

## INTRODUCTION

It is not generally known that John Philip Holland had some Limerick connections. He was born in a coast-guard's house in Liscannor, Co. Clare, on 29th February 1841. In 1853, after his father's death, the family moved to Limerick. John became a pupil at Sexton Street School, and joined the Christian Brothers' Order on 15th June 1858.

Holland had an interest in scientific experiments from an early age. He was fortunate to be transferred to the North Monastery, Cork, on 3rd November 1858, for further training as a teacher. Here he came under the tutelage of a Limerick man, Brother Dominic Burke, an excellent science teacher who encouraged him in his submarine designs. As early as 1859 he completed his first drafts of a design he never fundamentally changed.

The Holland family remained in Limerick for nearly twenty years while John taught in five different schools throughout the country. His brother Mick became involved with the Fenians and, being forced to flee the country, took up with other members of the Brotherhood in America. In 1873 John Holland left the Christian Brothers through ill-health and followed his family to Boston.

Having worked for a period with an engineering firm, Holland took up teaching for a further six years. He submitted a design for a submarine to the U.S. Navy but the Secretary of the Navy contemptuously rejected it as "a fantastic scheme of a civilian landsman". However, through his brother Mick, he met some fellow-countrymen who liked the sound of his strange ideas. Thus began the story of the "Fenian Ram" and the first faltering stages in the development of the modern submarine.

After twenty years of experiments and failures the U.S. government finally bought the "Holland No. 6" on 12th April 1900 for 150,000 dollars - a bargain price because it had cost twice that much money to produce. The submarine was commissioned on 12th October 1900, the American Navy's first craft of its kind.

By this time Holland had severed all connections with the Fenians. He sold his designs to the British Navy in 1901 and it launched its first Holland-designed submarine in October of that year. He then built two submarines for Japan which were used against Russia in the war of 1904-5. For his contribution to the Japanese naval victory Holland received the Order of the Rising Sun from the Emperor of Japan.

Submarines had by then become big business and the large corporations had taken control of their manufacture. Following a merger between Holland's Torpedo Boat Company and the Electric Storage Battery Company in 1898 to form the New Electric Boat Company, disagreements developed between the inventor and the engineers and directors of the new firm. He was bitterly disappointed in 1907 when his next submarine was rejected by the U.S. Government.

Holland's last years were not happy. Manoeuvred out of his company and plagued by ill-health, he pondered on the future of his invention. He was deeply perturbed by its terrible destructive powers and stressed that further research should be concentrated on its peaceful use. Before his death he had a long discussion with the first president of the American Red Cross, who asked if he considered that the invention of the submarine had increased the danger of war. Holland stated that the arms' race of the time was a menace to mankind but said that he saw the submarine as a deterrent to war and expressed the hope that it would be so. In his last year he proposed to go to Britain to warn the government of the catastrophic dangers of submarine warfare but bad health prevented him from undertaking the journey.

John Philip Holland died on 12th August 1914, just as the first World War was breaking out in Europe, a conflict which was to confirm with horrific finality the deadly capabilities of his invention.

This article tells the little known story of Holland's adventures with the Fenians in America, involving the launching and confiscation of the Fenian Ram.

# THE SALT WATER ENTERPRISE



ne Autumn day in 1876 a group of intense, rugged-looking Irishmen gathered at Coney Island outside New York and watched a frail bespectacled little man do tricks with a clockwork boat. The spies who dogged the Fenians would have been amused. More lunacy! Had they known the truth, the verdict would hardly have changed. The man with the clockwork boat was trying to convince the Fenians he could build them something like it that would challenge British supremacy at sea. And they bought the idea.

They were, as it turned out, on to something big, these Fenians gathered round John P. Holland. They could boast in time to come that they knew the father of the modern submarine when he was only an ex-Christian Brother from Liscannor with a bee in his bonnet about underwater boats. They backed him when no-one else would, and they financed his first three boats. As one of Holland's men in the

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later years put it: "It belongs to the record to say that the Irish question produced the modern submarine". Yet, in Ireland the story is not much known.

