MARCONI and the Discovery of WIRELESS

by LESLIE READE

MEN AND EVENTS

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and the Discovery of Wireless

by

LESLIE READE

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TO MY FATHER

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Foreword

This is not, and is not intended to be, a technical book about wireless telegraphy. Technical information has been deliberately kept to the minimum, but I have done my best to ensure that that minimum is accurate. Any reader whose curiosity is stimulated to seek further details should have no trouble in this technical age in finding them.

One handicap of this age, it seems to me, is that so many of us, young and old, are inclined to regard scientific wonders, either well-established or recently discovered, as a matter of course. To me, wireless still seems almost magical; and, generally, I am glad that I share with the greatest scientific genius of the age, Albert Einstein, at least the ability in the face of marvel and invention to 'pause to wonder'.

One other aspect of this age, the political, also demands some comment. As far as I am aware, only one biography of Marconi has any discussion at all of his part in the public life of Italy. A good deal of criticism has recently been directed—and very properly, in my opinion—against the German education authorities in the Federal Republic, in their instruction of their young people, for drawing a discreet veil over the Nazi era. Something similar arises in the life of Marconi (and probably in the biography of any other prominent German or Italian who flourished during the Fascist epoch). Al-

though information was neither willingly given, nor easily obtained, I have not shirked the task of trying to find the answers to questions which might, and perhaps should, be asked about the matter by alert readers who were not even born when the war which was caused by Fascism ended in 1945.

London
26th March 1962

Prologue

'In the midst of our thankfulness for deliverance, one name was mentioned with the deepest feeling of gratitude: that of Marconi.'

Those words were written by Mr. Lawrence Beesley, then a young schoolmaster, in the year 1912, a few weeks after the greatest marine disaster of all time. On a freezing, black night in April of that year, the largest steamer ever built up to that time struck an iceberg in mid-Atlantic on her maiden voyage and sank.

Mr. Beesley was in a lifeboat, with over sixty other passengers and members of the crew. Their vessel had gone down, and they were adrift on the ocean, hundreds of miles from land. But they knew that before the ship had sunk, calls for help had been sent out by the new telegraphy, the kind that sent its messages through the air without the need of telegraph poles or wires, and so could be used by ships at sea. Because it needed no wires, people were beginning to call this telegraphy 'wireless' for short. After the events of that April night, all the world knew about 'wireless'.

'. . . we waited in absolute silence in the quiet night,' Mr. Beesley wrote. 'And then, creeping over the edge of the sea . . . we saw a single light and presently a second below it. . . .'

The lights were those of the rescue ship, hurrying to pick up the shipwrecked hundreds.

That wreck and the rescue are part of the story of wireless, and a triumph for the man who was most responsible for its invention, Guglielmo Marconi.

This book will tell the story of his life.

CHAPTER I

'The Air is Full . . . of Miracles'

On the morning of April 25th, in the year 1874, in the Italian city of Bologna, a baby boy was born. Almost certainly that baby has had some influence on everybody who reads these words.

As I write, an Hungarian violinist, Elise Caerfalvi, is playing Bach's Sonata in G Minor for unaccompanied violin. The music is coming on electric waves through the air of a winter night in London, and started its journey perhaps two miles away from my typewriter. Using a different wave-length it might have been possible for listeners to have enjoyed that music two thousand miles away, or, indeed, at the very farthest point on the globe from London. And technically, this was, of course, just an ordinary broadcast.

In the means by which the music is being sent out, it is no different from a weather forecast, or a number in the hit parade, or the football results late on a Saturday afternoon—all so familiar and taken as a matter of course, like a bus, or a jet screaming overhead.

Yet, behind those routine, though greatly varied, sounds and noises in the air—the Bach, the 'pop' and the football scores—there is a long story of brilliant imagination and invention. What was once thought to be as impossible as man putting on wings and flying like a bird was made possible; and it has become even commonplace.

Man is able to talk through the air, to make himself

heard from one side of the globe of the earth to the other.

To some of us, that is still a wonder.

Since television has spread everywhere, there is talk of 'steam radio', which phrase is used to make wireless sound a little old-fashioned and rather unimportant.

But on 12th April 1961, when Major Yuri Gagarin, the first man in space, was whirling around the earth in his spaceship, *Vostok*, at a speed of five miles per second, it was 'steam radio' he used.

'I was in communication contact on several channels, using a telegraph key,' he said.

For the first time in history he carried out direct two-way 'cosmos-earth' radio communications by means of short and ultra-short waves.

Many of us, too, have probably heard the signals sounding like '*Bleep-bleep-bleep* . . . !' from sputniks tearing through space, tens of thousands of miles away, or rockets racing to the moon or even farther to one of the planets like Venus. Maybe the uses of 'steam radio' are actually increasing; *certainly*, the scientist who equips his sputnik with that '*bleep*' and the schoolboy who turns on his radio to get the football scores or the man listening to a broadcast of music are all three enjoying the benefits of wireless.

And wireless was the discovery and invention, more than of anyone else, of that Italian boy who arrived in the world one spring day in 1874.

His name was Guglielmo Marconi, 'Guglielmo' being the Italian for 'William'. In later life, both in England and the United States, where he was a frequent visitor and was almost as well known as he was in England, he was often known to his associates merely by his initials, 'G.M.'

Marconi was the son of a well-to-do business man

called Giuseppe and his second wife, Annie. Annie Marconi, who is also called 'Anna' in some of the references, was a member of the Scottish-Irish family, the Jamesons, who were and are famous as whisky distillers. Annie was born at Daphne Castle, Enniscorthy, Co. Wexford, Ireland, and went to study music at the Bologna Conservatory. She is said to have been a lively, beautiful girl, and when Giuseppe Marconi, who was a widower with a son called Luigi, met her, he fell deeply in love. The Irish girl returned his affection, and they were married in France at Boulogne-sur-Mer in 1864.

On 22nd November 1865, Annie gave birth to a son, who was named Alfonso[1]; but it was not until ten years had passed since their marriage that the second son, Guglielmo, was born.

The scene of his arrival was his father's town house, the Palazzo Mareschali, which looked like many similar Italian houses, with heavy shutters on the windows as a protection against the hot Italian sun. The address was Via Tre Novembre 5, and there the new baby was greeted by his stepbrother Luigi and his brother Alfonso.

Before telling the story of his relations with his family, and especially with his mother, it is worth taking a look at the world of 1874 into which Guglielmo Marconi was born.

It was a world very different from the one we know, and which to a considerable degree has been changed by the genius of Guglielmo Marconi himself.

His own country, Italy, like most of Europe, was a monarchy. It had been free and united, with its capital in Rome, for less than four years. The country was peaceful; but there was a plague of brigands, who committed robberies and outrages not only in remote Sicily (as

[1] Died of a heart attack, London, 24th April 1936.

sometimes happens even in the second half of the twentieth century), but near Rome itself.

The two countries, Britain and America, which, apart from his own, most influenced Marconi then occupied vastly different relative positions from those of to-day. Britain was, beyond question, the foremost power on earth. Queen Victoria had been on the throne for thirty-seven years, and Benjamin Disraeli Prime Minister for two months. The United States, under President Grant, was still suffering from the effects of the Civil War, which had ended nine years previously, in 1865.

In Italy, Britain and America, as well as other countries, there was no telephone, practically no electric light, no motor-cars. When people travelled on land they went either by railway or, for shorter distances, by some kind of horse-drawn vehicle.

Aeroplanes and regular air travel were also, of course, unknown; though by 1874 man had been occasionally flying in balloons for nearly 100 years.

At sea, there were still more sailing vessels than steamships. The fastest passage across the Atlantic, between New York and Europe (to Queenstown, now Cobh) had been made by the Inman liner *City of Brussels* and took just under eight days; but most crossings of the Atlantic were much slower.

On land men were able to communicate by the electric telegraph, and there was an ever increasing number of cables under the sea, stretching from continent to continent.

But when ships put out to sea, whether they were sailing vessels, or the latest iron screw steamers, which used sails only as a help to their engines, they had no means of direct communication with the land. And for those who were left behind ashore, anxiety and fear for a loved one

at sea inevitably came with the dead silence into which a ship passed once it had sunk below the horizon.

They realized full well that if accident or danger befell a ship she had no means of calling for help. Communication between ship and shore or ship and ship was limited in 1874 to signals by flags, or semaphore, or rocket. In other words, it had to be within the range of eye or ear.

Fear and dread stood invariably on every quay where a ship was about to sail, stepped silently aboard, and were the unseen companions of every lengthy voyage.

Men mentioned the date when they were due to set out on a long voyage with the same sick feeling that the date of anything unpleasant or dangerous arouses. It could be joked about, of course, and was; but it was the kind of joke that is made about visits to the dentist.

It is worth dwelling on the traditional isolation of ships at the beginning of the story of Marconi's life, because the greatest triumph of his life was to end for ever the age-old silence and anxiety which enfolded the mariners of the earth once land had dropped out of their sight.

Marconi gave seamen a voice to cry for help in time of peril; and in doing so he also lightened the burden of fear of those who had men at sea, and waited ashore, far beyond their seamen's horizon.

That was the world in 1874, and the state of traffic by sea, with which the baby Guglielmo Marconi was to have so much concern in his future life.

Soon after his birth, he was taken from Bologna to his father's country house, the Villa Grifone at Pontecchio, not far from the city. Here, Marconi's first scientific experiments were to take place; but long before that time arrived, when he was only three years of age, he was taken to England, where he remained for three years.

Back in Italy, as he grew up, Marconi himself later said

he wasn't a good boy. He never went formally or regularly to school but usually had a private tutor. He was still, however, quite young when he attended classes in physics and chemistry at the Instituto di Cavallero, Via delle Terme, in Florence. And that lovely city was chosen as the scene for Guglielmo's studies, because it was there his mother spent the winter for the sake of her health.

Although Guglielmo's older brother Alfonso was undoubtedly a 'good boy', there is no doubt that Guglielmo was the mother's favourite. Until her death, the relationship between the two was very close. They always spoke English to each other, which was the reason for Marconi's perfect English; and, more important, she was both his confidant in his early scientific experiments—even though she herself had no scientific knowledge—and his unfailing source of encouragement.

It should not be thought from this that Marconi's father was unkind or discouraging. Marconi indeed was exceptionally lucky in that he seems to have been born and brought up in what was a happy home. Except as between his mother and himself there may have been no very lavish displays of affection, but he was fond of his brothers, as they were of him. His parents were devoted to each other; and Giuseppe Marconi, although possibly old enough to be his son's grandfather, rather than his father, was not unsympathetic to the boy's interests, which were revealed quite early. In a few years' time he was handing out the money to make Guglielmo's experiments possible. He showed no great enthusiasm about doing it, but he never refused. What he wanted, before paying up, was an explanation of what was going on. And that, surely, was not unreasonable, especially as Giuseppe was a business man, who had the reputation, carefully acquired, of not throwing his money away.

In some ways, inventors are probably more fortunate than artists, whether they are born rich or poor. In most ages, since industry began, down to our own, and in nearly all lands, the killing struggles of writers, painters, musicians and other artists far exceed those of inventors and scientists.

Marconi was not only fortunate, then, to be an inventor, but, except for a few personal incidents, his whole life was unusually lucky.

He was born comparatively rich; he was healthy; he was never denied any aid he wanted for his work; he was world-famous before he was thirty; and he went to his death having known but a minimum of the bitterness and disappointment which have delayed or diminished the achievement of many equally well-known inventors; and have driven unnumbered artists to drink and despair and death.

True, he did meet opposition from conservative scientists, and from rivals, such as the cable and telegraph companies.

Before wireless, the cable companies had controlled the only means of electric communication between the continents; they had what is called a 'monopoly'. So they did all they could to hamper and discredit the new invention, which, if it could establish itself, would break their monopoly and cut deeply into their profits.

But both kinds of opposition, the doubting, disbelieving scientists and the rival communication companies, were most active *after* Marconi had, so to speak, arrived.

'Even trains will interrupt wireless telegraphy!'

So declared the professors in blinkers.

But fair-minded technical men believed the claims of Marconi and not the contradictions of the professors; and the general public sympathised with this modest and

agreeable young man, whose declared aim was to provide them with a cheaper means of communication.

In the early years, Marconi's companies were very short of money; but even then he had powerful allies.

At the very time when those trains were supposed to be capable of breaking wireless waves, *The Times* of London, then probably the most influential newspaper in the world, unconcernedly availed itself of Marconi's invention and printed despatches obtained by the wireless which 'couldn't' work. It was a decisive gesture of support, which Marconi never forgot.

Although his chief interests were undoubtedly scientific, Marconi was far from being a dull, one-tracked youth. From an early age, he also became greatly interested in the sea. Many times during his life he said if he hadn't been an inventor, he would like to have been a sailor, and he was no more than nine when he displayed his ability on the water. It was then, while he was sailing with his brothers, that he showed he was able to manage a small craft.

This was in the Bay of Leghorn, for he attended classes at the Leghorn Technical Institute, and was coached by Professor Rosa.

Marconi was still only in his teens when he began to set out on the work of his life. At Leghorn a blind telegraphist taught him the Morse code.

Marconi himself told more than once, and perhaps more concisely and clearly than anybody else, the story of the beginnings of wireless. One of these accounts is in a paper in rather faded blue typescript in the great library of the British Museum in London, and is called, *Origin of the Idea of Telegraphy by Etheric*[1] *Waves.*

Michael Faraday, who was born in 1791, the son of a blacksmith, wrote in 1832, 'I cannot but think that the

[1] Relating to the 'ether' or air.

action of electricity and magnetism is propagated through space in some form of vibration.'

James Clerk Maxwell (1831–79) heard about this, and proved by a mathematical formula that Faraday's electro-magnetic waves travelled through the air at a speed exactly similar to that of light, that is, 186,000 miles per second.

The German-Jewish physicist Heinrich Rudolf Hertz next comes into the line of discoverers. Hertz devised a transmitting oscillator, from which electric waves were made to radiate. To detect them in the air he used a metal hoop, which had a gap at one side. When the hoop was brought within the influence of an electrical current set up by the oscillator, sparks could be seen to cross the gap at the side. Hertz declared this proved that electric waves sent out into space could be detected by a metal hoop. He did much brilliant work, and died, when not yet quite thirty-seven, on 1st January 1894.

That spring, Marconi writes in the British Museum paper, he was reading about Hertz's work in an Italian electrical journal.

'I had followed Hertz's experiments for several years previous to this, but they had never before awakened in me more than a passing interest.'

In the summer, he went with Luigi and Alfonso to an hotel in the Alps. One night, with the scent and rustle of the pine trees just outside his window, the twenty-year-old youth lay awake, unable to sleep. It was a night memorable in his own life, and important in the lives of many men scattered over the world.

Artists, who are probably better able to express themselves than inventors, have sometimes described how they came to create their work. A. E. Housman, the poet, for instance, has told how a poem came to him one morning

while he was shaving, so that his skin suddenly crinkled and he cut himself.

William Archer, the critic and playwright, after long years of failure in the theatre as a dramatist, had a dream one night, and woke to find he had dreamt three Acts of a play, which he was to call *The Green Goddess*. But he knew it needed a fourth Act to complete it. The effort of working out that last Act consciously—while he was awake!—almost drove him to despair. He might in fact have given it up, but his friend, the great dramatist Bernard Shaw, encouraged him to persist. So Archer went on, finished his play, and achieved the biggest—indeed the only real—success of his life.

The great ideas of inventors, too, may also come to them in a flash, in a moment of inspiration. Or they may grow slowly and gradually, after long years of painful, hard work.

For Marconi, that night in the Alps was a night of revelation. For some reason, his mind went back to Hertz, the young genius acclaimed by Europe, but dead long before his time. Suddenly, in a shining moment, the tremendous idea was born.

With the aid of Hertz's discoveries, he could use the waves of the air for telegraphy without wires.

Telegraphy without wires . . . that meant it needed no poles . . . the messages might—could—would—*must!*—go anywhere! Across water—across the oceans—across the world . . . .

It was a vision and an idea without limits. But Marconi was more than a young man with a shining idea; he was also extremely hard-headed and practical. And imaginative. He had, among other qualities, the do-it-yourself knack which is nowadays so common, especially among young men. One of the big differences, however, was that

when young Marconi began his experiments, *he* more often than not had first to invent his own tools as well, just because the things he needed had never been needed before by man.

Continuing about what he intended to do on the basis prepared by Hertz, Marconi wrote: 'It occurred to me that if I could interrupt the wave transmission from the oscillator, breaking it up into long and short periods, similar interruptions would be detected in the spark-gap of the metal hoop. Here, in short, was the possibility of signalling across space by means of the Hertz waves. A short emission of the transmitted waves would signify the dot of the Morse alphabet, a long emission the dash, and thus words might be spelled out in the sparks of the distant receiver.'

The idea seemed so simple and obvious to Marconi that he couldn't believe others hadn't had the idea before him.

'I knew', Marconi continued, 'there were many clever men in the world experimenting with etheric waves, and I thought someone would quickly work out the problem.'

He read articles in the electrical journals, many of them, all he could lay his hands on, in Italian and in English; but did nothing. After all, he was only twenty, and he had never even been to college. But what next—?

'After waiting almost a year', he writes, 'without seeing any account of attempted application of the discoveries of Hertz to the transmission of signals, I began my first experiments, in December, 1894 . . .'

Two rooms at the top of the Villa Grifone were now set aside for Guglielmo's exclusive use. Except for the servants who now and again were allowed in to clean, only two persons ever saw the inside of those rooms: Marconi himself—and his mother. He had, of course, to fit up his rooms with a variety of electrical equipment,

batteries and transformers and oscillators, bells and wires —wires everywhere.

Then, night after night, while all the villa, all Pontecchio, indeed all Italy slept, young Marconi kept his light burning brightly in the silence of December darkness.

Working. Doors locked. Eating nothing. Working.

There was a lot of equipment and he needed yet more. And, as ever, he told his mother.

And, as ever, old Giuseppe just grumbled and paid, paid and grumbled . . .

Before the year turned the corner into January, something happened.

'I at once obtained results,' Marconi writes, 'which surprised me, and which I realised were new.'

One night, Guglielmo went and woke his mother, and brought her to his secret attics. He was about to show her something he considered important.

On a table was an electric key. He pressed it. Instantly, in the next attic, thirty feet away, a bell buzzed. There were no wires connecting it to the key. An electric impulse alone had made it sound—across space.

Such a thing had not happened since the world began. It was small, but it was tremendous.

At that moment, as the young explorer in science and his mother stood alone together in the sleeping Italian villa, a new age was born. It was the age that began with a small bell buzzing, and soon was to hear a message flashed across the sea, then a girdle of sound around the earth, and, within less than a lifetime, would lead to radio broadcasting and television, and to wonders of communication still to-day, nearly seventy years later, not entirely realised . . .

'The air', wrote a man in London not long after, 'is full of promises of miracles.'

CHAPTER II

From Italian Chestnuts to Signal Hill

It was the chestnut trees at his father's house, the Villa Grifone, which were to be used in Marconi's next experiments. Presumably he had known those trees all his life, and not thought much about them, as one doesn't of familiar things; but to-day they are an historic relic in the story of the development of wireless telegraphy.

'It had only been possible [until this time],' Marconi wrote more than thirty years later, 'to detect the effects of electric waves over short distances, hardly farther in fact than the distance over which one could make oneself heard by shouting.'

'The effect of an elevated aerial and an earth connection.'

That was a description of one of Marconi's key discoveries.

Helped by his brothers and the boys who worked in his father's garden, what Marconi did was to fix a wire to one of the chestnut trees, and lay an earth connection.

He had thus separated the two rods of the Hertz oscillator, so that one terminal of the secondary winding of the induction coil, already connected to a metal cylinder, was placed on top of the tree. The other rod was joined to a metal plate in the ground.

'I was able [by doing this]', Marconi wrote, 'to multi-

ply many times the range of communication for a given amount of power.'

He was soon sending and receiving understandable messages among the chestnut trees.

By the end of 1895, he was sending messages more than a mile, farther than one could see from the garden, actually over the hill, for 'the interference of obstacles' had at once begun to disappear.

The least effective part of Marconi's apparatus was the receiver, and so early in 1895 he set about improving and adapting for his own use an instrument known as a 'coherer', invented by the French physicist Edouard Branly.

['It consisted,'] said Marconi, 'of a small tube containing metal filings which had the peculiar property of allowing a current of electricity to pass through them only when they were under the influence of a high-frequency electric wave.'

The passage of the current was a signal and could be used to make a click in a telephone or to work a telegraphic recorder and write a message.

The next step, Marconi's family decided, was an expedition to England.

