it so suited him, the French commander could, during a few weeks at all events, have blockaded us in Malta. As it was, he cleared the sea of English commerce, drove our cargo vessels into neutral ports, and chased and captured our mail packets when they endeavoured to keep their usual courses. Nor was this all. He dominated the sea so as to render it a safe highway to Egypt for a French army corps, whilst he

prevented reinforcements reaching the English commander there. The republic had abandoned us when we destroyed the forts which Arabi Pasha was erecting at Alexandria : she revenged herself for the advantage we then and subsequently took by now driving us out of that city, and occupying it with her own forces. Her proximity to Egypt enabled her to concentrate troops there more rapidly and in greater numbers than we could ; our opportunity to destroy them should have been when they were transported there, but they sailed under a convoy sufficiently powerful to keep our depleted naval forces at bay.

Public clamour for once effected a good end. The people demanded the promotion and responsible employment of the hero of the Condor and Circe, and made the demand in such unmistakable terms that the Admiralty regulations for promotion were broken through, and the Commodore raised to flag rank and to second in command of the Mediterranean fleet. I need hardly say that admirals of all degrees, and captains, commanders, and lieutenants " of hope deferred," grumbled at the unwonted favour, and declared that the service was going to the dogs since the good old days when they first entered it. But going to the dogs or not, service ways were wonderfully accelerated by the authoritative ability of " Admiral Condor," who infused into dockyard authorities and easy-going members of the administrative department something of his own energy. He appeared ubiquitous, and with marvellous impartiality visited dockyard machine-shops and ships, to encourage and praise the industrious workers, and censure or punish the lazy. There was wisdom in his procedure also. Although he saw everything with his own eyes, and made himself acquainted with every detail of the repairs going on, he did not arrogate to himself all knowledge, nor despise the assistance of officers specially acquainted with the technic of particular trades. For his

constant assistant and adviser in steam matters he selected my immediate superior, Chief Engineer Haddow, of the Terrible. They had sailed together in the Malabar, in old Indian troopship days, when both were young and full of eager promise. They had both in their several vocations fulfilled those early promises, and were now admirably fitted to mutually assist their country in the hour of her distress. No better, no more useful comradeship existed in the fleet than between these two men, and well it was for the service and for our hopes of early fitness for sea that it did exist.

Do not let me be misunderstood. It was not the official position of Admiral Condor alone which gave him the authority he undoubtedly exerted. Judged by all the customs and regulations of the navy, he exercised powers very much greater than had ever before been assumed by an officer in his position. Virtually he exerted the authority, for the execution of the fleet repairs, of both the Commander-in-Chief and the Superintendent of the Dockyard, only he wielded it more powerfully and on the whole more skilfully than those chiefs would have done. It was very speedily known throughout the yard and fleet that whatever punishment or promotion he recommended would most assuredly be carried out, and that it was no less certainly his act than if he conveyed the culprit to the cell, and with his own hands inflicted punishment. It was just the case of the man behind the gun, and Admiral Condor was the energetic and capable man, whilst the higher authorities were the guns he trained and fired to do his behests. Of course considerable skill was necessary to play so difficult a part, but then he possessed the happy, frank, and jovial manner that so readily gains attention to suggestions which would have been wrecked by a Mrs. Gummidge's manner of recommendation. The engineer had a still more difficult part to play. His suggestions could not be made directly to the

highest authorities, nor his personality employed to obtain their assent. In his own department he was not even chief, and though responsible for the machinery in his own ship, he had neither responsibility for nor authority over that of the other ships in the fleet. To the difficulties arising from this inferior seniority must be added those which resulted from the jealousy of his brother officers. For engineers, although generally very good specimens of humanity, are only human after all, and senior officers felt keenly the personal slight they imagined implied to themselves in the constant companionship and intercourse of Admiral Condor and Edward Haddow. The latter needed, therefore, to exercise considerable tact to steer clear of offence and trouble in the delicate circumstances in which he was now placed; and the dexterity he displayed at this time was worthy of an experienced and long-trained diplomatist.

So the work went on with astonishing rapidity at Malta. Damaged armour plates were removed, and replaced by new ones where possible: by temporary substitutes of boiler plates and teak backing where armour plates could not be procured. It was impossible to render the ships as perfect as before the battle: we had neither the time nor material for such elaborate repairs. It was before all things necessary that we should get to sea again as quickly as possible, and fight another battle. It was also probable the French would be in no better condition than ourselves: they would hardly do more than re-fit in the most rapid manner possible, and would rather incur great risk of carnage in the next fight than have any delay in getting their ships to sea again. They were collecting transports at Toulon to convey an attacking force to Egypt when we first commenced our repairs: they had conveyed that military force to the land of the Pharaohs before we had finished our work. Our rear-admiral, had he been in chief command, would have attacked convoy and

transports with our cruisers and torpedo destroyers alone, but the Admiral overruled him in this strategy. The dead hand of traditional defence kept our cruisers round Malta, and carrying despatches and communications 'twixt there and Alexandria and Gibraltar, instead of boldly seeking opportunity for making that defence effective by harassing the enemy. Will our leaders in Parliament and in war ever learn the lesson this war should teach us, that we can only ensure our own safety by destroying that of the enemy—that we can only effectually protect ourselves against his attacks by blocking him in his own ports and keeping him there?

CHAPTER XI.

The Problem of the Guns.

One point came out very forcibly during these repair operations, and that was the utter inadequacy of the stores and materials kept at Malta for the requirements of the Mediterranean fleet. Of course they were ample, and more than ample, if the Director of Naval Construction was correct in his anticipation of the destruction of an ironclad in her first well-contested engagement, and the keeping of such stores at a foreign station would be, under such circumstances, a wilful waste of public money. Fortunately the anticipations of the director had not wholly ruled his actions as Assistant Controller. Stores and materials had been placed at Malta and other naval stations, though not in sufficient quantities for such an emergency as the present. These were also supplemented by the extra fittings carried on board the ships, all of which were consumed in the repairs. The ingenuity displayed by our engineer officers and artificers

in the economy of stores, and the adaptation of plates, brackets, and bolts for purposes not originally intended was marvellous, and much beyond any "tricks of the trade" which could be acquired in a Greenwich steam course. It was the ingenuity of thoroughly trained and skilful mechanics, who understood the necessities of their trades, and the possibilities existing in the scanty means at their command if they were properly applied. Another point also presented itself to me at this time, which, though it lay outside my own particular duties, greatly interested me. My attention was first drawn to it by Mr. Haddow, and both at that time and afterwards we frequently discussed the subject, having regard not only to our own observations, but also to our reading of works and reports bearing thereon. I refer to the unwieldly construction of modern naval ordnance. A civilian unacquainted with the manipulation of artillery sees in our big guns an indication of immense, nay, almost boundless destructive force, but the gunnery lieutenant knows that this force is limited by difficulties which arise in loading and training them. I am aware these difficulties have been largely reduced through hydraulic and other mechanical appliances for loading and supplying ammunition, but they have not been entirely removed, and they are in a great measure due to the outrageous length of the guns. But the danger in connection with them which more particularly struck my friend and chief was the great length of the chases exposed to hostile fire, and the consequent risk of a ship being deprived of a large proportion of her offensive power by a mere casual shot from a much smaller gun, possibly from a 6 in. quick firer. Indeed, two of our big guns had suffered from hits on the chases during the recent engagement, and were useless for future service unless they could be repaired, a contingency most unlikely, and which, if attempted, would probably be

productive of serious future disaster. How came these elongated monsters to be adopted for our navy, and was there no method by which equal precision, equal range, and equal penetration could be obtained from a shorter weapon? We came across some papers published by one disappointed and ill-treated inventor, and from them gleaned some interesting facts in connection with the history of English ordnance for the past 40 years. I certainly came to the conclusion then, and have not since seen reason to alter it, that the War Office and other Ordnance authorities displayed crass ignorance, and wilful indifference to the waste of public money, in the manner in which for years they treated the question of gunnery construction, and that their present "pooh-poohing" of high-pressure artillery is an iniquitous addition to their former sins of omission. The whole matter is of such vast importance to my country as to warrant some digression from my story to consider it.

It is a far cry back to the Crimean War, but it is frequently necessary to refer to times long anterior to the present in order correctly to understand the conditions, difficulties, and trials of to-day. It will be remembered generally by my readers that the Russian war occurred after a long interval of peace, an interval during which invention had been stimulated and machinery greatly improved. Machine tools had by the skill and applied science of Sir Joseph Whitworth and his contemporaries been brought to a high state of perfection, a perfection which rendered possible important improvements in other forms of machinery. These mechanical developments and improvements had, however, been chiefly applied to productive and commercial purposes. The long peace had not been fruitful of improvements in projectiles, nor promoted much research into the principles governing them. The use of armour plating for ships, which has arisen since that war, has given an impetus to improve-

ments in gun construction, and the battle between armour and guns, peacefully fought out in the schools and ranges, has developed weapons of immense power. It is true that at the time of the Crimean War some improvements had been made in the weapons of the British and French armies : rifles had been substituted for the old smooth bores ; howitzers, mortars, and cannon of increased calibre were in use ; and in one example, at least, rifling had been applied to siege guns. The Russian fortresses, however, presented so stout a resistance to the fire poured on them, that it became speedily evident the engineers had increased their defensive ability in a greater ratio than the artillerists had developed their offensive power, and from this date artillery officers, and mechanical engineers engaged in more general practice, endeavoured to effect various successive improvements, both in the mechanism of small arms and the mechanism and rifling of big guns. Amongst those who distinguished themselves, and rendered important services to our country in this way, will be remembered Lord Armstrong, Sir Joseph Whitworth, Fraser, Lancaster, Palliser, Snider, Colonel Roden, Wilson, Captain Moncrieff, Captain Scott, Vavasseur, and Nordenfelt. Many of their inventions have now been abandoned, having been superseded by later improvements, but they were successively great advances on previous forms of weapon or projectile, and the inventors were rewarded with pecuniary benefactions, and with knightly honours and promotions.

One of the earliest inventors was, however, unfortunately left out of these successive rewards, and although he had the satisfaction, before he died, of seeing his recommendations adopted by our Government, and guns constructed on the principles he had for so many years advocated, he never received public acknowledgment of his invention, nor adequate payment for the immense services he thereby

rendered. It was in the early part of 1855 that Mr. James A. Longridge, an engineer well and favourably known not only in the north of England, but throughout Europe, had his attention drawn to the subject of gun construction by the numerous failures of mortars in the Baltic. By fortuitous application of mathematical principles he came to the conclusion that the "best method of constructing a cylinder to resist internal pressure was to take a comparatively thin tube, and put upon it successive coils of wire, each coil being laid on with a definite tension, varying according to some law which would be expressed by a function of the radial distances of such coil from the axis of the cylinder." The determination of the proper tension was a problem of some complexity, but it was solved, and embodied in a formula which is, I believe, now in use at Woolwich Arsenal. The first patent to Mr. Longridge was granted on the 24th May, 1855, and on the 19th June he wrote to Lord Panmure, then Secretary for War, offering the invention freely to the Government. On the 9th July he was honoured by the Ordnance Select Committee at Woolwich with an interview, and left with them a brass cylinder for experimental purposes, after fully and minutely explaining his proposed method of construction.

Any person outside the Government service would naturally expect that the experiment would be intelligibly conducted, and the inventor's warnings and limitations respected. Unfortunately this was not the case, and the invention was lost to the service of the country for thirty years. The brass cylinder was 3 in. diameter and about 3 ft. long; it had no trunnions, was in no sense a gun, and was intended only to show the great strength of wire building to resist a radial or bursting strain. It was of the uniform thickness of a quarter of an inch, and covered with six coils of steel wire at the rear end, gradually decreasing to two coils at the front

end, the total thickness being only $\frac{5}{8}$ in., as against 2·37 in., the thickness of the service gun of the same calibre. Mr. Longridge had previously fired it repeatedly with charges up to $1\frac{1}{2}$ lb. of powder and two shots, but as it was not built to resist an experiment on longitudinal strains, it was laid on the ground with the breech abutting against a block of masonry, so as to counteract the recoil. All this was explained, as I have said, to the committee, but those "select" or "selected" servants of the public ignored the knowledge and instructions of the inventor, clamped the tube firmly to an oak block, with no support to the breech end, and in this condition fired it with a charge, first of 1 lb. and then of 2 lb. of powder, with the natural result that the breech end was blown away 90 yards to the rear. "It could not have been otherwise," remarked Mr. Longridge, "as a strain of about 120 tons was thrown upon an area of about $2\frac{1}{2}$ square inches of metal, the ultimate tension force of which did not exceed 8 tons per square inch." On being informed of this unfortunate result, he wrote to the Ordnance Department, pointing out that the failure was entirely due to the improper way of conducting the trial, an injudicious suggestion which provoked the reply that no further trial could be made at the public expense. But in addition to pointing out the cause of the failure, Mr. Longridge had offered to make another cylinder, or rather a gun, on the same principle, and submit it to further trial, and on receipt of this official answer he rejoined that what had already been done had been at his own cost, and that he was prepared at his own expense to submit another gun for trial. However, a Government committee, especially one of such importance as the Ordnance Select Committee, cannot be expected to admit that they or their officers have made a blunder. The repeated offer was made on the 2nd October, 1855. On the 25th October the audacious inventor, who had dared to

impugn the judgment of the committee, was informed that they, "having referred to the details of the preceding experiment, consider that no further trial is necessary with a gun of that construction."

Thus ended the first act in a comedy of errors which has cost our country a considerable amount of money: a committee of dignified authorities and experts, assisted by artillery officers of high degree, failed to understand the difference between a radial strain and the longitudinal strain of recoil, even after it had been pointed out to them; and because of this inadequacy of their own comprehension, they condemned a system of construction which has since been adopted for the heaviest ordnance, both by our own and other nations. One of the principles of construction contended for was that the two strains were entirely independent, and that in all calculations they should be entirely separated, and each borne by its own portion of the structure of the gun; but of the truth of this principle, or its practicability in actual construction, it was impossible to convince the authorities. They had become accustomed to certain mathematical reasoning and axioms, and fossilised in the use thereof. It is not by any means the only instance in which "much learning hath made men mad," but it is an instance much more likely to occur in an admirably organised and carefully regulated Government department, with hoary traditions and honoured methods of working to maintain, than in establishments exposed to the healthy stimulus of free and unfettered competition. There are men, however, who can outlive the condemnation of a departmental committee, and who can dare to act the words of Daniel de Foe: "He who opposes his own judgment against the opinion of the times ought to be backed with unanswerable truth; and he that hath truth on his side is a fool as well as a coward if he is afraid to

use it because of the currency or multitude of other men's opinions." Fortunately Mr. Longridge was one of these men, and he pursued his investigations, although they were greatly opposed to the "currency or multitude" of the artillerists' opinions. In the early part of 1856 he made a 3 in. gun, of which the inner tube was cast iron and the coil No. 16 W.G. iron wire, whilst the longitudinal strength was obtained by a wrought-iron strap passing round the breech, and on the front end of which strap were forged the trunnions. The gun was fired on the 4th June, and although it weighed only $3\frac{1}{2}$ cwt., it threw a shot of $7\frac{1}{2}$ lb. weight to a distance of 1,800 yards, a result not attainable, at that date, by any 6-pounder gun in the service. Thus in June, 1856, the problem of longitudinal strength was solved by a method exactly the same in principle as that adopted at Woolwich at the present day. In 1859 he constructed a further 3 in. gun for experimental purposes, and for the special purpose of illustrating the separation of the radial and longitudinal strains; and in this gun he adopted a breech-loading arrangement. It was successfully fired at Southport in June, 1860, was exhibited at the Institution of Civil Engineers in February, 1879, and is, I believe, still in existence. However, neither of these guns obtained the inventor any encouragement from the Government. His system had been condemned by the Ordnance Select Committee, and what possible advantage could accrue from any system suffering from such a ban?

On the 14th February, 1860, Mr. Longridge read a paper before the Institution of Civil Engineers, in which were embodied the results of investigations into the system of building up by shrinking successive hoops on to a central hoop, and the determination of the strains in such structures when at rest and under fire. Diagrams were exhibited, showing the serious deterioration in strength resulting from

even a minute error in workmanship or irregularity in the physical properties of the material. And from these diagrams, and from drawings of the 3 in. gun of 1856, he contrasted the enormous practical difficulties of realising the construction of a perfect gun under the Armstrong system, with the facility and security afforded by the wire system. The discussion extended over five evenings, but he failed to convince his hearers that his system (that system, be it remembered, which is now accepted by the Woolwich authorities) was the true and most practicable one. Three Government officials—Sir C. H. Gregory, then a member of the Ordnance Committee ; Dr. John Anderson, of Woolwich Arsenal ; and Col. Eardley Wilmot, R.A., the superintendent of the Royal Gun Factory—all condemned the wire system because of the self-raised bogie of longitudinal strength and imagined difficulty of making a secure breech. Possibly they had hunted up the records of the brass cylinder failure in 1855, and ignoring the blundering of artillerists, which caused the failure, and the undoubted success of the two 3 in. guns subsequently made, they endorsed the verdict of the committee, and accepted their decision as a definite and scientific settlement of the question. I am very loyal myself, both to my country and to my official superiors, but I think loyalty to heads of departments is carried too far when it extends to endorsing and championing all their blunders. However, I must admit that it generally pays the loyalist, and secures him recognition and promotion which he might not otherwise obtain. The failure to convince the non-official members of the institution appears more difficult of explanation. It must, indeed, be remembered that few of them had devoted, at that time, very extensive attention to the subject of projectiles or the construction of guns ; that the ordnance and arsenal authorities exerted all the influence of acknowledged experts ; and further, that the controversy between the two

great gunmakers—Armstrong and Whitworth—was then raging. The ordnance authorities devoted their chief attention to the rival claims of these eminent engineers, almost ignoring all others, and the discussion consequently largely drifted into the merely collateral issue of the respective merits of the Armstrong and Whitworth systems. In summing up the discussion, however, the president (Mr. Bidder) sufficiently indicated the position which, in his opinion, a wise Government, zealous of the safety of the country rather than of the honour and emoluments of its servants, would have adopted in this entanglement. He said: "Practical objections had, however, been fairly and legitimately argued against the proposed plan when related to the difficulty of securing the ends of the wire, of strengthening the breech, and of forming the muzzle. How far the author had succeeded in meeting these difficulties the members must judge. It was, however, evident that he had established such a *primâ facie* case as should have entitled him to have secured the attention of the Government in his attempts to produce a light and efficient gun, especially when it was considered that the subject was only now, for the first time, undergoing that careful scientific investigation which its great importance entitled it to."

Is there any supreme cause underlying this neglect by the authorities of Mr. Longridge's suggestions and ignoring of his repeated efforts to obtain an exhaustive trial of the wire system of gun construction? We must remember that the supremacy of the executive element, which in the navy subordinates the directors and chiefs of the civil, constructive, and engineering departments to admirals, vice and rear, also exists in the army, and places colonels and other spur-bedizened warriors in charge of tailors' shops, gun factories, and ammunition manufactories. There can be no possible objection to an ancient colonel supervising tailors,

and giving directions for the sewing on of buttons and facings, for some of them are eminently qualified for such duties ; but it is surely a mistake to suppose that because a man knows how to place a battery in the field, and direct the firing of a dozen guns, he is also qualified to decide all the knotty and highly scientific questions which arise in the construction of some hundreds of new guns. The very qualifications which render him eminent as a commander—rapidity of decision and obstinate determination to enforce his own will—are the traits which most detract from his usefulness as chief of a manufacturing establishment in a constant state of progression. To this must be added the love of uniformity, of adherence to type, of veneration for precedent, which distinguishes the army officer even more strongly than the naval executive officer, and which therefore make him view all innovations with suspicion and an innate determination to crush them if possible. I know that the Engineer-in-Chief at Whitehall has to conform his views to those of the Admiral Controller as regards material, and accept without protest the decisions of the Admiral Second Sea Lord as regards *personnel*, even when he is inwardly convinced that those views and decisions are not for the advantage of the navy. I am likewise convinced that any mechanical engineer at the gun factory, even when honoured with the euphonious designation of Assistant Superintendent, must conform his views, his reports, and even his mathematical calculations, to the pre-conceptions of the colonel in supreme command, if he would live a happier life than that of a pariah dog. It is possible that this systematic placing of military officers in civil positions for which they have no special aptitude, as rewards for military services in which they have occasionally distinguished themselves, is the supreme cause which so often bars the way to inventors like Mr. Longridge ; and the

mere possibility is worthy of close investigation in the public interest. Royal commissions have sat before now, and filled blue books with evidence and reports, on matters of much less importance to the welfare of the nation than is this system of military nepotism.

CHAPTER XII.

The Problem of the Guns—*Continued.*

No man can afford to entirely neglect his own immediate business, nor can a professional man lay aside a practice in which he is attaining eminence, in order that he may chase a chimera. The wire-wound guns were practicable enough, they were more speedily built and less costly than the shrunken hoops of Sir William Armstrong, and they had been tried in two experimental guns with great success; but the Ordnance Committee and artillery officers, together with superintendents and assistants, and officials of every degree, had declared the plan chimerical, and Mr. Longridge wisely devoted his energies for a time to those portions of his profession in which he was winning fame as well as profit. It was not until May, 1867, that he again moved in the gunnery question, and he then did so by a letter addressed to the President of the Ordnance Committee, recapitulating his investigations and proposals, offering the 1860, 3 in. breech-loader, then in London, for the inspection of the committee, enclosing drawings of large guns, with elaborate calculations of strains, and finally offering to give personal explanations of the details. The Fates were still unpropitious. It appears to have required three months for the highly-trained brain of a War Office clerk to concoct a suitable reply, but it came at last. On the 3rd of August he was informed that,

"looking to the extensive novelties your proposals involve, and having regard to the doubts which may be entertained as to the strength of the structures obtained by this system, and considering the great expense which would necessarily have to be incurred in experiments before full confidence could be placed in it, as well as to the fact that guns of the size contemplated are not required, Sir John Pakington must decline to authorise any experiments." Extensive novelties! doubts of strength! great expense! and big guns not required! are the reasons given by Sir John Pakington's amenuensis for declining to permit experiments. Will it be credited that a further application eight years afterwards (nothing in the meantime having been done in the way of investigation or experiment) evoked the reply that "his proposals were not considered to be applicable to her Majesty's service, and that, moreover, there was no novelty in the principle of his designs, and that, under these circumstances, Lord Eustace Cecil will not trouble him further concerning them." Truly the Civil Service clerks of the higher division have profited by the classical instruction obtained in the public schools. The phrase, "moreover, there was no novelty in the principle of his designs," is worthy the brightest efforts of that sect of philosophy who publicly, and for gain of fame and filthy lucre, taught the Greeks the art of subterfuge and scholastic evasion. It is quite true that Mr. Longridge had been urging the War Office authorities for twenty years back to examine and adopt wire-wound guns, but they had neither examined his designs and examples nor grasped the principles on which they were based. It would just be as reasonable and truthful for a Zulu chief, when first taught to read, to declare there was nothing new in the letters of the primer before him, because they were known to the Romans eighteen hundred years ago, as for the War Office to allege want of novelty in an invention

known to the inventor twenty years before, but never understood by the artillerists. Novelty is a relative term, and all knowledge is new to a man when he first grasps it, and there was novelty in this invention to War Office officials if they would only have examined and comprehended it.