Holland did not **invent** the submarine, of course. The idea had been knocking about for centuries, now and then spawning craft which were blighted by the lack of theory and the lack of underwater power better than human muscle. In Holland's day they were still such an exotic notion they had not even acquired a name. Submarine was the adjective. The noun was torpedo-boat, or wrecking-boat, or ram - for ramming an enemy vessel below the waterline was one use. No-one had ever quite succeeded in making one do what it was supposed to do.

Holland did. His ideas on how to make them work got to be so much better than anyone else's that his

second boat, the Fenian Ram, became a sort of missing link - a break-out from evolutionary pause. "After the completion of this boat", wrote an admiral who did take the idea seriously, "Holland led the world far and away in the solution of submarine problems".

For his part, he gave the title "father of the submarine" to David Bushnell, whose one-man Turtle had very nearly sunk a British frigate during the American War of Independence. In his own time he was influenced by the Hunley, a hand-cranked affair used by the Confederates. Mainly it killed its own. It sank five times with a total loss of thirty-five men, but achieved fame on the last disaster by becoming the first submarine to sink an enemy vessel.

That happened in 1864, while Holland was teaching in Enniscorthy. Later he recalled that he had first designed a flying-machine in 1863, "shortly before I began the study of submarines". It is fair to suppose that news of the Hunley's finest hour had its effect. He was soon experimenting, it is

said, with models in a tub.

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Probably not even John P. at the end of his days could say how much he had been spurred by the desire to strike a blow at the British. He liked them as little as any other child of the Famine. When he left the Brothers and emigrated in 1873 he chose America, partly for health reasons, partly because it might provide scope for his inventions but also, he said, because "I had no mind to do anything that would make John Bull any stronger".

It is doubtful if he had actually been in the IRB. His brother Michael was, and had been obliged to get out of Ireland on that account. In New York he introduced John to O'Donovan Rossa, who put him in touch with Jerome Collins, then science editor of the **New York Herald**.

The big chance came in August 1876, at the reception for those involved in the Catalpa rescue. This was the most spectacular stroke the American Fenians ever pulled. They hired a whaler (the Catalpa), and sailed to Australia, plucked six Fenian prisoners from a work-gang in the desert and, four months later sailed into New York Harbour and a general euphoria. "The men who sent the Catalpa to Australia", said John Boyle O'Reilly of the **Boston Pilot**, "are just the men to send out a hundred Catalpas to wipe British commerce from the seas". John P. Holland thought he knew how to help them do it.

John Devoy had organised the expedition. J.J. Breslin had led it. Holland met them at the reception and told them: "You gentlemen have a fund for making war on England. And you could put it to no better use than enabling me to build a submarine boat ...".

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He was, as we would now say, in with the heavy gang. These veterans of jail and revolution were turbulent, talented, given to ferocious internecine strife, in some cases mad, in all cases colourful. Devoy was a deserter from the French Foreign Legion. Rossa was a spectacular drunk. Jerome Collins was soon to die on an Arctic expedition. Breslin was the hero of the Catalpa. But Holland spoke to them, said Devoy, "like a headmaster to his children".

"We were startled by the proposition." But they took it seriously. And they did have the money. Dollars and cents were then rolling in, as Holland knew, to the Skirmishing Fund started by O'Donovan Rossa. What it would be used for was a matter for speculation - some anti-British activity short of total war, at any rate. Rossa, the arch-Provisional of his day, talked of

dynamite and "burning up" towns. Others, such as O'Leary and Devoy, had the grace to be shocked. But a submarine - that had possibilities. The trustees of the fund sent Breslin to Coney Island, heard his report, and appointed him head of what was cryptically called "the salt water enterprise". The Fenians were to take on the ruler of the waves.

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In some respects it sounded even more far-fetched than it does today - a fourteen-foot box, with a range of a few miles. Did the Fenians see their boat as a sort of Bruce Lee of the ocean, laying waste the ranks of H.M. warships as they closed in from every side? It was not quite that bad. The prime movers accepted there would have to be a phase of experiment before anything much emerged. Nor did they seriously think of going it alone. At best, Devoy reckoned, "we could only begin operations when the Home Organisation was ready for a fight and we had a few more boats". At other times they felt the best bet was to chip in on the opposition side in the event of Britain's ever going to war. Russia was a likely contender at this time.