His father was now increasingly enthusiastic about Guglielmo's discoveries, and his mother was naturally glad to make a long visit to the British Isles, the home of her own family. Well connected as they were, introductions were easy, and, thus fortified, Marconi and his mother arrived in London in February, 1896.

This may be a convenient place to pause and try to estimate the extent of Marconi's contribution to the discovery and invention of wireless. Some people, the Russians, for instance, deny that he was a pioneer at all; others believe that he was the sole inventor.

The real truth seems to lie between these extremes, and the best opinion is that Marconi, as was said at the beginning of this book, is entitled to more credit than any other single individual.

In the last chapter, we saw Marconi at the moment of his great inspiration, when he had the idea of using the Hertzian waves.

'I think I am right in saying,' Marconi wrote, 'that previous to my experiments no one had attempted the practical use of the Hertzian waves for telegraphy.'

Sir Will Crooks declared as far back as 1892 that telegraphy without wires was quite possible; only—he did not know how to do it! Oliver Lodge in 1894 had suggested ways of using the Hertzian waves, but not for telegraphy.

The achievements of Admiral Sir Henry Jackson[1], however, must stand apart. In 1891 he had the idea of using the Hertzian waves for naval signalling; and, working in secret, by the end of 1896 he had effected communication without wires over a distance of several hundred yards. In September of that year, Captain Jackson (as he then was) and Marconi met for the first time and compared results. They then discovered that, unknown to each other, they had been experimenting on parallel lines.

In point of time, Marconi was actually the first to take the all-important and decisive step between having the idea of wireless telegraphy and putting it into practice. But as a sheer feat of invention Jackson's achievement equalled Marconi's early success.

Another person to mention is Dr. Adolf Slaby[2], Professor at the Berlin-Charlottenburg Technical High School, because at one time the Germans made important claims on his behalf as a discoverer of wireless.

[1] Sir Henry Bradwardine Jackson, 1855–1929.
[2] 1849–1913.

Herr Dr. Slaby had been worrying himself into circles about the possible use to be made of the waves discovered by his fellow-countryman, Heinrich Hertz. Then came rumours of young Marconi's successes at the Villa Grifone, which caused great excitement to everyone interested; and, soon after that, news of Marconi's pending trip to England.

'Quickly making up my mind,' says the German Professor, 'I travelled to England.'

Some people say it was the Kaiser who quickly made up the Herr Professor's mind for him, and sent him hurrying across the North Sea to find out what he could. Whichever it was, let us leave this learned and impatient German, also for the moment in London, where Marconi and his mother are in lodgings, and, looking ahead a few years, end our examination of Marconi's rivals with one last claimant, Alexander Stefanovitch Popoff[1], the great Russian physicist.

It was because of Popoff that the Russians refused to have anything to do with a celebration in honour of Marconi in 1947.

Popoff, not Marconi, they said, had invented wireless telegraphy; but this was during the period when the Russians were claiming the invention of nearly everything useful in history, from apples to the equator.

Popoff was certainly among those interested in Hertzian waves; but he, like many others, had not been able to do more than express the opinion that they might be useful for signalling. Popoff himself said this when he met Marconi in 1902 aboard the Italian cruiser *Carlo Alberto* at St. Petersburg.

In the beginning, the Russian scientist used the waves only for electrical discharges into the atmosphere to

[1] 1859–1906.

measure thunderstorms. Then, spurred on by reports of Marconi's success, he too set about improving the coherer, and as a result, in 1898, he effected ship-to-shore communication over a distance of six miles.

It was a great achievement; but Marconi had done a similar thing—the previous year, in June, 1897.

The Tsar's Government, which misruled Russia in those times, neglected Popoff and claimed nothing for him; fifty years later, the Soviet Government claimed too much.

The truth was probably expressed by Popoff himself, when he stepped aboard the *Carlo Alberto* in 1902, shook Marconi's hand and said, 'I should like to greet the father of wireless telegraphy'.

Marconi himself had no false or inflated views of his early achievements, and in the British Museum paper already quoted, he gives a very fair summary:

'I have made use of known ideas. My instruments are improvements of my predecessors' with the introduction of a few developments which from my observation seemed necessary. It is only fair to say that the introduction of these new elements was the basis of my long-distance success. It is the business of science to acquire results with the least possible outlay of work or time, and results are regarded as the standards by which a man's work is judged.'

About three months after Marconi's death, in the autumn of 1937, Sir Ambrose Fleming in a paper on the inventor's achievement, said, 'Marconi had an especial power of reducing general principles to practice and devising the form of apparatus which would give best effect to them.'

In other words, making the tool to fit the job.

The same evening, Sir Ambrose also described Mar-

coni's chief single achievement in the field of wireless pioneering:

'His great contribution . . . was the . . . aerial wires with capacity at the top and the earth connection, both to the oscillator and coherer, by which an immense extension of range was at once bestowed, and by this *he converted an experimental apparatus into a practical system of wireless telegraphy by electric waves.*'

'Aerial wires with capacity at the top'—wires in the chestnut trees at the Villa Grifone—that was the distinctive feature of Marconi's work; and it is worth repeating, because it made the difference between the laboratory experiments of more than one man and a system of wireless telegraphy.

That, and Marconi's first use of the Hertzian waves to send an intelligible signal, make up his basic contribution to the discovery of wireless.

An American judge, William K. Townsend, on 4th May 1905, decided a legal dispute about who had invented what, in the case of *Marconi Wireless Telegraph Co. of America v. De Forest Wireless Telegraph Co.*[1] with these words, which put it all very clearly:

'Marconi . . . first disclosed the new highway.'

Now, let us go back to 1896 to London, where we left young Marconi and his mother.

Marconi continued his experiments, and soon after his arrival he met William H. Preece (afterwards, Sir William), who was Engineer-in-Chief to the Post Office. Preece had heard about Marconi's experiments in Italy, and without much delay he informed the inventor that every facility would be given him to demonstrate his apparatus to the Post Office authorities.

[1] This was the Company of the brilliant American inventor Lee De Forest (1873–1961), another claimant to wireless invention.

On 2nd June 1896, Marconi obtained the first patent ever granted to anybody anywhere for any invention relating to wireless telegraphy. Its number was 12039, and the official document declared the reason for the patent was:

'WHEREAS GUGLIELMO MARCONI of 71 Hereford Street Bayswater in the County of Middlesex,
hath represented unto us that he is in possession of an invention for

Improvements in transmitting electrical impulses and signals and in apparatus therefor . . .'

Some weeks after, in July, the day came when Marconi was to begin the trial of his invention before the Post Office chiefs.

With a few assistants, he had set up his apparatus on the roof of the General Post Office (now called the 'London Chief Office') in St. Martin's le Grand, while Mr. Preece and the other Post Office technicians watched.

It was an ordeal for Marconi, who was not yet twenty-two years old, which anybody who has ever sat for an important examination, or faced a selection board will easily understand.

He was pale and slim, without a hair on his face, and he was surrounded by men with important-looking white beards and large moustaches, top hats, large spectacles and well-tended stomachs.

Among them was our old friend, Herr Professor Dr. Adolf Slaby of Berlin-Charlottenburg, who had been allowed to watch.

And there they all stood, watching! Clever men, all of them, possibly looking even cleverer than they really were, but all old enough to be Marconi's father, and many as old as his grandfather.

But Marconi, although so young and alone, had one

great advantage over all those beards and toppers: he knew more about the matter than all of them put together.

He had prepared a receiving station about a mile away on the Embankment, and to it, from the roof of the Post Office, he tapped out his signals. Then, he sent a complete telegram, which was received perfectly without having to be repeated.

The learned German scientist, Dr. Adolf Slaby, suffered a considerable surprise.

'Marconi had made a discovery,' he wrote. 'Only in that way can be explained the secret of his success . . . the production of Hertz rays, the radiation through space . . . all this was known before. True, all this had been known to me also, and yet I was never able to exceed one hundred metres.'

Before his demonstration was over, Marconi attained about one and a half miles. 'Aerial wires with capacity at the top' and the earth connection were what had done it.

Although Mr. Preece had shown Marconi nothing but kindness and encouragement, the very importance of the personalities engaged, and the great prize at stake, made the tests an ordeal. They continued during July and August, but Marconi dealt with them coolly, efficiently and triumphantly.

So far as the British Post Office was concerned, Marconi's wireless telegraphy had begun its career.

Other tests soon followed: on 2nd September 1896, on Salisbury Plain, where messages were sent, under the interested eyes (and ears) of the army, up to eight miles; and, even more interestingly, within some months, over water.

'It was soon obvious,' Marconi wrote, 'that signalling by wireless could be more easily carried out across stretches of water than over land. As it was precisely in

such circumstances that ordinary telegraphic communication was least adequate, the sea was clearly the natural field for the development of wireless telegraphy.'

May 1897 was the date of Marconi's first wireless signals over water.

The scene was the Bristol Channel, and the signals were tapped out from Lavernock Point near Penarth to the island of Flat Holm, a distance of three and a half miles. Brean Down in Somerset, nine miles from Lavernock Point, was also reached.

Fifty-one years later, on 12th May 1948, a bronze plaque to commemorate the historic event was unveiled in the wall of St. Lawrence Church, Glamorgan, which is near the place where those first over-water signals were sent.

Working with Marconi in these experiments was George S. Kemp, then a new acquaintance, who was to remain one of Marconi's closest friends and assistants until his death in 1933.

'I was the first,' Marconi wrote, 'to telegraph from a ship in motion.'

That was the month after the success at the Bristol Channel.

Having been acclaimed in England, Marconi was invited home to Italy, where a land station was erected for him at Spezia, and a warship provided for experiments. King Humbert and Queen Margharita were present, and this was probably the first occasion when the Italian royal family displayed their interest in Marconi.

In July 1897, the Wireless Telegraph and Signal Company Ltd. was formed to develop the commercial possibilities of Marconi's wireless. Later, the name of the Company was changed, and has been called ever since, 'Marconi's Wireless Telegraph Company, Ltd.'

1. Experiments on GPO roof, London, 1896
2. Lavernock - Flat Holm (Bristol Channel), first wireless message across water, May 11, 1897
3. Reporting Kingstown Regatta by wireless, July, 1898
4. Wireless in Royal Yacht 'Osborne', 1898
5. Wireless across the Channel, South Foreland Lighthouse – Wimereux, March, 1899
6. Poldhu Wireless Station 1900-1933, used for first trans-Atlantic signal, 1901, and beam experiments, etc.
7. Chelmsford, Marconi Co., H.Q., Melba broadcast here, 1920

Historic events in the history of wireless: I

Before the end of 1897, preparations were being made at Dover to establish cross-Channel communication by wireless; and early in 1898 an experimental station was erected at Bournemouth. In the same year, Lord Kelvin visited another station at Alum Bay in the Isle of Wight, and as a token of his belief in the commercial future of wireless he insisted on paying a shilling for the message he sent off.

A journalist had a long interview with Marconi about this time, and has left a description of his appearance in the year 1897.

'He is a tall, slender young man, who looks at least thirty[1], and has a calm, serious manner and a grave precision of speech which further give the idea of many more years than are his. He is completely modest, makes no claim whatever as a scientist, and simply says that he has observed certain facts and invented instruments to meet them . . .'

Marconi's modesty of manner did him no harm. In the ordinary course of events, he would have been called up for compulsory service in the Italian forces. Lord Kelvin, however, was able to persuade the Italian authorities that it would be a loss to Italy if the young inventor were drafted into one of the deadening and useless tasks ('spud-bashing', button-polishing, or even saluting) which are the lot of the vast mass of young men who are forced into the ranks of their country's armed services.

Very sensibly, the Italian Government sent Marconi as an assistant Marine Attaché to London. He didn't have to do much assisting or Marine Attaching, and so was able to spend most of his time in useful experiments.

[1] He was actually not yet quite twenty-two when this was written.

In July 1898, the *Daily Express* of Dublin became the first newspaper in history to obtain news by wireless telegraphy. It asked the Marconi Company to report the Kingstown Regatta, and reports were sent by Marconi himself from the tug *Flying Huntress* to a land station set up in the grounds of the Harbour Master. From there the despatches were telephoned to the *Express*.

The following month of that busy summer, Marconi installed his wireless in the Royal Yacht *Osborne*, so that Queen Victoria at Osborne House might communicate with the Prince of Wales, who had hurt his knee, while he was cruising.

When the Queen realised that the young Italian, who had come to fit the Royal Yacht with the Wireless Telegraphy, wasn't just a kind of under-carpenter, she received him with much kindness and encouragement.

Marconi was able to study the effect of intervening hills on wireless communication, while the messages passed from the Royal Residence to the Royal Yacht.

'How is H.R.H.'s knee?' they tapped out on behalf of Victoria, *Regina et Imperatrix*.

'The knee is most satisfactory,' they tapped back on behalf of H.R.H.

The service continued for sixteen days, at the end of which period the royal knee no longer interfered with the Princely pleasures.

In December 1898, wireless communication was established between the East Goodwin Lightship and the South Foreland Lighthouse, and on 3rd March of the following year, for the first time, wireless was used for the saving of life.

The ship *Elbe* stranded on the Goodwin Sands, and the

East Goodwin Lightship at once summoned lifeboats from the South Foreland Lighthouse, and the crew were saved.[1]

The late summer of 1899 finally saw cross-Channel wireless in use. The British Association were meeting at Dover Town Hall, and the French Association at Boulogne. George Kemp had the task of sending a message of congratulation to France; and the answer, also by wireless, was read to the British Association by Professor Fleming.

Great enthusiasm in England and on the Continent marked this latest success of Marconi's invention. Wireless, it was thought, might soon go anywhere, to any distance, over hills or across oceans. But in fact, as yet, wireless did *not* go across the oceans, nor was it in any of the ships which sailed on them.

In October 1899, there was the threat of war in South Africa. One evening, before it was known how the crisis would end—peace or war?—a ship sailed for South Africa from Southampton. Aboard her was a young war correspondent, who many years later described what it was like to sail away in a time of excitement, without wireless:

'While the issues of peace and war seemed to hang in their last flickering balance . . . we steamed off into grey storms. There was, of course, no wireless in those days[2], and therefore at this most exciting moment [we] dropped

[1] Strangely enough, this event, of great historical interest, is shrouded in contradiction and doubt. A contemporary newspaper report described the *Elbe* as a 'barquentine', but no barquentine of that name is known. A year later, Marconi referred to the ship that was said to have stranded as 'a French steamer', but no such steamer is listed in the contemporary registers. Neither Lloyd's nor Trinity House have any record of the alleged occurrence.

[2] Not in that ship, the *Dunottar Castle*, that is to say.

completely out of the world. . . . We had now to pass a fortnight completely cut off . . .'

The young correspondent who 'dropped completely out of the world' was not quite twenty-five years old and his name was Winston Churchill.

Ten years were to pass before the Cape liners were fitted with wireless, and passengers aboard them were no longer 'completely cut off'.

Long before then, wireless made its first appearance in war. It happened that the very night the *Dunottar Castle* sailed, the war in South Africa began.

Wireless was used in South Africa during the campaign, but at first the messages were not clear. The reason was that there were no balloons to raise the aerials. But when kites were flown to do this, satisfactory messages were sent between De Aar and the Orange River, a distance of about seventy miles.

Earlier, in October 1899, wireless was again used to report a yachting event. This was the America's Cup races between *Columbia* and *Shamrock* off Sandy Hook, N.Y. Lee De Forest, the inventor of an American system of wireless, was also reporting the races.

'Old Lee De Forest did his best to jam us!' said a man who had been there.

Marconi returned to England in the American liner *St. Paul*, and during the passage carried out long-range experiments extending over hundreds of miles.

It was during this crossing that Marconi observed the effect of day and night signals: there was a far longer range during the hours of darkness.

On 15th November 1899, when the ship was still sixty-six nautical miles from the Needles, communication was established. News was collected, much of it about the war in South Africa. The bulletins were printed in a little

G. Marconi

THE TRANSATLANTIC TIMES.

VOLUME I. NUMBER I.

THE TRANSATLANTIC TIMES

Published on board the "*ST PAUL*," at Sea, *en route* for England, November 15th, 1899.

One Dollar per Copy in aid of the Seamen's Fund.

Mr. W W Bradfield, Editor in Chief. Mr T Bowden, Assistant Editor. Miss J B Hannan, Treasurer. Mr H H McClure, Managing Editor.

Through the courtesy of Mr G Marconi, the passengers on board the "St Paul," are accorded a rare privilege, that of receiving news several hours before landing. Mr Marconi and his assistants have arranged for work the apparatus used in reporting the Yacht Race in New York, and are now receiving dispatches from their station at the Needles. War news from South Africa and home messages from London and Paris are being received.

The most important dispatches are published on the opposite page. As all know, this is the first time that such a venture as this has been undertaken. A Newspaper published at Sea with Wireless Telegraph messages received and printed on a ship going twenty knots an hour!

This is the 53rd voyage eastward of the "St Paul." There are 375 passengers on board, counting the distinguished and extinguished

The days' runs have been as follows:—

Nov. 9th	435
,, 10th	436
,, 11th	475
,, 12th	424
,, 13th	431
,, 14th	414
,, 15th	412

97 miles to Needles at 12 o'clock, Nov. 15th.

BULLETINS

1.50 p.m. . . . — . First Signal received, 66 miles from Needles

2-40 "Was that you "St. Paul"? 50 miles from Needles.

2-50 Hurrah! Welcome Home! Where are you?

3-30 40 miles. Ladysmith, Kimberley and Mafeking holding out well. No big battle. 15,000 men recently landed.

3-40 "At Ladysmith no more killed. Bombardment at Kimberley effected the destruction of ONE TIN POT. It was auctioned for £200. It is felt that period of anxiety and strain is over, and that our turn has come."

4.00 Sorry to say the U. S. A. Cruiser "Charleston" is lost. All hands saved

The thanks of the Editors are given to Captain Jamison, who grants us the privelege of this issue

The first ocean newspaper, signed by Marconi, published 15th November 1899

newspaper called the *Transatlanti cTimes*. Here is one of them:

'3.40 At Ladysmith no more killed. Bombardment at Kimberley effected the destruction of ONE TIN POT . . ."

So, for the first time, passengers at sea obtained fresh, or what is called 'spot', news of the world. They were no more, in Winston Churchill's words, 'completely cut off'.

On 26th April 1900, Marconi took out his Patent No. 7777 'for tuned or syntonic telegraphy', which became famous in the history of wireless.

This invention introduced tuned circuits, and a wireless set could be tuned to a particular station just as a radio set can be tuned at the present day. Messages could also be recorded at greater distances, and more than one message could be sent along one aerial.

That same month, April 1900, also saw the foundation of The Marconi International Marine Communication Company Limited (known, conveniently, as 'The Marconi Marine Company').

This company was a partner of the older Marconi Company, and Marconi himself became the new Company's Technical Adviser. Its business was with all marine aspects of wireless.

All these events, and many more, showed that wireless was becoming something more than a novelty; it was becoming part of the communications system of the civilised world. As we said, ordinary, ignorant, unscientific people were beginning to think wireless could go anywhere. But not so the men of science, the extraordinary men, the men who *really* knew.

In the very first month of the new twentieth century, January 1901, Sir William Preece, now knighted, who had helped Marconi so much, said in an interview:

'We have now done as much with wireless telegraphy as is likely to be done.'

Nor did he think wireless messages could be sent 'indefinite distances'.

The great and spectacular climax of bridging the Atlantic by wireless had not yet been achieved. Nor, according to a great many of the scientists, could it be.

'Impossible——!'

'The curvature of the earth will send the waves out into space!'

Now Marconi was not only *not* a D.Sc., or Doctor of Science, he had no degree at all; and, worse than anything, he was still only twenty-seven. Yet, quietly but persistently, he maintained that wireless *could* cross the Atlantic.

The great men found it rather irritating.

'The young man's beginning to get a swelled head!'

On 26th November 1901, Marconi and his two assistants, G. S. Kemp and P. W. Paget, sailed in the *Sardinian* from Liverpool for St. John's, Newfoundland. If the learned professors had guessed Marconi's real purpose in that voyage, one can easily imagine the kind of send-off they would have given him. Even unprejudiced people, had they known the truth, would not have regarded that expedition as the one most likely to succeed.

But Marconi said nothing and slipped away in silence on to the winter Atlantic.

Ten days later, on December 6th, the *Evening Telegram* of St. John's, announced:

'MARCONI HERE.

. . . Experiments to be Made on This Coast.'

In an interview, Marconi spoke glibly about the many wrecks that had occurred on the Newfoundland coast, and how a wireless station might prevent further disasters. He had brought with him two balloons and six kites, and he said he hoped to make further experiments.