However, this third effort failed; and though Mr. Longridge read papers before the Institution of Civil Engineers and Royal United Service Institution, he made no further attempt to directly approach the War Office until 1882, when he addressed a letter to Mr. Childers, the Secretary of State for War (published in the form of a pamphlet entitled "Modern Ordnance"), wherein he points out an extraordinary error in a statement made by Colonel Maitland, the superintendent of the Royal Gun Factory, in a lecture before the Society of Arts. The Colonel admitted that the Fraser system of gun construction had a dangerous rival in the wire gun, but added, "unfortunately the wires have no cohesion with one another, and the great difficulty is to obtain what makers call end strength. It is of but little use to make your walls strong enough if the first round blows the breech out. In the early days of wire this was what happened, and Mr. Longridge, who invented the system, was compelled to abandon it." Now, my readers will quite understand that the system had never been abandoned by Mr. Longridge, who had from his first conception of it, in season and out of season, continued to urge its adoption; and that the early failure was due entirely to the inability of artillery officers to carry out their specially-taught duty of firing a tube, and not to any defect in the system. This letter or pamphlet probably induced the inquiry from Mr. Childers, in August, 1882, as to his willingness to attend before the Ordnance Committee, then engaged in the consideration of gun construction, and afford answers to such

questions as they might propose. The hopes thus raised were speedily disappointed. The committee sent Mr. Longridge a printed slip of paper containing five questions, three of which were wholly irrelevant, but they never granted him an interview, notwithstanding his repeated entreaties. Sir Fred Bramwell was a member of the committee, but unfortunately absent at the time in the United States. When afterwards spoken to on the subject, he said: "I asked the President of the Ordnance Committee about it, and it turned out that there had been a series of unlucky incidents. A conclusion had been come to that all Mr. Longridge could tell them was about wire guns and the questions which related specifically to wire guns, and these only were sent to him. Then it appears that a letter of his was mislaid, and then it appears that a second letter of his by some ill-luck was never received or got adrift in some way. Altogether there was an accumulation of disasters, which to my mind very well entitled Mr. Longridge to make complaint." This "accumulation of disasters" was unfortunate, but chiefly arose from the initial blunder of the committee in imagining they could gauge the extent of a man's knowledge without even seeing him. They were undoubtedly very clever men, but they were not quite "Thought readers."

And so the weary record goes on. The inventor was snubbed and ignored in his own country, and treated as a troublesome fellow who must be staved off and got rid of by any available subterfuge, whilst abroad his system was being carefully studied, and its applicability to the requirements of their artillery investigated. Captain Callenberg, chief of battery in the 1st Regiment of Rhenish Artillery, was instructed to report upon it, and he said: "The first and most important service rendered by Mr. Longridge is his insisting on a strictly scientific basis for gun construction.

Mr. Longridge's system rests on a perfectly scientific basis"; and after referring to the many difficulties incident to the construction of a heavy gun, he adds, "the system proposed by Mr. Longridge avoids all these difficulties." Captain G. Moch, of the French Artillery, embodied the formulæ and demonstrations of Mr. Longridge in an exhaustive series of articles he wrote for the "Revue d'Artillerie," and laid special emphasis on the importance of his two principles of a specially-regulated tension of laying on the wire, and the separation of the longitudinal and bursting strains. In June, 1885, Admiral Kolokoltzoff, chief of the gun factory at Aboukoff, and General Kalakoutsky, of the Russian Artillery, called on Mr. Longridge in London, and offered to make a wire gun at Aboukoff from his design and formulæ, and have it thoroughly tested. Thus it happened that the first "Longridge" *service* gun was made in Russia, and the result was so satisfactory that they have since continued to be made there up to 12 in. calibre.

In 1884 Colonel Maitland, in a lecture at the Royal United Service Institution, exhibited drawings of two wire guns then under construction, one at Elswick and the other at Woolwich, in neither of which, however, had the longitudinal and bursting strains been scientifically separated and provided for, as in the Longridge system. Mr. Longridge, in consequence of this lecture, on the 1st of August, 1884, addressed a letter to Lord Hartington, then Secretary of State for War, wherein he pointed out the unsatisfactory manner in which the matter was being dealt with, and concluded with an almost pathetic appeal: "My lord, I appeal to you once more whilst there is yet time. Let this 'dangerous rival,' this 'system full of promise,' have a fair trial. But let it be tried under the direction of one who understands it, and not of those who understand it not, and

only half believe in it. I place my knowledge and experience unconditionally at your lordship's disposal. With the able assistance of Colonel Maitland and the means at his command, the merits or demerits of the system could be tried at a very moderate cost in a few months." To this letter he received no reply. The inventiveness of the War Office clerks, the sophistical evasiveness gleaned from Gorgias or Protagoras, for once failed them, and the officials found refuge in discreet silence.

However, in July, 1885, the opportunity appeared to have arrived, as Mr. Longridge was then desired by the War Office to supply a 9·2 in. wire gun of his own design for experimental purposes. He in vain represented that he was not a gun maker, and begged that it might be constructed at the Royal Gun Factory, from drawings and instructions supplied by him. He was compelled to have one made by an outside firm, under considerable disadvantages, and twelve months before it was finished, and nearly two years before it was tried, he indicated to the War Office the danger of failure. "The trial of a gun made under such circumstances will not prove much one way or the other, and it is quite possible that a failure may take place in no way connected with the principles of the system which I have so long advocated, but which may be seized as a convenient opportunity for condemning the system." The fear proved only too well founded. At the first round it was disabled by an accident entirely independent of the principle of construction, and the Longridge system apparently condemned. The makers, however, were so satisfied of the immense advantages which would accrue from wire guns, and of the possibility of their being made effective on this system, that at their own expense they constructed a second gun and sent it to Shoeburyness for trial, and after exhaustive and long-continued trials, extending over three years, it was finally accepted and

taken into the service in 1892. Mr. Longridge wrote to the War Office explaining the cause of the accident to the first gun, and asking for it to be returned to the makers to be repaired, and once more he was treated with contemptuous silence. Again he asked for a copy of the report by the Ordnance Committee, and was informed, first by the Director of artillery, and, on his further pressing the matter, by the Commander-in-Chief, that the document was a confidential one, and that it was not intended to carry out any further experiments with the injured gun.

So ended Mr. Longridge's more direct negotiations with the War Office, but not so ended the results of his investigations. I have pointed out that both at Elswick and Woolwich endeavours were made to construct wire guns on some system independent of the carefully worked out results obtained by the original inventor ; the endeavours appear to have been a failure, and the failure should, and possibly may, have been expected by the officials at those factories. Many of them are trained, and some few are eminent, mathematicians, and they must surely have known that rule-of-thumb empiricism could not take the place of carefully-studied calculations. However, the failure, and the pertinacity with which the invention from time to time was forced to the front, at length taught them wisdom ; the Longridge system was finally adopted by that very Ordnance Department which had so long flaunted it, and details of his latest patents were mendaciously copied. The reasons given by the Ordnance Committee for the adoption of the wire system are his reasons, and read almost like a reprint from his own lectures or pamphlets, but they carefully omit any commendation to the original inventor who had for so many years urged them. Dr. W. Anderson, the director-general of ordnance factories, at a meeting of the Iron and Steel Institute on the 21st September, 1892, pointed out the

superiority of wire construction over forged steel in large masses : the very construction, be it remembered, which in 1888 the Director of artillery stated it was not intended further to experiment on, and which decision the Commander-in-Chief confirmed. Dr. W. Anderson's words are so pregnant with instruction to those who remember the history of Whitworth, Armstrong, Fraser, gun building and failures, that I venture to quote them.

"The treatment of steel in small masses and in very large masses were two totally different things, and they did not know yet what took place when severe internal stresses arose.

"With wire—and wire was now largely used in the manufacture of guns—he thought they could have steel of naturally high quality, and use it with safety, because of the smallness of the individual mass.

"As far as he could see, it was almost impossible to burst a gun made of wire. But the same sort of steel used in large masses would be exceedingly dangerous, because they were utterly ignorant of the condition in which the inside of the steel was. The gun might pass proof, might answer every purpose, and yet might be in a highly dangerous state, and they would have guns which had been used for many years ultimately bursting with a half charge. Such cases had occurred frequently. If mischief had been set up in the hardening, no amount of annealing could afterwards repair the mischief.

"That was one of the reasons why in the construction of guns it was very much better to rely for radial strength upon steel in the form of wire than in the form of large masses."

Thus we have one of the highest officials of the Ordnance Department admitting and enforcing in 1892 the great dangers inherent in forged steel guns, and the method by which they might be avoided, in exactly the same manner as

Mr. Longridge did in the years 1855 to 1860. Yet, because apparently of an obstinate official determination not to admit his invention, the department had continued for long over 30 years the use of "steel in large masses, which would be exceedingly dangerous, because they were utterly ignorant of the condition in which the inside of the mass of the steel was," and perversely declined even to thoroughly experiment on a better method. Who can deny that the maintenance of military discipline and conformity to military requirements, obtained by the promotion of artillery colonels to the direction of manufacturing establishments, is very dearly purchased by the output of guns which may be used for years in the service, and yet ultimately (so Dr. W. Anderson says) burst with a half charge?

I would that I could end the story of wire-gun construction at this point, and cast a mantle over the latter enormities of War Office humbledom, but I cannot do so without injustice to Mr. Longridge's memory. On the 24th September, 1892, he addressed to the Secretary of State for War a letter in which he recapitulated the services he had rendered in the elucidation of the mathematical theory of the application of wire in building up guns, and referred to some of the many advantages arising from the use of wire in lieu of forged steel: and in submitting that the system of wire-gun construction, which he had advocated for thirty-six years, was an admitted success, he asked for some recognition of his services. On the 18th June, 1893, Mr. Ralph Thompson replied from the War Office, that, "I am now directed by Mr. Secretary Campbell-Bannerman to acquaint you that, after full consideration of all the circumstances connected with the matter in question, he has awarded to you, in recognition of your services generally, an annuity of £200 (two hundred pounds), for your life, commencing from the 5th instant. . . . . Mr. Campbell-Bannerman wishes it to be under-

stood that this award is made in full discharge of all claims present and prospective on your behalf against her Majesty's Government in connection with the system of gun construction advocated by you." Mr. Longridge was not satisfied with an annuity of £200 granted to a man in his 77th year (the capitalised value of which is only £1,100), and he ventured to suggest that the wire guns then under construction should be designated "Longridge guns," and that he should receive from her Majesty some such marks of distinction as had often been conferred on his professional brethren. After a month's delay the reply came: "I am to acquaint you that Mr. Campbell-Bannerman is not prepared to order that guns, in the construction of which wire is introduced, shall be distinguished by the name of any individual; nor does he see any sufficient grounds on which he can recommend her Majesty should confer any honour upon you."

Poor Mr. Secretary; are you so blind as not to see that the inventor won by his 37 years of patient effort, and successful search for mathematical truth, greater honour and dignity than could be conferred by any paltry ribbon or silken thread you could recommend her Majesty to grant him? Poor, deluded Mr. Secretary, could you not find time, or actuarial ability, sufficient to enable you to more correctly appraise such eminent services than at £200 a year to a man long past his "three score years and ten"? What wonder is it, Mr. Secretary, that you, and your brother politicians and officials make inventors turn longingly to foreign governments for recognition of their genius, and seek profit and honour from our enemies, rather than serve their own country for wretched payments thrown to them like gnawed bones to hungry dogs? Your subordinates had "sucked the brains," so far as they were able, of Mr. Longridge, and when the sucking was over, and they imagined

the brain was dry, you could not "see any sufficient grounds on which you could recommend her Majesty should confer any honour." Really, Mr. Secretary, I, a mere greaser in her Majesty's navy, feel contemptuous pity for you.

CHAPTER XIII.

The Problem of the Guns: High Pressures.

I HAVE gone into the history of wire-gun invention and construction at some length, not merely on account of the injustice with which the inventor was treated by the Ordnance authorities, but because his inventions and principles have as yet only been partially adopted by them. It is true they now build wire guns at Woolwich, and use Mr. Longridge's formulæ for winding the wire on the internal cylinder, but they do not yet take advantage of the greater strength thus placed at their disposal by increasing the maximum pressure under which the explosives are used. I was fortunate enough to meet with a copy of his work, "Artillery of the Future," published in 1891 (and now out of print), and also with his later work, "The Progress of Artillery: Naval Guns." I fear I should be doing an injustice to the author if I attempted to compress into my present limits all his arguments and calculations. Some of his conclusions I will venture to give, but the reader who desires to know all the dangers of our present naval guns, and the iniquities of our present Ordnance Department's conservatism, should peruse Mr. Longridge's very lucid little book. He concludes, after presenting very fairly the difficulties to be overcome before high pressure can be adopted, with words which, combined with the history of his previous endeavours to

serve his country, contain a stern warning—a warning which will probably be long neglected at Woolwich, but which the despised civilians, the taxpayers of the country, would do well to ponder: "But there is one difficulty which it is more difficult to overcome—the inertia of opinion. My old master, George Stephenson, would often say that he found little difficulty in engineering matter, but engineering men was a very different thing. It took me about thirty-seven years to overcome the inertia of opinion against wire guns. How long will it take to overcome that against high pressure?"

Mr. Longridge commences his thesis by pointing out the great increase in the proportionate weight of the charge of rifled ordnance to the weight of the projectile. In the early days (1859-1860) it was $\frac{1}{7}$ to $\frac{1}{8}$ the weight of the projectile; in 1879 it was $\frac{1}{3}$ to $\frac{1}{4}$; but in 1886 it was $\frac{2}{3}$ to $\frac{1}{2}$. This increased proportionate charge was obtained by what General Brackenbury calls "taming the spirit of artillery," by providing "that the strength of the powder be restrained, cribbed, cabined, and confined to suit the weakness of the gun." By using enormous charges of slow-burning powder without increasing the maximum pressure in the gun the artillerists obtained their increased ballistic power by greatly lengthening the gun, by which means "the expansive power of the powder acted for a greater distance upon the projectiles before they reached the muzzle." One example will sufficiently illustrate this. In the 12 in. 35-ton gun of 1877 the travel of the projectile was only about 12 ft. 6 in., or $12\frac{1}{2}$ calibres, whilst in the 12 in. gun of 1887 it was 22 ft., or 22 calibres, so that with the same mean pressure the energy of the projectile was increased in the proportion of $12\frac{1}{2}$ to 22, or by 76 per cent. However, the discovery of the new powders, such as Ballistite and Cordite (the latter being practically the English form of Ballistite) completely revolutionised artillery practice. This will readily be understood by the non-

professional reader when it is remembered that in the charcoal powders only about 43 per cent of the material was converted into gaseous form, the other 57 per cent being inert, whilst with the new powders, having the nitro-compounds for a base, practically the whole of the material is converted into gaseous form. Mr. Longridge, in his "Naval Guns," gives two tables which I venture to reproduce, as they will probably assist us in understanding some of his reasoning. Table I. refers to heavy ordnance of the period 1886-7, Table II. to heavy guns constructed in 1894.

It will be seen that as between 1887 and 1894 there is a remarkable increase of energy per ton of gun, from 499 to 703 foot-tons, and per pound of powder from 61·2 to 233·5 foot-tons. Endeavouring to analyse the various causes contributing to this increased energy, Mr. Longridge found that it was not in exact proportion to the increase in length. "The true length of a gun, in a ballistic point of view, *is the travel of the projectile*, or the distance through which the force of the powder acts upon it." The guns of 1886 were about 30 calibres, and those of 1894 were about 40 calibres in length over all; but, from the ballistic point of view, the lengths were $22\frac{1}{2}$ and $31\frac{1}{4}$ calibres respectively. Taking the latter figures, the increase in energy due to length would be as 1 to 1·22, or about 22 per cent, whereas the increase per pound of powder has been from 61·2 to 233 foot-tons, or about 282 per cent. It is therefore evident that the chief cause of the increased ballistic effect lies in the powder, and not in the guns. And a further analysis shows that the superiority of the new powder has a threefold basis: (1) That the volume of gas evolved per unit of weight is much greater; (2) that the temperature of explosion is also much greater; (3) that the bulk of the charge is considerably reduced.

By a series of calculations easy to follow, we find that a 6 in. gun of 20 calibres in length has a muzzle energy of

3,909 foot-tons; if the length is increased to 40 calibres, the muzzle energy is increased to 6,027 foot-tons; if it again be doubled, so as to be 80 calibres, or 40 ft., the muzzle energy

TABLE I.

Nature of gun.	Weight of gun.	Weight of projectiles.	Weight of charge.	Muzzle velocity.	Energy developed.		
					At muzzle.	Per ton of gun.	Per lb. of powder.
	tons.	lbs.	lbs.	ft. per sec.	ft. tons.	ft. tons	ft. tons.
6 inch	5	100	42	1,920	2,556	511	60·8
8 inch	14	210	118	2,240	7,060	508	60·0
12 inch	45	714	295	1,892	18,060	420	61·2
13·5 inch	67	1,250	630	2,025	35,560	530	56·3
16·25 inch	110	1 800	850	2,148	57,580	519	67·6
Average.....	..	..	..	2,045	..	490	61·2

TABLE II.

Nature of gun.	Weight of gun.	Weight of projectiles.	Weight of charge.	Muzzle velocity.	Energy developed.		
					At muzzle.	Per ton of gun.	Per lb. of powder.
	tons.	lbs.	lbs.	ft. per sec.	ft. tons.	ft. tons.	ft. tons.
Elswick 6 inch gun, 1894.....	6·5	100	19·5	2,680	4,879	715	255
Woolwich Longridge 12 inch gun, 1894..	46·0	850	148	2,323	31,800	691	212
Average.....	..	..	..	..	..	703	233½

is 7,012 tons. Thus it will be seen that nowhere does increased length yield equal increase of energy, and that the last 20 ft. has only given an increase of 985 foot-tons, or

about 16 per cent. It is, therefore, evident that guns of extreme length do not yield such proportional increase of power as will compensate for their unhandiness and general liability to damage.

How, then, can this increased power be obtained? Mr. Longridge answers that it may be done by altering the conditions under which the powder is used—that is, by an increase of the maximum pressure. With Cordite and Ballistite the maximum pressure fired in closed vessels with gravimetric density = 1 is about 170 to 190 tons per square inch, and in actual gunnery practice it is now generally limited to about 15 to 20 tons per square inch. The service pressure of the old charcoal powders was about 17 tons per square inch, although their maximum in a closed vessel did not exceed 43 tons. It will thus be seen that in the new powders there is an immense reserve of power on which to draw. The pressure in steam engines has gone up from 10 lb. to 240 lb. per square inch, with resulting advantages known to the veriest tyro, and yet we are using the same, or in many cases less, pressures in guns at the present day than we did thirty or forty years ago. The conditions may, however, easily be adjusted to increased pressure in three ways, and, in considering these, it should be remembered that our Government has now adopted the system of wire guns, which may be made to resist an internal pressure of 30 or 40 tons per square inch, with as great a margin of safety as the forged steel guns previously in use had under a pressure of 17 tons per square inch. In a given gun, and with a given projectile, the pressure may be increased—

(*a*) By increasing the weight of charge ;

(*b*) By increasing the density of loading ;

(*c*) By decreasing the grain, or, in the case of Cordite, its diameter.

I have compiled from Mr. Longridge's little book the following table relative to 12 in. wire-wound (Longridge) guns on board the Majestic and sister ships. They are about 37 ft.—*i.e.*, about 37 calibres—long over all, but the length of travel of the projectile is only about 30 ft.; their weight is 46 tons, and they fire a projectile of 850 lb. with a charge of 148 lb. of Cordite. It will be seen on reference to Mr. W. Laird Clowes' very useful naval pocket-book, that some of the figures in the first line do not agree with the latest results and details available, but I have retained them in order that the comparison may be a just one, as the same basis has been used for the calculated figures of the subsequent lines :—

	Maximum pressure.	Muzzle velocity.	Muzzle energy.	Energy per lb. of Cordite.	Energy per ton of gun.	Penetration of wrought iron by Maitland's formula.
	Tons per sq. in.	Feet per second.	Foot tons.	Foot tons.	Foot tons.	Inches.
A 12 in. wire gun; projectile, 850 lb.; charge, 148 lb. of cordite.	16·5	2,328	31,800	211·9	691·0	25·74
B Same gun, but with reduced powder chamber	27·0	2,694	42,741	284·8	929·0	29·85
C Same gun and projectile, the pressure raised by increasing the charge to 207 lb. of cordite.	27·0	2,885	49,032	237·0	1065·0	31·98

B shows an increase of energy and of penetration power of about 34 per cent over A; whilst C shows an increase of 54 per cent over A.