Holland was being more than optimistic if, as Devoy said, he envisaged a boat "that would cross the Atlantic, go unseen into Southampton or Portsmouth Harbour, throw a petroleum shell into an English ship, and get away undiscovered". But he was telling no more than the truth when he wrote, as late as 1900, that "the submarine was indeed a sea-devil against which no means that we possess at present can prevail". ASDIC was a development of the nineteen-twenties, and not a particularly successful submarine-tracker. Back in the eighteen seventies a submarine offered a prospect akin to a laser-toting helicopter that could vanish at will. "A weapon", said Holland, "against which there is no defence".

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So it may have seemed to the Fenian leadership who heard Breslin's report from Coney Island. They cannot have had more than the vaguest idea how it was to work. Devoy's memoirs, admittedly written long after the event, show that he did not really know what was happening on the technical side. For expert opinion they consulted someone who, as Captain of Engineers in the Civil War, "was in charge of fifteen miles of earthworks in front of Petersburg". Breslin, Devoy thought, "understood it better than any of us." But Breslin in Mick Holland's opinion "knew as much about natural philosophy as a cow".

What they did have was the under-

dog's instinct for something that would change the rules favouring a powerful maritime enemy. Most of the early submarines were the product of that sort of thinking. For that matter, potential targets disapproved of them for quite the same reason. "Damned un-English", said an admiral. The French of Napoleon's day declared them "fit only for Algerians and pirates". Admiral St Vincent saw in them "a mode of war which those who commanded the seas did not want, and which, if successful, would deprive them of it". An odd addition to such company was a speaker in the Treaty Debates of 1922. "I hold that the submarine is a mean and treacherous form of attack ...".

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With high hopes, at any rate, the Fenians commissioned an engineering firm to make them a submarine. Work went on at first in New York, and later across the Hudson at Paterson, where Holland taught school. There, on the Passaic river, Holland's first submarine was launched on May 22, 1878.

She was a funny little thing, of square cross-section, with diving-planes midships. Holland would later take a porpoise for prototype - this one looked a bit like a penguin with its head stuck on wrong.

She did not behave well. She sank on launching, and the primitive petrol-engine never worked. But Holland hooked it up to work on steam from an accompanying launch, trusted her to take him below the waters of the Passaic, and learned a lot about submarines.

The Fenians responded with commendable imagination (Rossa, indeed, seems to have given the enterprise a bad press among some of them by the extravagance of his talk). The trustees of the Skirmishing Fund decided to stick with the salt water enterprise. Holland scuttled the little boat in the Passaic, left his teaching, and became a fulltime submariner in the pay of the Fenians.

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The boat that came to be known as the Fenian Ram was built at the Delamater Iron Works in the heart of New York. It was all supposed to be highly secret. It was not, of course. Mick Holland said the builder sometimes invited friends of his "to come and look at this damn fool thing the Fenians were spending the poor servant girls' money on to destroy the English sea power". Foreign dignitaries knew where to come to talk with the inventor about the possibility of acquiring something similar for their countries. The Fenian habit of conducting their arguments in public, often through their various newspapers,



**John Philip Holland**

meant that a good deal about the Ram got into print. The ordinary papers did that anyway. It was the **New York Sun** that gave her her name.

She took to the water in May 1881, and for years provided New Yorkers with unflinching spectacle. The Keystone Cops element was often there, as when they tested her erratic armoury, or surfaced in the path of a ferry-boat, or realised in the middle of the bay that a little boy had hitched a ride up top. But she also provided something new by way of spectacle - she was a submarine that worked. "There is scarcely anything required of a good submarine", said Holland in his dry way, "that this one did not do well enough".

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He had come a long way from the drawings on his school blackboard. The boat as originally conceived was to be driven by foot-pedals, of which all one can say is that they would have made extra problems underwater. The operator, in primitive scuba gear, was supposed to engage the enemy by flooding the cockpit, getting out, placing an explosive which was slung

alongside, getting back in, and peddling away before the charge went off. Not until World War II would midget subs succeed in doing that.