' "The longest distance I have yet sent a message," said the inventor, "is 225 miles, but before leaving your country I hope to accomplish the feat of sending messages 400 miles." '

The weather, wild and windy, was most unsuitable for hearing things in the air, and at that time of the year, December, would probably only get worse. So they began work at once and, after surveying available land and premises, decided to instal themselves and their gear in a room of a former barracks, which was now a hospital.

It was situated high up on the top of Signal Hill, overlooking the port of St. John's.

The paper reported that Marconi hoped to get into touch with the *Lucania*, already equipped with wireless, and perhaps other vessels . . . results would be 'waited for with great interest by the public' and they hoped everything would 'be perfectly satisfactory'.

'The public' noticed that a light was burning till past midnight in that room at the Old Fever Hospital, and on the days following they saw kites flying over it; but in fact 'the public' displayed little interest, being naturally preoccupied with their Christmas shopping.

They might have felt differently if anybody had guessed for a moment what was really going on under their noses.

The year before, in 1900, a large wireless station had been built at Poldhu in Cornwall, and Marconi's real and secret plan had nothing to do with contacting the *Lucania* or any other ship; nor with erecting a wireless station as a guard against shipwrecks.

His purpose was to have signals sent out from Poldhu, some 1,800 miles away, clear across the Atlantic, and receive them at the spot he had chosen in Newfoundland.

'The critical moment had come,' Marconi writes, 'for which the way had been prepared by six years of hard and unremitting work.'

The feeling of secret excitement, of facing a climacteric or turning point, might be compared with another great test which was to begin from the same town eighteen years later, in June 1919: the first direct crossing of the Atlantic by air.

St. John's went shopping; and Marconi and his aides quietly set about making history.

It was Thursday, 12th December 1901.

Marconi had earlier decided not to rely on the usual coherer signals recorded on tape, but to have a telephone receiver—'the human ear being far more sensitive than the recorder'.

The balloon which was to have carried the aerial aloft had been seized by the wind in a preliminary trial the previous day, 'and disappeared to parts unknown'. Now, on this day of days, Marconi had to rely on his kites. Early that Thursday morning they had succeeded, in spite of the furious gale, in getting one of the kites, with the aerial attached, up into the air, to about four hundred feet.

'Suddenly,' Marconi's story continues, 'about half past twelve there sounded the sharp click of the "tapper", showing me that something was coming and I listened intently.'

'Unmistakably, the three sharp little clicks corresponding to three dots[1], sounded several times in my ear; but I would not be satisfied without corroboration. . . .'

[1] The Morse letter S. See Appendix A, p. 139.

He handed the telephone to Kemp, and asked, 'Can you hear anything, Mr. Kemp?'

'Yes, there it is,' said Kemp.

'The letter S?'

'Distinctly, Mr. Marconi.'

Marconi, though he must have been greatly moved, gave no sign of his emotion.

'He was never unduly elated or never unduly depressed,' said Paget, the day after Marconi's death, more than thirty-five years later.[1]

But that December morning in 1901 was certainly a day for elation.

'I knew then that I had been absolutely right in my calculations,' Marconi wrote. 'The electric waves which were being sent out from Poldhu had traversed the Atlantic, serenely ignoring the curvature of the earth which so many doubters had considered would be a fatal obstacle . . .'

The 'three sharp little clicks were distinctly and unmistakably heard about twenty-five times altogether'.

In a celebration on the thirtieth anniversary of what in America was ever afterwards known as 'Marconi Day', the triumphant experiment was re-staged with all the United States listening in, and speakers joined in from great cities all around the world. Marconi himself was in

[1] There is considerable evidence that Paget also heard the S that historic morning. On at least one occasion, in the interview from which this statement is taken, he himself said so. A year or two earlier, both Marconi himself and Kemp said the same thing. Indeed, both took part in a broadcast, in which Marconi, Kemp and Paget were represented as having listened, in turn, to the signal. Nevertheless, a letter from Marconi to his Company, written at St. John's very soon after the event, on 23rd December 1901, contains this passage: 'I regret to say Mr. Paget was not very well for about two days, and was not present on the Thursday when the best results were obtained.'

London, and repeated the three dots of the Morse S for his unseen, world audience.

As 'Marconi Day' was approaching once more in 1935, Orrin E. Dunlap, Jr. had this to say:

'Men of science who now reflect on December 12, 1901, still see the wonder of the achievement, for at high noon, it was a miracle . . . that a feeble electric wave would leap the ocean and strike a slender wire target dangling from a kite.'

In a broadcast in December 1935, Marconi recalled the great day, and said:

'I now felt for the first time absolutely certain that the day would come when mankind would be able to send messages without wires not only across the Atlantic, but between the furthermost ends of the earth.'

In 1901 that was still faith; but in 1901 wireless *had* crossed the Atlantic. That was fact. Beginning with a leap of all of thirty feet across the attic, followed by a message transmitted a mile from the old chestnut trees in a quiet Italian garden, in seven years a signal had leapt nearly two thousand miles over the Atlantic, direct to the former barrack room on the storm-stricken Newfoundland hill; a signal, man-made and unmistakable for all the scream and uproar of the December gale.

CHAPTER III

Foes, Friends and a Prize

Wireless crossed the Atlantic Ocean on Thursday, 12th December 1901. Next day, Friday, the party at St. John's received further signals, although fainter. But still the world had heard not a word about it.

The local St. John's press had a few lines about that missing 'thirty guinea balloon' and, on the Friday, a statement that 'a test will be made to pick up the S.S. *Lucania* tomorrow'. On Saturday, a kite was reported lost. And so much for Marconi. The papers knew that so far the experiments had 'failed'. They said so.

But Marconi had quietly cabled his friends in England of the triumph, and on Saturday afternoon called on Governor Sir Cavendish Boyle with his astonishing story. Then, at the Cochrane Hotel, he told the newspapermen, and a storm of excitement burst over the world.

There was 'fever-heat excitement' in New York, and entire pages of the Sunday papers, with pictures, maps, facts and fiction, reflected the general exultation at Marconi's success.

It was not until Monday that the St. John's newspapers were able to report the world sensation in their midst, which they had completely missed. They made amends:

THE WIRELESS WIZARD!

MARCONI HOLDS WORLD'S ATTENTION

'Signor Marconi is to-day the most celebrated man in the world . . . the greatest genius of the age . . .'

They even announced his imminent marriage to a lady in Indianapolis, U.S.A.

In short, ordinary people everywhere, who had previously believed in Marconi, were delighted. But there were others—powerful people—who were not; and the reason was plain enough.

For many years, submarine cables under the Atlantic had been in use. Now, for the first time, it seemed possible that a rival method of fast communication might one day come into commercial use. The cable companies and other 'experts' had always known that the curvature of the earth—among other reasons—would prevent wireless crossing the Atlantic. So, when wireless *did* cross the Atlantic, they greeted Marconi's S with very subdued cheers indeed. Their reaction was not entirely unlike that of the rural naturalist, who, when he first saw a baby panda, protested, 'There ain't no such critter!'

To the cable companies, that S was *not* 'man-made'.

'Mistake! Mistake!' they cried at first—a mistake by Marconi of all men in his own special field.

'Atmospheric disturbance——!' That took care of the three clicks of the Morse S, which Marconi said he had heard.

'But what about Kemp——? He heard it too——!'

'*Two* mistakes——! Electric strays——!'

Two men, it seemed, had suffered from clicks in the ear; two heads were worse than one . . . so the cable companies babbled on, consoling themselves, saying it hadn't happened . . . quoting the great Edison, who at first doubting the near-miracle had called it 'a newspaper fake' (but not quoting his warm congratulations to Marconi the next day!) . . .

Marconi, although young in years, was already a shrewd man of the world, and was not surprised by this reaction. But he *was* secretly upset that both his friend Sir William Preece and Dr. Oliver Lodge (soon to be knighted) were among the sceptics.

Sir William, we remember, had declared shortly before that the limits of wireless telegraphy had been reached.

'Causes of disturbances,' he now said, '. . . are . . . fatal to the establishment of a . . . reliable system of commercial (wireless) telegraphy.'

The cable companies had 'nothing to fear . . . from aetheric telegraphy.'

And the Eastern Telegraph Company, to whom this opinion was given, felt a little better.

Lodge said that 'secrecy', 'certainty', 'speed and accuracy' were all alike on the side of the long-established submarine cables.

And the Anglo-American Telegraph Company, who, in their turn, received this bit of comfort, were comforted.

In 1901, it was true, forty words per minute could be sent by cable, and only twenty-two by wireless; but (in spite of Preece) wireless was only at the beginning of its development. Preece and Lodge were both honest men and clever scientists, but their latest knowledge of Marconi's work was three years old, and so they were out of date.

At the present time, more than half a century after these events, it can be said that over a given period, and comparing the latest submarine cables with the most modern radio equipment, telephonic communication, for one thing, *is* more reliable by cable than by wireless. For secrecy and accuracy, there is nothing in it.

What about cost?

'Since the closing years of the last century,' said Mar-

coni in his December 1935 broadcast, already quoted, 'I have striven to give the world improved and *cheaper* means of communication by electrical transmissions through space.'

Wireless costs less than cables to operate, and, if free competition between the two had continued, the public might have enjoyed cheap communication from one continent to another, which Marconi had foreseen and intended in the early years of his venture. But, as in so many other aspects of modern life, the tendency of big business was ultimately to combine rather than to compete.

The result is that the cost of what used to be called a 'marconigram' between, say, London and New York is no cheaper than that of a message sent by the intrinsically far more expensive cable.

But going back to 1901, the frightened cable companies did not restrict their opposition to Marconi to mere denials of his success. That famous S not only never had been heard on Signal Hill, Newfoundland, but what business had Signor G. Marconi to be listening for it there, in the first place?

Answer, 'None!'

Newfoundland, said the Anglo-American Telegraph Company indignantly, was *their* territory!

'Out! Out! Out!' they cried, and threatened to set the law on young Marconi.

And young Marconi had to get out.

They were difficult times for Marconi's infant Wireless Telegraph Company.

'I'll tell you something,' said a man, who began working for the Company about that time and was paid ten shillings per week. 'Sometimes, there wasn't even enough money to pay that, or any of the wages. But we didn't

complain. It was an interesting life, and there was always the chance of being sent abroad. We were all for wireless, that was the thing! There was a wonderful feeling of *esprit de corps* at Finch Lane[1]. And always there was "G. M." —that's what Marconi was always called. He had wonderful imagination, tremendous faith. He wasn't a scientist, but that didn't matter. The details of his ideas were worked out by people like Franklin—Charles Samuel Franklin—'

The action of the cable companies meant a set-back for Marconi, but it did not last long. With the help of the Canadian Government a Marconi station was opened at Glace Bay, Nova Scotia, in 1902. It played an important part in transatlantic wireless.

In Italy, Marconi's own government now became more active in his support. They placed at his disposal, for research and experiment for a period of six months, the cruiser *Carlo Alberto*, and in her Marconi and his assistants made an interesting and valuable voyage of thousands of miles.

King Victor Emmanuel was aboard when the vessel went to Russia, and was visited by the Tsar. It was at this time also, in 1902, that Marconi had his meeting with Popoff, already mentioned.

While the *Carlo Alberto* lay in St. Petersburg harbour, wireless communication was established with Poldhu in Cornwall, and had become so efficient that it was almost a matter of routine.

During the cruise, the German Kaiser also came aboard the Italian man-of-war and met young Marconi.

Still only twenty-eight, and without any title, Marconi now often found himself in the company of Kings and Emperors. In the world of 1902, these men were not only among the most powerful on earth, but also the most

[1] In the City of London, where the Company's office was.

self-important and difficult to get on with. Most royal personages wanted to be friendly, but having little information, and no contact with ordinary people, succeeded only in talking like asses. The Kaiser, chiefly interested in himself, but far better informed than most royalties, could sometimes be charming, but more often was distinguished by a special brand of rudeness and inquisitiveness of his own.

With them all, Marconi conducted himself with a dignity, composure and discretion that would have done credit to a far older and more experienced man.

The cruise continued through Portuguese waters, and to North Africa. Apart from scientific achievement, it was a useful and continuing advertisement for the struggling Marconi companies.

In 1903, *The Times* newspaper, which had supported Marconi from the beginning, now began to take news regularly by wireless; and in the summer Marconi had a signal little success in Germany.

'Marconi had made a discovery——!'

This, we noted, was the tribute paid to him by Professor Adolf Slaby. Yet, some time later—possibly because of the never-sleeping jealousy of his master, the Kaiser—Slaby denied that he owed anything to Marconi, and went on developing his own system of wireless.

All the same, on 12th August 1903, the crack German liner *Deutschland* gave up Slaby's system for Marconi's.

Marconi was now beginning to travel widely and often, with literally scores of trips to the United States. In the age of air travel, when a passage from Europe to New York takes less than half a day, that doesn't sound remarkable. But in Marconi's lifetime, the fastest Atlantic crossing by sea was nearer a week than a day.

So, through his life, Marconi must have spent alto-

gether scores of weeks, amounting to many months and several years, just in crossing the Atlantic Ocean.

On one of his visits to America, Marconi met Thomas Edison, 'the sage of Menlo Park'. The two men got on well, and were able to work together for their common benefit.

'Name the two most famous inventors in the world!'

'Edison and Marconi.'

In the beginning of the century, and for many years afterwards, in most parts of the world, that demand would have produced those names from the great majority of all ages, who were asked the question.

Marconi was now a well-known figure in London 'Society'. Young, brilliantly clever and good-looking, but not at all swollen-headed, he was invited everywhere. In 1905, when it became known that he was engaged to be married to the Hon. Beatrice O'Brien, daughter of the 14th Baron Inchiquin, the papers printed much news and many portraits of the attractive couple.

'The Marconi-O'Brien Wedding Was the Social Event of Last Week,' declared *The Queen*, a weekly publication.

The wedding took place at St. George's, Hanover Square in London, on 16th March 1905, and the couple sailed at once for New York in the *Campania* on an inspection tour of the wireless station at Glace Bay in Canada.

Three children were born of this marriage: Degna, on 11th September 1908; Giulio, on 21st May 1910; and Gioia, on 10th April 1916.

But the marriage did not prove happy.

Soon after its celebration, on May 4th, Marconi won a most important legal judgment, affirming the originality of his inventions and discoveries. This was in the United States court action, already mentioned, in which Judge

Townsend declared it was Marconi who had 'disclosed the new highway'. (See p. 32.)

The Russo-Japanese War had been raging for some time in Manchuria, and once again *The Times* of London proclaimed its own practical faith in Marconi's wireless by using it to send messages to the mainland for onward transmission by telegraph and cable to London. The correspondent was stationed aboard the small steamer *Haimun*, which had been fitted with wireless, and he sent off his copy just as if he was working from a shore telegraph station. To-day this is commonplace, but it was a great novelty in 1905.

Marconi was not complacent about his growing triumph. On the contrary. With his senses alert, and using all the capacity of his largely self-taught mind, in 1905 at Poldhu he began some remarkable new experiments.

These were with an L-shaped, bent aerial, two metres vertical and sixty horizontal. The bent antenna radiated most strongly in the direction opposite to that to which the free end pointed. With this aerial, Marconi, by shifting the horizontal part of the aerial in various directions and noting where the signals were received most strongly, was able to locate the direction of an invisible ship no less than sixteen miles away.

'This discovery,' Professor Fleming commented in a tribute after Marconi's death, 'illustrated very well Marconi's remarkable power of intuitive invention. He did not arrive at any of his results by mathematical prediction. In fact, I think his mathematical knowledge was not very great.'

It is interesting to reflect for a moment on the difference in the quality of men's minds. Einstein scrawled a mathematical formula, and changed the history of the world. Using the knowledge derived from that formula,

man split the atom and threatened the future of mankind itself. But Marconi, with little mathematics and less theory, on his own lower plane of attainment, just calmly proceeded to go ahead and 'what other men had been content to prove impossible, he accomplished'.

It was a period of endless activity. On 18th October 1907, the first wireless message was sent from Cape Breton in Canada to Clifden, Ireland; and in February 1908, public wireless service both ways across the Atlantic was established.

'In fact,' said the old Marconi engineer, 'we still had a lot of trouble. Until the beam[1], there wasn't enough power or speed, and it was hard to compete with the cables.'

So, what happened——?

'What happened was, sometimes—without telling—we had to send *our* wireless messages by using *their* cables!'

Of course, the cable companies didn't know. They were still jealous of the Marconi Company. They—and others—said that public money had been lavished on the Marconi Company, and that Marconi himself had been favoured unfairly over other inventors.

Some people say Marconi was an astute business man as well as a great inventor; others contradict this. In many ways, Marconi was certainly a man of his time.

He himself was not greedy or a money-grubber. Indeed, all through his life he gave away money to charities, and did so quietly and without publicity. 'When thou doest alms, sound not a trumpet before thee' seems to have been his motto.

All the same, Marconi probably shared the belief of that day, that business men had the right to make as much

[1] See p. 109.

money as possible as quickly as possible. The object of business, of course, is still to make money; but now there are laws and regulations which compel rich companies to pay some regard to the interests of the public.

'I know the right to swing my arm,' said the American lawyer Arthur Garfield Hayes in a year when President Roosevelt was in the White House, 'stops where the other fellow's nose begins.'

Thirty years previously, in what was called the Edwardian era, when King Edward VII was on the throne, the period we are talking about, the thing that mattered was not where the other fellow's nose began, but only how strong your own arm was.

The 'arm' of the Marconi companies was, so to speak, both weak and strong. Sometimes, as we have seen, they didn't have enough money to pay wages; and compared with the great rich companies of that time, they were very small fry.

On the other hand, compared with the other wireless companies in other countries, such as Telefunken in Germany (invented by Dr. Slaby and his collaborator Georg von Arco), or De Forest in America, Marconi was a giant.

They called him a bully, selfish and arrogant.

Messages to and from other companies would not be passed on, or only after much delay. Marconi operators themselves were forbidden to have any communication with the operators of other companies.

All this was true; but it was equally true of Marconi's competitors.

Money-making, not serving the public, was the important thing.

In England, this attitude was to lead in a few years, in 1912–13, to what was called 'the Marconi scandal'.

The charge was that men in the Government had used information they had obtained from their public service to make money by dealing on the stock exchange in shares of the Marconi Company or companies. The charge was certainly exaggerated, and Marconi himself was entirely innocent; but the memory of the episode lingered for many years.

The Germans, with their Telefunken, were quick to encourage opposition to Marconi, his companies and all his works. Their restless Kaiser Wilhelm in the early years of the century had become some kind of inventor himself. His speciality was fabricating fancy titles for his own glorification—'Protector of Islam' and 'Admiral of the Atlantic' were among them. And the Kaiser was always egging on his subjects.

It is true that competition between the wireless companies was the cause of something like anarchy in the air. There was real need for international agreement and regulation; and Germany, not altogether unselfishly, loudly demanded such agreement.

In October 1906, after many postponements, an international conference opened in Berlin, and lasted until the end of the month. It ended without an agreement for control of the air, but an international bureau was to be set up in Berne to deal with future difficulties and disputes. It was not enough, but in that age of free-for-all the companies would accept no more.

On 19th November 1909, when Marconi was not yet thirty-six, his inventive genius received international acknowledgement when he shared with Dr. Ferdinand Braun, the German physicist, the award of one of the greatest honours of all, the Nobel Prize for Physics.

CHAPTER IV

The Men With Broken Ears

After Marconi's crossing of the Atlantic, his other successful experiments and the formation of the Marconi companies, interest in wireless spread to the steamship companies.

The first merchant ship in the world ever to be equipped with wireless for commercial reasons, that is, for the purpose of sending and receiving paid messages, was the German liner *Kaiser Wilhelm der Grosse*. That was in March 1900; and in November of that year, the Belgian mail packet *Princesse Clementine*, on the Ostend-Dover route, was also fitted out with Marconi wireless.

The operator was an Englishman, F. S. Stacey, and it was he too, who became the 'Marconi man', as they were then usually called, in the first British liner to carry wireless. This was the *Lake Champlain*, a vessel of 7,392 tons, with one funnel and four masts, owned by the Beaver Line. Liverpool-Montreal was her trade, and she sailed from the former port on her historic voyage on 21st May 1901.

Many years later, Stacey himself wrote about that crossing. There was no special room in the ship for the wireless apparatus, and so one had to be built. It was placed on the boat deck, and was really not much more than a cupboard, 4 ft. 6 in. in length and 3 ft. 6 in. in width. Possibly to save expense, it was built against an iron bulkhead, which formed one side of the structure. It

had no windows and, if natural light was needed, the door had to be kept open. Altogether, this little cabin cost £5, and may be compared with the large and well-fitted radio cabins aboard modern ships, such as in the illustration facing page 81.

But however small and unimpressive the wireless cabin of the *Lake Champlain* might be, the apparatus itself was a source of enormous interest to most of the 1,200 people aboard.