From this table it is evident that the present wire guns may be greatly increased in power by adopting a pressure of 27 tons instead of 16·5 tons per square inch, and we have already seen that they are safer under the former pressure than the old forged steel guns were under the latter. But this does not end the possibilities of high-pressure guns. If, under

a pressure of 27 tons the travel of the projectile be reduced to 174 in. = 14 ft. 6 in., the ballistic result will be the same as at present under a pressure of 16·5 tons per square inch. In such case the gun would be 24 ft. instead of 37 ft. total length, and weigh 35 tons instead of 46 tons. I need hardly ask any gunnery lieutenant, or any master gunner, which weapon he would prefer, if they were equally reliable. But there is a still further change can be made by increasing the pressure and reducing the calibre, whereby, strange though it may seem, a 24-ton gun may be made to do the work of a 46-ton gun. The following comparison of the two guns will explain this :—

	Present gun.	Proposed gun.
Maximum pressure.....	16·5 tons per square inch	30 tons per square inch.
Calibre.....	12 inches.	10 inches.
Length over all.....	37 feet.	24 feet.
Weight of gun.....	46 tons.	24 tons.
Weight of projectile.....	850 lbs.	500 lbs.
Weight of charge.....	148 lbs.	134 lbs.
Penetration of wrought iron...	25·72 inches.	25·49 inches.

I will not pursue the examples of these large pounding guns further: the calculations are Mr. Longridge's calculations, and the deductions his deductions. Whether credit or discredit eventually attaches to them, the onus thereof rests upon him; but he has surely, in reference to high pressure, as Mr. Bidder said in 1860 respecting wire guns, "established such a *primâ facie* case as should have entitled him to have secured the attention of the Government in his attempts to produce a light and efficient gun, especially when it was considered that the subject was only now, for the first time, undergoing that careful scientific investigation which its

great importance entitled it to." The "inertia of opinion," however, is against him; the traditions and preconceptions of Woolwich and Elswick are opposed to his "chimerical evolutions"; and unless the attention of the great mass of the British public is aroused, the attention of those masses of taxpayers and breadwinners who demand to be adequately defended, without caring for the military orthodoxy or heterodoxy of the system—until there is an irresistible demand for better and shorter guns, we shall not secure that "attention of the Government" which the president of the Institution of Civil Engineers deemed desirable for wire wrapping so many years before it was obtained. To assist in arousing this public attention, let me give one or two more examples of what Mr. Longridge contends may be done.

The Woolwich Longridge 6 in. quick-firing gun is about 21 ft. 4 in. in length over all, and its penetration of wrought iron, with a maximum pressure of 20 tons, is 17·92 in. The same gun, with a pressure of 30 tons per square inch, will give a penetration of 21·64 in. On the other hand, a gun not exceeding 12 ft. 6 in. in length (or 8 ft. 10 in. less than the present one), but worked at a pressure of 30 tons per square inch, will give an amount of energy equal to the Woolwich service gun.

The 4·74 quick-firing gun of Elswick is 16 ft. 2 in. in length, and fires a projectile of 45 lb., with a charge of $5\frac{5}{8}$ lb. of Cordite, giving a penetration of wrought iron of 8·53 in. By increasing the charge of Cordite to $9\frac{1}{2}$ lb. the pressure would be raised to 30 tons per square inch, and the penetration to 12·13 in., rendering this small quick-firing gun a truly powerful armament for our armed merchantmen. On the other hand, a gun of the same calibre, but only 6 ft. long, with a maximum pressure of 30 tons per square inch, would give the same ballistic result as the Elswick gun of 16 ft. long, with a pressure of 14 tons per square inch.

Let us consider the effect of increased pressure in the armament of 12 in. and 6 in. guns of H.M. Majestic. The total muzzle energy would rise from 187,104 foot-tons to 282,768 foot-tons, which would give an increase of ballistic power of 51 per cent. On the other hand, if the present power is deemed sufficient, the substitution of 10 in., and shortened 6 in. guns, will reduce the weight of these batteries from 492 tons to 336 tons (100 rounds being included for each gun in both cases), a saving of about 156 tons, which may be utilised either for increasing the number of guns, the weight of armour, or the weight of ammunition or coal carried. One hundred and fifty-six tons seems a small saving in a vessel of this gigantic size, but I feel sure our very able Director of Naval Construction will gladly welcome any few tons he can gain from any part of the ship save the hull; at all events he would greet it with acclamation, small though it might be, if offered him by the engine builders.

The greatest advantage which would accrue from the change would, however, be in the increased handiness of the guns, and diminution of their liability to accident in consequence of their shortened chases. Our present monster guns are difficult to mount, difficult to protect and to manœuvre, and comparatively worthless if any of their complicated auxiliary machinery becomes damaged or deranged. Their weight, and the heavy top weight necessitated by their mountings and other machinery, involve a perpetual problem for the naval architect, and demand all his skill, and often the sacrifice of other desirable advantages, to maintain the stability of the ship. Our executive officers distrust them, our seamen hate them, and the only toleration extended to them by any branch of the naval service arises from the desire to be as well equipped as our foes.

And this we could be—so it would appear—with shorter and lighter guns, more easy of construction, less costly to

build and fire, and more readily manipulated by hand in case of disablement in action of the hydraulic or electrical machinery. How long shall we have to wait for this improvement? Will another weary thirty years, or another disastrous war, be needed before our "colonel superintendents" of gun factories and ammunition works discover that more ability is needed for constructing or improving a gun than for dressing a dozen of them in line, or deciding the exact date and conditions for the wearing of duck trousers?

CHAPTER XIV.

Completion of Repairs at Malta—The Second Battle of Toulon.

My digression has been a long one, but not altogether inappropriate to my subject. As the navy suffers—as undoubtedly it does suffer—through the subordinate position assigned to naval engineers, so the Ordnance service suffers, and possibly in a larger degree, from the subordination of mechanical and civil engineers to the control of military officers. The danger to the common weal which arises through this perpetuation of mediæval etiquette and regulations into modern complex circumstances, may be overcome by frank acknowledgment on the part of the military superior that he is not gifted with all knowledge; but this is an admission hard to make. The very qualities which serve the soldier best in the battlefield, and conduce to success in the campaign, tend to make him conservative of his authority, and jealous of any interference therewith from the outside world. Possibly the only solution we can arrive at will be the entire separation of the military from the engineering or manufacturing departments; but this solution will not come yet awhile. However, at Malta we

had partially overcome the difficulty. The authority of Chief Engineer Haddow had been real, although unacknowledged, in all matters of repairs, for the moving spirit and second commandant of the fleet had accepted and enforced his requirements. Thus it occurred that our ships were again ready for action in less time than could have been expected from a dockyard like Malta, which, though well equipped for ordinary times, possesses neither the reserve of tools, materials, nor artisans of the splendid establishments at Devonport, Portsmouth, or Chatham. It was sheer hard work, unlimited devotion to duty on the part of every man, whether on shore or afloat, and skilful management on the part of the officers, which accomplished the task; the performance was most creditable to everyone concerned, but, though meritorious, was not altogether unprecedented; it was after the manner of Britons when driven into a corner.

The fleet was ready again to take the sea: what use would be made of it? We had been reinforced by two ironclads from Devonport, the Jupiter and Victorious, both of the Majestic class, and therefore of the most powerful type of battleship afloat. Their arrival was most welcome. They convoyed transports with stores and ammunition, and men and officers to replace those disabled in the recent battle. They also brought with them news from home, such as we could not gather from the newspapers, nor even from our own home letters. The Admirals at the ports and the recruiting department at Whitehall were still at their wits' end to obtain men. The discharged crews from merchant ships laid up in port were none too eager for enlistment, and many seamen continued in their old ships when transferred to neutral flags. However, some of them were obtained for the navy, but it was chiefly the deck hands. The engine-room complements furnished a much smaller proportion for enlistment: the engineers holding certificates would not take

service as artificers, with the wretched prospects held out to them; whilst the stokers and donkey-men, and other assistants, endeavoured to procure work at the various dockyards and shipbuilding yards, now fully employed. For, strange anomaly though it may appear, the Admiralty continued to build vessels, and even increased numbers of vessels, although they were unable to find crews for them. The deck hands thus obtained were poor substitutes for trained bluejackets. The lieutenants who got them (they were distributed pretty evenly throughout the fleet) complained bitterly of their want of knowledge of drill, and utter disregard of discipline—in fact of their deficiency of all the qualifications, except brute courage, which combine to make the royal navy sailor. Our engineer's complaints of the new engine-room complements were still more bitter, and curses both loud and deep were heaped upon them. I am afraid that, despite my early training and my friend Haddow's example, I was inclined at this juncture to use strong language myself: I was young, and we had some of our best stokers and artificers taken for the Admiral's vessel, and received in exchange some of the draft from Devonport.

I said that when we retreated to Malta we had parted with the command of the Mediterranean to our foes. We had not yet regained it, although two ironclads had reached us from home; and although our cruisers and larger torpedo craft carried communications from point to point therein, not a mail steamer, nor ocean tramp, durst venture to traverse its length, and wherever the Union Jack was seen it was flying from the mast of a vessel which, either by armament or speed, but most chiefly by speed, could protect herself from the enemy. It was a curious position for the ships of the "Ruler of the Waves" to trust to their speed for escape, but it is perfectly true that just then guns were valued by our officers much less than racing qualities, and

our engineers, and not our gunners, fought our ships: we fought by running away. The French had landed an army corps in Egypt, and had occupied Alexandria; the harbour was theirs now, and the Lieutenant-Governor of Cyprus, the island which was to have been to us a source of strength, a rallying point for our forces, was daily trembling lest he should be attacked from that port. Alexandrian forts displayed the tricolour, and all the ships in the harbour hoisted it, even to our unfortunate English cruiser, the Scout, which was caught there when the French fleet closed up the entrance. It was evident we had a double task before us—to reassert our command of the Mediterranean, and to reconquer Lower Egypt.

The strategy of our Commander-in-Chief was finally determined by accident, a factor which counts for more in warfare than is generally suspected or acknowledged. We had scouts out, and knew that the greater part of the French transports and war vessels had again left the Egyptian port. What we did not know, and were seeking to ascertain, were the further operations this departure portended. We had free communication between India and Suakin and other ports on the Red Sea; we already had some dusky warriors in the dominions of the Khedive, and reinforcements from Bombay, Madras, and Bengal were rapidly being despatched there. If the Republic was resolutely resolved to conquer Egypt, or, as her statesmen alleged, to relieve it from British captivity and oppression, it was evident that she would have a severe struggle before her in that country, and would need to well secure her base before overrunning the interior. It was no mere conquest of Algeria, to be attempted with flying columns and stray detachments separated from their base; the troops opposed to her were disciplined in European methods, and their officers knew well the overwhelming effect which menaced

communications exercise on an advance. Which would be the most successful method for the fleet to attack—to bombard Alexandria, and by shell and rocket endeavour to destroy the magazines and stores there, or for the present to leave those severely alone, and seek to prevent any further communications with the place from France? There was great temptation to adopt the former course. It might possibly (indeed we all felt assured would) lead to a glorious victory, bringing promotion and stars and medals for all the combatants, and an earl's coronet for the Admiral. The accident which dissipated the temptation was the capture of a French torpedo boat (Torpilleure de Haute Mer), carrying important communications. From these we gathered that large bodies of troops were about to be sent to Alexandria from both Toulon and Algiers, and that the transports were to be accompanied by a sufficient escort of warships to protect them against the resuscitated British fleet. This was an opportunity not to be neglected. The conditions of the battle would be far more favourable to us than in the last engagement, whilst the destruction of the French command of the sea which victory would assure would be fatal to their forces in Egypt. Brave though these undoubtedly were, and ably commanded, they would be reduced to the position of a flying column cut off from its base, and would be starved into submission unless the communications could be restored.

Kinglake graphically describes the joy which our infantry, erstwhile ploughboys, felt when approaching the Russian columns for close conflict: the joy which spread through the ranks at the end of the suspense they had endured, and at the near approach of the final struggle. They knew, even ploughboys of that day must have realised, that many of them would never hear the shouts of victory, and that the

groans of others would mingle with the cries of triumph; but they cared for none of these sombre thoughts: the Berserk fit was on them, and their desire only was to get near enough to strike a manly blow. Such joy was felt all through our fleet when the news spread, for somehow or other it got out, that we were to meet our opponents again on the open sea. Even in the stokehole and engine-room there was elation, though honours and promotion seldom reached so far down the ship, and the encouraging spectacle of sinking ships and bursting magazines were hidden from the engineers. Somehow or other they felt they would be doing their share in winning the battle: the Berserk fit was on them also, though they could only exercise it in opening and closing throttle valves, or oiling bearings.

We were unfortunate in the Terrible, and prevented from taking part in the opening of the attack. A hot main bearing had given us trouble several times, and caused us stoppages, both when cruising alone and accompanying the fleet. Thus it happened that on the morning the French fleet hove in sight we were far behind our consorts, and engaged in reducing the heat of the bearing, instead of being in the van, courting the first shots from the enemy's leading ships. We had enough fighting before the day was finished, but the dissatisfaction felt by all classes was intense, and the remarks which any passing engineer or artificer heard from the sulky members of the fighting branch were anything but complimentary to them. Our captain for once, if never before, realised the importance of the "Lascar and oil can" duties. Here was his ship kept out of action, the chances of prize money imperilled, and his own opportunity of a K.C.B. wholly gone, all because a miserable piece of iron, far down in the bowels of the ship, would stupidly get hot at a critical moment. To this I might add that we had neither engineer officers nor artificers sufficient in number to deal

with such an emergency. We all did our duty manfully, but we could have done better with more assistance.

In the triangle formed by Sardinia, Tunis, and Sicily the great struggle took place. The French fleet was a powerful one, consisting of 19 ironclads and heavily-armoured cruisers of various classes, 13 minor cruisers, all more or less protected by deck or armour, and a large number of torpedo boats and destroyers. It was, however, encumbered with no less than 63 transports, all crowded with troops, and carrying large supplies of ammunition. The protection of these transports necessarily hampered the fleet movements, and restricted its tactics, the more so because an explosion on one or more of them might endanger some of the war vessels. The Admiral was, in fact, in much the same difficulty as a commander of Elizabeth's reign convoying fire ships, which were almost as dangerous to himself as to his foe : only in the case of the Frenchman the danger was entirely to himself, and the advantage his enemy's. Our Commander-in-chief had only 14 ironclads and 8 cruisers, the latter comprising some of our latest and most powerful type, such as the Terrible and Powerful, heavily armed and engined, but having for defence only a protected deck, and coal stored round the vital parts of the ship. These cruisers were to fight, and not merely watch events, as in the last action, and would therefore have to rely greatly on their speed in manœuvring, a quality which an eminent American naval officer considered the most essential for success in a modern naval engagement. Our Admiral had also a large number of torpedo destroyers and catchers with him, besides some of the smaller class styled torpedo boats. In the present encounter he exceeded his opponent in the number, as well as the size and quality of his torpedo craft, whereas in the last he was inferior in the number he had of them. Our advance was in three lines, in line ahead formation, and the

various ship commanders had been instructed in the tactics to be followed after the *melée* commenced. The leading idea was to reach and attack the transports, either capturing or sinking them, but in any case to prevent their escape to Alexandria, or Algiers or Toulon. The French Admiral appears to have been sailing, when first sighted, in indented line abreast, but so indented as to form a crescent, the two horns of which were formed by the fighting vessels, whilst the transports were thrown back in the centre. However, as he approached he altered the formation into a triple line ahead, at the tail of the centre line being the transports, protected by torpedo boats, and crowded together like a hen's frightened brood when an eagle appears in the sky. Whether they fully realised it or not, there was sufficient reason for their fright: the eagle truly was upon them, and would not depart without seizing his prey. The French commander, however, displayed great skill in the disposition of his ships, and whilst placing the most powerful in the van, so as to bear the brunt of the battle, he detailed as many as he could possibly spare to watch over and defend the unprotected ones. Nor did he endeavour to refuse the gage thrown down: his object was to reach Alexandria, and he appreciated that by turning tail he should not only abandon that object, but also lose that imperial command of the sea which he had gained at the first battle of Toulon, and which had enabled him to make the Mediterranean a French highway to Egypt. He therefore resolutely continued his eastward sailing.

CHAPTER XV.

The Second Battle of Toulon—Torpedo Boats and Destroyers—The Duel with the Duguesclin—The Attack on the Transports—The Retreat of the French.

THE captain of the Terrible was no feather-bed sailor, and ordinary difficulties would not keep him from participating in the fight; nor was our chief engineer, who had made a reputation and wished to maintain it, any more anxious to miss the fun. He was down below, dressed only in shirt and thinnest of white trousers, directing and encouraging his men, and at times assisting them with his own skilful hands. No unnecessary time was therefore lost, and as the Admiral had reduced his speed to admit of the slowest vessels keeping up with him, and was therefore steaming at much less speed than we could make, we were not long out of the engagement. The lessons of the former battle had not been forgotten on either side, and the fire, even of the big guns, was reserved until the fleets were well within range. The condition of the sea was much more favourable to torpedo attack than in the former fight, and the torpedo commanders were resolved to make full use of the opportunity now afforded them. In both navies the gunners had so far reaped the greater glory, but there was a determination on all hands to try the efficacy of both ram and torpedo. On our own ships, certainly, and I believe on the French also, it was fully understood that the struggle was to be continued unto death; that no half victory, no seeking flight to repair damages and fight again, was to be attempted; but that the indisputable command of the Mediterranean sea was this day to be finally and completely lost and won.

Our Admiral's intention was to dovetail his three divisions between the three French divisions, and drive

down their lines until he reached the transports. The torpedo craft were to hang around the main combatants, and attack as and when they could, unrestricted by any more definite instructions than that they were to inflict all possible damage as quickly as possible. The big guns did not do any great things as the fleets advanced. The positions of the platforms and targets were constantly shifting, and the firing was not yet of the constant and continuous kind which becomes a storm of fire. The deck wreckage was considerable, though not quite so considerable as on the former occasion, because there were much fewer deck encumbrances to wreck. At Malta, when we repaired and re-fitted, all deck erections, or rather the remains of them, had been as far as possible removed. The convenience they afforded in ordinary times was sacrificed in order to avoid the danger they became under fire. We had also had sand bags placed round the funnels, and on other parts of the deck where they would afford shelter either in working the guns or manouvring the ship. Few boats remained on any of the vessels ; most of them had been smashed up in the previous fight, and we had not been able to obtain sufficient at Malta to fully replace them. The French had taken similar precautions, and to some extent been forced into the same makeshift devices as ourselves. They had, however, erected on many of their vessels teak or iron coffer dams protected by sand bags, and these, as we discovered, afforded very useful shelter to their men. In this, as well as other ways, they displayed the advantage of such an admirably equipped base as Toulon, connected by rail with the most extensive arsenals in the country, and supplied with the latest and most improved appliances for shipbuilding and repairs. The existence of a base of operations has a most important influence on naval strategy, and the Federal officers appreciated this during the American

War. Their first efforts were directed to the formation on shore of a depôt for stores and repairs, and the protection of such depôt against hostile menace and attack. But if an even temporary depôt is so valuable to a fleet when it can be secured near to the scene of operations, it is evident that a permanent arsenal, equipped with docks, gridirons, and workshops, and above all amply supplied with stores, must be more valuable still, and increase in usefulness in proportion to the completeness of the machinery and material available there. Our Whitehall officials have at various times made spasmodic efforts to render coaling stations and other naval ports of call safe against attack, and in so doing they have acted wisely, although the wisdom has too frequently been of that character which merely commences a good work, and does not persevere in the well-doing necessary to finish it.

When we in the Terrible approached the conflicting fleets our Admiral had partly effected his purpose of dovetailing his ships between the French lines. His ship, the Majestic, had encountered her old antagonist, the Carnot, and passed on after pouring in a couple of broadsides from her 50-ton and 6 in. guns and quick firers, a complimentary salute which the Carnot had handsomely returned. Following the Majestic was the Renown, whose captain was near to the top of the list, and determined to so distinguish himself in action as to secure promotion to flag rank. In exchanging fire with the Carnot he was favoured either by chance or the skill of his gunners, and at the second discharge disabled one of her secondary turrets, and put a pair of 5·16 in. quick-firing guns out of action. The quarters were close, and $3\frac{3}{4}$ in. of steel, though the temper was of the best, and the fixing of the most cunning device, could not resist a shell from a 10 in. gun. The turret, as a turret, almost disappeared, and the men inside were placed *hors de combat* : broken rivets, shell

splinters, and torn and twisted masses of steel, are fatal to the crew of these protected enclosures when struck by a heavy shot. Immediately behind the Carnot was the Charlemagne, exchanging shots with the Majestic as the two vessels passed. The captain of the Renown saw, or imagined he saw, an opportunity for ramming, and the engine-room telegraph rang out and indicated "Full speed ahead" immediately she was clear of the Carnot. The men threw themselves flat on the decks all over the ship, for the sudden accession of speed sufficiently indicated to them the intention to ram, and the complete stoppage of the engines a few minutes afterwards warned them that the moment of supreme struggle had arrived. Somehow or other the ramming was not effected. I never could quite learn whether the quartermaster of the Renown failed to keep her head exactly in the right direction, or whether the steersman of the Charlemagne turned her a point or two out of her course, and so averted the danger. The vessels bumped, and crushed, and tore each other's sides, loosening armour, and levelling all projections, but without effecting that desired rent in the side which makes this mode of attack so fatal when truly and fairly delivered. However, as she got clear of the Charlemagne, the Renown fired her two after 10 in. guns at the stern of the French battleship, and was successful in disabling one of her screws and injuring her rudder. She had three screws, and gallantly endeavoured to steer with the two remaining serviceable, but the endeavour was not very successful. The Renown fired a Whitehead torpedo at her, but it failed to reach its mark, and her destruction had to be left to another : the order of the battle and the Admiral's plan would not permit of any lingering over a single opponent : the haste to be made was to reach the transports. The Charlemagne met her fate almost immediately afterwards. Whilst exchanging shots with the

Rodney she was rammed by the Polyphemus, and sank at once. The Polyphemus was not seriously damaged: she was probably better adapted for mere ramming than any other ship in our navy, and she had justified the designs of her builders by the success achieved in this attempt. It must, however, be remembered that her attack was rendered possible, and greatly assisted, by conditions which do not invariably exist. The steering ability of the Charlemagne had been greatly damaged, indeed almost destroyed by the shells from the Renown; the attention of her officers and crew was distracted by the fire of the Rodney; and the movements of the Polyphemus were covered and protected by the larger vessels following her. It can hardly be supposed that a squadron of such-like torpedo rams could themselves encounter a fleet of first-class ironclads. This peculiar craft carries only 6-pounder quick-firing guns, which are utterly useless against armour or heavy ordnance. She can, therefore, rely for attack only on her ram and torpedoes, both of which require to be used at close quarters. As her speed is only 16 or 17 knots, it will be seen that for torpedo attack she is vastly inferior to the destroyers, whilst for ramming purposes she does not possess the advantage which the line-of-battle ship has, in being able to cover her attack by the fire of her guns.