By the time he got to installing one of the new petrol engines, the actual Holland I had become pure experiment. Without an air-supply the engine would not have worked for more than the briefest dip underwater, and if the cockpit was flooded it would not have worked at all.

In the new design, the Ram's engine worked on compressed air while submerged, and exhausted through a valve. Holland rightly guessed against all opposition that this would work as long as pressure outside and inside remained the same. He had planned that the engine would have its own air-supply, so that cockpit pressure could remain at atmospheric. In the event, engine and operators (there was a crew of three) breathed the same air at a pressure which varied with depth - rather uncomfortable, but simple and safe.

Electricity, of course, held the future in underwater power. But batteries were still primitive. So were petrol engines, for that matter. Wisely or

otherwise, he opted for these, apart from one aberration into steam, until his final boat.

Holland I had used planes midships to force her bodily under, like tiny airplane wings in reverse. That was how orthodoxy would have it. Some designs used vertical propellers for the same purpose. Holland sometimes remarked that the people who ran down his ideas (and by implication failed to understand submarines) were invariably those skilled in ship-building. The point should be made that such people would find it hardest to make the necessary mental leaps, such as from level-keel sinking to diving. On the new boat he put the planes aft, so that she upped her end and thrust her nose under at a sizeable angle.

The tilt would have made another boat unstable. But he knew enough to make sure the ballast-water couldn't move about and shift the centre of gravity to the lower end. Well might he compare the Ram, in lines and performance, with the porpoises he liked to point out as the experts on the subject.

Lastly, there was the gun. Not yet a torpedo-launcher, but still a pneumatic affair of some complexity. Underwater

guns of any size are, in fact, a formidable engineering proposition if the tail is not to wag the dog to disastrous effect. Holland's pioneering design was said to be capable of lobbing a hundred-pound shell nearly a quarter of a mile.

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The remarkable thing is that the Ram was permitted to go freely about her business in New York harbour, gun and all. The British worried about what was going on. "This is presumably a Fenian enterprise for the purpose of an attempt to blow up British War Vessels", the chargé d'affaires in Washington wrote home to his superiors in the course of a detailed ac-

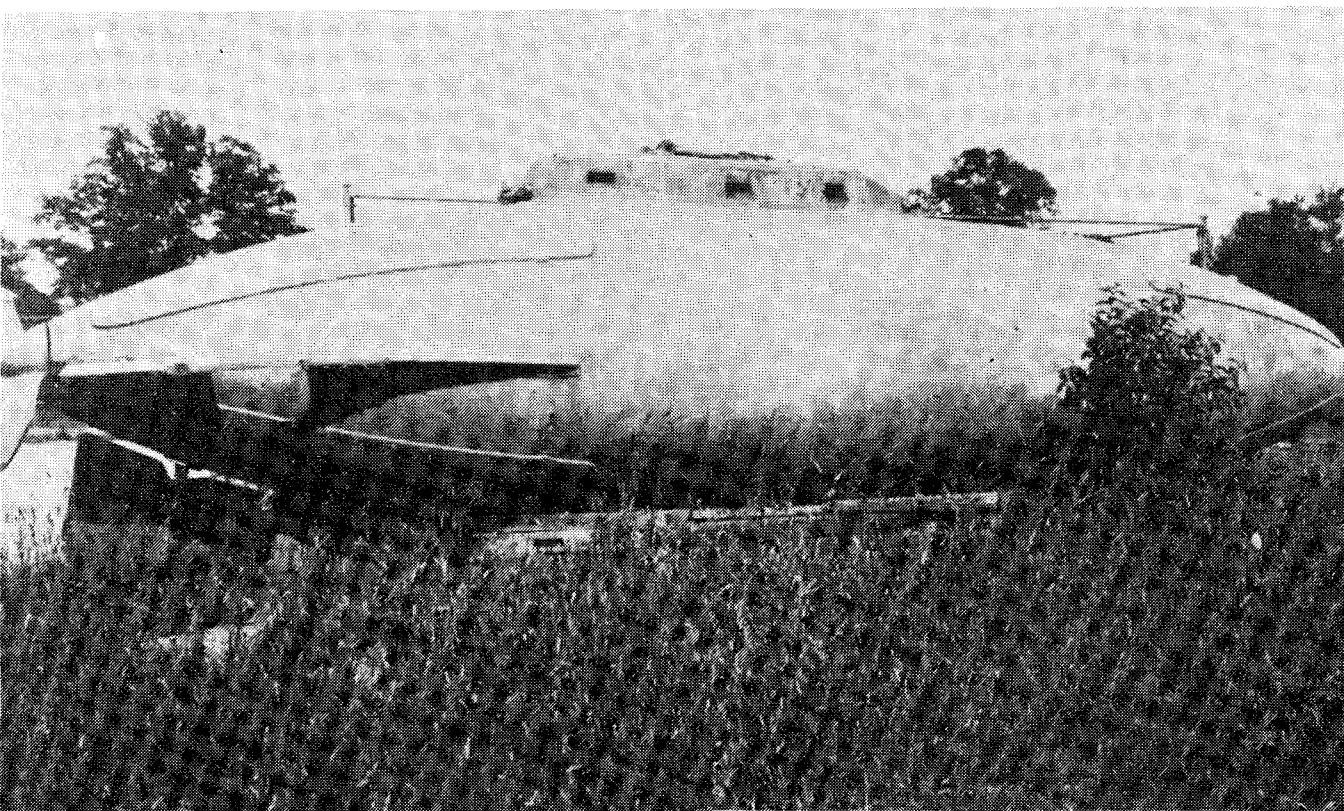
counts being held by the authorities. Quite possibly they thought Holland was more intent on pursuing an inventor's experiments than on providing them with an instrument of war.