'How far does it signal——?'

'What's an aerial——?'

'How does it work——?'

These, and dozens of other questions, turned Stacey himself during the Western passage into a would-be one-man information bureau on wireless. Passengers and crew alike questioned him about the wonderful new invention, and there were many who did not believe that wireless would work.

The *Lake Champlain* soon got beyond the range of Holyhead and Rosslare stations with which she had been in communication, and as yet there were no wireless stations in America. So Stacey was unable to produce messages he had received to confound the disbelievers. Nor were there any ships equipped with Marconi wireless on the Atlantic for Stacey to talk to. Of course, he could talk to himself; and it is said that he did.

Because of her wireless, the ship aroused great interest in Canada. On her return voyage to England, when Stacey was calling up Crookhaven, he was surprised to receive an answer from the Cunarder *Lucania*. Wireless had been installed in her during the *Lake Champlain*'s absence from England, and the *Lucania* was now making her first crossing with the new equipment.

In the autumn of that same year, 1901, another Cunarder,

the *Campania*, having also been equipped with wireless, came within range of the *Lucania* at sea. A conversation between the two took place, and part of it was the following:

Campania: Have you seen any ice, or have you experienced any fog, please?

Lucania: No; have seen no ice or experienced any fog. We have had fine weather up to the present . . .

To us, this seems a very ordinary conversation, but when it was reported in 1901, it aroused great interest.

Accustomed as we are to broadcasting, television, and even to telephoning many ships at sea, it is hard for us to appreciate how wonderful Marconi's wireless seemed when it was new. Sending messages through the air without wires was almost a piece of magic (and to some old people, as we have said, it still is).

But that simple chat between the *Campania* and *Lucania* started other thoughts as well.

'Suppose,' somebody said, 'two ships came within wireless range in mid-ocean, as these two Cunarders did, and one of them happened to have some trouble aboard—say, her engines had broken down at sea—might it not be that the wireless telegraphy could save her?'

The answer, of course, was 'Yes!'

'And what about giving warnings of bad weather——?'

'Yes, again. Wireless could send warnings from one ship to another, when both were far beyond the range of any coastguard signalling station on either side of the Atlantic Ocean.'

Altogether, it was clear, a ship with wireless would be safer than one without.

'Presumably, then,' the sensible person asks, 'shipowners rushed to spend money on buying wireless equipment for their vessels?'

'Wrong!' is the unexpected answer.

In 1901, it is true, a few owners did begin to *think* about it.

'Would not the money spent on wireless be recovered by paying smaller insurance premiums——?' the owner asked himself.

The answer to this one was, 'Right!'

But when it came actually to *spending* the money just to make ships safer, and chiefly for the crews, a strange paralysis overcame the owners. It stopped their hands before they could sign the cheques to pay for the wireless sets.

After all, in those days, weren't ships and sailors both dirt-cheap?

'I cannot forget,' said Marconi to the meeting of his Marine Company as late as 1914, 'that when this company was registered in the year 1900 it had for its object the introduction of wireless telegraphy upon ships at sea to save life and to save ships, but with very few exceptions we found very little disposition to take advantage of the valuable services which we offered.'

Yet successes of all kinds were being won by wireless in ships at sea. In October 1903, for instance, the *Lucania* all through her passage from New York to Liverpool received news by wireless, which was printed in the ship's newspaper. In June 1904, aboard the *Campania*, not only was a newspaper printed, but advertising space was sold as well.

Slowly, the number of ships with wireless grew. By the end of June 1907, 139 ships of all flags had Marconi's system, the range of which was between 150 and 300 miles. Most of these ships had only one 'Marconi man', who was often nicknamed 'Sparks', because of the crackling spark of his set.

What sort of men were they, and what was their work like?

They were usually young, and many of them had come to the Marconi Company after working as Post Office telegraphists. As wireless operators they received no more than £4 per month; but they were not expected to pay anything for their board and lodging at sea. Ashore, the pay was 2/6 per day. Money in the early years of the century, it is true, would buy far more than it does to-day. All the same, as a very famous operator, now seventy-five years old, said to me, 'It was barely enough to live on'.

Some attempt was made to organise the operators into a union so that they could join together and demand higher wages and better working conditions. But the attempt failed, because the Company just *happened* to scatter the leaders of the movement to the distant parts of the earth.

Wages were low in those days in all skilled trades, and working conditions hard. Yet the wireless men were immensely enthusiastic about their new telegraphy.

'Wireless—that's the only thing we cared about!' a pioneer of wireless said to me.

It must also be pointed out that the Marconi Company itself did not have great resources. We have seen how painfully slow the steamship owners were to buy wireless facilities for their ships. On the other hand, the richer and stronger cable companies were afraid of what they regarded as a new and dangerous competitor, and so they immediately tried to ruin the young Marconi Company. The Marconi Company, in turn, to stay alive, had to squeeze its own employees.

This was the general system of business at that time, and it is sometimes called by those who were not yet born, and so did not suffer under it, 'The Good Old Days'.

For the young Marconi operators it was particularly hard, because they did not even have the compensation of a feeling of comradeship with the other officers aboard ship.

Instead, the Marconi men were regarded by them as 'nuisances' and upstarts.

'The idea of that—that—telegraph *clerk* wearing an officer's uniform——!'

To a *real* ship's officer it seemed a piece of impertinence.

'In many ships,' said the veteran Marconi man, 'we were not allowed into the officers' mess. We had to take our meals alone. And when we were paying off after an engagement, however well we'd carried out our duties, in our discharge books, our conduct was never marked higher than "GOOD"; never "VERY GOOD" or "EXCELLENT". "GOOD" was good enough for Sparks—that ——— Marconi man——!'

Why were these highly skilled, overworked and devoted young men treated so shabbily? Perhaps just because they *were* highly skilled and concerned with something new; and, above all, because they were so young.

It happens that there is a very interesting account of a Marconi operator's life aboard ship in the year 1907, as it looked to a deck officer. The author, now Sir James Bisset, a former Commodore of the Cunard Line, says that 'in its early stages wireless seemed of little use . . .'

There were few 'marconigrams', no regular news or weather bulletins, and so 'the wireless operators had little to do except amuse themselves by calling up other ships . . .'

Old Marconi men to whom I have shown that passage say Sir James is mistaken, and that there *were* regular news and weather bulletins from the very early days. But that is a detail.

Guglielmo Marconi

Signal Hill, St. John's, Newfoundland

To a deck officer, full of gold braid and importance, the young wireless men appeared to be just larking their way across the seas, *and* were paid the princely salary of £4 per month, board and lodging and practically no work included!

Effective criticisms certainly could be made against some of those pioneer wireless men, but their unruly conduct was just part of the unruly world. In the first years of the century, as we saw in the last chapter, there were no international agreements about the control of wireless.

If the bosses refused to make agreements, why should the operators?

That, presumably, is how they all looked at it. But the results were almost unbelievable.

Marconi's wireless, as we know, was not the only system. So, except for the distress calls of CQD and later SOS[1], not only was there no co-operation between the rival companies, but there was real enmity between them. All the companies, including Marconi's, forbade their operators to pass on messages sent by their rivals; and we have already noted how Lee De Forest jammed Marconi as best he could in the America's Cup races one year.

In America, there was a growing number of amateur wireless operators, who owned, and often built, their own sets, and sent out any messages they liked.

'Isn't the air free?' they asked. 'And aren't we free men doing no more than we are entitled to do?'

On one occasion in 1906, while the President of the United States was visiting the American fleet, wireless messages for him were held up because of amateur interference.

In addition, there were the reckless practical jokers. On

[1] See Appendix B for the origin of these calls, p. 141.

Christmas night, 1909, in the teeth of a gale, an American Revenue cutter, the *Gresham*, put out to sea from Boston, Mass., in answer to a distress call from a sinking ship. But the call was a fake, sent out by an amateur operator. This was the 1909 idea of a joke—exactly similar in its irresponsibility to a false fire alarm, though, of course, still worse in the resulting waste of effort, and even danger to life.

How different is this picture of reckless amateurs at work from the radio 'hams' of to-day! Everybody interested in radio has heard of the valuable help radio hams have so often given in cases of illness or distress, by passing on, or even obtaining, information for persons in need of it on the other side of the world.

Marconi men at sea also were often troubled by amateurs ashore, and sometimes these quarrels over the air even led to fights on land, when 'Sparks' arrived in port.

'GTH——!'

'GTHOM——!'

Or, in plain words, 'Go to hell——!' or, a little more sarcastic perhaps, 'Go to hell, Old Man——!'

Those were well-known terms of abuse on the Atlantic, for which the initial letters in the Morse code supplied all the information needed.

OM, however, was also found quite often in ordinary commercial messages, and was typical of the informality of the day.

Love messages and invitations also went through the air from these apparently irresponsible, flirtatious or fighting young men.

But there was also a very different side to their character, and as it came out when they were tested by danger, it is the most important of all.

It was early in 1909, when an accident at sea made the

name of one Marconi operator world-famous. For the first time also, some of the general public in Britain and America learnt a little of the working conditions of wireless operators at sea.

The name of the particular wireless man concerned was John Robinson Binns, but known always as 'Jack' Binns.

He was the sole operator in the White Star liner *Republic*, 15,378 gross tons, bound East from New York. Soon after half past five on the morning of 23rd January 1909, in a dense fog off Nantucket Island, the *Republic* was run into and badly damaged by the *Florida*, an Italian vessel of 5,018 tons.

She disappeared at once into the fog, and as she had no wireless it was some time before the *Republic* found out the name of the ship which had hit her.

But in a very short time after the collision, Jack Binns groped through the wreckage of his wireless cabin, got to his set and found it was undamaged. The electric light had gone, but an emergency provided a glimmer. Then, freezing with cold, in the dark of that January dawn, fog swirling about him, Jack Binns performed a routine but notable act.

For the first time in history, the international call for help was going out from a large passenger ship.

'CQD, CQD, CQD,' Jack Binns tapped. 'SC, SC, SC—*Republic* rammed by unknown steamer 26 miles South-West of Nantucket lightship.'

SC was the call sign of Siasconset, the nearest land station; and as the range of the *Republic*'s wireless on the storage batteries was reduced to 50 to 60 miles, it was the Siasconset station which relayed her distress call to any ships which might be near.

During the long day and night that followed, as the *Republic* slowly sank, Jack Binns, who was twenty-six

years old at the time, remained at his post. Captain William I. Sealby, master of the *Republic*, put a boat over, which found the *Florida*. She was actually not very far from the *Republic*, but quite invisible in the fog. As she was not so badly damaged as the British liner, it was decided to transfer the *Republic*'s passengers and most of the crew to her. After several hours this was safely completed.

The Captain, Binns and a skeleton crew remained in the *Republic*.

It was still very early in the morning, perhaps about six o' clock, when the *Baltic*, bound for New York, intercepted Binns's CQD. The *Baltic*, 23,876 tons, was then one of the largest ships in the world.

'We were a "two-man" ship,' Mr. H. J. Tattersall, one of those two men, and happily still surviving, writes. His skilful and devoted work at his key in the hard day that was to follow also in due time received public acknowledgement.

There was no telephone to the bridge, and so he took the CQD to the Captain himself.

'The Captain read it and muttered, "We're short of coal!" '

But, of course, the *Baltic* turned around at once. She was only about sixty-five miles from the *Republic*, but although Marconi had already begun working on his direction finder (see p. 55), this was years before he had perfected it.

So, all day, in the fog, the *Baltic*, having reached the *Republic*'s reported position and finding nothing there, steamed this way and that, sounding her fog horn, tapping out her own messages, firing maroons, and finding—nothing.

'HOW ARE YOU, OM?' Tattersall asked Binns.

'I'M ON THE JOB,' Binns answered. 'SHIP SINKING, BUT WILL STICK TO THE END.'

Hour after hour, Binns sat at his apparatus, sending out his calls. He had broken a side lever off his key when starting his set in the dark, and so had to hold the lever with one hand and send with the other. He was numb and freezing. He did not even have time to eat, and a steward fed him with a few currants and a glass of wine.

Trying to guide each other, the *Republic* and *Baltic* had been firing maroons. Now, as the winter night was coming on, they were each down to their last maroon.

'B–O–O–M——!'

With his acute, trained hearing, Binns was the only man aboard the *Republic* who finally heard it, the *Baltic*'s last maroon: faintly, but certainly.

Then, he dashed back to his wrecked cabin and tried—somehow—to guide the rescuing *Baltic* by wireless.

'The trouble was,' somebody told me who was in the *Baltic* that historic evening, and was in a position to know, 'the strength of the *Republic*'s signal wasn't loud enough to do any good——!'

But just before six o' clock in the evening, there was a shout from the sloping deck of the *Republic*.

'Her light——!'

And there it was, the light of the *Baltic*. Soon, the *lights*. And passengers lining the rails, and cheering the gallant little crew of the *Republic*. Twelve hours to do sixty-five miles, and, at last, lights and cheers and rescue.

Then followed a second transfer of many hundreds of people in small boats at sea, and in darkness. This time, the passengers and most of the crews of both the *Republic* and the *Florida* were taken to the *Baltic*. And, again, after many hours, the operation was safely completed. The *Republic* was then abandoned.

Yet, when dawn came and she was found to be still afloat, one last attempt was made to bring her into port.

Once more, Jack Binns accompanied his Captain and a few members of the crew to his ship. But all was in vain, and in the end the White Star liner sank.

News of Jack Binns's dogged courage had preceded him by wireless to New York, and he and Captain Sealby were both given a hero's welcome.

Binns was a small man—in inches—and modest.

'I don't consider I'm the hero the papers are all trying to make me out,' he said. 'Any seafaring man expects to have to do as much when the pinch comes.'

Interest in wireless operators was now aroused, and soon afterwards, while he was visiting a friend in the wireless cabin of the German liner *Kaiserin Augusta Victoria*, Binns spoke about an operator's life.

'By the way,' he said, 'it's not the danger that wears out a man's nerves; it's the strain of listening all the time.'

Then he took up the wireless phones, and said to his interviewer, 'Just let me clamp this down on you the way we have to wear it. It must be tight enough for you not to hear *me* at all.'

Then he clamped the headpiece on the other man's head.

'Well, you can imagine how one has to listen to pick out dots and dashes from that, with the ship vibrating from her engines and the pound of the sea against her. When an operator is trying to catch an important message, he'll clamp that thing down tighter and tighter and never notice that it hurts till afterward.'

Then, Jack Binns said something really extraordinary and memorable.

'*Every one of us gets a broken ear or two sooner or later.* Feel mine.'

The interviewer did so.

'Sure enough,' he said, 'the upper cartilage was crumpled into absolute pliability.'

There was talk about the need to invent something which would magnify the sound of messages—and to-day, of course, that has been done.

Binns went on to speak about the lack of sleep and the strain of constant listening, the lack of exercise, and the fear of missing a message.

'In bad weather,' he said, 'we get no sleep at all.'

Surprising as it may seem, the memory of those broken ears of the early Marconi men has now almost completely faded.

A few years ago, when I was gathering data for a radio play about the *Republic* and the *Florida*, I came upon Jack Binns's story, and mentioned it to a former Radio Officer of the Marconi Company. It was news to him. Then, soon afterwards he told me that quite by chance, he had come upon independent corroboration of the story.

An old Marconi operator, perhaps of about the same age as Binns, had something to say on this topic.

'In the early years,' he declared, 'we'd even bend the wires of the phones to press them closer to our ears. Then, you know what——? We'd wrap *towels* around our heads to shut out sea and ship noises!'

It was noticed, incidentally, that this veteran of the sea himself had 'the beginnings of a cauliflower ear'.

'The phones were never off our ears, when we were single operators, from the time we got up till we went to bed at night.'

This was what my other seventy-five-year-old friend told me.

'Of course, our ears were flattened back—and hurt.'

He added a vivid detail about a technique of avoiding the effect of the ship's vibration.

'We'd stand on deck, the phones held in our hands to our ears, and we'd be *on tiptoes*—it helped.'

This is something of the other side of the lives of those pioneer wireless men, whom Sir James Bisset recalls as larking away their lives on the passage of the Western Ocean.

Back in 1909, Jack Binns was recognised at his true value. He returned to England after his narrow escape in the *Republic*, and on February 10th the directors of the Marconi Company held a reception for him at their London office.

Guglielmo Marconi presented Binns with a gold watch, and congratulated him on having been the first to show what wireless could do to save life at sea.

(It was not literally the first time this had happened;[1] but it was certainly the first to capture the world's attention.)

'Any seafaring man would have done the same!'

So said the little hero himself—the man with broken ears.[2]

[1] See the incident of the *Elbe*, p. 38.

[2] Jack Binns died in New York, 8th December 1959. His medals were given through the Marconi Marine Co. to Peterborough, his native town, in April 1961.

CHAPTER V

The Year 1910 and After

'In 1910, the Marconi Company was on its beam ends!' So the old Marconi engineer told me.

'We'd done well, better than we could have hoped —technically. But there just wasn't any money for wireless. The cable companies were just too strong for us.'

The curious thing is, that while technically wireless moved from triumph to triumph, commercially and financially it made little progress, and remained a very weak sister of the Big Business World.

Yet, although the Company might have been on its beam ends in 1910, the year King Edward VII died, it certainly didn't sink. And if it didn't sink, when it was sinking, something must have come along to pull it out.

'Of course!' said the engineer. 'And that makes 1910 a notable year, a turning point in the commercial story of wireless.'

'And what was it, the something that pulled the Company out——?'

'So far as 1910 is concerned, the answer is in two letters: G. I.'

By that the old Marconi engineer didn't mean the common nickname for an American soldier of the Second World War.

'G. I. were the initials of Godfrey Isaacs. And just as Marconi was always known as "G. M.", so Godfrey Isaacs came to be called "G. I." '

Who exactly was this Godfrey Isaacs, who now enters the story of wireless?

It was Marconi himself who invited Godfrey Isaacs to become Chairman of the Marconi Company.

He was a member of a notable Anglo-Jewish family. One relation was a Lord Mayor of London; and Godfrey's own brother was the famous Rufus Isaacs, later Lord Chief Justice of England, Viceroy of India, Marquess of Reading, and holder of other distinctions and offices.

Godfrey Isaacs had spent most of his life in his father's fruit and shipbroking business, which had required much travel in Europe. He had also had the advantage of education at a foreign university. He knew several languages, many foreign peoples and their customs, and was a brilliant business man and financier. With this wealth of foreign interests, and a charm of manner which could be expressed and appreciated in several languages, Isaacs was altogether an ideal Chairman for such a company as Marconi's.

'For a time', the engineer continued, 'money was so low, it was hard to find the cash to pay the engineers. G. I. put his hand in his own pocket and deposited a cheque. So, all the engineers with wages due rushed round to the bank quick to get their cheques cashed, before all the money was used up!'

The Company had never paid a dividend, and looked as if it never would.

'Its shares', said Godfrey Isaacs himself a few years later, 'were unsaleable at ten or twelve shillings.'

After the *Titanic*, they sold as high as £9 10s.

1910 was in fact the end of the very thin time. Henceforth, under Isaacs's strong and enterprising management, there was enough money, and were prospects of more.

After Godfrey Isaacs moved in, Marconi could often

move out, give less time to business and more to research.

Expansion continued and quickened. Experiments or trials were followed without great delay by commercial service.

On 8th April 1910, the first wireless message was sent from Australia to New Zealand, a distance of about 1,100 miles; and in June 1910 the first wireless station was opened at Durban in South Africa.

The first disappointments with wireless during the Boer War because of a lack of aerials, had left a memory. There was opposition to setting up wireless in South Africa; but in the end it was felt that the trend was on the side of the new telegraphy, and the Government supported the plan.

1910 went on in unexpected and exciting directions for wireless.

When King Edward VII died on May 6th, the Prime Minister and other members of the Government were at sea in the Bay of Biscay in the Admiralty yacht *Enchantress*.

And it was the wireless which brought the news of the King's death.

How would they have heard had there been no wireless?

That, it will be realised, is the wrong question. Members of the Government would always be bound to hear, some time, of the death of the sovereign. But they would not have been able to go to sea at all, if their doing so would have meant their being cut off from the capital.

In other words, the invention of wireless had given a new mobility, which is illustrated by the accident of its having been the means of communication which brought the news of the King's sudden death.

Wireless for many people was now no longer a novelty. Thousands sent 'Marconigrams' overseas, just as they

would formerly have sent messages by cable. But even these customers had not the slightest idea of the many still undiscovered uses of wireless. This was hardly surprising when we recall the remarkable words of that expert telegraphist, Sir William Preece, nine years earlier, in 1901:

'We have now done as much with wireless telegraphy as is likely to be done.'