The captain of the Terrible saw that there was just a possibility of circling round the fleets and attacking the transports from the rear of the formation: it was a longer way round to them than running the gauntlet between the lines, as the ironclads were doing, but he could steam at full speed, and possibly reach his destination as quickly as they could on their interior course. When it is remembered that we had stopped to cool a hot main bearing, and were now ordered to run the engines at full speed, it may easily be imagined that we had an arduous task. The new hands we

had received out of the draft from Portsmouth had, it is true, become accustomed to the ship, and learned something of our methods of working, but they were still far below the level of naval hands. Two of them were rated as artificers, having been obtained from one of the merchant lines, where, before the outbreak of the war, they had served as junior engineers. They were certainly not bad mechanics, and so far as the main engines and some of the auxiliaries were concerned were as reliable as our own men, but they were not accustomed to the discipline of a man-of-war, and unable to conserve their authority as naval men did. Probably there was some jealousy of them. Many of the stokers had served an apprenticeship twice over in the fleet, and felt some contempt for these men suddenly placed over them on transfer from mere merchantmen. We had also a number of bluejackets sent down as temporary assistants in keeping up the fires, and Jack, in addition to his feeling of superiority over any outsider, even though he were a Britisher, had a special grievance of his own at this moment : he was doing extra work, as a mere coalheaver, until such time as he was wanted for fighting, and in the meantime he was debarred from those glimpses of the battle caught by his comrades who were on deck or in firing quarters. There was therefore additional strain and anxiety thrown upon the engineers and older artificers, particularly under the circumstances of the breakdown from the hot bearing. Nor was it anxiety alone which troubled us. There was hard physical work to be performed to keep the heat down to any degree which would permit our running full speed, and this physical work had to be shared by everyone in the engineers' department, whether they carried on their sleeves gold lace or three buttons, or were merely attired in the slop of the fireman. When it is remembered that we were in the Mediterranean, and that we had the whole of our forty-eight Belleville boilers fired to the

utmost capacity, the heat down below can be imagined. This matter of temperature alone is sufficient to try the endurance of men, and it was only by combination of encouraging sympathy and stern discipline that they could be kept up to their best work; of course, they had, like their comrades the bluejackets, the Briton's sense of duty, but they had not encouragement given by actual participation in the fighting for an outbreak of the Viking spirit of combat. It was in them undoubtedly, but latent midst the din of moving engines and the constant labour of firing. The greater honour is due to men who perform their work so admirably under such unemotional conditions.

We came on the transports at last, without sustaining any material damage from sundry shots which had been fired at us. It will be observed that in the dovetailing operation the French had one outside line and the English the other, and our captain very wisely took the protected side. He intended fighting, but it was fighting with a distinct object, and he had no Quixotic desire to draw upon himself the attacks of any intermediate enemies until he reached his intended prizes, the giants Briareus. But these prizes were guarded well by both battleships and torpedo boats, and the Frenchmen had evidently no intention to permit their destruction by a flank attack. Their nest of hornets was out to meet us, and threatened us on every side with their moving mines. They had an advantage over the Terrible in speed, but not so great an advantage as to enable them to approach within striking distance under fire of our quick-firing guns. We had, fortunately, some men on board trained to the use of this form of ordnance, and they succeeded in hitting their rapidly-moving targets more than once. Our machine guns were also admirably and effectively served against any boat which got within their range. But the attack was not long left to ourselves; before we had

broken through the cordon of small boats, we were joined by some of our own destroyers, and thus in a position to make a resolute and determined onslaught against the enemy's weakest point. It was the case of the "weak chain," and we had found the defective link.

We were through the line of torpedo boats, and exchanging shots with some of the French cruisers. The Duguesclin came to meet us, and protect her brood of frightened chickens: we could see their decks crowded with helpless troops, whose bravery and skill were unavailing in an emergency like this. They could watch the progress of the fight, and encourage with their shouts their valorous seamen, but they knew all the time that if the fight went against their side their own shift would be a short and terrible one. However, the Duguesclin deserved the thanks of her country, and worthily sustained the fame of the gallant knight whose name she bore. She was vastly inferior in displacement to the Terrible, being only 5,894 tons, against our 14,200 tons, and her speed was only 14 knots, whilst we could make 22 knots. Her fighting qualities, however, were formidable. She had an armour belt of 6·5 in. to 9·1 in., whilst her four barbettes were protected by 8 in. compound plates: a protected deck was also formed of 2 in. plates. She carried four 9·45 in. breech-loading guns in separate barbettes, one 7·5 in. breechloader in her bow, and six 5·46 in. breechloaders, disposed three in each beam, in addition to revolving one-pounders and torpedo tubes. Her sister ship, the Vauban, closely followed her, and they both shaped their course to attack on the same side, and so deprive us of the advantage of a portion of our armament. This was a serious disadvantage to us considering the power of their heavy guns, and the advantage in the possession by us of quick firers, of which they had none, would hardly equalise the conditions. However, we had our destroyers behind us, and their number

was being constantly augmented: all the torpedo officers were anxious to carry out the Admiral's command to inflict as much damage as they could in the shortest possible time, and they imagined no better opportunity presented itself than in this quarter of the fight.

The first hit from the Dugnesclin knocked down one of our military masts, and killed or severely wounded all its occupants. Almost immediately afterwards a shell from the Vulcan burst on our upper deck, and tore down half our after funnel, besides killing more of our crew. This damage to the funnel tended to reduce our speed, but whilst we were in the midst of the conflict this would not matter much, and although it caused additional sulphur and discomfort in the stokehole, our men hardly heeded it in the excitement of the moment. We were hard worked down there now, for although we had to keep the steam up as heretofore, the bluejackets who had been aiding us were recalled to their several posts: they were wanted for the more important duty of working the guns. This is exactly what happened on all the ships this day where assistance had been given to the stokehole from the deck prior to the commencement of the battle. This is what must always happen in naval warfare, for the first and urgent duty of all on board the ship is to capture, sink, or otherwise disable their opponent; and it therefore becomes the more imperative that the stokehole and engine-room should be manned by their own proper staff, and not forced to rely on any extraneous or eleemosynary help. However, we had the satisfaction of knowing that our sufferings were being avenged by the fighting men above us. The guns of the Terrible were making merry music in reply to the Frenchmen, and though we could not see the results of their fire, we could rest content that they were doing as good and gallant service above as we were below deck.

The French torpedo boats had failed to stop us, not merely through the effective working of our quick-firing guns, but because our destroyers kept them fully employed in their own defence. In number and weight of guns our boats had generally an advantage, and this advantage they used to the utmost in pressing a persistent and resolute attack. The Frenchmen were also hampered in their tactics by much the same considerations as detained our Channel fleet near home shores: they were acting on the defensive, and confined their efforts rather to resisting attacks on the vessels they were protecting than to making offensive attacks on the vessels menacing them. I have also said that we were more numerous than our opponents in this class of boat, and our officers and men fully understood that if the victory was to be gained by us this advantage must be pushed to its utmost limit. We, therefore, were left comparatively unmolested by the French torpedo boats during our duel with the Duguesclin and Vauban, and fortunate it was for us that we obtained this immunity, for our task was quite sufficient for our strength, and the severity of the fire from the armed cruisers a test of our men's endurance, without the stress of having constantly to dodge torpedoes. Our above-deck fittings were speedily reduced to wreckage, and persistent and heavy shell fire rendered our men less steady than when at drill. There was no fear of the foe; no doubt of the result existed; Jack still counted himself worth a dozen Frenchmen, but he was inclined to hurry his fire and get his gun off, without that careful aim and alignment so needful for the success of his fire. In this respect he was no worse than his foes, but he was fighting against two ships, and could not concentrate his fire as they could. The fate of the Terrible would probably have been that of my old ship, the Acorn, had it not been for our friendly torpedo boats: we should have made a better fight of it than she did, but would

have gone to the bottom all the same. However, two of our destroyers got within range of the Vauban, and one of them placed a torpedo in her below the water line. The destruction was immediate and complete, but the greatness of the destruction was dwarfed by the magnitude of the moral effect it produced. We heard afterwards from our prisoners that when the Vauban was struck it was recognised by the whole fleet—by the officers and men of the fighting ships, as well as those of the transports—that the defences of the Frenchmen had been forced, and that the object of their expedition was not merely imperilled, but that, if attained at all, would only be effected after disastrous sacrifice of life. And they were right in this. The two destroyers carried quick-firing guns in addition to their dreaded tubes, and these guns, though perfectly useless against ironclads or the larger cruisers, would be very serviceable against merchantmen. Nor did the danger end with these two boats; there were others following them, and pressing at their utmost speed to join in the attack. The French torpedo commanders became demoralised. In their eagerness to defeat the attack they rushed their boats about at utmost speed without sufficient heed to the direction or object of their movements. It was a case of fighting as one that beateth the air, and we all know how useless such efforts are, whatever energy may be thrown into them.

We were now left with only the Duguesclin for an opponent, and our chances of victory were greatly increased: our men had only one target to fire at, on which they could keep their eyes constantly fixed, whilst the weight of metal they could direct against that one was doubled through the destruction of the other. We therefore had decidedly the advantage in the attack. The weight of our broadside was about 250 lb. greater than the Duguesclin, whilst the individual weight of each shell from our 9·2 in. breechloaders

was 116 lb. greater than her heaviest projectile. With equal hits, therefore, in equally vital parts, the damage effected by our fire would be much more severe. This was eventually the case, but we suffered severely enough before we silenced our opponent. A shell reached us below deck, burst in one of the eight boiler-rooms, and exploded two of the six Belleville boilers contained therein. The scene was appalling. Not only were men blown to pieces by the shell explosion, but others, even outside the boiler-room, were severely scalded by the escaping steam. The sufferers were engineers, artificers, and stokers, the idlers and non-combatants of the ship, members of the "Lascar and oil-can" crew, who were unfitted for the honours and promotions of the Berserk fraternity, but not unfitted for the martyrdom of parboiling in high-pressure steam. The spectacle on the fighting deck of a man-of-war during action is a revolting one, but I never saw on such a deck anything so sickening as the sight of these poor scalded stokers and artificers when lifted from the floors. I will not endeavour to harrow my readers' feelings by describing the flesh dropping off the bones of the men as we moved them : it is sufficient that they so died, or for a time lingered in almost unendurable suffering, and that they encountered this death and suffering in simple discharge of the duty they had undertaken for their country.

Our task was not confined to clearing the boiler-room and replacing the slain by new stokers. The ventilation of the Terrible when she left her builders' hands was almost perfect, but it was perfected by the introduction of numerous fans, and a very complete system of tubes and shafts for the egress of foul air. It was an urgent necessity to keep this ventilation as complete as possible even in the midst of battle, and our first investigation had to be of the damage done, and our first effort to repair it to the utmost of our limited ability. Mr. Haddow had no notion of permitting

the remainder of the crew to be poisoned by foul air because a portion of his machinery had been damaged and some of his crew killed. Calm and unruffled, he delivered his orders, and directed the operations of his assistants, as truly a captain and leader in his own department as Admiral Condor was of his section of the fleet. Fortunately the shot had not struck us below the water-line ; we were still free from important leakage : we were still able to fight. So whilst below decks we were removing the wounded, clearing the *débris*, and generally repairing damages and restoring our more urgent necessities to the best of our ability, our men on the fighting deck were pounding away at the Duguesclin with increased vigour. We were not long before we received some reward for our efforts in the silencing of one of her 9·45 in. guns, a success which at once elated our own bluejackets and depressed our opponents.

In the meantime, our torpedo craft had got within striking distance of the French troopships, and were busily engaged spreading destruction. Not only by torpedoes, but with quick-firing guns, they were pressing the attack, and spreading confusion in the enemy's fleet. The French Admiral had directed his efforts against the front attack, and had so far resisted it with considerable success. It will be remembered that his fleet was more powerful than our own, particularly in line-of-battle ships, and if he could have dispossessed himself of the dominant idea of escorting his transports, he would probably have manœuvred his vessels in such manner as to bring an overwhelming superiority of fire against any British ship. The idea of escort, of convoy, of defending the helpless transports clustered in his rear, and of forcing a passage for these through his opponents' fleet was, however, the dominant one with him, and he had, when the method of our attack developed itself to him, so placed his ships as to present a formidable gauntlet to be run

before the weak point in his formation could be reached. The flank attack had disconcerted his plans, and exhibited the weakness of his method. His cruisers—he had thirteen minor ones in addition to those which might possibly be deemed fit to take places in the line—had been chiefly placed in front of the transports, so as to attack and resist any stray ship which might force its way through the ironclads: for resisting a flank attack, or one from the rear, he had only his torpedo boats available, and these were inferior both in number and quality to those accompanying our fleet. The present development of the battle, therefore, necessitated an alteration in tactics, amounting almost to a change in front, an operation no less difficult of successful conduct in a sea fight than in a land engagement. One of the difficulties this change involved was the uncertainty of the general plan felt by every ship commander: he knew the intention of the Admiral at the commencement of the battle, and the part he was expected to take in furthering such intention, but the scope and extent of his obligations in this new situation were not so clear to him. This uncertainty of knowledge, or appreciation of the general plan by sectional commanders, is of much greater importance than at first blush appears, since it deprives them of ability to render proper assistance to their comrades, and induces them to press their own immediate victory to the utmost extent, without regard to the progress or requirements of the battle in other portions of the field. The French war vessels hastened to protect the transports against the new attack, but in doing so they lost their first formation, and reduced an orderly and skilful defence into a desperate melée.

This was the commencement of their defeat, but it would be unfair to attribute it solely to the flank attack on the transports. The ironclads had been pounding their way between the French lines of ships, and in their progress both

inflicting and receiving serious damage. The carnage on board both fleets was much greater than in the former battle of Toulon; first because the fight commenced and was continued at closer quarters, but chiefly because the repaired ships were not so well prepared for defence as formerly: they had been made ready to fight again, it is true, but it was readiness to fight under defensive conditions much less efficient than at the commencement of the war. Our Rear Admiral distinguished himself, as we expected of him, and the captains and men who followed in his wake were stimulated not merely by his example, but also by the certainty they felt that his eyes were watching their movements, and that their endurance would be rewarded by his notice and approval. Since his skilful management of affairs at Malta a feeling had grown up that he saw everything, and knew the merits or shortcomings of every man in the fleet. It was an exaggerated notion, no doubt, but a natural one among such a community. We all felt that he was the man behind the gun, and it was a pardonable amplification for sailors to attribute excessive power to the man who had hitherto used his weapons with ability. The immediate result of the confusion which arose in the French fleet was to afford an opportunity for torpedo attack, and of this opportunity advantage was quickly taken. Our sailors had been shown the way to do it by the Circe in the previous battle of Toulon, and they speedily proved that the example had not been lost upon them. Whilst taking advantage of any cover afforded by their own ships, the commanders of these little vessels lost no chance of attacking an opponent. The conditions were favourable, the tactics skilful, and the results equal to our deserts. The French ironclads fell before the combined attack of gun, torpedo, and ram, against which their confusion rendered them unable to properly contend: they were fighting as single ships instead of as a

fleet, but as single ships crowded together, and hampered in their movements by their own consorts. Each French ship which fell a victim to our attack reduced their numerical superiority ; each ship disabled increased their confusion ; each flag struck assisted the feeling of despondency which set in amongst their sailors. The battle continued, growing more and more destructive to both ships and crews, but steadily progressing towards victory for the British flag. The endeavour to reach Alexandria had been defeated : the French Admiral would be fortunate indeed if he escaped to Toulon with any portion of his fleet.

In truth he was in much the same plight as the Duke of Medina Sidonia found himself when Drake attacked him with fire ships in Calais roads. "We are lost, Señor Oquenda," cried the Duke to his bravest captain, and the Frenchman might truthfully have echoed these words. The troopships which he had to convoy must not be abandoned, and yet the endeavour to protect them was the initial cause of his disaster, and the necessity of extricating them was still his greatest trouble. Like the crowded galleons of Medina Sidonia, they became mere shambles under fire, and they were even more helpless than the Spanish ships, because their fire was of the most feeble order. And the war was now raging round them with terrible severity. The Duguesclin's fire was silenced by ours, and she drifted a helpless hulk on the water. A torpedo had struck her, and though it had not so completely effected its purpose as to sink her, the gaping hole made in her side rendered her useless for further fighting ; her crew had sufficient work to keep her afloat without indulging in the pastime of firing off guns. We were able to push the Terrible, as well as the destroyers, among the transports, and ship after ship succumbed to the Union Jack.

The scramble went on after the retreat commenced. The transports could offer no effectual resistance to the smallest of the torpedo craft, nor could many of them escape by their speed. They struck their flags with a unanimity which is no disparagement to their courage, but a strong testimony to the discernment of their officers. The war vessels fought to the last. "Its dogged that does it," seemed to be the motto of their commanders, and certainly if "dogged" could have retrieved the day our victory would not have been so complete as it finally became. But it could not. When the battle and pursuit were over only two ironclads, four cruisers, and eight or nine transports got back to the protection of the Toulon guns. We were actually encumbered by the wealth of our spoils, and hard pressed to find prize crews to take our captures to Malta. Our own losses had been severe, both in men and ships; two ironclads and three cruisers had gone below, and the carnage on the remainder, particularly on the cruisers, had been frightful. Such ships as were left to us were terribly shattered, and few of them would again be made fit for action without a very lengthy and expensive course of repairs. It must be remembered that most had undergone a previous fight, and the renovation we had been able to give them had only been of the temporary nature represented by the careening of a vessel, and caulking her bottom, in the olden days. But, however severe our own losses, we had won the crown for which we were striving, and once again gained the indisputable command of the Mediterranean: of that there could be no doubt, since there were no French ships in that sea to dispute it with us.

Victory is to the general who makes the fewest mistakes, and in this contest the English appear to have obtained that desirable position. The number of transports grouped under one convoy was a source of great embarrassment to the

French commander, and ultimately the deciding factor of the battle. The French loss would probably have been much less disastrous had these sailed as single ships, unaccompanied by any convoy. In such case no doubt some of them would have been captured, but others would have run the gauntlet, and landed their cargoes at Alexandria. Again, the determination of our own Admiral to fight to the last extremity, even to such desperate end as the Revenge of yore, had an inspiriting influence on our officers and men, who from the first understood that there was no retreat for them: they had "but to do and die." The methods of the strategy and tactics employed have been elsewhere dealt with by others whose training has enabled them to better judge of them: indeed, I am not perfectly sure that I have quite correctly described them. My own observations were principally directed to the machinery, and motive powers involved, which more directly affected me in my profession.

I have spoken of the explosion of the shell, and destruction of the boilers, in the Terrible, and the consequent loss of life in the engine-room staff. This was not an isolated instance either with our own ships or the French. The fire on both sides was directed as much as possible against the centre of the ship, because her vital parts were there situated, and although the centre was the most strongly protected portion, any damage inflicted there would be more disastrous than in a weaker but less important part. Thus it happened that armour plates intended to protect the engine and boiler space were actually driven in, and crushed the engineers working round about. Again, the working of the machinery of a modern man-of-war greatly depends on proper and sufficient ventilation, which is not only necessary for the comfort of the stokers and artificers, but also for securing a sufficient draught for the boilers. It was found that under the strain of action all our ventilating arrangements suffered

great damage. Not only were deck cowls knocked away, but fans, even when they escaped direct hits, were so strained and twisted, either in themselves or their shafting, as to become unworkable. The communications also had caused us as much trouble as on the former occasion, and the speaking tubes, and electrical or mechanical indicators we had temporarily repaired were no more reliable than before. On the other hand, we received great help from the use of sand bags, and their efficiency was so marked as to induce one youthful lieutenant to suggest that, hung over the side of vessels, they would form a cheap and reliable substitute for armour. I have not, however, yet heard of any commendation of his plan from the constructive department. Probably such a cheap and novel method of protection would raise some difficult questions in stability and speed.

CHAPTER XVI.

The News in Paris—Riots in Paris—The News in London—The End of the War.

Ill news travels apace, and rumours of the French defeat were not long in reaching Paris. When first the rumour was heard there it was hardly credited, either by the officials who knew the strength, and also the weakness, of the French fleet, or by the populace, who only imagined it to be false because they could not, and would not, conceive their countrymen to be defeated. But it was true, nevertheless, and confirmation of it reached the capital along with such details as revealed the awful import of the disaster. Then the rage broke forth, and the boulevards rang with yells for vengeance on the men who had betrayed France. Who the betrayers were, how they had betrayed her, was not very clear to the canaille, nor did it much matter: they must

have revenge on someone or other, and those nearest at hand should be the first to feel it. So a minister or two, incautiously lingering in the neighbourhood of the Champs Elysees, were strung up to convenient lamp posts, whilst stray soldiers and gendarmes, who failed to vigorously shout with the mob, were hung to keep them company. The city which, so shortly before, was brilliantly illuminated in honour of victory, was now lit, by an enraged mob, with burning ministerial mansions and public offices. There was vengeance in the air, and it must be wreaked on their own countrymen, since the British ships and British seamen were out of its reach.

A Parisian mob is easily excited to deeds of violence, and the political condition of the republic ministers to this excitability. The various groups in the French Chamber are all opportunist, and ready to seize every opening for attack on the group which for the moment is in possession of power. It was so in the first Revolution, and has continued since, though the names of Girondist and Jacobin have long ceased to represent any concrete ideas. There are men to-day who emulate the astuteness of Barère in transferring their allegiance from party to party in order to promote their own individual advancement. Vituperative speeches by such deputies, addressed to an already-excited mob, naturally produced increased disorder, and secured the dismissal of the President and Ministry at dictation of mere brute force. But change of Ministers could not regain the Mediterranean, nor replace the French fleet, and eloquent declamation would not renew the line of communication with the army in Egypt. The new Ministry and their military and naval advisers had immediately to frame a fresh plan of campaign, and endeavour to carry it into effect. The riotous crowds on the boulevards, the assumptions of mob orators, who claimed part in the Cabinet

deliberations, and the mutinous conduct of some of the military forces, increased their difficulties, and rendered more impossible the obtaining of that victory which was so necessary for the salvation of themselves and their country. The mob demanded revenge: the demand was re-echoed through France; but the country had lost for a time that discipline, that implicit obedience to authority, that reliance on and devotion to a leader, which are so absolutely essential for success in military enterprise.