Strictly speaking, they owned the boats anyway - they had spent some sixty thousand dollars on them. But it was a bad business. One winter's night in 1883 Breslin showed up at the docks, armed with a tug and a forged imprimatur, and towed the Ram and the little Fenian Model in convoy into the night. They were bound for New Haven, some distance up Long Island Sound. That involved crossing the Hudson and rounding Manhattan into the East River. Of all the Ram's voyages, this must have been the strangest. The Model foundered in rough water at the

company was taken over by men with a keener eye to business. He died a rather embittered man, speculating towards the end on peaceful uses for his invention. A few weeks after his death in August 1914, the little German U9 showed what submarines could do in war by taking on three British heavy cruisers and sinking the lot.

The three Fenian boats survive, one way or another. The Model lies where she sank that November night in 1883. A freelance attempt to raise Holland I for scrap succeeded only in pulling off her tower. Long afterwards she was hauled up to take an honoured place in the Paterson museum.

The grounded Ram remained for



#### The Fenian Ram

count of the Ram's movements. It was noted that she "appears to have most wonderful powers as a destructive machine; more so than any Boat yet invented". They tried to persuade the Americans to step in. But the rulers of the land where every citizen might carry a gun reasoned that the same went for submarines. Holland went on to build his third Fenian boat, a scale-model he would use to test modifications on the design.

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It is not clear why an element among the Fenians decided to annex the Fenian Ram. Possibly they feared that the internal wrangle about the disposal of the Skirmishing Fund, which was then going before the courts, might result in

mouth of the Sound; the Ram made it to New Haven.

"I'll let her rot on their hands", said Holland. She did that, more or less. Her new skippers gave her such a bad name for dangerous practice around New Haven that the port authorities presently ordered her off the water.

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Holland went on to make two pretty unpromising boats - unpromising probably because the backers gave him less of his head than the Fenians had done - before Holland VI in 1900 became the prototype submarine of the American navy. By then, his ideas were becoming the common property of the world's navies. Control of his own com-

pany was taken over by men with a keener eye to business. He died a rather embittered man, speculating towards the end on peaceful uses for his invention. A few weeks after his death in August 1914, the little German U9 showed what submarines could do in war by taking on three British heavy cruisers and sinking the lot.

She was not to go to war. She stands today in a public park in Paterson, giving piggy-backs to the descendants of that kid who hitched the ride. But yet a monument, as Mick stoutly declared her, "to the honesty, ability and earnestness of the revolutionary Irishman".