How wrong he was had been seen very soon after he uttered those words. He was to be proved wrong again, in a new and amazing direction; and the first signs of this new development began to appear about the year 1910.

A means of transmitting pictures by telegraph had been invented by Bonelli and Caselli not later than 1872. Then, about 1908, Thorne Baker sent out hundreds of pictures over telephone lines; and in 1910 he succeeded in sending out photographs by wireless.

Sight had been converted into sound, and sound back again into sight. It may seem easy, but it was the beginning of a new kind of wireless miracle.

On 30th November 1924, the Marconi Company, working with their associate company in America, Radio Corporation of America, sent pictures of President Coolidge and other personages across the Atlantic. These were published in the newspapers soon afterwards; and about 1927 the process of sending pictures by wireless was established.

Thorne Baker's achievement in 1910 seems to have been a decisive step in this remarkable achievement.

It was Thorne Baker also who soon afterwards succeeded in transmitting music by wireless.

This was in April 1911, and the piece sent out was a few bars of 'God Save the King'. It was a forecast of broadcasting as it is now known. Nor was this experiment

by any means the first which had sent music over the air in some form of transmission without wires.

On 21st December 1906, at Brant Rock, Mass., U.S.A., a Canadian inventor, Aubrey Fassenden, had sent Handel's 'Largo' over the air.

Even earlier, on 11th July 1906, at the Armstrong College in Newcastle-on-Tyne, as the newspaper of the day said, 'Professor Thornton displayed some interesting experiments' to King Edward VII and Queen Alexandra.

By means of a German invention called in England 'the talking arcs', greetings 'from a distant room' were sent to the King and Queen, and also 'a piccolo solo, songs and a violin solo'.

'There was also', said another account, 'a whistling solo, which particularly delighted their Majesties.'

None of the names of these compositions is known, but it may be they were the first pieces of music ever 'broadcast' before an invited audience.

Marconi himself was actively concerned in all these, and many other, experiments. All promised great possibilities, but in 1910 none excited much public interest.

The wireless sensation of 1910 undoubtedly came with a much more conventional use of the medium; but one that had not yet been exploited, and which made its practical value clear to the world in the most exciting form: the drama of a chase.

This happened with the arrest of persons wanted by the police.

In the old days, when ships sailed away and disappeared until they made port, it sometimes happened that certain individuals disappeared with them—and just at a time when the police might be desiring their appearance; and immediately.

A man on the run who stayed on land remained within

constant range of the telegraph: an unlucky recognition, and the wires of all Europe would be humming with his description, with eyes watching at every frontier and platform from the Hook to the Bosphorus.

But let the same fugitive decide to cast his lot upon the waters, and he at once gave himself a start and an advantage. Once aboard and at sea, even if by an outside chance he was recognised, there was not much the ship's authorities could do about it until she made her landfall. By that time, the hunt might have cooled, local police would have to cable for instructions, even if they were interested—and most police forces in most parts of the world have their own troubles without importing any.

In practice, it happened more often than not that a fugitive was able to leave his ship without being forced to stay and answer a lot of frightening questions about his past.

It was not really a happy day for the criminal classes when Guglielmo Marconi made that bell ring in the attic in the Villa Grifone. In due time, ships came to be equipped with wireless, and thereafter a strange and very difficult barrier arose between the man the police wanted and the freedom the man wanted.

By 1911, there was little excitement when an official of the Italian city of Mantua, charged with stealing 30,000 lire, was arrested aboard the S.S. *Principe Umberto* off the coast of Uruguay, as the result of a wireless appeal from the Italian police.

The public in the previous year had been made to realise the importance of wireless telegraphy as an agent of justice.

'An invisible bloodhound following the scent over the high seas.'

That is what a newspaper of 1910 called wireless; and it was because of the part it played in the case of Dr. Hawley Harvey Crippen, formerly of the United States, but in 1910 a respectable resident of Camden Town, London, N.W., England.

In February of that eventful year for wireless, Mrs. Crippen disappeared from the house where the little doctor lived with her and unhappiness.

After a time, he announced that she had gone home to America; and there, on a date unknown, of a cause unspecified, in a town unnamed, she had died.

In the mouth of another man it might not have been a very convincing story; but the fact was, Dr. Crippen was a kind little man, who was known to have been very badly treated by his big, flashy and extremely selfish wife. So he was believed. He was also, however, in love with his typist, Ethel, who after a time came to live with him.

This caused gossip; and eventually a Scotland Yard detective, Chief Inspector Walter Dew, began making enquiries. He called on Crippen at his office.

'The stories I have told about her death are untrue', said the doctor. 'As far as I know, she is still alive.'

The real truth was she had run off to America with another man.

'I sat down to think it over as to how to cover up her absence without any scandal', Dr. Crippen continued.

So he had told people Mrs. Crippen was dead.

Then the detective went with the doctor and looked over the house in Camden Town. He tapped and poked, searched high and low, found nothing suspicious, and was satisfied with the truth of Dr. Crippen's true story.

Just a few details remained and, to settle them, Dew went again to Crippen's office. To his surprise, he learned that the little doctor had taken his departure.

Without the formality of leaving a forwarding address.

And he hadn't left Ethel either.

Back went the Inspector to Camden Town. And again he began to tap and poke. With more energy and more persistence.

And a poker.

Next day but one, he unearthed human remains under the coal cellar. They were those of Mrs. Belle Crippen, slain, it now seemed, by a dose of the drug called 'hyoscine'.

On July 16th, warrants were issued for the arrest of Dr. Crippen and Ethel for murder, and their descriptions were published.

Among those who read them in the English papers was Captain H. G. Kendall, master of the Canadian Pacific liner *Montrose*, then waiting in the port of Antwerp to begin her voyage to Canada.

She sailed on July 20th, and among her passengers was a gentleman calling himself 'Dr. John File Robinson', who was accompanied by his rather delicate son, aged about sixteen, 'Master John George Robinson'.

'I discovered them two hours after leaving Antwerp', said Captain Kendall.

He watched them while they weren't looking until he 'had found out good clues'. He noticed that 'Master Robinson' squeezed 'his' father's hand a great deal, and 'he' looked really more like a girl than a boy.

Soon, the Captain was convinced that the Robinsons were in fact Dr. Crippen and Ethel.

What was to be done?

It happened that Captain Kendall had been Second Officer in the *Lake Champlain* when she had been equipped with wireless, the first British ocean-going vessel to have it. And the first message received, wishing her success

FIVE PEOPLE IMPORTANT TO MARCONI

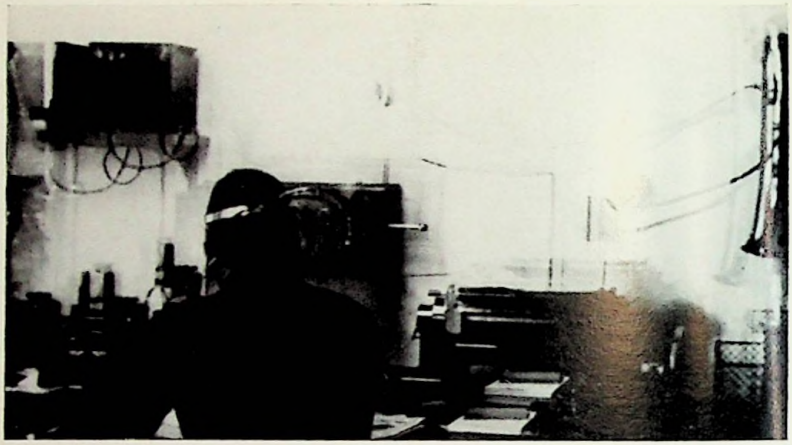
Heinrich Hertz

William Henry
Preece

Signora
Marconi

Adolf Slaby

Godfrey Isaacs



Two wireless cabins; (above) *Titanic* 1912,*
(below) *Empress of Canada* 1961

* This is the only picture of the wireless cabin of the *Titanic* and has never previously been published. It was taken by Fr. F. M. Browne, S.J. who sailed in the *Titanic* to Queenstown. Harold Bride is seen at work.

with her equipment, had come from none other than Marconi himself.

It was enough to make a man more aware of the possibilities of wireless than the average deck officer of the day. Wireless to Captain H. G. Kendall was not just a gadget or a pastime, as it had been to Third Officer James Bisset, for instance.

Early in the afternoon of Friday, 22nd July 1910, the clever Captain was satisfied of the real identity of the 'Robinsons'. Then, having sworn his Marconi operator to secrecy, he had a confidential wireless message sent off:

'. . . Have strong suspicion that Crippen London cellar murderer and accomplice are amongst Saloon passengers. . . .'

By chance, I recently spoke to the man who was the operator at Poldhu who received Captain Kendall's sensational message. The authorities were promptly informed.

Kendall, extending his confidence only to his Chief Officer, continued to keep an eye on the two, without losing their trust and intimacy.

To see whether Crippen in fact had false teeth, as Scotland Yard (mistakenly) had declared, the Captain told the little doctor uproarious jokes so that he would laugh loudly and open his mouth. . . .

Meantime, behind their backs, by other steamers he was relaying wireless despatches, describing with humorous detail the 'Robinsons' and their life aboard ship, to be later published by the *Daily Mail*:

'Her trousers are very tight about the hips . . . are split . . . down the back and secured with large safety pins. . . . His beard is growing nicely. I often see him stroking it and seeming pleased. . . . He would often sit on deck and look up aloft at the wireless aerial, and listen to the cracking electric spark messages being sent by the

Marconi operator. He said, "What a wonderful invention it is!" '

On July 23rd, Chief Inspector Dew sailed from Liverpool in the *Laurentic*, which was faster than the *Montrose*, and was due to reach Canada first.

By means of wireless, the fascinated world now watched the spectacle of the detective's ship speeding across the Atlantic to spring the trap on Dr. Crippen at the very moment when he counted on attaining freedom and happiness with Ethel.

Disguised as a St. Lawrence River pilot, on July 31st, Dew boarded the *Montrose* at Father Point. He was accompanied by other police officers and welcomed by Captain Kendall.

'Good morning, Dr. Crippen; I am Chief Inspector Dew,' said the man from Scotland Yard.

'Good morning, Mr. Dew,' Dr. Crippen managed to say. But the unexpected meeting was a great shock to him and to Ethel.

Dr. Crippen was hanged for the murder of his wife on November 23rd. Ethel was tried and found Not Guilty of having been concerned in it.

Naturally, the arrest of Crippen under such melodramatic circumstances was another tremendous advertisement for wireless and its inventor.

Marconi himself came very close to losing his own life, less than two years after his wireless had done so much to end Crippen's.

He was an active man, interested in horses, the early aeroplanes and motor-cars. On 24th September 1912, while driving his car on the narrow road at the village of Borghetto di Vara, near Spezia, he had a bad collision with another car. Several people were injured. But Marconi himself was grievously hurt. He lost the sight of

his right eye, which had to be removed to save the sight of the left.

For the rest of his life, he had to wear an artificial eye.

Strangers marvelled at the artistic perfection of Signor Marconi's false eye, and none could say which was the real and which the imitation.

Marconi, who had needed both, could; but he just worked on, saying nothing, and thinking he was lucky to be alive.

CHAPTER VI

The Steamship *Titanic*

'The greatest value of wireless, in my belief', Marconi wrote in 1932, 'is still demonstrated by its utility at sea.'

In his broadcast to Australia in December 1935, from which we have already quoted his words about cheaper communication, he mentioned the long period he had been working in wireless.

'Not a little of this time have [*sic*] been devoted to the development of systems which would afford mariners a surer and safer aid to navigation and thereby a larger measure of safety and security for the passengers who travelled with them.'

It was in the year 1912, twenty years and more before these words were spoken, that the whole world realised, more forcefully than ever before or ever since, the enormous importance of wireless telegraphy at sea.

Marconi's own estimate in 1932 of what was still the greatest value of wireless had long before proved correct. For him, too, there was also the satisfaction of knowing, as early as 1912, that his invention had achieved its noblest aim.

This book began with the words of thanks to Marconi by a man who, with hundreds of others, had been saved from shipwreck by the aid of wireless. In half a century and more, it is still the most dramatic story in the history of wireless. It is, of course, the story of the steamship

Titanic, and it has been told so often before that it is not necessary to re-tell it here in full detail. Nor should it be left out. A life of Marconi without the *Titanic* would be like Wellington without Waterloo.

And there is another reason, which was well expressed by my old Marconi veteran, Jack Binns's contemporary. 'The *Republic* and the *Florida*', he said, 'convinced the shipowners how valuable wireless might be for saving their property; the *Titanic* convinced the whole world it might save their lives.'

This was true. After the *Titanic*, there were the beginnings of compulsory wireless for shipping; and after the *Titanic* there could have remained few places in the world which had not at least heard about the new method of telegraphy.

Here, then, I shall describe the tragedy largely as it appeared to the *Titanic*'s two Marconi operators, and use as a main source a long letter written soon afterwards by one of them, Harold S. Bride, to the Traffic Manager of the Marconi Company, Mr. W. R. Cross.

Often exaggerated or distorted in the telling, the facts of the *Titanic* were strange and terrible enough in themselves.

It was on Wednesday, 10th April 1912, that this new White Star liner sailed from Southampton for New York on her maiden voyage.

She was the largest ship that had ever been built to that time, and was of 46,328 gross tons, 882 feet in length, and 92.5 feet beam. Half a century later, in 1962, she would still be the fifth largest merchant vessel afloat.[1]

[1] Surpassed in size only by the *Queen Elizabeth*, 83,673 tons; *Queen Mary*, 81,237; *France*, 66,300, and *United States*, 53,329. For comparison, the Lloyd Triestino liner launched in September, 1961, and named *Guglielmo Marconi* in honour of the inventor is designed to be 27,500 tons.

It is often said that the *Titanic* was also the fastest ship in the world, but this was not true. The Cunard liners *Mauretania* and *Lusitania*, which held the speed records, were faster. Nor was the *Titanic* trying to break the record. The *Titanic*, however, was undoubtedly the most luxurious ship the world had ever seen, and even to-day in some of the craftsmanship of her fittings and the magnificence of her First Class staterooms she has not been surpassed. She was designed to accommodate 2,650 passengers, of whom by far the greatest number would travel in the Third Class. They were, of course, much poorer people than the First Class passengers; but even their cabins, dining saloon and other quarters were more comfortable than in any earlier ship.

A beautiful ship to the eye as well, the *Titanic* was indeed in every outward respect a splendid craft. Only as a seaworthy machine was she a deadly illusion.

After leaving Southampton she called at Cherbourg and Queenstown (now Cobh), and at about 1.30 p.m. on Thursday, April 11th, she stood out to sea on the Atlantic passage to New York. Aboard were 1,316 passengers, including 109 children, and a crew of 885, making 2,201 persons in all.

The *Titanic* was, of course, equipped with the most up-to-date wireless of the time. Its guaranteed radius was 350 miles, which could be exceeded at night. She could send 500 miles, and receive from high power stations at 1,500 miles. The set was worked by a Marconi 5 kw. motor generator, and the wireless cabin was on the Boat Deck abaft the first funnel. There were three adjoining rooms, one for operating the set, one for the dynamo and the third for sleeping.

The two operators were the chief, John George Phillips, always called 'Jack', of course, and Harold S. Bride.

Phillips was born at Godalming in Surrey, and had his twenty-fifth birthday the day the *Titanic* sailed from Queenstown. It was to be his last.

Bride, the junior, from Nunhead, was twenty-two and had joined the Marconi Company in July 1911. Within a few days, the names of these two young men were to be known around the world, to an even wider extent than that of Jack Binns of the *Republic*, three years earlier.

The voyage west had been calm, and the Marconi men had been fully occupied sending and receiving messages for the hundreds of well-to-do passengers—including some very rich and famous people—as well as with routine ship traffic, news and weather bulletins.

Sunday, April 14th, was again calm, but as the day wore on it got steadily colder.

Phillips and Bride had had a lot of trouble with the set the night before. In his letter afterwards, Bride wrote about:

'. . . the leads from the Secondary of the Transformer having burnt through, inside the casing . . .'

After they had bound those leads with rubber tape, they once more had the apparatus in perfect working order, 'but not before we had put in nearly six hours' work'.

'Owing to this trouble', Bride wrote, 'I had promised to relieve Mr. Phillips on the following night at midnight instead of the usual time, "two-o-clock", as he seemed very tired.'

During the Sunday afternoon Bride was called by the steamer *Californian* of the Leyland Line, also bound west, London to Boston.

Californian reported to *Titanic* there was ice about.

Earlier during the day, ice warnings had been received from other ships.

'You turn in, boy', Phillips said to Bride as he took the

night shift, 'and get some sleep, and go up as soon as you can and give me a chance. I'm all done for with this work of making repairs.'

'About nine p.m. I turned in,' Bride wrote.

It was now bitterly cold. Captain Smith had received the ice warnings, and the officer of the watch on the bridge and the two lookouts up in the crow's nest on the foremast strained their eyes, searching the horizon for icebergs.

There was no moon, but millions of stars shone in the sky; and from the *Titanic*'s portholes and saloon windows hundreds of bright lights, row above row, gleamed and twinkled on the calm, black sea. It was so unusually calm, the Atlantic Ocean was almost like a lake.

The *Titanic* was almost the fastest ship in the world, and that night she was going faster than she ever had in her short life. Up and up the speed went, until she reached 22½ knots, or about 26 miles per hour.

In the Palm Court on Deck A, the First Class passengers were drinking their after-dinner coffee and listening to the music of the *Titanic*'s band. There was a sing-song of hymns in the Second Class Library.

Far down, eighty feet or so below the wireless cabin on the Boat Deck, where Harold Bride was now asleep and Jack Phillips was sending off a large number of messages to the shore station of Cape Race in Newfoundland, the stokers, stripped to the waist, shovelled coal on to the fires—for the *Titanic*, like all ships of the day, used coal, not oil, as fuel. On the open decks, the temperature might be freezing, but down in the stokehold, the stokers and trimmers were sweating as they worked.

Soon after eleven o' clock, many of the passengers had gone to their cabins, and turned in. It was a good night to get tucked in to bed in a nice, warm, cosy cabin.

'Just about midnight', Bride writes in his letter, 'I woke on my own accord.'

He lay in his bunk for a little while, listening to Phillips in the next cabin sending to Cape Race.

'I read what he was sending. It was traffic matter.'

Nothing had disturbed Harold Bride, but while he was asleep, the beginning of the most dreadful disaster in the history of the sea had occurred.

The *Titanic* had struck an iceberg; and before three hours had gone, over 1,500 of the 2,201 persons aboard were dead.

But the ship was so big that most of her passengers in the many decks above the engine rooms and stokehold either were not awakened by the collision with the iceberg, or felt no more than a slight jar.

Mr. Beesley, who was in his bunk reading a Bible, felt 'what seemed to me nothing more than an extra heave of the engines . . and so I continued my reading.'

Harold Bride, in his bunk on the Boat Deck several decks above Mr. Beesley on Deck F, heard nothing at all; and slept on for another twenty minutes.

But the firemen on the starboard side of the vessel, below the waterline, and eighty feet under the sleeping Marconi operator, had a terrifyingly different experience.

Without warning, and with a sudden crash of tearing steel, the whole side of the ship gave way, and the sea poured into No. 10 stokehold.

The iceberg ripped a hole some 300 feet long on the starboard side of the *Titanic*, beneath the waterline. Some had called her 'unsinkable'; soon they were to be proved wrong.

Far above, in the wireless cabin, Phillips tapped away. Twenty minutes passed, and Bride woke and began listening.

'I remembered', he said, 'how tired he was, and I got out of bed without my clothes to relieve him.'

Everything to Bride must have seemed quite normal. But then Phillips told him without alarm what had happened.

'Apparently we had struck something', Bride wrote, 'as previous to my turning out he had felt the ship tremble and stop, and expressed an opinion that we should have to return to Belfast.'

Belfast was where the *Titanic* had been built.

Bride wasn't frightened either, or even, it seems, much interested.

'Why don't you turn in?' he suggested, and took over the phones.

Phillips, tired out from his long watch, was just about to do so, when an unexpected visitor appeared.

It was white-bearded Captain Smith.

'We've struck an iceberg,' said the Captain. 'I'm having an inspection made to see what it's done for us. You'd better get ready to send out a call for assistance. But don't send it until I tell you.'

And he was gone.

About ten minutes later he came back, just putting his head inside the cabin door.

'Send the call for assistance!' Captain Smith ordered.

Phillips was now back at the phones. He was the senior.

'We could hear the most terrible confusion outside,' Bride said. But then went on to add, rather curiously, 'But there was not the least thing to indicate there was any trouble.'

'What call shall I send?' Phillips asked.

'The regular international call for help. Just that,' Captain Smith replied.