The naval and military leaders understood the gravity of the situation: they saw clearly enough that the strategy of the English fleet would be transformed by the victory it had obtained, and that an effort would be made, by blockading their ports of egress in the Channel and Bay of Biscay, to prevent further depredations in the Atlantic. Few ships would be required to keep French cruisers out of the inland sea; indeed, the blockade of Toulon was already resumed, though we had only battered ships to place at the harbour's mouth, and the men thus released from duty in the Mediterranean would be available for manning the ships lying idle in the Tamir and the Medway. We had plenty of ships in reserve, and new ones building, and the French admirals imagined that we would now find crews for them, and send them out in increased numbers to scour the Channel and the Atlantic. If this should be the policy adopted by the English fleet, then it was apparent to them that the fate of the French army in Egypt was sealed: neither supplies nor reinforcements could reach there, nor transports be sent to bring home the harassed soldiers. We had a free road from India to the Egyptian Red Sea ports, and reinforcements were already on their way, or in some cases already landed in Upper Egypt, and the merely defensive attitude of the British forces there would ere long be transformed into offensive operations.

The reception of the news in England produced a sensation which was not calculated to assuage the difficulties of the French leaders. The victory affected all sorts and conditions of the people, not only the toilers for daily wage, who had been suffering the pangs of partial famine, but the wealthy landowners and merchants, whose incomes had been reduced, whilst the demands thereon, both for national expenditure and charitable assistance, had been enormously increased. Merchants, who for months past had been trembling for the stability of their undertakings ; underwriters, who had daily been dreading ruin from the risks they had accepted ; bankers, whose safes were crammed with scrip which might prove mere waste paper, once more breathed freely—the prestige of our flag was restored, and the Union Jack would again float o'er the sea. London put on gala attire, and exhibited her delight in venetian masts and flags by day, and candles, lamps, and electric lights by night. Nor were country towns and villages less demonstrative : the little town of Newent, in Gloucestershire, was half burned down through a fire which arose through rolling burning tar barrels through the streets, a form of rejoicing to which the inhabitants have been addicted from time immemorial. It is related that at Dudley, Tipton, and other places in the Black Country, the women actually wept on each other's necks as they related the news of the victory ; whilst in Lancashire many of the cotton lords gave their hands and their families an honest wholesome meal—the first sufficient one they had obtained for many a day. There was reason for such rejoicing, because the victory brought with it the prospect both of food for suffering women and children, and of raw material for our manufactures ; however arduous the struggle might still be, the nation could support it if only the ocean highways could be kept open.

One of the tokens of victory is the naming of the battle. By universal custom this is conceded to the victor, though in doubtful or disputed engagements both sides will sometimes award names as indicative of the claims they respectively make. In this case there could be no doubt as to the conquering side, and the British press and public asserted their right by naming it the "Second Battle of Toulon." The title appeared peculiar, seeing that the fight was far away from Toulon, but it was confirmed by the unanimous voice of the nation, and on consideration it seemed appropriate, because it reminded the people alike of the defeat and of the ultimate victory of our fleet. It is well for a nation to remember the days of its adversity, when its flag bent before the foe, when its soldiers bowed their heads and laid down their arms to their opponents: it is better when the nation remembers the causes which led up to the defeat, apportions to its several servants their proper meed of praise and blame, and takes measures to remedy for the future the existing military or naval defects. In the present war of which I am writing the nation became educated to more just judgments than it was able to give at the commencement of it. When the first battle of Toulon was fought the Commander-in-Chief fell a sacrifice to the indignation at a defeat for which he was not wholly to blame, whilst the loss of the Lucania caused the fall of a Ministry, who were thus punished for the shortcomings and blunders of many previous Administrations. A like imperfection of judgment should have rendered the present Ministry the most popular of the reign, and ensured them all the glory of a Roman triumph. But the pressmen, the editors, and leader writers, and "our own correspondents," who instruct the populace how to think, and thus create public opinion, had themselves learned to more closely analyse events and their causes, and to discriminate between military leader-

ship and mere political chicanery. Party methods and party allegiance resumed their power; the rats once more returned to their haunts, and the Opposition was again stronger in the House of Commons than the supporters of the Cabinet. Perhaps it was well for the country that at this juncture such a swing of the political pendulum occurred. The Ministerial side of the House contained many members of distinguished ability, and some few who were as devoted Imperialists as the "Jingoes" on the opposite benches, but it also contained others, and those among the leaders of the party, who desired peace above all things, and who were ready to abandon not merely the hope of conquest, but even the retention of inheritance, rather than continue to wage war. The very cleverness of these politicians was a snare to them. They had so devoted themselves to study of the "dismal science" of political economy as to lose sympathy with the passionate emotions which sweep over masses of mankind, and compel them to a certain course of action. They had divided, distributed, and re-compounded, capital, rents, wages, and profits, until the empire became to them a mere algebraical quality of exchange, which they surveyed with the niggard scrutiny of the bucolic parish counsellor. The victory achieved in the Mediterranean appeared to them a good opportunity for opening negotiations, and for abandoning our coat to a foe who had just failed to filch our cloak. A vague suggestion from the leader of the House that the present moment was propitious for conciliating the French, and appeasing them by magnanimous concessions, raised instant tumult. The rats, who ratted for the honour and glory of England, were still solicitous to uphold her power. The leader of the Opposition was moved to virtuous indignation at the proposed abandonment of the civilising mission of his country, and his satellites were ready, for the country's

good, to exchange their enforced ease and leisure for the troubles and anxieties of office. So it came about that the early defeats of the war were forgotten in the joy of present victory, and the Ministers, who retired when the Lucania was captured, returned once more to the precincts of Downing Street when the French fleet was destroyed; only shuffling themselves into different official chairs to those they formerly occupied. This re-shuffling of appointments is one of those amusing traits of political Tom-noddies which tends to conserve the authority of permanent officials, and is therefore carefully incorporated into the most sacred traditions of all departments, from the circumlocution closet down to the petty bag office.

The second battle of Toulon had raised the prestige of England with continental powers: they saw that the lion's tail could not yet be twisted with impunity, and that the naval force still at our disposal was formidable enough to determine the conclusion of the present war. Indeed, continental military men began to vaguely wonder whether the naval strength of England, with her vast reserve of ships, some of the first class and some of the second or third class, but all of them fightable and seaworthy, did not more than compensate for the lack of those bloated army corps which rendered central Europe one vast camp. No doubt the vague surmise would be a certain reality if only the *personnel* was equal in numbers to its quality; but, unfortunately, the value of our reserve ships was reduced by want of seamen and engineers to man and move them.

However, the impression on continental opinion was sufficient to rouse the "honest broker" to activity, and his first tender of conciliatory offices to the combatants was accompanied by massing of troops on the eastern frontier of France. At the same time the Italian fleet made a demonstration in the Levant which, accompanied as it was by

assurances and explanations to ourselves, was certainly not reassuring to our enemy. All these movements tended for peace, and the new Premier skilfully took advantage of them, and so conducted the negotiations as to effect a very formidable combination against the republic. He did not exact onerous terms, for peace was essential to enable us to deal with pressing claims made upon us by other Powers; we retained the vessels we had captured, we received back most of the merchantmen taken from us, and compensation for the others, and we obtained a free hand for our future administration of Egypt, and additional representation on the board of the Suez Canal. The Khedive was indemnified for the invasion of his territories, and retained the arms and ordnance of the French troops entrapped there, as a penalty on the republic for the disturbance of the peace of a friendly Power. There was none of that revision of the map of Europe anticipated at the commencement of the war: the various Powers appeared afraid to try the prowess in the field of the troops they had taken so much trouble to train, and our own Premier was too anxious for peace, if only it could be peace with honour, to encourage any prolongation of the struggle.

CHAPTER XVII.

My Return Home—Engineers' Complaints.

I RETURNED to England, with other officers and men, soon after the second battle of Toulon. The illuminations were not yet over, and floral fêtes, garden parties, and charming dances diversified the dinners and banquets with which the returning braves were welcomed. The ships of our fleet, the Admiral, and his "squadron commandants" (to quote an

appropriate Indian military term), remained at Malta or in its vicinity, and most of the captains were with them, but Mrs. Leo Hunter was content with a lieutenant, or paymaster, or even a full-grown midshipmite who had been under fire, when she could not capture a captain or rear-admiral. I was present at one or two of her entertainments, but seldom met any engineers there; indeed, she persistently ignored my own proper designation and gave me brevet rank as a lieutenant-commander in introducing me, although the purple stripe on my arm was conspicuous enough. My first excursion, when I could escape from attendance at the Admiralty, was to the Devonshire Rectory, where the tender home welcome was mingled with pride felt in the son and the brother who had taken part in the recent battles. I believe my father looked upon me as a worthy successor to Sir Richard Grenville. In a house near to the Rectory lived a fair sweet maid, not *yet* one of us, to whom I oft related my story of the war, who listened eagerly,

> "And bade me, if I had a friend that lov'd her,
> I should but teach him how to tell my story,
> And that would woo her."

I had been quite long enough away from home, and endured sufficient hardships, to revel in the peacefulness of the old village, and enjoy the greetings of the hedgers and ditchers, or the charming milkmaids, whom I met on their way to work. They looked upon me as a veritable Mars resting from his wielding of the thunderbolts, and would not be undeceived when I told them that my nearest approach to such prowess was the opening of a throttle valve. Admiration is very sweet to mankind, and my uniform begat admiration. I wore it more frequently in the village than I wore mufti—a pardonable vanity in which I am sure most of my readers would have indulged had they been tempted as I was.

My holiday came to an end all too soon, and I reported myself at Portsmouth for duty. I met some of my old Mediterranean companions there, together with many men new to me, but all I met were busily employed, as I soon was myself. The dockyard authorities were fitting out new vessels to replace the damaged ones lying in Malta harbour, and the naval engineers assigned to these several vessels found plenty of work on board. During the day time, when on duty (and we were kept on duty for more than the working man's ideal day of eight hours), we had little time for conversation, but we found plenty of opportunity over our pipes in the evening for discussing the iniquities of naval administration, or comparing notes of our departmental grievances. And the number of grievances we discovered was wonderful. Every man appeared to have some additional reason for growling at the powers that be, and deemed it a duty to the engineering profession to communicate it to his fellows. The most persistent grumblers were such officers of the Naval Engineer Reserve as had joined the navy. They complained, and with some show of reason, that they had been employed on duties which brought them no honour, as honour is understood by the multitude, whilst their loyalty to their engagements was in many cases productive of pecuniary loss. One gentleman in particular was most vigorous in his denunciation of Admiralty regulations and Admiralty officials, and the circumstances of his case lent a charming piquancy to his criticism. He had, years before, been present at the bombardment of Alexandria, in command of an ocean tramp employed as a transport, and this experience supplied him with numerous tales for the amusement and edification of his shore friends. It also provided him with acquaintances whose serviceable good nature secured him the post of marine engineering superintendent for a large carrying company He held a

commission in the Naval Engineer Reserve, and on the strength of it was dubbed by his acquaintances "Captain" Lackless, a title which he did not repudiate, or only declined in such a manner as assured his friends that it was not unacceptable to him. Judge, then, of his indignation when he reported himself at Portsmouth, at being posted as second engineer on a large Admiralty cargo steamer, employed in conveying stores between the various home ports. The chief, although his junior in age by many years, and certainly inferior to him in ability, belonged to the Royal Navy, and therefore took precedence of him. This was gall and wormwood to "Captain" Lackless, who for many years past had been a little autocrat in the company's engineering works, and placed or displaced the engineers of their various steamers at his own sweet will. Nor did his annoyance end in the engine-room: one of his works clerks was a naval paymaster on half pay, who had been recalled to active employment on the outbreak of the war. They served on the same steamer, and so it happened that "Captain" Lackless found himself junior in naval rank to a man whom, a week or two before, he had designated a mere writer. I am not inclined to endorse every complaint made by these reserve engineers. Some of them came to us with great expectations, and were deservedly disappointed; but they all had reason to complain of the neglect with which they had been treated by the authorities in time of peace. No opportunity had been afforded them of learning the discipline and methods of working of a man-of-war; no instruction had been given them in mounting and dismounting guns, or examining and repairing torpedo tubes; they were left untrained in the distinguishing features of a war vessel, and therefore, for a time at least, were useless thereon. The officers of our reserves are only called upon in a national emergency; it is surely absurd to commence teaching them

their goose-step when the emergency is upon us, and they are required for instant and useful action. Naturally, they felt snubbed by the authorities, even before they joined for service, but when they joined, and found engine-room artificers efficient in martial duties which they had yet to learn, their professional pride was severely hurt, and their dislike to Admiralty red tape considerably intensified. Most of them openly expressed their envy of such of their comrades as had continued with their old merchant ships on their transfer to the American, German, or Italian flags.

My naval engineering friends were, as usual, complaining of their rank, promotion, and pay, and made peculiarly bitter comparisons between the other civil branches and their own. For instance, whilst they made no objection to the engineer under six years' seniority ranking with, but after, lieutenants under eight years' seniority (for lieutenants, as combatant officers, who take precedence of civil officers for command, ought, of right, to have due prominence given to their rank), they did strongly object to ranking with an *assistant* paymaster of six but under twelve years' seniority. The careful measuring of grog, and weighing of salt pork and cocoa cake, are doubtless duties of immense importance. The fighting quality of the fleet depends on the strength of the sailors, and the sailors' strength is dependent on their being properly fed; but as this proper feeding is largely assisted by mixing the rum and water in due quantities, and sufficiently boiling the salt pork and cocoa, we might infer that the ship's cooks of over six years but under twelve years' seniority ought equally to rank with the ship's engineer. The fact is, the paymaster's position is a relic of mediæval superstition, when all men who could write their name or read a sentence in a missal were entitled to benefit of clergy. In these days, when schoolboys are trained in the mysteries of double entry, and initiated into the

compilation of balance-sheets, some further and more competitive test is desirable for the pursers, if they are retained at all as ornamental appendages to men-of-war. It might, for instance, be the preparation of pea soup or boiling of oatmeal porridge. Setting aside all exceptional opportunities of promotion or of shore appointments, the ordinary pay of these pursers compared very favourably with those of the engineers. During his early years, perchance the assistant engineer reaped the benefit of his professional standing. He was certainly better paid on his appointment; but this advantage rapidly disappeared as service accumulated. When the members of the two branches first reached the respective ranks of fleet, staff, or chief engineer on the one hand, and of fleet or staff paymaster or paymaster on the other, their pay was equal, namely, 14s. a day. Whilst, however, the engineer is limited to a maximum rate of 26s. a day after 14 years' service in those higher ranks, involving, generally, some 12 years' prior service as assistant and engineer, the paymaster can attain in corresponding relative ranks a pay of 33s., after a total service in the navy of 27 years. No wonder our old "Lascars" wish they had qualified with the tea caddy and bread cask rather than the oil can.

The paymasters certainly appear very well paid for their work as compared with my own branch of naval officers, but I am not prepared to assert that they are overpaid: my lords have, doubtless, considered their case well, and frequently consulted the Accountant-General respecting the money value of their services. However, I certainly do wish that our engineer-in-chief had as great financial influence as the "general" at the head of the pay and allowances branch. The medical officers are an improvement on their early predecessors, both in their intellectual and professional training, and the emoluments they receive

in recognition thereof; indeed, for their own special duties, they are as admirably equipped as engineers are for theirs, and I can pay them no higher compliment than this. But I certainly do join the engineers in the wish that the salaries were divided as equally as the education is apportioned. Strange to say, my brother officers felt more jealousy of the medicals than of the paymasters, owing possibly to their assumption of superiority as members of one of the ancient learned professions, and also to the greater advantages accorded them in promotion and pay. The surgeon on entering the navy (he is never an assistant) receives 11s. 6d. a day, or 4s. more than the "assistant" greaser, and ranks from his first appointment equally with the full-fledged engineer. After four years he receives 13s. 6d. a day, and after eight years 15s. 6d. a day, the latter being more than the chief or staff engineer obtains on first appointment. When he is promoted to staff surgeon his pay is 21s. a day, after four years 24s. a day, and he ranks with the staff engineer, wears an equal uniform, is subjected to equal expenses, but receives a much larger income on which to support his expenditure. On reaching the rank of fleet surgeon his pay is 27s. a day, or 1s. more than the maximum of the fleet engineer, and this is increased to 30s. and 33s. a day respectively after four and eight years' service in that rank. My brother officers contended that there was not such difference in the qualifications of the two professions as would justify the higher pay and other advantages given the medicals. They were of opinion—and there is something to be said for the opinion—that a naval engineer requires and receives a training as complete and encyclopædic as the naval surgeon, and that the services he renders in driving the ship are incomparably greater than the binding up of scratched legs, or setting of shattered fingers, by the more favoured officers.

However, I had heard these complaints and murmurings ever since I joined the service. They were not confined to the engineering branch alone, for, so far as my experience goes, every man thinks himself neglected and unfairly treated from the moment he enters the Government service. This is so marked a characteristic of State employment that it would appear there is some great underlying cause for it, but what the cause is I have never yet been able to discover. Socialists assure us that universal happiness will follow upon universal State service. Perhaps the philosophical Fabians may be able to explain the divergence between the prediction, and the result of the partial application of their theories. I have such a high respect for their reasoning that I do not doubt their ability to solve this, to me, insoluble problem; my only doubt is whether they will descend from their pinnacle of abstract meditation to enlighten a poor Philistine like myself.

The indignation which the engineers expressed when the honours for the recent victories were announced was of a much more relentless type than their ordinary grumbling. They did not dare express themselves openly by petitions to the Admiralty, or letters to the press, but they gladly provided copy for interviewers, and welcomed smart reporters to their club rooms and evening haunts. Some few braved official censure, if discovery followed on their act, by writing pseudonym letters to the *Times* and *Army and Navy Gazette*, while others supplied honourable members with facts and reasons for attack on the Admiralty. The most drastic measures of reform were demanded, especially by those who suffered the least injustice, by the young engineers who had hardly passed the harbour's mouth, and by students hurried from Greenwich to take home duty on insufficiently manned ironclads. These young gentlemen, who had not yet heard a shot fired in anger, were wroth that no chief engineers were

created Companions of the Bath, nor inspectors of machinery knighted. With far more reason some of our fraternity, who had been through the recent action, complained that the valour they had displayed had been unrecognised in the distribution of the coveted Victoria Cross. Surely, they said, there is as much valour in standing to your duty in a steam-filled engine-room, stopping leaks, or repairing breakages, with the chance each moment of being drowned like a rat in a hole, as there is in pointing and firing a gun with bursting shells around you. My good friends, you have not yet studied human nature, or you would not weary the Admiralty and the public with such childish complaints. Have you not yet learned that the advertisement is greater than the deed, and that valour is useless unless exhibited in presence of a superior officer? However, in ordinary promotion they really had great reason for outcry. Of course some few were promoted, for we had vacancies created in the ordinary lists which must be filled up, but there was none of that general advancement which the executive officers enjoyed as reward for the good fight they had made, nor even so much promotion as the other civil officers received. It was far better to be a doctor or a purser in those days than an engineer, although on the latter corps depended the ability to move our ships, and the want of such encouragement as would recruit their ranks had been the chief cause of our past disasters.

My comrades were the commissioned officers of the profession, but I knew some of the inferior branch—the engine-room artificers—whom I was proud to call my friends. Their treatment was even worse than ours: they had no warrants offered them as rewards for their hard work, nor commissions distributed in appreciation of their fitness for higher rank. They were awarded silver medals like any ordinary bluejacket, and received her Gracious Majesty's

permission, expressed through Admiralty General Order No. —, to wear them on such occasions as the regulations directed. The medals did not act like the immortal "silver churn:" they failed to keep in the service any who could claim their discharge, and as these at the end of the war were numerous, there was a pretty considerable exodus of artificers. The chickens were coming home to roost, and the difficulties they would engender in their roosting would be considerable, if peace should not continue.

CHAPTER XVIII.

Difficulties with the United States—The Equipment of the Disputants—Declaration of War—Declaration of Paris and Privateers—The United States Navy.

THE continuance of peace was not so assured as English statesmen could wish. It will be remembered that our political difficulties were not with France alone; that we had troubles all over the world, and, at the commencement of the recent war, had grave reason to dread the intervention of Russia. Why that ambitious Power did not take such an opportunity to extend her Asiatic possessions is a question which probably can only be answered by a peep into the secret recesses of her Chancery: possibly she was not fully prepared; probably she desired her ally to pick the chesnuts out of the fire, for her afterwards to enjoy. We had escaped the danger of a contest with her, and the mediation of the central European Powers, so happily tendered, had secured us from present attack by her: Russian diplomatists saw that the leaders of the triple alliance deemed it necessary for their own security that the English empire should not be dismembered by powers who might afterwards threaten

themselves. For the moment we were safe from attack on this side the Atlantic, and assured of a brief breathing space wherein to repair our damages and recruit our strength; but, on the other side the Atlantic, there was a danger which for a time had seemed to fade away, and which the nation generally had lost sight of during the recent struggle. Some paltry questions of frontier lines through impervious forests, some trifling claims to unnavigable rivers, had been magnified into infractions of the Monroe doctrine, and threats against the sovereignty of the American people. So far as the little Spanish-American States were concerned, we might easily have settled the matter by the shells from two or three gunboats, or the landing of a battalion of marines; but when the United States intervened the question became a much graver one. It had been slowly dragging its course along for some years—now bursting forth into actual and immediate danger of hostilities, and again slumbering as though the gates of the Temple of Janus were ever to remain closed—but the sore was never really healed. A chance difficulty in finding a suitable platform for the Presidential campaign brought it once more to the front; both the contesting parties were determined to uphold the honour and safety of their country; both protested that they would drive the British flag ignominiously from American soil, and clear the land of the free from future contamination by worn-out and effete feudal monarchies. The platform was selected suddenly, and without much consideration of the effect it might produce: the Secretary of State in present office wrote threatening despatches, and the orators who hoped to oust him made bellicose speeches; American editors indulged in spread-eagleism; and the people generally worked themselves into a state of rabid excitement over the wrongs their country suffered, and which must now be redressed. There was then, and still remains in the United States, one element in

the constitution which must ever be an element of danger, if not of actual menace, both to ourselves and to other nations; and that is the facility afforded foreigners for becoming citizens of the country. Thus it happens that a large proportion of the voting population consists of men who, though citizens of the States, are by sentiment and political instinct revolutionary foreigners, cherishing a bitter hatred of their fatherland, and ready to plunge their adopted country at any moment into war, if by so doing they can inflict injury on the country of their birth. It appeared plain enough to our statesmen, and even to our people, that we had only concluded peace in order to be dragged into another war. When the demand was formally made that imperial troops should evacuate Canada, and the British Crown abandon its suzerainty over that colony, it was evident the struggle could no longer be averted.