By ship's time it was about 12.15—some thirty-five

minutes since the accident had happened—and Jack Phillips began to tap out his first message for help from MGY (the call sign of the *Titanic*):

'CQD, CQD, MGY. STRUCK ICEBERG. COME TO OUR ASSISTANCE AT ONCE. POSITION: LAT. 41.46N; LONG. 50.14W.'

For five minutes, Phillips flashed his signals, while he and Bride 'joked'.

Captain Smith returned.

'What are you sending?' he asked.

'CQD.'[1]

At this, Bride made a little joke.

'Send SOS,' he said. 'It's the new call, and it may be your last chance to send it.'

Jack Phillips laughed, and changed the call to SOS[1].

It is not easy to see why the two Marconi men considered the accident funny; but the fact is, they did. Even Captain Smith laughed, or perhaps only pretended to, at Bride's SOS joke. Perhaps Bride and Phillips thought it absurd that a mere iceberg could seriously damage their huge, gleaming-new, mighty *Titanic*.

'The noise of escaping steam,' Bride reports, 'directly over our Cabin caused a deal of trouble to Mr. Phillips in reading the replies to our distress call, and this I also reported to Captain Smith, who by some means managed to get it abated.'

The *Titanic* was blowing off steam to avert the danger of an explosion, and as the wireless apparatus had no amplifier at all, it is easy to understand Phillips's trouble—Jack Binns and his broken ears were proof of the occupational difficulty of hearing, even under ordinary conditions.

Soon ships were answering the *Titanic*'s CQD and SOS.

[1] For the origin of CQD and SOS, see Appendix B, p. 141.

'The *Frankfurt* was the first to answer,' Bride writes. 'We gave him the ship's position which he acknowledged by "OK, stdbi." '[1]

This German vessel was 153 miles from the *Titanic*. Next came the Cunard *Carpathia*, about 58.

Thomas Cottam, the *Carpathia*'s Marconi man, was unlacing his boots and preparing to go to bed when he overheard Cape Cod say they had a lot of messages for the *Titanic*. Cottam, who hadn't heard MGY's SOS, reported this to the *Titanic*. Instead of getting an acknowledgement, this message came:

'HAVE STRUCK AN ICEBERG. COME TO OUR ASSISTANCE AT ONCE. IT'S CQD, OM. POSITION: LAT. 41.46N: LONG. 50.14W.'

Cottam ran to tell his captain the astounding news.

At first, Captain Arthur Rostron thought Cottam had made a mistake. It was absurd! That the largest and strongest ship in the world, on her maiden voyage, on a glass-calm night should need help—and from *him*, the little *Carpathia*——!

But Cottam managed to convince Captain Rostron.

Back on board the *Titanic*, Phillips was soon getting a message that the *Carpathia* was turning round and coming to help as fast as she could.

'Phillips told me to run and tell [the Captain] what the *Carpathia* had answered,' says Bride. 'I did so. . . . I found him engaged in superintending the filling and lowering of the lifeboats.'

The joking was now over.

'Women and children first!'

That was the order sounding across the decks. There had to be a choice who was to live and who was to die;

[1] Which means, 'All right, I'll stand by and listen.'

because there weren't enough boats to save all the human beings, passengers and crew, aboard the *Titanic*.

Captain Smith knew his ship was fatally damaged, and would soon sink. But there was no panic.

The ship's band were playing popular hits of the day, the new ragtime, such as 'You Beautiful Doll' and 'Alexander's Ragtime Band'. Many of the passengers refused to leave what still seemed the safe and steady, brightly-lit deck of the *Titanic*.

She was sloping down towards the bows now, but not very steeply. Many did not even notice it.

More time passed . . .

'We now realised the awful state of affairs,' Bride wrote, 'the ship listing heavily to Port and Forward.'

Bride had forgotten to dress, and Phillips sent him to do so.

'The Captain also came in and told us, she was sinking fast and would not last longer than half an hour.'

Phillips went 'outside to see how things were progressing', and Bride took over the key and raised the *Baltic*; but she was far away.

Then, Phillips came back.

'The forward well deck is under water,' he told Bride.

'We got our lifebelts out,' Bride wrote, 'and tied them on each other, after putting on additional clothing.'

Bride put an overcoat over him as he went back to work. Ships called him, including the *Frankfurt* again, and the *Carpathia* almost continuously. Bride was running reports of her progress to Captain Smith, 'through an awful mass of people'.

'The decks were full of scrambling men and women.'

The *Carpathia* was steaming faster than she had ever steamed before in the ten years of her life. But it was not fast enough.

And through the black, still, freezing night went Phillips's call for help:

'SOS SOS MGY. HAVE STRUCK BERG. SINKING BY THE HEAD. NEED IMMEDIATE ASSISTANCE. POSITION . . .'

The North Atlantic was now crackling and screaming with the cry. Ship passed it to ship; every ship heard it . . . every ship but one.

All this time, nearer than the *Baltic*, nearer than the *Frankfurt*, nearer even than the *Carpathia*, was another ship. She was no more than ten miles off, and her lights were clearly visible from the decks of the *Titanic*.

She was the *Californian*, hove to in the ice.

Earlier that Sunday afternoon, it was that same *Californian*, which had sent an ice warning Bride received.

After the *Titanic* struck the iceberg, the two ships saw each other's lights, and signalled to each other with blinker lamps. But neither received or understood the signals of the other.

If the *Californian* had steamed as fast as she could to the *Titanic*, she could have saved nearly everybody on board.

That she did nothing at all is one of the great tragedies of the sea, and *why* she did is possibly its greatest mystery.

Through more than two and a half hours, two men stood watch on the bridge of the *Californian*, watched the *Titanic* sink, did not understand what they were seeing, and remained quietly asleep in the ice.

Why?

The key fact is, the *Californian* was not only unseeing, but deaf.

Cecil Furmstone Evans, eighteen years old, was her sole Marconi operator. After a very long and hard day's work of sixteen and a half hours, he switched off his set and turned in at 11.30.

"THOSE WHO HAD BEEN SAVED, HAD BEEN SAVED THROUGH ONE MAN—MR. MARCONI

Extract from a speech by the Right Hon. Herbert Samuel, the Postmaster-General, on April 18th

A cartoon published after the *Titanic* disaster

Ten minutes later the *Titanic* was ripped open by the iceberg.

'SOS, SOS . . .' Phillips was soon tapping out ten miles away, within sight of the *Californian*; but the deaf *Californian* heard nothing.

The *Titanic* was near the end now, and Captain Smith came into the wireless cabin.

'You can do nothing more', he said. 'You have done your full duty. I release you. Abandon your cabin. Look out for yourselves.'

But Phillips would not yet give up.

'Leaving Mr. Phillips operating,' Bride wrote, 'I went to our sleeping cabin and got all our money together.'

When he got back, he found a coal trimmer or fireman 'gently relieving Mr. Phillips of his lifebelt'. Phillips was too busy to notice.

There was a fight and the man was laid out.

Far below, the *Titanic*'s engineers had continued working, knowing that their chance of escape was nil; but knowing also that if they left their post and came out, the ship would be without light, and without power.

'We were ready to stand by with emergency apparatus and candles,' Bride wrote, 'but there was no necessity to use them.'

There were thirty-three Engineers and Electricians, and thirty-three died.

Now, the water could be heard washing over the Boat Deck, and at last Phillips made up his mind.

'Come, let's clear out!' he said.

Phillips began walking towards the stern, and Bride never saw him again.

The *Titanic* went down at 2.20 in the morning of Monday, 15th April 1912.

About an hour and a half later, the *Carpathia*, sum-

moned by Marconi's wireless, reached the scene of the disaster, and began picking up the surviving passengers and crew from the lifeboats.

They numbered 711 of the 2,201 aboard.

Harold Bride had managed to reach a collapsible lifeboat, where his legs were injured, but eventually he got aboard the *Carpathia*, and after a short spell in her hospital, he went to relieve Cottam, the *Carpathia*'s operator.

Hundreds of messages from survivors were sent out as soon as communication could be established with the shore stations, and Bride and Cottam had only a few hours of sleep before the *Carpathia* arrived in New York on the Thursday evening.

It was a dismal, wet night. The saddened survivors came slowly down the gangplank on to the pier to their relatives and friends, shocked and for the most part in silence.

A slim, clean-shaven man was waiting at the gangplank.

Quickly, he went aboard and straight up to the *Carpathia*'s wireless cabin. There, Bride was sitting helpless, his legs swathed in heavy bandages. The newcomer took his hand and greeted him warmly.

Probably none of the *Titanic*'s survivors had noticed this unobtrusive man's quiet arrival; though without him none of them might ever have reached New York.

And next day a New York paper published his picture. Over it was printed, 'THE REAL RESCUER', and beneath, 'Mr. G. Marconi'.

CHAPTER VII

The First World War and the Beginning of Broadcasting

'COURT CIRCULAR'

Buckingham Palace, July 24.

'. . . Commandatore [*sic*][1] G. Marconi also had the honour of being received by the King.'

That announcement appeared in the London papers on 25th July 1914. It was a Saturday, and on the Monday following a further item said:

'. . . when the King received Mr. Marconi at Buckingham Palace on Friday his Majesty handed him the Insignia of the Honorary Grand Cross of the Victorian Order.'

The honour which was conferred on Marconi that day undoubtedly gained an added virtue because of the time at which the award happened to be made. A great crisis and threat of war overhung the land, which meant, among many other things, that King George V was much busier than usual. Yet the King still found time to summon Marconi by telegraph to visit him. And there was a particular reason for it.

More than two years had passed since the loss of the *Titanic*. Soon after it, the Postmaster-General, the Rt. Hon. Herbert Samuel, had made a speech in which he said:

[1] So printed; the correct spelling is 'Commendatore'.

'Those who had been saved, had been saved through one man—Mr. Marconi.'

That was the feeling all over the world. Never had Marconi's fame been so high. It was indeed the peak of his whole life.

The vital importance of wireless at sea was now beyond question. Public opinion demanded that ships be equipped with wireless, and even the stingy shipowners began giving way. The result was, for the first time, the Marconi companies began making money. It was, therefore, with a feeling of dismay that the public heard about the so-called 'Marconi scandal' (see p. 57), and people were ashamed that Marconi himself should have been drawn into the enquiry.

Not the slightest shadow was cast on his own personal honour, however, and the decoration conferred by King George V was intended to emphasise that not only was Marconi's character above reproach, but that he had deserved well of the state.

After the *Titanic*, an International Convention For the Safety of Life At Sea was signed in London on 20th January 1914. Certain recommendations were made, and to fulfil part of them, a Bill was presented to Parliament requiring all ships carrying fifty persons or more to be fitted with wireless.

The law did not compel *all* ships to have wireless; nor does it to-day. Nor is our surprise any the less that it doesn't.

Godfrey Isaacs in 1914 had something to say about this.

'What is going to happen,' he asked, 'when a ship sails from port with forty-nine passengers and crew, and a fiftieth is born on the voyage? I do not know whether . . . when it arrives in port it will have contravened the law for not carrying wireless telegraphy on board; certainly

[it] will have one disadvantage—it will not be able to advise friends at home of the welcome arrival of the addition to the family.'

Agreements were being drafted in July 1914 for the erection by the Marconi Company of a chain of wireless stations through the British Empire; and also to regulate the conditions under which British steamship owners should use Marconi's wireless.

At the meeting of the Company, Marconi spoke about the wireless industry, and also expressed his indignation at having been dragged into the 'scandals', which were really a British political row.

'Many times,' he continued, 'have I been tempted to return to Italy. . . . I should return permanently . . . tomorrow . . . were it not for a sense of duty and loyalty to my colleagues . . .'

A few days later began what used to be called in Britain and some parts of Europe, 'The Great War'.

Although The Great War or World War I, whichever it is called, began in 1914, Marconi's own country, Italy, did not enter the fight until 1915.

An Italian citizen all his life, Marconi's sympathies and interests were with Britain and her Allies from the beginning, and he continued to place his knowledge and work at their service.

About this time, wireless was capable of a speed of thirty words per minute. Marconi's latest interest was in the development of a direction-finding apparatus, with which, it will be remembered, he had first been occupied in 1905.

In the spring of 1915 Marconi had to go to New York to give evidence in a law case for the American Marconi Company against the German wireless company Telefunken.

Before the case was finished, it looked as if Italy would enter the war very soon on the side of Britain, and Marconi received a secret summons to return home at once.

It was thought that the Germans might try to capture him, and so Marconi made the crossing in the *St. Paul*, an American, and therefore still neutral, ship. Once, the *St. Paul*, as the vessel of his notable experiments, had resounded with the name 'Marconi'; but on this passage, he travelled under a false name, and without labels on his luggage.

Marconi reached home safely, and soon afterwards Italy declared war on Germany.

Marconi, who had been honoured by being appointed a Senator in Italy, in June 1915, joined the army with the low rank of Lieutenant in the Engineers.

All the same, he was soon organising the wireless service of the army. This was a more important duty than any other Lieutenant had, but then no other Lieutenant was so important as Senator Guglielmo Marconi, who was in fact probably the world's most important Lieutenant.

He took no active part in the fighting; and it must be remembered always, because it is always so easy to forget, that although Marconi led such an active and apparently normal a life, he was in fact half sightless.

In 1914, Marconi had been making tests of wireless telephony, and had succeeded in maintaining spoken conversation between two Italian warships over a distance of forty-five miles. Although experimental wireless was generally forbidden during the war, Marconi, of course, was not the subject of that ban, and in fact continued his work.

As was his custom, he also visited England even during the war. He was conspicuous at public parades and jubila-

tions designed to convince the British people of the warmth of Italian friendship, which was largely a fact, and of the strength of Italian arms, which was largely a fiction.

As an unruffled and coolly efficient figure, Marconi's presence was, therefore, particularly valuable on those not infrequent occasions when the Italian forces happened to be in retreat.

All during his life, in fact, nobody was less like the Englishman's vulgar idea of an Italian as dark, gesticulating and comically devoted to grand opera and coloured ice cream.

Marconi wasn't particularly dark, he spoke calmly and rather slowly, and he wasn't even exceptionally fond of music.

At the end of the war in 1919, Marconi, as one of the most famous Italians alive, was invited to serve in the delegation of Italy to the Versailles Peace Conference. He took the job as a patriotic duty, even though it meant postponing his return to full-time work on his experiments.

Tranquillity was essential to him. So, after the Peace Conference, he decided to escape from the variety of interruptions which his fame mobilised against his work.

Marconi decided to make a drastic change in his life: he would leave his house in Rome and live where he could not be so easily disturbed; he would go and live at sea.

At the end of 1919, or the beginning of 1920, to carry out this decision Marconi bought a yacht. She was the *Rowenska*, which had been built at Leith in 1904 for the Archduchess Maria Theresa of Austria, and was 220 ft. overall, 21½ ft. beam, and had a depth of 16½ ft. Marconi had her converted to a floating home, a workshop and a research laboratory; and changed her name to *Elettra*.

Under that name, the yacht became famous, and for the remaining seventeen years of his life, *Elettra* was Marconi's headquarters.

'The yacht,' he said, 'not only makes me independent, but it takes me away from curious eyes and distractions. I can work there at all hours of the day and the night . . .'

As the years passed, *Elettra* became ever more comfortably, and indeed luxuriously, equipped. She had guest rooms, four bathrooms, and, of course, the most modern and efficient wireless equipment. In Marconi's private cabins were signed photographs not only of his friends, the King and Queen of Italy, but also of other reigning monarchs, and many famous persons.

The year 1920, like 1910, was an eventful one in many ways for Marconi personally, and for wireless.

It saw the introduction of a most important development in wireless, the Auto-Alarm.

The night the *Titanic* went down, the wireless operator of the *Californian* was asleep off duty, and more than 1,500 lives were lost.

At the British enquiry, Marconi gave evidence, and described an idea he had.

'A danger signal accompanied by a "long dash". . . . This would cause a bell to give a prolonged ring, much the same as that of a fire alarm on shore . . .'

The operator would then be called or wakened, knowing that the bell denoted a ship was in distress and needed help.

But until that invention came into existence, one result of the *Titanic* was the 'Continuous Watch' System, which required the employment of three wireless operators, so that one could always be listening for a distress call.

In 1920, the perfecting of the Auto-Alarm meant a saving in wages for shipowners, and the instrument was

happily accepted. It is now compulsory in British ships.

That same year brought Marconi the great personal sorrow of his mother's death. They had been much closer than most mothers and sons, and until she died Signora Marconi was her son's confidante and supporter. A quarter of a century had passed since Guglielmo had made the bell ring in the attic; and it was actually early in 1920, the year of her death, that another dramatic stage was reached in the development of wireless.

Marconi Company operators at St. John's, Newfoundland, spoke by telephone to the Marconi Company at Chelmsford in England, over 2,000 miles away.

This year, 1920, saw indeed what is now often described in science (and in sport!) as a 'break-through', that is, a substantial advance.

That summer was the very threshold of broadcasting as we know it to-day. It owed much to the invention of the thermionic valve by Dr. Ambrose Fleming, who had many associations with Marconi.

There were intense and exciting experiment and achievement, much of it starting from the Marconi wireless station at Chelmsford. Wireless was known for commercial messages, news bulletins, weather reports, and, of course, for distress calls at sea.

In 1920, it came to be used for something quite different in purpose: entertainment.

In the Strand, in London, on the wall of a building, which used to be called 'Marconi House', is a tablet which reads:

WITHIN THIS BUILDING
MARCONI'S WIRELESS
TELEGRAPH COMPANY
LTD. OPERATED THEIR
FAMOUS BROADCASTING

STATION 2.L.O. FROM MAY
11TH TO NOVEMBER 15TH
1922 WHEN IT BECAME
THE FIRST STATION OF THE
BRITISH BROADCASTING
COMPANY.
THE FIRST PRE-ANNOUNCED BROADCAST
OF PUBLIC ENTERTAINMENT IN THE
WORLD TOOK PLACE TWO YEARS
EARLIER WHEN DAME NELLIE MELBA
SANG FROM MARCONI'S CHELMSFORD
WORKS ON JUNE 15TH, 1920

The performance of the great Australian singer, Nellie Melba, took place in the evening.

'Punctually at a quarter-past 7', said a newspaper the next morning, 'the words of "Home, Sweet Home" . . . swam into the receivers. Those who heard might have been members of an audience in the Albert Hall.'

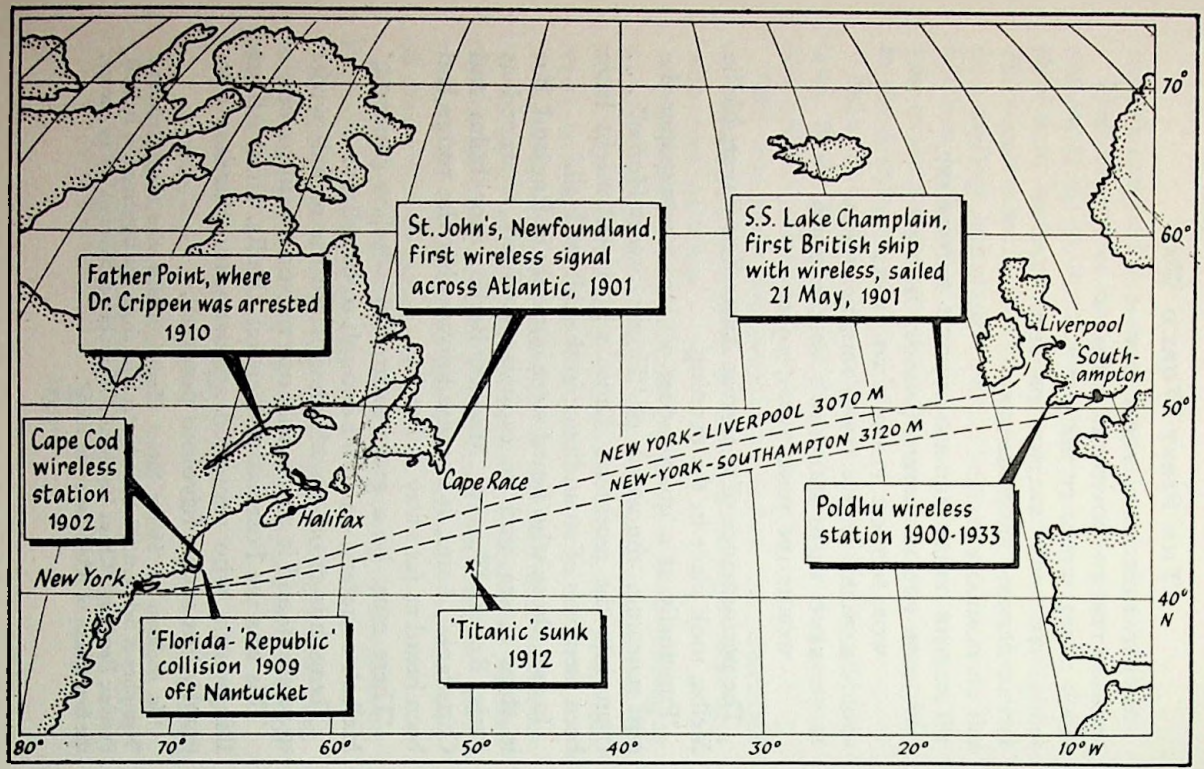
In fact, those who heard were not only in England, but in ships at sea, and 'in capitals as widely separated as Paris, Rome, Warsaw, Madrid, Berlin, Stockholm and Christiania'. Later, it became known that the songs had been heard as far away as Persia.

'There must be a great future for wireless concerts,' Melba's secretary was bold enough to prophesy.

Thousands of others who had heard the recital[1] wrote to praise it; and it seems only one person disapproved.

This was the Postmaster-General, the Rt. Hon. Albert Illingworth, who protested against using wireless telegraphy 'for such a frivolous purpose'.

[1] In addition to 'Home Sweet Home', Melba also sang Bemberg: 'Nymphes et Sylvains' (in French); 'Addio' from 'La Bohème' (in Italian), Puccini; Bemberg: 'Chant Venétien'; 'Nymphes et Sylvains' as an encore; the first stanza of 'God Save the King'.



Historic events in the history of wireless: II

But the British public preferred the lovely singing of Nellie Melba to the croaks of their Postmaster, and the experiments continued.

Just over a month later, beginning on 21st July 1920, the liner *Victorian*, at sea, held a highly successful series of trials with wireless, or radio telephony, as it now began to be called.

Conversations were carried on with Chelmsford over 600 miles, a concert was heard, and the *Victorian* herself acted as a sending station, transmitting gramophone records.

Most of the numbers were requests from ships spread over a radius of 800 miles in the North Atlantic. Many of these vessels had receiving sets, but no wireless telephone transmitters, and so their requests went to the *Victorian* by the long-established dots-and-dashes of wireless telegraphy.

'Please let's hear Harry Lauder singing "I Love a Lassie", OM!' So the Marconi man tapped.

The passengers sat and waited. In a few minutes, there was Harry Lauder's voice, coming out of a box—in mid-ocean; thousands of miles from land! And many others.

It was impossible, and yet it was happening!

The biggest problem of communicating by wireless telephone with ships at sea was how to link the ship's apparatus with ordinary land telephone lines. This difficulty was solved quite soon, and then the oceans as well as the continents were suddenly opened to the sounds of nature and of man.

The song of the nightingale and the voice of Melba alike could now be sent over the waters. Of course, it was not all sweet sounds. The throbbings and shatterings of the twentieth century also could now be flung thousands of miles along the air waves from the city streets and

factories, where they arose and were almost no longer even noticed, to the still parts of the earth, whose quiet they broke for ever. But so too might there be heard, for the first time in distant places by new listeners, and as if just created, the solemn and majestic airs of Bach or the gaiety and heavenly themes of Mozart.

Music, the drama—in fact, the whole world was soon to be revealed to all the world, making a new world. The strange and wonderful experience came to the ears not only of neighbours, but to men living thousands of miles away in remote lands, on lonely farms; not only to luxury liners, but to fishermen tied to their nets amid the fogs and storms of the deep and the shallow seas.

From the *Elettra*, Marconi conducted many experiments in rebroadcasting similar to those held aboard the *Victorian*, and gave the newspapers of the world cause for reporting one radio sensation after another.

Melba's voice was heard in mid-Atlantic and sent on to Europe. At Cowes, the Savoy band playing in London was heard aboard *Elettra*, and so loudly that neighbouring yachts begged *Senatore* Marconi, please, for a little less of it!

The word 'broadcasting' itself now became known, and programmes of organised entertainment were published in American newspapers. From very early days, advertising accompanied broadcasting in the United States, and soon hundreds of stations with millions of listeners were spread over the land. There, the word 'wireless' was hardly ever heard or read any more—it was 'radio' only.

In England, on 11th May 1922, as the plaque in the Strand notes, 2LO with its famous call sign, 'London Calling', began operations.

On 14th November 1923, Marconi first spoke over a

B.B.C.[1] microphone with a long and detailed history of broadcasting.

His talk was notable for the great number of names of scientists and inventors and discoverers he mentioned, and was a fair answer to the few who asserted that he 'hogged' all the glory and credit for himself.

On 30th May 1924, Marconi, using a 92-metre wave length, held the first direct telephone conversation between England and Australia. This success followed earlier experiments by Marconi in *Elettra* while cruising in the South Atlantic, and his assistant and colleague Charles Samuel Franklin.

As early as 1896 Marconi had been interested in the possibilities of short waves. Then, he thought their future unpromising. Later still, when the nature of the Heaviside layer in the upper atmosphere became known, it seemed possible that the layer would 'bounce' back the short waves, so that they could be used without the loss by attenuation which previously had made them unprofitable.

It was about this time that Marconi and Franklin were working on the 'Beam' system, which was to prove a tremendous advance in radio. Franklin, under Marconi's direction, from a specially installed station at Poldhu, directed short-wave transmissions not in scattered waves but in one 'beam' to Marconi in the *Elettra*.

Sensational results were obtained.

Franklin's beam aerial, while needing a most economical amount of power, led to the establishment of high-speed radio communication to and from all parts of the world.

Hitherto, said Marconi, it had been thought that short

[1] Then, B.B.C. stood for 'British Broadcasting *Company*', not 'Corporation'.

waves could be used reliably only at night, and that otherwise long waves using much more power were needed for communicating over long distances.

The beam brought about a real revolution in wireless transmission, in speed, in economy and certainty. An agreement between the Marconi Company and the British Government was reached in 1924 for the erection of 'Imperial Beam Stations', and in 1926 and 1927 a chain of them was erected in Canada, Australia, South Africa and India.

'For the first time,' the retired Marconi engineer told me, 'we could really compete with the cable companies on equal terms—or even better!'

Marconi's own personal life was marked in 1924 also by a great change. His marriage was dissolved by an ecclesiastical decree at Fiume on February 12th, which decision was later confirmed by the civil court.

At some time, Marconi met and fell in love with a beautiful blonde Italian girl, Countess Maria Cristina Bezzi-Scali. Her parents approved of Marconi, who as a middle-aged man was still as popular as he had been as a youth in his twenties. But, as they were faithful Roman Catholics, to whom divorce is not permitted, there could be no question of a marriage between their daughter and Marconi.

Then, most fortunately, the Westminster Consistory Court in London (where, it will be recalled, Marconi had been married) discovered that he hadn't been properly married in the first place. The result was to make Marconi once more a single man, and free to marry if he wanted to.

This is exactly what he did want, and on 12th June 1927, he and the Countess Maria Bezzi-Scali were married.

That autumn the couple went to New York. It was the

bridegroom's eighty-fifth crossing of the Atlantic, and ship reporters said they had never seen *Commendatore* Marconi looking so well, so happy or so young. He was fifth-three, but looked much less.

Unlike his first union, his marriage in 1927 brought him great happiness. And as this is a gay and cheerful subject, it may also be the place to say something about another, the mass of honours and honorifics bestowed upon or applied to Marconi at different times during his career.

Like everybody else, he was, of course, a plain 'Signor' or 'Mister'; but as far back as 1897, when he was only twenty-three, he was awarded an Italian knighthood. That made him a *Cavaliere*.

In 1915, he was appointed to the Italian Senate, and so after that was often called '*Senatore*', which needs no explanation. He will also be remembered as the most important Lieutenant of the Italian Army, which rank in Italian is *Tenente*. Later, he was promoted to Captain or *Capitano*.

It was felt, however, and with good reason, that *Capitano* Guglielmo Marconi's interests had been largely connected with the sea, and so in 1916 he was transferred to the Italian Navy, and given the rank of Commander or *Comandante*. As by this time Marconi also held a rank in various orders of chivalry, such as the Grand Cross of the Order of the Crown of Italy, he was also therefore entitled to be called (rather confusingly) a *Commendatore* as well as a *Comandante* and a *Cavaliere*.

In order not to make this too simple for those who wish to keep a precise record of the correct method of addressing an envelope, for instance, to Guglielmo Marconi at different times, we must not forget that he had won in 1909 the very high honour of a Nobel Prize. But, in addi-

tion, he also collected an impressive number of gold, silver and other medals, Certificates, Diplomas, Freedoms of Cities, and fourteen Honorary Doctorates from fourteen universities in five countries, for which reason he was entitled, fourteen times over, to be addressed as *Dottore*.

In 1929, the Italian King was feeling especially pleased with Marconi, and so bestowed a Marquisate on him. In the last years of his life, therefore, the inventor was most often called Marquis or *Marchese*. In 1936, he was also promoted in the Navy from *Comandante* to *Contrammiraglio*, or Rear Admiral. But when space was short in the newspapers, especially in America, Marconi became neither *Cavaliere* nor *Tenente*, neither *Capitano* nor *Dottore*, not *Comandante* nor *Comendatore*, not a Freeman or a Fellow, a Medallist or a Member, not an Academician or even a *Marchese*, but like millions of lesser men, just once more plain *Mister*.

Early in 1930 the *Elettra* was in the Mediterranean, when Marconi spoke from a telephone aboard the yacht to telephone subscribers in many cities all over the world, including London, New York, Sydney, Buenos Aires, Bombay, Cape Town and Montreal. It was probably the most comprehensive demonstration yet given to the world of the efficiency of the link possible between telephones afloat and ashore.

With the same apparatus, Marconi aboard the *Elettra* off Genoa on 26th March 1930, gave a wireless signal which went to Grimsby in England, and thence by beam switched on the lights in the City Hall in Sydney, New South Wales, over 9,000 miles away, and thereby opened the annual Australian Electrical and Wireless Exhibition.

Just under four months later, on July 20th, Marconi

won another distinction: he became a father for the fourth time.

A baby girl was born to him and the Marchesa, and judging by his intense and touching devotion to the child during the few years that remained to him, it is possibly not entirely sentimental to say that Marconi valued his paternity on this occasion more than the whole long list of honours and ranks and titles and degrees piled upon him through his life.

They named the little girl Maria Elettra Elena Anna; but her father called her always, and only, by the name which had come to mean most to him in the whole world, 'Elettra'.

CHAPTER VIII

Marconi and Mussolini

'Many times have I been tempted to return to Italy, where the pleasures of my native land await me, and where I can continue my scientific pursuits under ideal conditions . . .'

Some of those words spoken by Marconi in 1914 have already been quoted. They are repeated here for their revelation of his feelings towards Italy. It is perhaps there that the explanation may be found of the apparent mystery of his political activities in the latter part of his life; for although only half Italian by descent, Marconi was always and only a patriotic Italian.

His work, and the many travels connected with it, had occupied him from the time he was a young man until he was nearly fifty. He was fond of horses and aeroplanes and—in spite of the terrible accident in which he had been injured—of motor-cars too. But many things had no interest for him. One of these was politics, and the method of governing the country.

It was then a surprise in 1923, when at the age of forty-nine Marconi joined the Italian Fascist Party, and for the rest of his life he was an active and enthusiastic Fascist.

What was the Fascist Party, and 'Fascism', the name which described its philosophy?

Both words, 'Fascist' and 'Fascism', come from the Latin word *fascio* meaning a 'bundle'. It was used in

Roman times to denote the *fasces* or bundles of twigs, which were the badge of office of the 'lictors' or special police of ancient Rome, and a symbol of strength. The theory was, there is little strength in a single twig, but much in a number of them tied together. A simple proof of this can be had by breaking a single twig with one's fingers; but it is a different thing to break a bundle of them.

At the end of the First World War, a discontented and ambitious ex-soldier named Benito Mussolini (1883–1945) began organising gangs of young men—equally discontented but certainly less ambitious—to fight against Socialist and Communist workmen who were on strike or agitating for higher wages. Hundreds of thousands of workmen in fact had occupied the factories with the intention of running them themselves.

At first, Mussolini, who had been a revolutionary Socialist himself, supported the occupation. But the movement was badly led, and Mussolini turned against it. He had trained as a school teacher, but had become a journalist.

Putting his gangs of young ruffians into uniform, of which a black shirt was the chief feature, Mussolini and his friends led the 'Fascists' in a relentless war against the Italian workers.

Italy was a poor country and discontented, with a widespread belief that she had been cheated out of her share of the spoils of victory in the 1914–18 War.

The Russian Revolution of 1917 had also created an unreasoning fear of Communism among the rich, the aristocracy and the Church.

Now called the *Duce*, or Leader, Mussolini took advantage of these various forces and fears, and promised to restore order and make Italy strong and 'glorious'. On

this vague programme, the King called on Mussolini in October 1922 to take over the government of Italy.[1]

A few months later, in 1923, Guglielmo Marconi joined the Fascist movement.

'*Credere! Obbedire! Combattere!*' ('Believe! Obey! Fight!') shouted the Fascists; and for many years that is just what most of the Italian people did.

What, it must be asked, was Marconi doing in such company?

A clever, law-abiding, cultivated and thoughtful man, all his associations and experience were in countries where freedom and democracy were always praised, if not always practised.

Mussolini's government was based openly on force, and despised both democracy and liberty.

'Liberty', bellowed the *Duce*, 'is a stinking corpse!'

It was exactly the kind of régime which might appeal to a bully and an autocrat.

Marconi, from every account, was a very different character.

'Oh, a very pleasant man——!'

'Quiet—very thoughtful and considerate——!'

Such are typical opinions gathered from those who knew him.

Less typical, but perhaps even more illuminating, are these words, which are perhaps somewhat unexpected from a very learned associate or 'boffin':

'He was always a hell of a lad for a leg-pull!'

In other words, a man with an acute sense of humour. It becomes the more curious that Marconi could have put up with the absurdities of Fascism. These may have distracted attention from the basic tyranny and corruption,

[1] Those who would like to know more about the rise and nature of Fascism should turn to Appendix E.

but they also put a strain on men with less humour than Marconi. But more of this later.

'Marconi was far too reserved and diplomatic ever to make an unguarded remark . . .'

These words from another man who knew Marconi may contain a hint of the reason for his joining the Fascists. Men who are 'reserved' and 'diplomatic' are perhaps more inclined to avoid rows and the utterance of unpleasant truths than others who are more outspoken.

When Paget claimed to have been present and to have heard the first transatlantic signal,[1] Marconi, years afterwards, confirmed his statement. This may have been mere forgetfulness, but it seems unlikely; more probably it was the expression of Marconi's good nature, of his unwillingness to expose the now unimportant boast of a valued colleague.

This easy-going attitude when dealing with incidents not thought to be important coupled with an instinctive caution in larger matters somehow fits the impression one forms of Marconi from his photographs. He is apparently either the quiet City man in black jacket and striped trousers or the Cowes yachtsman in white nautical cap and smart blue uniform—a striking contrast in each case both to the common image of the absentminded professor or mad genius of fiction and to such real personages as Edison or Einstein, for example, with their careless attire and generally shaggy appearance.

However daring and original Marconi was in science, in ordinary, every-day affairs he looked, and perhaps was, a model of conformity and convention.

The weakness in a temperament of this kind is that sometimes the will is lacking to contradict or disagree even in important matters. Disagreement or telling the

[1] See p. 46.

truth in circumstances which may amount to bad manners sometimes demands great courage, that is, moral courage, a rarer quality than physical bravery. Nobody can question Marconi's physical courage, but it is possible that his 'reserve' and 'diplomacy' contributed to his failure to speak out against the evils of Fascism.

For his positive act of joining the Fascist movement, there is no doubt that patriotism was an important reason. Business reasons were also a factor. Yet, in the first years of the régime, very few prominent Italians did join Mussolini.

The aristocrats, the rich and the Church leaders were delighted to have him suppress the discontented workers; but they also considered themselves too lofty and dignified to be associated with—let alone led by!—this son of a blacksmith, who was himself, at best, a working journalist, and, at worst, a street rough.

Marconi, whatever his reason for joining the movement, was restrained by no such false pride; and Mussolini never forgot it.

Soon, Marconi may have been impressed by the energy and busy-ness of the new régime.

It was not until 1959, for instance, that England opened her first motor speedway; but the Italians under Mussolini had them some thirty years earlier. An Italian ship, the *Rex*, won the Atlantic speed record; thousands of unemployed were put to work. It was all new and exciting, like a 'young' country; and in fact the Fascist song, which became the new national anthem, was called '*Giovinezza*' or 'Youth'.

Foreign visitors also noticed that Italian trains now often ran on time, and quite forgot about the thousands of ordinary brave Italians who preferred freedom even to punctual trains, defiantly said so, and were beaten up and

sent away to prisons in the Lipari Islands and elsewhere for their courage.

Moreover, the Italians, unlike the Germans, who were soon to accept the far greater tyranny of Hitler for unprotesting years, without ever firing a shot until he was near defeat, tried five times[1] to assassinate Mussolini.

A few prominent Italians also joined their many obscure countrymen in bold opposition to the Duce. There were, for instance, Francesco Nitti, the statesman, who preferred exile to submission; and the great musician Arturo Toscanini, who refused to play *Giovinezza*, was pelted with rotten eggs, and went to live in the United States.

History honours the memory of these, and many other nameless, Italians, who never fell for the bluster, the bullying or even the so-called 'glamour' of Fascism. We can only be sorry that Marconi has no place in that particular roll of honour.

'Fascism is doing a fine work in Italy,' said Marconi instead, one autumn day in 1927, on arriving in New York, 'Italy under Benito Mussolini has turned the corner. His bold, audacious political and financial policies have transformed the country.'

Three years previously, the bravest and most powerful opponent of Mussolini and Fascism still remaining in Italy was the Socialist leader, Giacomo Matteotti. One day, Mussolini, furious and at the end of his patience, publicly threatened him in the Chamber, the Italian Parliament.

A few days later, on 10th June 1924, a gangster from

[1] On 7th April 1926, an Irishwoman also fired a pistol at Mussolini, point-blank, but succeeded only in somewhat changing the shape of his nose. This, more than ever, convinced him he bore a charmed life; and nearly twenty years were to pass before the illusion was exposed.

St. Louis in the United States, with some confederates, murdered Matteotti.

No mystery veiled the identity of the man who inspired the crime, for very soon a bold voice rang through the Chamber:

'I declare here before this assembly, before all the Italian people, that I assume, I alone, the political, moral, historical responsibility for everything that has happened. If sentences . . . are enough to hang a man, out with the noose!'

The speaker was none other than the *Duce*, Benito Mussolini himself.

'Under the genial leadership of Mussolini,' declared Marconi three years later, 'Italy is giving proof of immense activity . . .'

'I could not help being charmed by Signor Mussolini's gentle and simple bearing,' said another famous man to the newspaper reporters in Rome at the beginning of 1927, not two years after Mussolini's public confession to murder. 'If I had been an Italian, I am sure that I should have been wholeheartedly with you from start to finish . . .'

The man who said that knew far more about politics and history than Marconi, for it was Winston Churchill, who at the time was Chancellor of the Exchequer in the British Government.

It was indeed a dark age in Europe. Murderers and gangsters gained control of great nations, and millions of ordinary, apparently decent people, as well as statesmen of other countries, supported the tyrants and excused or kept dead silent about their crimes.

There was a moral sickness in the world. Right and wrong were sometimes made to appear the same, or, worse, wrong was often deliberately disguised as right. A nation attacked for no reason was usually held to be as guilty as the attacker.

It is important to recall those years not only as part of the age during which Marconi lived, but to show the atmosphere of moral confusion in which he supported Mussolini.

The situation in Italy in 1924, after the murder of Matteotti, may become more real, if we try to imagine something similar happening in Britain to-day.

Suppose the Prime Minister at the time this is written, Mr. Harold Macmillan, were to hire a gunman to murder the Leader of the Opposition, at present Mr. Hugh Gaitskell; then suppose the Prime Minister were soon afterwards to go before the House of Commons, and declare:

'Mr. Speaker, Sir. I take the opportunity of telling the House this afternoon, and the British people, that I alone assume responsibility for the—ah—somewhat abrupt end of the late Rt. Hon. gentleman, the member for South Leeds . . .'

After which, England's most famous inventor, whoever he may be, is interviewed by the ship reporters in New York, and says:

'Under the genial leadership of Mr. Macmillan, Britain is giving proof of immense activity . . .'

Even in the disturbed condition of the world to-day it sounds like a nightmare; but in 1924 and during more than twenty years afterwards, that nightmare was day-to-day normality.

In the years following, Marconi stayed in close touch with Mussolini, told him of his new discoveries, and often demonstrated them to the *Duce*.