The British army is notably weak for the extent of territory it has to protect. With the exception of India, few of our colonial possessions are adequately garrisoned, and we have frequently experienced reverses in puny wars through the insufficiency of our troops present on the spot. The frontier of Canada is an extended one, and open to invasion at many points, whilst the garrison ordinarily kept there can do little more than watch these points, and endeavour to concentrate within the frontier when the method and direction of the attack has become developed. This, however, is not so serious a defect as may at first sight appear. The imperial troops are seasoned men, and form an admirable nucleus round which the colonial militia can congregate, whilst the majority of the colonists have a holy horror of annexation to the States. If the British troops in Canada were few in number, the American forces throughout the States were equally deficient in numbers, and probably greatly inferior in quality. They had no such training

ground as our Indian frontier, and American officers were much better fitted for hunting down contumacious Sioux, or conducting guerilla warfare, than meeting disciplined troops in campaign. If the Canadian side of the frontier was open to invasion, there were places on the American line where a hostile force could effect a lodgment from which it could only be driven with great difficulty. It is true that the States could, as in the Confederate war, raise masses of men, and after a time train them into steady troops by discipline of sheer slaughter, but this was a plan the Canadians could equally adopt, with the advantage of an ample reserve of trained officers upon whom to fall back. The possibilities of the land conflict were more nearly equal than the Yankees were willing to acknowledge.

The fact was, the lessons of the Confederate war were lost sight of by the American officers and nation: the habit of exaggeration which so pervades their character had distorted the history of that war into a story of disconnected conflicts between mediæval Paladins, and thus a dangerous notion of invincibility had grown up with the younger generations. A very slight survey of the facts will show that the most potent factor in the success of the Northern States was their overwhelming superiority in naval force, a superiority which enabled them to declare and enforce one of the most extensive and effective blockades which has ever been witnessed. The Southern States were completely hemmed in both by land and sea, and unable to gain access to the outer world, either to obtain supplies of warlike materials and clothing, or to dispose of such produce as they could raise in the uninvaded portions of their dominions. In was this blockade, more than any ability displayed by Grant or Sherman, which decided the fate of the rebellion, and it was this effectiveness of naval strategy which should have been aimed at by the United States in their struggle with Great

Britain. If they could secure the command of the sea, they would conquer Canada. If they failed to obtain that command, if they could not stop communications between the colony and the mother country, they would certainly not hold the provinces north of the frontier line, however lavishly they might pour forth hordes of undisciplined men as food for powder.

What was their equipment for such a war? They had 16 line-of-battle ships, 26 cruisers, 13 coast defence vessels, and 13 torpedo boats, a force vastly inferior to that which the English could bring into action, even after their recent heavy losses in the Mediterranean. The four powerful steamers of the American Line, the New York, Paris, St. Louis, and St. Paul, were also subventioned for service as armed cruisers. The two former will be remembered as belonging to the Inman Line, and were built at Clydebank; the two latter were native built at Philadelphia. The indicated horse power was the same for all the vessels, 20,000, giving a calculated speed of 21 knots; but whilst the English-built ships had a sea speed of 20 knots, the Americans only reached 19 knots. They were, however, all formidable vessels, and an important addition to the naval strength of the United States.

This naval force of the States was absurdly small when compared with those of the European Powers: it was utterly unfitted to fight against the navies of France, or Germany, or Russia. Against such nations it could probably have effected little damage which would contribute to the conclusion of the war: it could not have destroyed their war-ships, and interruption of commerce would have caused the minimum of inconvenience to nations with numerous and adequate land routes. But the States held in reserve a form of attack which might prove particularly disastrous to an insular country like our own, relying on ocean transit for a

large proportion of its food supply, and for the conduct of its trade with foreign countries. At the Congress of Paris, in April, 1856, the Plenipotentiaries of Great Britain, France, Prussia, Russia, Sardinia, and Turkey signed a declaration in reference to maritime law in time of war, the first clause of which was : "1. Privateering is and remains abolished." The concluding clause stated : "The present Declaration is not and shall not be binding except between those Powers who have acceded or shall accede to it." The French Minister communicated this Declaration to the United States of America, and on July 28, 1856, Mr. Secretary Marey answered that the United States would approve of it provided there were added to Article I. the following words : "And that the private property of the subjects or citizens of a belligerent on the high sea shall be exempted from seizure by public armed vessels of the other belligerent, except it be contraband." A presidential election soon after interrupted the consideration of the subject, and the United States have never since assented to the Declaration.

The American waters have ever been the home of the buccaneer and filibuster. Our own beloved Drake, greatest of privateers and scourge of Philip's armada, sought Spanish ships and Spanish gold in the West Indies and round the coast of Chili and Peru. The cruelties of Alva were revenged by the capture of the great galleon which annually sailed from Lima to Cadiz, and threats uttered against our Virgin Queen stimulated the courage and audacity of the "sea dogs" who scoured the Caribbean Seas. The times have been quieter since the war of independence. The rough methods of semi-private warfare of the sixteenth century have been termed piracy in this nineteenth. Yet the spirit of Drake still lingers round the Indies, and has impelled Yankee adventurers into filibustering expeditions to Texas, Mexico, and Cuba. Letters of marque are consonant to their character.

They combine opportunity for romantic daring, and generous pillage, with democratic license and equality. The liberty to employ privateers, which the republic had reserved to herself, was therefore a distinct advantage, and permitted the employment of her mercantile marine in the form which would best commend itself to her merchant sailors and officers.

In England, on the contrary, the disuse of privateering since the great struggle with Napoleon, the efforts of her statesmen to restrict or abolish it, and the vast development of the Royal Navy, had combined to deprive us of successors to Drake's "sea dogs." We had seamen both in the Royal Navy and the mercantile marine as sturdy and true as those of the Elizabethan days, but they had not the mixture of qualifications, of equal adaptability to trading enterprise or desperate fighting, essential to the character of the privateer. The declaration of Paris did not bind us against issuing letters of marque in war with the United States, but the character of our merchant sailors would deprive such letters of much of their value.

The British nation had too recently emerged from a desperate war to be enthusiastic for another; British statesmen had too recently experienced the difficulties and uncertainties of a naval struggle to enter upon a second with a light heart. But the demand for the evacuation of Canada was accompanied by preparations which left no doubt of the intention to compel it, if necessary, by force of arms, and neither the national sentiment nor the welfare of the country would permit the abandonment of so important a colony without a desperate endeavour to retain it. The refusal of the demand was immediately followed by a declaration of war by the United States against Great Britain.

Our mercantile marine supremacy had been almost annihilated by the war with France. Such ocean steamers

as had not been captured in the early days of the struggle by the enemy's cruisers had been transferred to foreign flags, or sold outright to foreign owners. On the conclusion of peace those ships which had been registered in foreign countries merely to protect them against capture were re-transferred to the British register, whilst the numerous steamers laid up in our own ports were again prepared for sea. British energy was exerting itself to repair the damage which had been suffered, and regain as far as possible the commerce which had been lost. Of course it was impossible to recover the vessels which had been sunk or those sold to foreign holders, and, unfortunately, these were numerous ; but new vessels were ordered, with engine power and carrying capacity at least equal, and sometimes superior to those which had been lost. The Union Jack was soon floating over the seas as in times of yore, and merchants in Liverpool, Manchester, and Glasgow were once more ordering cargoes to be shipped in British bottoms. American privateers would therefore have plenty of prey if only their speed and prowess were equal to the capture. In the French war we had to guard against duly accredited men-of-war, the general disposition of which was, or at least should have been, known to our Intelligence Department. By blockading the naval and fortified ports of France we could have prevented the egress of such vessels, and secured for ourselves the sea routes. Such a blockade should have been possible with the number of ships in our navy: it only became ineffective through the insufficiency in numbers of our seamen and engineers. The enforcement of a blockade of the American ports would be much more difficult. The coast line was an extended one, with numerous and admirable harbours, whilst between those harbours were bays and creeks which could readily be made available for repairs, and shipment of coal and supplies. The ordinary

American seems, from his earliest infancy, to have his faculties of invention and adaptability developed. Men are so scarce in that vast, and as yet only partially developed country, that there is a constant strain after labour-saving machinery, and a continued effort to make the best possible use of existing conditions. The pestilential vessels which would prey on our commerce could, in an emergency, re-fit or re-coal in sequestered bays or secluded rivers without resorting to naval dockyards, or seeking harbours shadowed by an enemy's fleet. It must be remembered they were not weighted with armour, not even with protected decks, and were intended only to damage or destroy merchant vessels; not to wage battle against royal cruisers. Repairs to them were therefore comparatively easy of execution. Indeed, it was by no means certain that the Americans might not build some sufficiently formidable pirate craft in very secluded and unsuspected spots; the heaviest and most difficult portions of them, such as engines, and large castings and forgings, could be prepared far away in the interior, and transported over their octopod railroad system to the coast. This would be a trifling matter compared to some of the difficulties Yankees have encountered and overcome in the expansion of their country.

The President no sooner declared the United States to be at war with Great Britain than the preparations for privateering were commenced. The naval "bureau" (the Americans are fond of French terms) freely issued letters of authority to merchant captains to seize and destroy the ships of the enemy, and these captains were sufficiently energetic in fitting out their vessels and providing crews. There was no difficulty in getting men: hatred to this country, combined with love of adventure and hope of plunder, sufficed to bring forth as many as were required. If the majority of them were desperadoes; if some of them

had worked at Dartmoor, and others lingered in Cuban or Mexican jails, they were none the less formidable on that account; their very antecedents, and unhappy experiences, would render them more determined not to submit to capture. "Dead men tell no tales" is an axiom in the Wild West, and the men who quote the axiom are much inclined to act upon it. This is one of the dangers of privateering, and the European Governments pursued a humane course when they declared that, as between themselves, it was, and should remain abolished. The guns were as motley as the crews. Obsolete Parrott and Rodman cast-iron guns were hunted up from obscure stores, from local museums, city parks, and corners of arsenal yards. Dahlgren bronze guns were prizes eagerly sought for by ships' husbands anxious to get their vessels to sea, whilst the few stray quick-firing rifled guns to be found on the market reached a fabulous price. Machine guns and small arms were more readily procured, and were of excellent quality: the repeating rifles of the Winchester Factory are, in some respects, superior to our Lee-Metfords for the rough usage of war, whilst the name of Colt is a sufficient guarantee of the quality of the revolvers from those works. So in some fashion or other the privateers were fitted out, and though the arms were often old-fashioned and the ammunition of wretched quality, they were in the hands of men who most assuredly would fight, and fight well, too. There was the old buccaneering spirit in them, and the buccaneers, though sometimes cruel, were never cowards.

We soon knew of the presence of these privateers. Our merchantmen were chased by them relentlessly, and either captured and carried to port, or burned. Sometimes the crews of the captured ships were taken prisoners; sometimes they threw in their lot with their captors, either from hope of plunder, or under duress; sometimes they amused the

victors by walking the plank. The privateers, in too many instances, had the spirit and ethics of pirates, and very rapidly degenerated into piratical acts. Stories occasionally reached England, through some of the fugitives, of atrocities which seemed revivals of the deeds of Montbars, Mansvelt, Sawkins, and Henry Morgan. No doubt they were greatly exaggerated, but they served to raise the indignation and war fever of the nation.

I have pointed out the weakness of the Americans in number of ships: they were equally weak in the quality of those they possessed. Probably they had no ironclad approaching, for offensive and defensive power, our own magnificent line-of-battle ships of the Majestic class. Whilst the latter were 14,900 tons displacement, the Kearsage and Kentucky, the most recently built American line-of-battle ships, were only 11,500 tons displacement. The former were protected by a belt of 9 in. Harveyed armour, whereas the latter had only an armour belt ranging from 4 in. to 15 in. thick. This was, however, of nickel steel, and much greater resisting power was claimed for it than any other description of rolled or compound plate. The I.H.P. of the English ships with natural draught was 10,000, and with forced draught 12,000, giving a speed of 17·5 knots: that of the Americans with forced draught 10,500, giving a speed of 16 knots only. The full coal capacity of the Majestic class would enable them to steam 7,600 miles at 10 knots; that of the Kearsage 6,000 miles at the same speed. In armament the American vessels had an apparent advantage, as they not only carried four 12 in. breechloaders like our own ships, but in addition had four 8 in. breechloaders. It must, however, be remembered that our four 12 in. guns were of the wire-wound Longridge type, and, therefore, much more reliable than the solid cast-steel or built-up guns to which the Americans still adhered. The 8 in. guns were also

mounted one in the upper storey of each turret and one on each beam, two 12 in. guns being placed in the lower storey of each turret. This arrangement had not commended itself to our naval designers, and our gunnery officers were unanimous in condemning it. If any failure occurred, it was probable that it would be more disastrous than in a ship with turret guns mounted as in our own. The quick-firing batteries were also in our favour, as the increased power of our larger guns would more than compensate for the greater number on the American ships: they had, for instance, fourteen 5 in. quick-firers, against our twelve 6 in. quick-firers. These may be taken as examples of the best types of line-of-battle ships in the two navies, and the comparison between them did not strike terror into the British Admiralty.

The American coast defence vessels were not very formidable; their displacement alone will indicate that either armour, armament, or engine and coal capacity must have been sacrificed in reducing it: generally it may be assumed to be the latter. Eight of them had only a displacement of 1,875 tons and 340 I.H.P. each. The larger Monterey had only 4,138 tons displacement and 5,072 I.H.P. with forced draught. It was calculated she could make 14·4 knots, but it could only be for a very short distance, as her coal capacity was only 200 tons. The Puritan was a more formidable ship of 6,060 tons displacement and 3,700 I.H.P. She could make 12·4 knots speed, and had a coal capacity of 580 tons, which was, however, insufficient to rank her as a sea-going vessel.

In cruisers they appeared relatively better off so far as numbers went, but only two of these, the Minneapolis and Columbia, would have been classed as first class in our navy. All the others had less than 8,000 tons displacement, some of them being, indeed, only about 1,000 tons, with a capacity for crawling about at the rate of 8 or 10 knots only. There

was one vessel in their fleet which as yet was an unknown quantity. It appeared in the Navy List as a "dynamite gun vessel," and had a calculated speed under forced draught of 22·5 knots. Considerable mystery was observed about her powers and mode of operations. The States pressmen predicted great results from her employment, even to the annihilation of an enemy's squadron, but the naval authorities did not appear to join in these glowing anticipations. She was launched in 1888, and her design had not been repeated.

The *personnel* of the American navy was equal to its ordinary requirements; the training of the officers was excellent, and thoroughly practical. There is generally a vagueness about American scientific work which would not be tolerated in the universities of the "effete and worn-out old continent," but in the naval college there is little of this laxity: the instruction is at least equal to that of Greenwich College. The numerous river boats and steamers furnish a rich recruiting ground for seamen and stokers, who have at least such primary knowledge of a ship as will enable them to distinguish her stem from her sternpost, and the stokehold from the conning tower. There is plenty of hard work on these harbour and river boats; they are run at high speeds and under conditions of great pressure, so that the men employed on them do not find the work on men-of-war much heavier, though vastly differing in kind. The naval engineers were skilful officers, and the value of their services had recently been recognised by Congress in the passing of an act conferring on them military titles and military rank. This act was drafted and promoted by Senator Watson C. Squire, of Oregon, and certainly contained some provisions which might, with advantage, be copied by our own Admiralty. The chief of the engineering department was styled "Director General of Naval Engineering," and he

held the rank and status of a rear-admiral ; his two assistants, styled "Inspectors General of Naval Engineering," held the relative rank of commodore, and were, like their chief, to be selected by the President from the naval engineering staff. The duties of the senior assistant included designing of all machinery, experiments in marine, electrical, and mechanical studies, visiting technological schools and merchant ships, attending all trials, and preparing data and instructions for the service engineers. It will be seen at once that the tendency of such omnivorous powers and duties would be to stereotype the forms and methods of machinery used in the navy, but the American fashion of bundling out all officials with each change of the political whirligig removes this danger to some extent. There is much greater risk of stagnation in England, with its army of permanent officials holding office practically for life, but with us it is again modified by the advantage we possess of highly-trained engineers outside the Government circle, whose continued search for new or improved construction reacts on the more conservative State employés. There is one important regulation of Senator Squire's Act which we might copy with great advantage. The duties of the Director General include everything connected with engineering material and *personnel*, and he is a member of every board connected with the navy, a position which enables him to protect the interests of his profession against both the executive and the civil branches of naval administration. When we compare the position held by this officer with our own Engineer-in-chief at Whitehall, and our chief's subjection to the Assistant Controller of the Navy, we may well feel envious of the advantages possessed by our professional brethren in the United States. There can be little doubt that he would be in a better position to conserve our interests and represent our services, than he is at present, if he were dubbed

"Director General," ranked with a rear-admiral, and attended, as an *ex-officio* member, all naval boards.

It is not, however, in humanity to attain perfection, and the senator's Act, whilst removing some glaring defects, unfortunately introduced others. The American Navy, like our own, had suffered through an inefficient complement of engineer officers; indeed, their straits had been worse, and many engineers had either died through diseases contracted in performance of their duties in time of peace, or had, in some instances, anticipated the end of illness by committing suicide. The Act fixed the number of commissioned engineers at 303, being an increase of 110 over the number previously allowed by law, and of 130 over those actually enrolled. But the titles given to these 303 officers became a source of trouble not anticipated either by the promoters of the bill or the legislative bodies which passed it. There were to be 18 captains, 25 commanders, 60 lieutenant commanders, 70 lieutenants, 65 junior lieutenants, and 65 ensigns, all military titles, corresponding with those borne by the executive or deck officers. The result may readily be imagined. If you address a frog by the name of a bull, it will seek to swell itself out to one, and this was what the engineers endeavoured to do. They were dubbed captains and commanders, and they sought to be so in fact as well as name. The American papers fostered the endeavour. One professional paper, the editor of which ought really to have known better, wrote: "Indeed, it would seem proper that the cadets designed for the engineer corps should be thoroughly trained in gunnery, in navigation, and in tactics, and we venture the opinion that the high intelligence which enables a man to become a good steam engineer will be found to fit him to take any position of responsibility or command in a modern navy." The Act, therefore, which was passed to remove some of the disabilities under which the engineers had laboured, and

raise their numbers to a sufficiency to cope with the increased machinery of the navy, resulted in an injustice to the executive branch. From the naval bureau to the smallest gunboat there was continued friction. The executive commodores and captains and lieutenants desired to continue that absolute command of their ships which they had possessed in times past, and contended that it was essential that it should remain, both for military purposes and for proper and safe navigation. The engineers replied that the machinery of a ship being the most important portion of her fighting equipment, she could only be properly fought by, or at least in conjunction and with the approval of, the officer in charge of her machinery ; whilst he was the proper supreme director of the navigation, since she could not move at all without his aid. That this is no exaggeration of the claims made will be seen by an article in an American magazine of almost world-wide fame, in which, after claiming "positive military rank" for naval engineers, the writer concludes : "The great commanders of the future will be men who, like the gallant and honoured Admiral Ammen, combine, with stout hearts and stragetic brains, an intimate knowledge, based on engineering study, of the details and capabilities of the mass of machinery which constitutes that boating (*sic*) fortress, the warship of to-day." Of course this is absurd ; the duties and training of the average naval engineer do not qualify him for high military command, and the exceptional display by some few, of extraordinary military ability, would hardly justify conferring on the entire corps powers in the due use of which they had received no training. The friction was not allayed when the war broke out, and it continued to exercise a very detrimental influence on American strategy. The example of divided counsels, consequent on dividing responsibility to meet a clamorous and ill-conceived demand, should be a warning to our own Admiralty in the future, to

maintain unimpaired the absolute and unquestioned authority of the commanding military officer of the ship.

The American fleet was directed to concentrate in the neighbourhood of Long Island. The naval and military commanders had no very definite plan of operations ready at the outbreak of the war, nor, as I have said, any trained army to carry out extensive land operations. There was much tall talk in Washington of a dash on Canada, whilst the drinking saloons of New York, Chicago, and Baltimore were rife with suggestions for the destruction of the British power, but no concerted military or naval movements resulted therefrom. The patriotic outbursts of the saloons, however, had one important result: they induced hundreds of able men to eagerly seek service in the numerous privateers fitting out, or to volunteer for a raid into Ireland, which, from political dissatisfaction, was deemed to be the weakest point in our empire.

CHAPTER XIX.

The British Preparations — The British Concentration — Engineers' Troubles on the Blenheim.

We usually had about a dozen vessels of various descriptions in the North American and West Indian command, but at the outbreak of the war we had about seventeen, five of which were first-class line-of-battle ships, and the remainder formidable cruisers. Our squadrons throughout the world had been strengthened considerably before the French war commenced, not merely in view of the hostilities impending with that nation, but also of other threatening eventualities. The North American command had shared in these reinforcements. When the second battle of Toulon gave us the absolute control of the Mediterranean, so many of our ships had to be placed under repairs, or under inspection for

breaking up, that we were left without any sufficient fleet in that sea. It was, however, urgently necessary that this condition of affairs should be remedied at once, and therefore the released crews had to be transferred to ships at home for duty in them at Malta, or in the Channel Squadron, in place of other ships sent from that squadron to the Mediterranean. In ships, therefore, we were deficient of those which had been disabled for present fighting purposes in obtaining our victory. In officers and men we had lost a considerable number either killed or wounded, and the conclusion of the war had nipped in the bud any tendency to volunteering which had arisen. The ordinary recruiting hardly did more than replace the men who were entitled to, and took their discharge. In one department it did not even do this : the engine-room artificers were being discharged more rapidly than they could be recruited, and those who, under special and temporary conditions, had enlisted from the mercantile marine, again reverted to civil employ.

One good result arose from the dominant influence of the Director of Naval Construction ; the building of new vessels had never been suspended, and, indeed, an increased proportion had been laid down during the continuance of the war. We, therefore, now possessed not merely the former reserve ships, but had also a number of new ones ready, or building, for service ; all we wanted was the men to work them.

The first necessity of the British Admiralty was to increase the strength of the North American Squadron. The mere fact of its being unusually strong did not render it sufficient for the protection of our territories. From New Orleans it was easy to threaten our quiet possession of Jamaica, whilst the Windward and Leeward Islands under our flag were open to attack from both sides—from both the Atlantic and the Caribbean Sea. The Ministry then in office had no intention of parting with any of our possessions, and it is certain that

no such notion would enter the head of a British naval officer. But between these islands and our base at Halifax there was a long stretch of sea, hostile in the sense that on it cruised warships and privateers flying the stars and stripes. The Commander-in-chief could not abandon Halifax, for it was not only his base, but enabled him to protect against invasion the entrance to the St. Lawrence, and also to observe any attempted approach to the coast of Newfoundland; neither could he leave unprotected the West Indian Islands. It was therefore necessary to divide his force into two portions, one for cruising round the West Indian Islands, and the other for the protection of our more northerly provinces. This was not the end of the problem. If the extent of the United States coast line rendered a blockade impracticable, it was at least imperative that watch should be kept on the movements of their men-of-war, and their attempts at concentration observed. It is quite evident that our squadron was not sufficiently powerful for all these purposes, and must be immediately reinforced. Some of the ships intended for the Mediterranean were ordered to the North American station. This, however, could only be a temporary expedient, for it was absolutely necessary to be prepared for any eventualities in the East: although we were free from complications there at the moment, it was impossible to anticipate how long this freedom might continue.

The North American command was reinforced, and every available cruiser sent from the Channel command to protect the route across the Atlantic. Our home admirals were less dominated by the idea of defence than in the French war, but the Lords of the Admiralty, who still retained the supreme direction of affairs, failed to take full advantage of this liberty. They still kept vessels cruising about the English Channel which would have been much more useful on the American coast. They were also limited in the

numbers of the vessels they could despatch, not by want of ships or guns, for they had plenty of the former available, and at least some of the latter, but by want of men. The demand for stokers, artificers, and naval engineers was incessant, and every device employed for securing them, short of revision of existing regulations. It was all in vain The war fever had not yet risen to the height of self-sacrifice, and men could not be tempted into the Admiralty service to the detriment of their comfort and pockets, when they gained no honour for doing so. Naval Reserve engineers, like the invited guests of old, all with one consent began to make excuse, and the excuses were as varied and pertinent as in the parable.

Thus once again it happened at the outbreak of the war we were hampered in our fleet movements by want of men, more particularly of that class on whom we relied to move the ships. It is often said that in land warfare the victory is most likely to be gained by that power which can, on the declaration of war, most rapidly concentrate its troops, and throw an overwhelming force on some crucial point. To some extent this applies to naval warfare. The power which can first concentrate its ships in the enemy's waters, and blockade his naval ports, compels him to fight at a disadvantage, or to abandon that command of the sea to secure which men-of-war exist. Had we in past years increased the numbers of our seamen and engine-room staff in the ratio demanded by the more patriotic of our critics, we might have been able to throw upon the North American coast a sufficient force to prevent the escape of many of the Yankee privateers.

However, our Admiral was enabled to concentrate, within a few weeks, a fairly formidable force at Halifax. It is quite true that in order to send him the ships my lords had been compelled to promote a further batch of leading stokers to

the rank of chief, so that they might take the position of artificers, though they most assuredly could not perform the duties, and had also reduced the number of engineer officers carried on the larger cruisers and ironclads. The torpedo destroyers were in even worse fix : their complements were so depleted that on more than one occasion a chief stoker—that is, an intelligent labourer—had to take charge of the machinery of the vessel during the sickness of the proper officers, whilst bluejackets were sent below to assist him and his fellow-stokers in their legitimate work of shovelling coal into the furnaces.

The Powerful was in the hands of the dockyard authorities undergoing repairs, which she certainly needed after the damages she had sustained in the recent engagement. My friend and chief, Mr. Haddow, had been promoted to staff engineer, and then placed on half pay. The jealousy engendered by Admiral Condor's appreciation and use of his professional abilities had raised him enemies : their depreciation of him was subtle, but none the less effective, and there was no difficulty in discovering an Admiralty regulation under which he could be for the time shelved. Whilst the war clouds were gathering and bursting on the other side the Atlantic, Staff-engineer Haddow (half pay) was enjoying a well-earned rest with his family in a secluded Cornish village. No such good fortune extended my leave. I was transferred from the Powerful to the Blenheim, and sailed in her for Halifax.

The Blenheim is a protected cruiser of 9,000 tons displacement, with cylindrical boilers, and triple-expansion engines of 13,000 I.H.P. under natural draught, and 20,000 I.H.P. under forced draught. Under natural draught she was supposed to make 18·5 knots, and under forced draught 22 knots, but these calculations are for the most favourable conditions, and cannot be maintained for any

length of time. An eminent authority says of warships in general, "the average so-called 21-knot ship may be regarded as good, provided that she is moderately clean, for a spurt, without serious risk of breaking down, at about 18·4 knots; and for a continuous chase, lasting several days, at about 16·8 knots." This remark is applied by the author to all navies, but I have found our own ships give rather better results, due probably to the exceptionally solid and truly finished work of English marine-engine builders. The Blenheim, however, was not one of the "better" ships. During the whole of this commission we had considerable trouble with her engines and boilers. They were built by one of the best and most reliable firms in the country, but she has been in the service over six years, and during that time had undergone many alterations, repairs, and improvements at the hands of dockyard officials. Possibly these various visits to the docks may have had something to do with her present performances. We had hardly lost sight of the Irish coast when a manhole joint in No. 2 boiler blew out, severely scalding one of our artificers and a stoker. As we were not in sight of an enemy, nor likely to meet one who could give us much trouble, the slight loss of speed consequent on the accident was of little consequence, and we repaired the damage with our own staff before we reached Halifax. The temporary loss of the artificer was of much greater importance, as we could ill spare any of these men. The water-tight doors also gave us endless trouble, and the maledictions vented on dockyard management, when we attempted to move them, were numerous and emphatic. Not only was there a difficulty in closing some of them from the deck, but in the case of one of the bunker doors it was found impossible to close it from below, even when all the gearing was detached and crowbars made use of. Wood packing was fitted ready for use in case of our going into action, but

it is hardly necessary to point out that this substitute was a very poor one in the event of a shell bursting in the bunker. Finally, just before we finished our voyage, we had an explosion in No. 3 boiler, which, though the consequences fortunately were not very disastrous, subjected us to the assembly of a court of inquiry, and subsequent court martial, on our arrival at Halifax.

The examination of the boiler showed that the crown of the combustion chamber had come down about three inches, and had drawn over the ends of several stays. This appeared to be due to shortness of water in the boiler, owing to false indication by the gauge glasses, which were found to be choked by the indiarubber packing. This was assumed to be due to improper workmanship when replacing broken glasses, which should have been detected had proper supervision been exercised by the engineer officers of the ship. The fleet engineer in charge of the Blenheim, and the engineer who was senior next under him, were placed upon their trial for the alleged neglect.

We had on board one fleet engineer, one engineer, and four assistant engineers, two of whom were under a year's seniority, with only a few months' sea-going experience, whilst a third had come straight to the ship from Greenwich only a week before she sailed. The engine-room staff consisted of eighteen artificers, only six of whom had seen much sea service ; three chief stokers, three acting chief stokers, fifteen leading stokers, and one hundred and forty-two stokers.

The fleet engineer pleaded that he had, according to all the evidence adduced before the Court, exercised such supervision as was usual in the navy, and all the ordinary care and prudence which a skilful officer would use. He pointed out that defective *fitting* of the glasses would cause their immediate breakage, and therefore could not have

been the cause of the accident ; that failures with them had taken place in other ships than the Blenheim, and that the Admiralty had decided in future to deepen the recess in which they were fitted, and substitute asbestos rings for the rubber ones. It was, therefore, probable that the failure resulted rather from defective design than from defective fitting. He admitted that he had not personally tested the gauge glasses, but he submitted that he had other and far more important duties devolving upon him in the engine-room than mere stokehole examinations ; this was the sum of his offence, and this was the first time he had been under arrest, or subjected to censure during his long series of 29 years. The engineer's defence was somewhat similar, pointing out, however, that the gauge glasses had been actually tested, and apparently were working satisfactorily, only a few minutes before the accident, thus confirming the inference that the indiarubber washers, as presently fitted, did not work satisfactorily, causing the choking of the glasses. The vast extent of the machinery in the ship rendered the exercise of personal supervision over all the individual members of the engineering staff extremely difficult. There were four distinct sets of triple-expansion, inverted-cylinder engines, and these occupied, with their adjuncts, nearly two-thirds of the length of a ship of 9,000 tons displacement.

I remember being at a county ball, at Pembroke, once when on duty in Milford Haven. I asked a country Hebe for a waltz, and she explained that she was utterly ignorant of the dance, but, she added, taking my arm, "Come along, we'll do something." This was the feeling of the executive officers of the court martial : the offenders had been brought before the Court, and must, therefore, be punished for the trouble they caused. They were sentenced to be censured and dismissed their ship. The latter part of the sentence

was remitted by the Admiral, as there were no other engineers available to replace them, but the censure remainded for ever on their records of service.

Now, the crucial question before the Court was one of mechanical engineering, and none but proficients in machinery could properly have dealt with it. The Admiralty officials had evidently doubted the working of gauge glasses fitted in the manner of those in the Blenheim, for they had given instructions for their replacement by an improved pattern on other ships Whether this defect in design was the cause of the accident, or whether it arose from negligence in fitting, was a question which could only be determined by experts, and not by gunners and seamen. Our engineers contended, and in this they were surely justified, that prosecutions arising purely out of machinery working should be conducted before a court composed of engineer officers, presided over, for disciplinary purposes, by a superior officer of the executive branch. The present system is as unfair to them as it would be to try a captain before a court of paymasters, for running his ship on a reef.

If we examine the facts more closely, we may possibly come to the conclusion that either my lords, or some high officials of the Admiralty, should have appeared before the court martial in place of these engineer officers. They had evidently some doubts of the reliability of the pattern of gauge glasses used on the Blenheim, yet they issued no warning to the engineers, nor gave any directions for special care to be exercised in fitting and testing them. They had sent a large and important cruiser to sea with only three commissioned engineer officers having practical sea experience, the rest being assistants comparatively fresh from college, whilst of the eighteen artificers, only six were seasoned men, the remainder being fresh hands who had hardly yet got their sea legs on. They had placed six chief stokers on

board—the new rating which was to replace discontented artificers, and save the country's money and officials' tempers—but of these six only three were permanently promoted, the rest having only acting rank. The fifteen leading stokers were all young men, for the constant promotions from that rating to chief stokers, under existing regulations, had denuded it of all the older and better trained men. I doubt if my friend Haddow could have managed such a crew without some disaster, and I am sure no other man in the navy could have effected that which was beyond his power. These deficiencies in the number and quality of the engine-room staff were the natural results of Admiralty policy, and the particular legacy of the reductions made in that unfortunate year 1892. It would certainly have been more just, if less expedient, had the Lords of the Admiralty, past or present, or their highest officials, stood at the bar for trial, in lieu of the unfortunate officers who suffered from their mal-administration.

CHAPTER XX.

The Sea Fight—Development of Piracy—The Burning of Belfast.

SOME isolated engagements took place between stray cruisers, in which the victories were pretty equally divided between the combatants. Both sides also sustained losses of merchantmen, though the British loss in this respect was much greater than the American: they suffered much from the swarms of privateers now at sea. These minor conflicts, however, were only preliminary tests of strength during the concentration of the fleets. The American Commander-in-Chief had at length gathered all his available ships, and determined to sally forth, like the knight errant of old, to

find his foe. He resembled the knight errant in another phase: he had been so long in buckling on his armour (that is collecting his vessels), that his foe had time to obtain reinforcements. From the Cape, from Australia, from the West Coast of Africa, as well as from the home ports, war vessels of various kinds had arrived, all ready and eager for action. The struggle, as between England and America, took largely of the nature of a civil war, and it is a truism that no other war engenders such bitterness of feeling and unrelenting hatred. The Americans had admirably trained their officers and crews in the management of their ships, but had been less skilful in securing instruction in fleet tactics. No care had been taken to watch the British concentration at Halifax, nor effort made to ascertain the force assembled there. Thus it happened that when the fleets met in Massachusetts Bay the Yankee commander found himself, very much to his own surprise, inferior in strength to his opponent. Nor did he get his orders carried out with the loyalty which in naval and military manœuvres is so essential for success. One of the inspectors-general was with the fleet in chief direction of the engineering department afloat: he was not on board the Admiral's ship, apparently because on another vessel he could more ostensibly exercise the independent authority which he claimed. The Admiral's idea was to keep his fleet well together, and reduce the speed of his faster vessels to that which could be maintained by the slower ones: the engineer's idea was to run the ships at their best until contact was made with the British fleet, trusting to the great speed of such vessels as the Columbia for keeping out of harm's way if the enemy should prove too strong. The Admiral exerted his supreme authority, and with the assistance of his captains enforced it, but the jealousy and friction continued, and tended to impede the working of the

ships. It is hardly needful to deal with the incidents of the battle. It was a running fight, but the speed was not the high speed which some American naval officers contended was more desirable even than powerful armour or heavy guns. They had many illusions dispelled, and learned many lessons that day. The importance of steadiness in war vessels, so as to afford a reliable platform for the guns, was fully exemplified ; and the protection which armour afforded, though not perfect, was proved to be most valuable to the ships carrying it. The carnage on the unprotected or imperfectly-protected cruisers was fearful, whilst the enormous power for attack and defence wielded by our first-class line-of-battle ships was fully shown. Our enemy had nothing which, as all-round battleships, could compare with ours of the Majestic class. During the day it was demonstrated, over and over again, that no cruiser, whatever her size, or however complete her equipment for the special duties she had to perform, could venture to encounter a large modern line-of-battle ship in isolated action. The inferiority in the weight of their fire was alone sufficient to place them at a prodigious disadvantage, which no additional speed, even if they possessed it, could obliterate.

The victory was to the English ; the American fleet was either captured or sunk, save one or two minor craft which escaped to their home ports to tell the story of their defeat :

> "They came as fleet as forest deer ;
> We drove them back as tame."

There was wailing in New York and Washington when the news reached them, and an outburst of patriotic rage in the saloons. There were loud threats of burning Montreal, and reducing Quebec to ashes, but as the United States forces had as yet been unable to obtain a footing across the frontier, their vaporings were of little force. We had grown accus-

tomed to them by this time, and feared them no more than we should have dreaded "Bottom's" roar. We returned to Halifax to repair and refit to the best of our poor ability, and to arrange for the transfer of our prizes to the home ports. We anticipated, and received, plenty of admiration and praise from the inhabitants of that port, and hoped for a time of enjoyment at dances, dinner parties, and nightly receptions, to cheer us for our daily toil. We came there full of joyful satisfaction at the victory we had already achieved: we little recked of the disastrous news we were so soon to receive, nor of the further toils it would entail upon us.

Whilst we were preparing for and fighting the United States men-of-war, their privateers were playing havoc with our commerce. They speedily scared the Union Jack from the Atlantic as completely as the French cruisers had. Some few of our larger merchant vessels, under the command of Naval Reserve officers, were taken into Admiralty employ as transports or mail boats, and these carried quick-firing guns: the majority, however, had to trust entirely to their speed for escape, for no letters of marque were issued to them, nor any encouragement given to arm, even at the expense of their owners. The rapid success of the privateers was their bane; they had now no prey to seek, whilst the appearance of smoke on the horizon became a menace to them, since it more probably portended a torpedo destroyer or cruiser, than the simple unarmed merchantmen they wanted. So the same process of evolution set in with them as had led Morgan and his companions to attack and plunder Puerto del Principe, Puerto Bello, Maracaibo, and Panama. If their enemies would not venture to sea, they must seek and sack them on land. One of the most daring of the privateers was by birth an Irishman, possessing all the ability and reckless courage of his race, combined with an undying

hatred to the English nation. He had, before the war, been engaged in numerous conspiracies for the establishment of an Irish republic, and his present actions were rather dictated by his desire to promote that end than by any greed of private gain. He had plundered ships, and even forced their crews to walk the plank, but it was only that he might inflict injury on the enemy of his country and assist his co-patriots in the attainment of their desire. He had gained the same sort of general command over a number of ships which was exercised by Captain Sawkins and Henry Morgan: he was not their acknowledged admiral, but if any emergency arose he would, for the nonce, be the unquestioned generalissimo. Failing ships for prey, he determined to plunder the English ports, and for that purpose collected a force of five or six heavily-armed and swift steamers, manned by as sturdy a set of ruffians as could be obtained throughout the States. He very skilfully avoided all the main ocean routes, where he would be likely to meet cruisers, and by unfrequented seas reached the northern coast of Ireland, which at the moment was imperfectly protected. The achievement is easier now than in old buccaneering days: the admirable charts and improved compasses of to-day are as available for the privateer as for the naval or mercantile captain.

Captain Sarsfield was now in the very region he desired. He was within striking distance of the most important port in Ireland, and by striking at it he could inflict enormous damage on the empire, without great injury to his friends. The destruction of Belfast would be the signal for a determined uprising in the south, and thus afford opportunity for an invasion by patriotic sympathisers still in America. He was not yet aware of the defeat of the American fleet, but had he known it he would probably not have been deterred from his attempt. He was on a filibustering expedition:

his tactics were those of the filibuster, and his intense patriotism would impel him to the most desperate ventures. He had, however, been so far favoured by fortune as to avoid any English ships on the open sea by whom his course could be impeded or reported. As he neared the coast he still escaped notice; even the mail packets running into Belfast only sighted his leading ship at a distance, and mistook her for an ordinary trader. The coast and port were well known to his mate, who acted as pilot; the night was dark, and the flotilla observed the blockade-running precaution of extinguishing or masking their lights; when day broke the ships were within easy cannon range of Belfast.

However eager the seamen might be for loot, their leaders were determined to subordinate plunder to revenge. Nor were the men, who were recruited from the most desperate section of Irish Americans, altogether unwilling to destroy the city rather than demand any ransom from her. They were aware that the adventure might any moment be interrupted by the arrival of English warships, and this interruption would undoubtedly mean death to all of them. English naval officers would be apt to treat their present proceedings as piracy, the penalty for which is hanging. If, however, they were allowed time—and so far everything had been in their favour—they might escape, both sated with revenge and loaded with booty: in any case they would have struck terror into the hated Saxon.

There was no warning given of the attack. One of the guns of Captain Sarsfield's ship belched forth fire, and a shell whirled through the air towards the devoted city. From ship after ship, and gun after gun, the fire was repeated. Before the inhabitants were properly aroused from their sleep they were slain, and their houses were falling upon them. The effect of shell fire directed against a protected

ship, or a fortress, is sufficiently awful, but when directed on an unprotected town, with many houses of jerry-built type, and few buildings which are bomb proof, it is simply diabolical. In the present bombardment an additional element of horror was introduced. Some ingenious American had invented a shell charged with a sort of Greek fire. The privateers carried a large supply of them, and freely used them after their first discharge. The city and shipping were therefore speedily on fire in numerous places, and these fires were distributed over such an area as to threaten the total destruction of anything left standing by the bursting shells.

One infantry battalion was stationed at Belfast, and the men were got under arms as speedily as possible. Their colonel was a brave and skilful officer, who had won honours both in hill fights in northern India and in battles against Soudanese dervishes, but never had such a task as the present been set before him. He had to defend a city unfortified, unprotected, and already in flames, against a fire poured forth by an enemy he could not reach. Years ago General Burgoyne advised riflemen in pits to maintain their position against artillery fire, in full assurance that they could silence it before they succumbed; but rifle pits afford very much better protection than burning and falling houses, and are indeed almost unassailable, except by vertical fire from mortars. It would be much more difficult to keep troops steady under present conditions than under those anticipated by General Burgoyne. Again, the infantry fire was comparatively ineffective against the ships, as their bulwarks of iron or steel were sufficiently strong to resist the passage of any bullet, more particularly the light, elongated bullets of the Lee-Metford weapons. A battery of artillery formerly stationed at Belfast had recently been transferred to the Curragh to join an army corps for Canada, and it had not yet been replaced. The only naval vessel in the port was a

torpedo destroyer, and it was hardly possible for her to fight and beat off, or destroy, five ships armed with quick-firing guns. However, the attempt must be made, and whilst troops were hurriedly assembled and rushed to salient points to open such fire as they could, the torpedo boat was moved down to divert the privateers' attention, and if possible blow them out of the water.

Meantime Belfast was burning and falling about its inhabitants' heads. War is awful enough for men, even when they are excited by all the glamour of combat; but it is more terrible still for sleeping women and helpless children to be exposed to its ravages, and blown to pieces in their beds, or burned to death before they have time or opportunity to escape from their houses. Yet this is the danger to which any unprotected seaport town is exposed by modern privateering, if only the privateer is more zealous to destroy than to acquire filthy lucre. But he must be prepared to accept the risks of the adventure, and these are terribly against him. Captain Sarsfield had so far, it is true, effected his purpose; he had virtually destroyed a prosperous city, and sunk or set on fire much of its shipping; he had escaped, by combination of accidents, from any sufficient attack on his squadron by the English fleet, or by English artillery, during his advance and attack, and if he could now get out of Carrickfergus Bay, he would have accomplished a feat which might well confer immortal fame on himself, and strike terror into the heart of the hated Saxon. He turned to escape from the ruined port, followed still by the torpedo boat, which had flown at him after the manner of a bantam cock, but without any marked success, and as he turned away he gloried in the damage he had inflicted. His glorying was short-lived. From the moment he commenced his retreat his luck deserted him, and the victory he had achieved became the prelude to his destruction. The torpedo

destroyer struck the first effective blow at his power ; she placed a torpedo in the bottom of one of his vessels, and the usual result followed : the pirates thereon no longer ranged the seas. It is true Sarsfield revenged his comrades—he sank the torpedo boat—but the spell of success was broken, and his officers and seamen, superstitious as most of their race, trembled at the unseen but approaching disaster.

They turned towards the North Channel, through which they had securely passed so shortly before. Captain Sarsfield had intended sailing south-east to Liverpool, and there repeating his fiendish bombardment, but the spirits of his men were broken. On his own ship they refused to make any further attempt on English ports at present, and the most desperate and reckless of his men plainly informed him that it was time they sought some place of safety for their own necks. They were right as to the time having arrived for swift escape, unless they were prepared to encounter overwhelming odds of English war vessels. The telegraph wires had not been idle during the bombardment ; almost with the first alarm the news had been flashed along them to Dublin, and thence all round the coast, that pirates were attacking the city. From Dublin, from Liverpool, Holyhead, and Milford Haven, from out of the Firth of Clyde, and even from the Coast of Mull, warships of various sorts and sizes were hastening to intercept the insolent invaders. The details of the attack, the horrors of the bombardment, were unknown to the commanders of these ships, but such stories were not needed to inflame their ardour ; it was sufficient for them that an enemy had actually attempted an invasion, and was either destroying a British port, or escaping from it with the spoils he had taken.

The privateers passed the North Channel safely : indeed, it was quite possible for them to have escaped their pursuers altogether ha y exercised in their retreat the same skill

which they displayed in the attack. Unfortunately for themselves, they were alarmed at their own success, and dreaded the results of their own victory, and this alarm destroyed their discipline. Their commander was no longer obeyed without question ; he was no longer their generalissimo, but a comrade, chief indeed, but subject to criticism by his companions, compelled to consult their desires, and to accept their decisions. The first sign of the revolt was on board his own ship, when the crew refused to sail to Liverpool and attempt to burn it also : they had already done more than enough to imperil their necks, they said, and must now seek some way of saving them, if way there be. Once clear of the North Channel, a conference was demanded by the various crews, and much valuable time was lost in discussing probabilities and projects, and signalling backwards and forwards the decisions thereon. A captain trusted and obeyed might have extricated them even yet from the dilemma, since they had the start, which is so valuable, in the race, but a captaincy in commission was a broken reed to trust to in such emergency. First, they sailed toward Iceland, with a shadowy sort of idea of striking south for the American Coast, and trusting the Providence they had so recently defied, for escape from British cruisers : then they changed their counsels, and their course, determining to run their ships up some of the fiords, and seek shelter for themselves in the recesses of Norway. Their vacillation received the reward it richly merited : they never reached the fiords, but met the British men-of-war instead.

CHAPTER XXI.

The Destruction of the Pirates—The News in England—The New First Lord—The Bombardment of New York—The Resurrection of Bumbledom.

ONCE trapped, the privateers fought like men, and very brave men, too. The authority of Captain Sarsfield again became acknowledged, from the ship's cook or the powder monkey to the oldest captain of the flotilla. Every effort for escape which the most judicious commander could have devised was made by him: his ships were scattered on devious courses, so as to separate their pursuers, whilst his own was kept in the wake to protect and assist their escape. It was all in vain. The sea dogs were too numerous for the quarry to break through. There was neither asking nor giving of quarter, and one after another the privateer ships took the final plunge, fighting to the last, and seeking, even when past all hope, to inflict one more wound on their hated foes. The last to succumb was the ship commanded by Sarsfield himself. He had not shunned the conflict; indeed, he had striven to keep her ever in the thick of it, that attention might be distracted from her consorts, but she had notwithstanding kept afloat, and fighting to the last. It was almost like that ballad of the fleet, where—

The sun went down, and the stars came out far over the summer sea,
But never a moment ceased the fight of the one and the fifty-three.
Ship after ship, the whole night long, their high galleons came—
Ship after ship, the whole night long, with her battle thunders and flame;
Ship after ship, the whole night long, drew back with her dead and her shame;

For some were sunk, and many were shattered, and so could fight us no more.
God of battles! was there ever a battle like this in the world before?

There is a lesson to be gathered from this destruction of Belfast, and the subsequent loss of the ships which accomplished it. The whole expedition was the conception of Patrick Sarsfield, who in audacity, in resourcefulness, in bulldog courage, and merciless cruelty was no unworthy successor to his great namesake. We may justly feel horror at the device of sacrificing innocent women and babes for the purpose of terrorising their rulers, but we cannot help admitting the boldness of the conception, nor the audacious skill with which it was carried out. It was again the case of the man behind the gun, and, just as truly as our own officers in the Mediterranean, did Captain Sarsfield once more show that victory inclines neither to the weapon nor the ship, but to the man who has the ability to use them.

Newspaper editors were delighted with the news of the attack on Belfast; not that they were unpatriotic enough to desire the destruction of our ports, or unfeeling enough to wish the cruel doing to death of babes; but it furnished them with splendid copy, and enforced the moral of their past editorial articles. The Home Ruler discovered in it an additional reason for promoting the severance of the Emerald Isle from her predominant partner; the navy league advocates saw a powerful enforcement of their plea for more men; indeed, he must have been a poor editor who could not in some manner or other have made use of it to promote the circulation of his paper, and increase his own reputation for prescience and sound judgment. But the press generally was true enough at heart to demand that there should be no such further mishaps; that the coasts of our islands should no longer be subjected to insult, nor our ports to destruction;

and that neither measures of economy should prevail, nor the amenities of civilised warfare be observed, until chastisement had been inflicted upon our foe for the evil deed. The press did not, however, create public opinion in this instance: a spontaneous burst of indignant wrath swept over the conntry from Land's End to John O'Groats; people of all political and social creeds demanded that our navy and army should be increased to the fullest extent needful for the security of our dominions. The imperial, the Berserk spirit was fully roused: there was no need for newspaper writers to call it into being.

The Cabinet took a wise step immediately they heard the news. The First Lord of the Admiralty was a man of great experience and ability, and this very ability made him recognise that the juncture required a naval officer at the head of the Whitehall department: he begged the Premier to accept his resignation, not in the character of a scapegoat, but in order to make this change. There was only one man whom the people would demand at this moment—the idol of his countrymen, and the adored of the fleet. He desired a command on the American Station, but sacrificed his own wishes for the good of his country. When the House met in the evening, the Ministry were able to disarm criticism by announcing the change in the First Lord—a change made with the full concurrence and at the recommendation of his predecessor, and for the purpose of promoting the militant power of the country, and for no other end.

The new First Lord was in harness at once. The same broad grasp of the situation, the same immunity from the tyranny of petty details and routine, which so distinguished him at Malta, again marked his administration at Whitehall. My former chief, Mr. Haddow, was summoned from his retreat at St. Germains to act as confidential assistant to the

First Lord, whilst the greatest naval constructor in the country was induced to accept a temporary seat on the board. This gentleman, who was experienced in naval methods of administration throughout the world, occupied the position contemplated in 1882, when an Order in Council appointed an additional civil lord, "possessed of special mechanical and engineering knowledge, as well as experience in the superintendence of large private establishments." It was a misfortune for naval engineers, and therefore for the country at large, that this appointment, which promised so much, only continued for three years, having been abolished in 1885. The acceptance of the revived seat by its present occupant was an indication of the patriotic feeling which pervaded all ranks. He had taken a distinguished part in politics, had held office when the Opposition were in power, and had been noted for his loyalty to the party to which he had attached himself. Party ties were now thrown to the winds, and, as in the brave days of old, duty to his country was placed supreme over all other considerations. It is difficult to appraise the value of the services he rendered. Not only was he as fearless of offending against pedantic regulations and red-tape rules as the First Lord himself, but he had such technical knowledge of shipbuilding and engineering, and such practical acquaintance with the Admiralty, as enabled him to offend with wisdom.

Mr. Haddow was entrusted with the delicate mission of securing engineers and artificers. The new civil lord had advised that, as a temporary measure, they should be engaged for the war only; that additional pay should be given to the engineer officers and artificers at present in the navy, during such time as they were on war duty; and that the short service officers and men should be paid on the same scale. He also recommended that, pending some further and more definite regulations, the senior artificers

should be granted acting warrants, and those trifling but much-coveted privileges which warrants cover. The First Lord approved the regulations, and the Cabinet sanctioned them. The House of Commons was in an extravagant mood, and the Chancellor of the Exchequer found greater difficulty in refusing votes of money than in obtaining them. All this tended to assist Mr. Haddow in his mission, and to ensure the success of his quest. I have already mentioned his dexterous diplomacy when at Malta; he again displayed it in the present emergency. The Amalgamated Society of Engineers, the Marine Engineers' Union, and other trade societies had hitherto boycotted or openly opposed the Royal Navy; unless their enmity could be appeased, there was little chance of obtaining the desired supply of trained mechanics for the subordinate department. The stokers had failed in their intended rôle of supplanting the artificers; the executive officers refused to report favourably upon them, and the new civil lord was utterly opposed to the employment of such unskilled labour for highly technical work. It was, therefore, absolutely necessary to propitiate the trades unions; and Mr. Haddow took the frank and straightforward course of seeking interviews with their officials. It was an acknowledgment of the power of unions which, in ordinary days, he would have condemned; but these were no ordinary days of courtly ceremony and official procedure: the country was in its death agony, and any means which would save it must be adopted, whether they were or were not the methods of the authorised and bedizened servants. The adjustment of the difficulty was soon arrived at. The naval engineer carried with him a message of peace in the more favourable terms and shortened service which the Admiralty now offered; whilst the union officials were, after all, Britons, and desirous of protecting their native land against further insult and disaster. The owners of the

large liners, and of the vast engineering works throughout the country, supplied officers: whilst the clubs rapidly filled up the ranks of the subordinate department. Stokers, too, were offering in plentiful numbers, not always of the best quality but at all events sufficiently skilful to perform their duties when distributed through crews of more fully trained men. The Berserk fit was on us, and few escaped the contagion.

So the Admiralty were in a position to do more than replace the vessels damaged in the recent victory over the American fleet; they were able to increase the number of ships on that station, as well as commission a flying squadron to watch the Atlantic. Not only were more ships available for our coast defence, but the commanders-in-chief on our home stations, and their captains, received a very pertinent reminder from the First Lord that they were expected to cruise about and intercept the enemy's ships, and not stay in port waiting for them until all the damage was done. We soon had what we ought to have had on the first declaration of war—cruisers scouring the Atlantic in search of stray privateers, and, above all, a perfect swarm of cruisers, gun vessels, sloops, and torpedo boats watching every port and every river mouth and creek on the American coast. There was ample reason for their vigilance. The example of Captain Sarsfield was not lost on his fellow-patriots. For some time to come we had little reason to dread organised naval warfare, but any moment we might expect an attempt to escape on the part of a privateer, and it was impossible to say what damage might be done by such a vessel before she was destroyed.

Neither our authorities at home, nor our admiral on the American station, intended to let the destruction of Belfast remain unavenged. The United States papers had applauded the deed, and Congress had voted honours to

the unreturning braves, with pensions and emoluments to their widows and families. No contrition was expressed by the authorities for the dastardly act, no sympathy tendered, through neutral powers, to the innocent sufferers. The evil passions which war had engendered seemed to have deprived them of all those feelings of compassion evolved by civilisation, and which are not wholly unknown to more savage races. The barbarous feelings of the Red Indian, when he tears away his victim's bleeding scalp, appeared to possess the whole nation.

Our admiral determined there should be no blundering in his attack. He collected his ships and stores at Halifax; he weeded out the less able members of the crews into transports and store ships, replacing them by more vigorous sailors; and he carefully planned his tactics, and instructed his captains therein. Nothing was left to chance which could be anticipated—nothing trusted to fickle Fortune's favour which could previously be secured. Then, when all was ready, he weighed anchor, and dropped down towards New York.

The United States naval and military authorities had meantime not been idle. They despised torpedoes, but they did not neglect to use them in the absence of gun vessels. The river steamers on the Hudson, the ferry-boats in New York Harbour, the very coal barges in Brooklyn dockyard, were fitted with torpedo tubes. It was quite true they would be useless in a conflict, since their expanse of deck, and high upper erections, would render them easy and certain targets for quick-firing guns. But the astute Yankee argued that they would act in some such way as the horrible heads and dragons' mouths on Chinese shields; they would strike terror into an enemy by the very uncouthness of their appearance. Submarine mines were also laid, and, in the majority of cases, connected by wires with the land, so as to

be fired by electricity. The naval lieutenants (who were the cream of their service) and military engineers combined to make the defences of New York Harbour as perfect as possible. Unfortunately for themselves, they had no iron-clads to supplement their Whiteheads and mines, and they scouted the idea of clothing merchantmen in sandbags for duty as line-of-battle ships. They were, moreover, unable to keep their preparations secret. A traitor stole the plans of their minefield, and sold them for British gold, so that our Commander-in-Chief knew what channels to avoid, and where to fish for the sunken menaces to his ships. The whole of the fixed mines were either fished up or exploded, with no more disastrous result than arises from a display of fireworks at our Crystal Palace.

The defences of the haven were forced, the lowering batteries silenced ; the English fleet lay in the most imposing harbour in the world, and within gun range of America's commercial metropolis. Torpedo nets surrounded our ships, but our quick-firing guns were even quicker and better protection against the Yankees' improvised torpedo boats ; few of them which attempted an attack returned to the wharves to tell the story of their reception. A flag of truce was sent on shore to announce that the cities of Brooklyn, New York, and Jersey would be bombarded after the expiration of 24 hours, such time being allowed for the removal of peaceable inhabitants. The destruction of defenceless cities is condemned by modern public opinion, and was only resorted to by the British Commander as a fitting and just punishment for the burning of Belfast ; but in the infliction of this punishment he was more merciful than Sarsfield, and permitted the escape of women and children before he commenced the destruction of buildings. Even after the expiration of the allotted time he waited some five or six hours, before opening fire, so that any civilians lingering behind,

through stress on the transport service, or their own procrastination, might have further opportunity for escape. The authorities sullenly disregarded the threat, and made no appeal to the British Commander to stay his hand; some ministers, merchants, and newspaper editors, with a crowd of self-elected busybodies, came as a deputation to implore him to spare the cities, and inflict a fine, but they were told that it was impossible to grant such a prayer, even had it been preferred by the duly-constituted authorities, who obstinately remained silent. It was not loot we desired, but the infliction of merited chastisement. And when the bombardment commenced the chastisement was surely severe enough to satisfy the most revengeful of jingoes. Our ships did not use Greek fire, it is true, but they used many shells weighing from 850 lb. to 1,800 lb. in lieu of the 100 lb. projectiles of the pirates; this increased weight rendered their bursting effect most terribly destructive. As far as possible the fire was directed against public buildings, towering warehouses, and palatial piles of offices, rather than dwelling-houses, but it was impossible entirely to spare private residences. When the bombardment ceased the beauty of the cities had departed. Where once lordly buildings rose storey above storey, piles of ruins could now be seen, and wide streets, tree-bordered, which had been the pride of the inhabitants, were now choked with fallen buildings. There was much less destruction of innocent life than at Belfast, thanks to the warning which had been given; some lives had, however, been sacrificed which we would gladly have spared had we been able, and the list of slain exemplified the horrible cruelty which results from abandonment of the Paris declaration. Had letters of marque not been granted by the United States Government, we should not have had Belfast burned, nor been compelled to bombard New York.

It is unnecessary to relate each incident of the war. We were "lords of the sea" once more, owing to the wiser administration at Whitehall and the war fever which pervaded the nation. The three guiding lights of our Admiralty, each in his several sphere, rose superior to red tapeism, to the letter of the regulations, and the traditions of the departments. They restrained the absurdities of the permanent officials, and compelled them to provide ships and crews where and how they could be found, without regard to the clauses of the last budget or the half-forgotten minutes of Mr. Secretary Pepys. The "elasticity" of which some of our sea lords had boasted, but which had ceased to exist, was again restored under the administration of men who knew their country's necessities, and would not be restrained by any paper rules from wisely and quickly relieving them. Our war vessels threatened every port and every creek on the Atlantic coast or bordering the Mexican Gulf. We seized American ships wherever we found them, and we harried their towns with the zeal of Drake or Raleigh, taking from them handsome ransoms to spare them from destruction. Captain Sarsfield's raid certainly ministered to our prize money, and whilst we regretted the sufferings he had so cruelly inflicted, most of us on the North American station felt thankful to him for the increased weight of our purses. But the command of the sea meant to us far more than prize money or destruction of peaceful towns: it enabled us to pour reinforcements into Canada, and to turn the tide of invasion into the States. We had plenty of volunteers for land as well as sea service. Our battalions were swollen to repletion, and the men who had served some years with the colours were sufficient to impart steadiness to the recruits. Victory on land, victory by sea, attended our arms, and we were enabled to dictate terms of peace sufficiently honourable for ourselves, without

being too onerous on our transatlantic cousins. We had come out of the death struggle victors at last, but sadly maimed, and suffering from many a wound which would fester and drain us for years to come.

I have told the story, in such imperfect fashion as I am able, of the troubles and disasters of my country, and the causes which led up to them. By her insular position she is protected from many of the dangers which threaten continental nations, and enabled to dispense with the conscription, which presses so heavily on their material resources and industrial progress. But the same insular position, and the far-spreading disposition of our colonies and possessions, require that we should be unquestionably supreme at sea, and that not only as against one Power, but also against a combination of Powers. In the number of our ships, and more particularly of powerful line-of-battle ships, we appeared to possess this supremacy over any single Power, though not to the extent a mere comparison of numbers would indicate, since if we have more ships, we have also much more work for them to perform. Nor were all the ships borne on our navy list available for service, not so much on account of their condition and fitness for sea as for want of men to man them. More particularly was this want observable in the engine-room staff, every grade of which was in a chronic state of dissatisfaction, and every member of which spread through the land stories of the hardships and injustice under which he and his comrades suffered. The unfortunate reduction in complements, decreed and carried out in 1892, had entailed increased labour and responsibilities both on the remaining commissioned engineers and on the artificers, and rendered more difficult the obtaining of a sufficient number of candidates for either Greenwich or the subordinate staff of the engine-room. This reduction, which had been condemned by our most eminent marine-engine-

builders and naval engineers, and which had raised the hostility of the trades unions, had been imperfectly compensated by the Naval Reserve, found on a great emergency to be absent or unreliable. Three men of powerful individuality and genius, who were great enough to forsake the slavish observance of traditional methods, devised temporary expedients by which were overcome the apathy of engineer students at our great engine-works and the hostility of the trades unions, and by which, therefore, our engine-rooms were fully manned and our reserve ships enabled to get to sea. The arrangements were only temporary, and ceased with the conclusion of peace. Will the spirit of them be continued into the future administration of the navy, so as to secure us the command of the sea, far and wide as the world extends, which is so essential for our prosperity, or even for our security?

The First Lord is now Commander-in-Chief at Devonport, and Whitehall knows him no more, save on levee days, or when royal, or special, or departmental committees are compiling volumes of evidence which few will read, and still fewer understand. The civil lord has retired to his chambers in Great George Street, there to design ironclads for the Brazilians, and cruisers for the Chinese, or burn the midnight oil in solving problems which have puzzled naval architects for this past generation or more. Mr. Haddow is an inspector of machinery and senior engineer officer on the Australian station, resting in that comparatively easy post from the labours of his past busy life, and looking forward to the arrival of his pension day as the pinnacle of the ambition which his country permits to him. We have a new First Lord, whose skill in agriculture is the admiration of his county, and exploits in the hunting field are inspirations to the habitués of Melton, but who is totally ignorant of naval matters, and not even the possessor

of a steam yacht or fishing smack. After the proclamation of peace there was a fresh shuffling of the political cards, and in the turn of promotion this clever and accomplished agriculturist was transferred from the superintendence of the Education Department to the control of the "Queen's Navie." And so once more the good old times are repeated, and the burlesque song of "Her Majesty's Ship Pinafore" becomes a stern and sad reality. The lords who constitute the board have again to rely on the permanent officials for advice and instruction; for information of details and traditions, and guidance in the application of them. The routine exchange of reports, memorandums, and suggestions is once more in full swing, and general orders, departmental orders, and red-tape orders, are issuing from Whitehall as of yore, as though no wars had taken place to burst the bubble reputation of our naval administration.

A committee is now sitting to determine the complement of engineers, artificers, and stokers, for the several ships in her Majesty's navy, and to report on any grievances the engine-room staff may bring forward. The Second Sea Lord presides over its deliberations, and, I am sorry to say, no other officer of the executive branch is a member of it; the importance of this laches will be seen when it is remembered that the gallant admiral has never commanded a ship since the days of the great reduction. The other members are the Director of Naval Construction (who is also Assistant-Controller), the Engineer-in-Chief, and two naval engineers, one of whom will retire from the service in a few months under the age clause. It is already named in the service the "Second Manning Committee," an ominous title after the disastrous results which followed on the deliberation of the first manning committee.

The disasters of the recent war roused the British public from apathy; the destruction of Belfast called forth all the

frenzy of the old Berserk spirit. The ability of administrators who discarded prescriptive regulations gave us victory over our active and resolute enemy at the time of our direst peril. The national anxiety, and demand for improved administration is, however, passing away in rejoicings over renewed peace, and prospect of renewed prosperity. The lesson administered to us with so much national suffering, and temporary loss of power and reputation, is in danger of being forgotten, unless our statesmen, leaving the petty battles of Tweedledum and Tweedledee, resolutely endeavour to grasp its significance and to remedy the defects it points out. It is worse than useless, it is a wicked waste of public money, to build magnificent ironclads and saucy cruisers, unless we can find men to move them. It is absolutely certain that at the present time we have neither engineer officers, nor artificers, sufficient for the ships we have ready for commission, even with the attenuated complements of the 1892 regulations; and it is equally evident that we cannot, under present regulations, obtain the numbers required, now the war fever is over. This is the lesson: Which of all our politicians will be the sufficient statesman to devise and enforce a remedy?

THE END.

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