Marconi always wore a little green, red and white Fascist badge in his buttonhole, and, it would seem, rarely neglected an opportunity of publicly identifying himself with the régime, even when making a joke.

In 1926, for instance, when speaking at Bologna

University about some 1917 experiments, he said this:

'I used the first beam or "fascio" apparatus using short waves two or three metres in length, and perhaps I may be allowed to claim for this that I was the first Fascist in Italy'.

Mussolini, for his part, was naturally delighted with the support and admiration of the world-famous inventor, and warmly returned Marconi's friendship.

'To Marconi, Magician of Space and Conqueror of the Ether.' So did the *Duce* inscribe his photograph, which was always on display in *Elettra*.

To add to the prestige of his régime, Mussolini founded the Royal Academy of Italy (the chief prizes in science and art being named, of course, after his modest self). In November 1928, to add to the prestige of the new Academy, a famous man accepted office as its first President. It was, almost needless to say, Guglielmo Marconi.

But it was during the last few years of his life, from about the end of 1935, when Italy attacked Abyssinia, or Ethiopia, to use its official name, that Marconi became known all over the world as one of Mussolini's most valuable and determined helpers.

'I recollect that Marconi quite lost patience with Mussolini on the question of the Abyssinian affair.'

That is the statement of one of Marconi's assistants, and, of course, contradicts every single word publicly uttered by Marconi himself on the subject.

And here may be quoted other opinions about Marconi's politics, from men who knew or worked with him.

'He was a Fascist!' said one, without hesitation.

But others denied that Marconi ever gave more than 'lip service' to the Fascists.

However great the quantity of published evidence might be, some of Marconi's old colleagues were in fact indignant that anybody should credit Marconi with sin-

cerity in his oft-expressed admiration for Mussolini or belief in Fascist politics.

I do not know whether they were equally indignant with Marconi in, say, 1935, when he was telling the world how wonderful Mussolini was.

'. . . so far as I was aware', wrote Marconi's personal assistant aboard the *Elettra*, 'he showed no interest in politics in the same way that he never attended church or showed the slightest interest in religion. . . . He always seemed to me to be utterly bored with the whole business of politics.'

It is also the author of these lines who gives a hint about Marconi's understanding of the absurdities of Fascism, to which reference has already been made.

'After some particularly strenuous tests', he writes, '[Marconi] put on his jacket again, saying that he must not be caught without his badge showing, referring to the Fascist emblem in his lapel.'

'I can recall many occasions', says another close associate of Marconi's, 'on which he privately ridiculed the Fascist "popinjays".'

'I can produce [no] evidence', says a high official of the Marconi Company, to substantiate the statement that the Marchese Marconi was an ardent supporter of the Fascist Party. . . .

'The impression I gained from the various conversations I had with him at the time', this writer continues, 'was that Italians living in Italy who had a public standing were virtually obliged to become members of the Party in order to retain their social standing and public recognition. My personal opinion is that Marconi's interest in the Fascist Party never went beyond that, although I am aware that he allowed his name to be used for some of the important activities of the Party.'

Nevertheless, whatever his secret thoughts might have been, in the war which Italy waged against Ethiopia in 1935 and 1936, Marconi unquestionably played a very prominent part in support of the Fascist régime.

In spite of the new buildings, the new *autostrada*[1], the new ships, the new uniforms, even the new-old Roman salute, in 1935 Italy was still poor, and largely, although silently, discontented.

Fascism had hidden, but not solved, Italy's problems.

Ethiopia was a black African country, Christian in religion, but ill-equipped with roads, railways, aeroplanes, tanks, poison gas and other signs of Christian civilization of the 1935 model.

Their army was in fact partly dependent on bows and arrows for weapons, and so altogether the Ethiopians looked like a distraction for the Italian people and an easy target for the Italian forces.

The one danger, Mussolini believed, might be the League of Nations, of which both Italy and Ethiopia were members. The League was an organisation similar to the present United Nations, the chief purpose of which was to prevent wars.

'I and all my countrymen,' said Marconi from Brazil on 25th September 1935, shortly before Italy did start her war, 'place absolute confidence in Mussolini's ability and patriotism.'

He also pointed out to the newspapers that he had offered Mussolini his services 'in any capacity' in Africa.

'I shall confer immediately with the *Duce* about a military assignment in Eritrea,' Marconi told an American reporter at Genoa on his arrival there on October 17th. He had hurried home from Rio; but in those days a

[1] Motor speedways.

'hurried' passage was not of hours, but by sea, and in the fastest ship was a matter of weeks.

Marconi was sixty-one years old, and had but one eye. Mussolini, therefore, invited his friend to 'fight' for Italy not in the field in Africa but over the air waves.

This, in the next few months, Marconi did with enthusiasm.

On October 3rd, the Fascist forces invaded Ethiopia, and the League of Nations, hesitantly and half-heartedly, decreed certain economic and financial measures (called 'sanctions') against Italy, which were to begin on November 18th.

On the last night of October, Marconi broadcast to the United States a long defence of Italy's action. He complained bitterly about 'the so-called sanctions', made fun of the League, and ended:

'You Americans . . . won't fail to recognize the justice of Italy's claim.'

He broadcast again to America on Armistice Day, November 11th, once more denouncing the League, and complaining that Italy had been singled out for unjust treatment.

The war meanwhile was conducted with great cruelty against a practically defenceless people. Poison gas was used against them; tanks went into action against mud huts; and one of Mussolini's sons serving in the Italian Air Force dropped a bomb into the midst of a crowd of civilians, men, women and children.

'The effect was beautiful', declared young Mussolini afterwards. 'When the crowd fled in all directions, it reminded me of a flower opening.'

'Italy has been found guilty . . . of seeking to give civilization to backward and oppressed tribes,' said Marconi in ironic mood at the opening meeting of

the Royal Academy season on November 17th.

He pledged the support of Italian 'art, science and culture' to 'the final triumph of the sacred nationalist cause'.

Marconi also wanted to broadcast in England, but on November 20th, the B.B.C. announced that they had refused his offer. Marconi came to England to press his request, and saw Sir John Reith, then the head of the Corporation.

'Our meeting was friendly', said Marconi later, 'but Sir John Reith adhered to his decision.'

After Italy had beaten the unfortunate Ethiopians, two laws were introduced into the Italian Senate, one to annex Ethiopia to Italy, the other to proclaim the King of Italy 'Emperor of Ethiopia'.

As a reward for his services in the war, Mussolini gave Marconi the 'honour' of introducing these two laws. The date was Saturday, 16th May 1936.

'Italians now wish to turn their hands to the plough', Marconi announced, 'but they have proved to the world that they also know how to fight . . . nobody should forget that our workers and colonists are and never will cease to be soldiers, ready if necessary to defend at any cost the legitimate fruit of their victory.'

He included also much praise of Mussolini for 'willing, preparing and directing' the Ethiopian campaign.

And Mussolini promoted Marconi to the rank of Rear Admiral.[1]

'I could never believe', says one of Marconi's former associates, 'that he ever actually wrote the text of what he broadcast.'

Perhaps not; perhaps he didn't write his speech in the Senate that Saturday afternoon either. Certainly, all of it, speeches and broadcasts, from start to finish, was just

[1] 21st June 1936.

typical, undistinguished Fascist propaganda, its sole and shameful distinction being that it was spoken by a greatly respected man.

There was little real good to be said for Fascism, and it was said loudly and often.

Those who assert, a quarter of a century after his death, that Marconi was never more than a nominal Fascist may be right.

It must be said, however, that never at any time during his life did Marconi himself deny his allegiance; nor, after his death, when every obituary in every country proclaimed him, with a generosity of exact detail, to have been for years a loyal and enthusiastic follower of Mussolini, was there, from any quarter, a single denial or a solitary word of protest.

All who now contradict the evidence of Marconi's political faith agree that he joined the Fascists only for reasons of business or social expediency, in other words, for material ends. That argument would seem to erode the best, and possibly only valid, excuse, that of patriotism, however mistaken, for a good man's having given his name, his fame and his ability to a tyrannical government and its cruel and selfish leader.

Marconi's association with Mussolini continued through the short period of life remaining to him; and he actually had an appointment with the *Duce* at six o' clock in the evening of his last day on earth, an engagement which was frustrated only by Marconi's fatal heart attack.

No man, it is said, is wholly bad or wholly good. The history of our time casts considerable doubt on the first part of that proposition, but the other is beyond dispute.

Marconi was a benefactor of mankind, and, beyond question, on balance a good and humane man. But when he joined the Fascist movement in 1923, he was certainly

politically inexperienced, perhaps even naïve, and probably contemptuous of ordinary politicians. In those days, and for many years afterwards, exact knowledge of Fascism, as well as firm opposition to it, were to be found chiefly in the working class; and *their* opinions received little respect from the wealthier ranks of society.

Mussolini seemed new and vigorous; and, above all, he marched, or at any rate made much noise, under the black banner of anti-Communism. Then, as now, that magic and holy slogan was a cloak for any infamy, a key to any cabinet.

Possibly, then, ignorance of the true nature of Fascism, of its brutality and blind reaction, was partly accountable for Marconi's joining the movement. The murder of Matteotti should have revealed the truth both about Fascism and its bloodstained leader; but if the Englishman Winston Churchill could still accept Mussolini, why not Marconi?

Altogether, the most charitable explanation, and still perhaps the most likely, of Marconi's long association with the unsavoury movement of Fascism is not that now suggested by his old colleagues, that he was actuated solely by his own personal materialistic interests, but that he thought, however mistakenly, that he was acting for the good of his country.

In the light of the heroism of many poor and humble opponents of Fascism, it is an unsatisfying excuse, but it is better than none. Some of Mussolini's strongest supporters, especially in countries outside Italy, had even less.

CHAPTER IX

Marconi—the End, and the Echo

'Technically, 1928 on were the most important years of Marconi's life.'

That was the opinion of an engineer and colleague of Marconi's, who had worked closely with him during six of the last years of the inventor's life. Remembering Marconi's earlier achievements, I thought this a rather surprising statement, and asked for some explanation.

'Marconi,' he said, 'was a man twenty-five years before his time. He forecast radar in a speech in New York in 1922, and he even demonstrated radar in Italy in 1933 or 1934. He showed that communication beyond the horizon by microwaves was possible, when it was thought they were limited to the horizon. Now, a quarter of a century later, we know most continents have adopted microwave techniques.'

In experiments carried out between the *Elettra* and different parts of the Italian coast, from about 1928 until 1936, Marconi once more showed how wrong general opinion was about the limitation on microwaves by the earth's surface. In 1932, the waves were proved to exceed the optical distance by two to three times; in August 1933 by nearly nine times.

'The land will stop the microwaves!'

But Marconi proved that the microwaves would not be stopped by intervening land, not even by high hills. And

his success has led to immense improvements in both radiotelegraphy and radiotelephony.

More than thirty years before, when that first S had crossed the Atlantic, Marconi had shown up scientific opinion, and, more particularly, scientists.

'The chief question was whether wireless waves would be stopped by the curvature of the earth,' he said in a broadcast to Australia in 1935.

Of course, it hadn't.

'As Sir Oliver Lodge has said,' he continued, 'it was [therefore] an epoch in history.'

All the same, after Signal Hill, it may be recalled, by no means all the scientists threw their hats in the air over Marconi's success. But in the years following, he had shown the many uses and great benefits of wireless.

By the time the experiments with microwaves were going on, broadcasting was firmly established, and television was being talked about.

'Further improvements in the apparatus,' said Marconi after the successful microwaves experiments, 'are likely again to revolutionise radio communications.'

Now, there was no doubting Professor Sylvanus P. Thompson to jeer, 'There is no future in wireless. Even trains will stop those waves!'

The experienced and respectful world listened to Marconi, and was confident that what he had predicted would in time come to pass. As indeed it did, though unfortunately he did not live to see it all.

He continued to work hard, and to travel as ever. He must have covered tens of thousands of miles, and although he, like any alert and curious-minded person, enjoyed his voyaging to foreign parts, there was no doubt it was a strain upon him.

In the autumn of 1934, while he was in London, his

health broke down, and he had to go into a nursing home. He was out of action over the turn of the year, and it was February 1935 before Marconi was able to return to Italy. Even then, the doctors were not too hopeful about his health, unless he agreed to work less; but he did nothing of the kind.

Instead, he set out on another long journey to South America, and was in Rio in the autumn, when the crisis with Ethiopia occurred. The part Marconi played in the war, which began in October 1935, has been described already. His name was in the news even more prominently and more frequently than it usually was; though, at that time, he was being quoted more often on war than on wireless.

Just before Italy attacked Ethiopia, it was widely reported in America that Marconi had a new invention, something in the nature of a 'magic ray', which would stop motor vehicles and bring down aeroplanes, while operating from a long way off. This invention, it was said by the noisiest of Mussolini's friends in America, would prove to be Marconi's most valuable contribution to the Fascist war effort, and would finish the Ethiopians instantly.

When, however, it was pointed out that the Ethiopians had few motor-cars and no aeroplanes, and that this 'magic ray', even if it existed, would be without a target in Ethiopia, less was heard about it.

Marconi, who exposed himself to criticism for his political activities, was of unquestionable integrity in scientific matters, and himself killed the 'magic ray'. He began his first broadcast to the United States justifying the Italian attack on Ethiopia with a denial that he had invented anything to 'stop motor engines at great distances, or do worse tricks than that'.

'Let me reassure you at once', he went on, 'by saying that you may fly to your heart's content as there will be no stopping you—for the present, at any rate.'

A little has been said of the importance of microwaves. They had a medical function as well, and at the end of January 1937, Pope Pius XI received treatment by the latest process of the day.

This incident helped to remind the world of Marconi's real work, as had his broadcast on the previous November 11th, when he boldly predicted that in time there would be television across the ocean—a forecast which was realised by Telstar, but not until July, 1962.

After the end of the Ethiopian war, Marconi had returned to the quiet of his own valuable research. His name was gone from the headlines.

But it was back there again, and for the last time, on 20th July 1937:

SUDDEN DEATH OF
MARCONI
ITALY MOURNS A
GREAT SON

The end had come to him in Rome early that day after a heart attack. It was a Tuesday. The morning before he had gone to the station with the Marchesa and Elettra to see them off on a short holiday. He had an appointment to see Mussolini at six o' clock that evening to report on his latest experiments, but he was stricken before then. Mussolini was the first to call at Marconi's house. The Marchesa hurried back to Rome, but arrived too late. It was Elettra's seventh birthday.

His body in the uniform of the Italian Royal Academy lay in state, and the funeral took place the next evening at six o' clock. Before the coffin was borne into the church,

there was carried out the Fascist rite of calling upon the dead man by name. This was similar to the ceremony in the French Foreign Legion, when a dead Legionaire is called by name, and a comrade answers for him, 'Present!'

Thousands of people walked behind the cortège, and many thousands more lined the route. Throughout Italy there was five minutes of radio silence in honour of the dead inventor.

That commemorative silence was not confined to Marconi's native land. The entire world now paid tribute, in various ways, to the man whose inventions had so greatly benefited mankind.

England, which was almost a second home to Marconi, took a specially prominent part in the ceremony. The Postmaster-General, Major G. C. Tryon, M.P., decided that, as a tribute to Marconi, all wireless telegraph and wireless telephone stations in the British Isles should keep two minutes' silence from six o' clock, the time of the funeral in Rome (and which because of British Summer Time was also six o' clock in Britain).

The girl operators at the Wood Street International Telephone Exchange in the City of London stood at attention by their switchboards, as did all the operators at the central radio office of the G.P.O. The silence was also kept by the B.B.C.

In America, there were even longer stories about Marconi. Pages of articles and pictures filled the newspapers. The leading newspaper, *The New York Times*, called him a 'great gentleman'.

'The father of the wireless telegraph', was the salute to Marconi by his old rival, Dr. Lee De Forest. He added, 'The thousands of elevated antennas on ship and shore stand as tall monuments to his daring genius.'

The Times in London said that Marconi might be

regarded as 'the name by which the age is called'.

Marconi passed away at the beginning of the age of television.

In spite of his forecast about trans-oceanic television, which may have been his last public statement on the subject, he had usually seemed curiously unenthusiastic about it. He was, of course, often asked for his views about the possibilities, and his lack of interest more than once raised a suspicion that Marconi doubted the practicability of television.

With his unsurpassed knowledge of all kinds of wireless—not to mention his Armistice Day broadcast in 1936—Marconi almost certainly realised better than most men that television would soon be almost universal. It is more likely that his apparent indifference was due to a belief that the chief value of television would be in entertainment.

He was frequently questioned, after broadcasting was established, for his opinion about the entertainment value of wireless.

His thoughts, then, it was said, seemed to go elsewhere, and his answer would always be the same:

'Can you compare entertainment with the saving of men's lives?'

Marconi was a naturally shy man, but he certainly did not dislike people, nor despise their pleasures. He was no prig—far from it, in fact!—but his view of wireless was a lofty one. There was never any doubt of the gratification he obtained when he came upon instances of the comfort and pleasure wireless gave to the sick or the lonely.

From the early days of broadcasting patients in hospital wards began listening through earphones to radio programmes, finding inspiration in beautiful music, amusement in a comedian, and distraction always from their pain and suffering.

In October 1931, during his world tour, Marconi had reached Grand Canyon, Colorado, which is cowboy country. A report got about that he was staying at the hotel. At first, the cowboys did not believe it. Then they rode to the hotel, cheered him when he appeared, and amid a demonstration of enthusiasm mingled with a shower of questions about wireless, repeated one statement over and over:

'What a difference radio has made to us——!'

On the range, before broadcasting arrived, they used to be alone; with radio, all the news and music of the world were 'at their fingertips'.

More than thirty years later, when so many people think of television as the only source of entertainment, there is still a place for wireless. Not surprisingly, its value is greatest and most apparent in the empty places of the earth, for men living beyond the range of television, or for men on the move. For all of them wireless still provides their sole entertainment and their only contact with civilisation.

As with the cowboys of Grand Canyon, so it is with the much less familiar cattle drovers on the Murranji Track in the desolate Northern Territory of Australia. Driving their 1,500 cattle nine miles a day, but riding many miles more themselves, the drovers live hard. Their food may be ample, but is dull and monotonous; they have to be on watch in the dark hours lest any harm befall their cattle, and so they sleep little. They never have a bath, they are never free of anxiety.

But, there, on the truck carrying their 'grub' and their gear is also a portable wireless, with all its significance: a portable key to the companionship of the world.

The poet Ronald Campbell Macfie has described how, in a Western Isle,

Silence oppressed the listening mind;
We hearkened but we only heard
The wailing of a homeless wind,
The warbling of a lonely bird.

But, then, the wireless was turned on, and——

We heard a thousands birds astir;

. . .

We talked with cities far and near,
With East and West and North and South.
Our little Isle became an Ear;
The sky a great melodious Mouth.

All the far music of the Earth
Flowed like a river down a glen,

. . .

We knew that though the world was wide,
Yet in their hearts all men were kin.

It is in Australia also that the Royal Flying Doctor Service operates. In recent years it has become known to many nations, and imitated by a few; and it could not function without wireless.

Less familiar is the role of wireless in different trades, and in some unusual educational ventures.

Whalers hunting in the Antarctic were equipped with radio telephone sets, so that the boats could talk to one another and report instantly when and where they had found their quarry. The result was, the catch increased so enormously that new regulations had to be introduced to prevent the complete extinction of the whales!

Wireless and television are familiar in Britain as an aid to school lessons; but in some remote parts of America there would be no lessons at all without wireless; with it,

lessons not only take place, but also give children the thrill of sending wireless messages themselves.

What happens is, lessons are given by radio to a scattering of children, who have access to two-way sets. Separated from one another by dozens and scores of miles though they are, the wonder of wireless enables them to take part in reading or arithmetic, for instance, almost as if they were all together in one small school room.

But when all is said and done, it is to the sea and the borders of the sea that our minds are turned unfailingly by the old word 'wireless'.

'The sea,' said Marconi, 'was clearly the natural field for the development of wireless telegraphy. . . . The greatest value of wireless, in my belief, is still demonstrated by its utility at sea, which was its first application.'

The lives of many who earn their bread near or on the sea prove the truth of Marconi's words: the lonely lighthouse-keepers in the far North in Alaska keeping touch by wireless with the crowded world; the men of the weather ships tossed in a winter gale on the North Atlantic, as they send their essential information to the jets screaming out of sight, far above them, through the calm of the upper air; the U.S. Coastguards of the International Ice Patrol keeping their spring and summer watch against another *Titanic* disaster; down to the North Sea trawlermen using their echometers—a development of wireless—to help them find the fish—all are the beneficiaries of Guglielmo Marconi.

Anybody (with enough money!) can talk to many ships at sea by wireless telephony; there are few to which we cannot send messages by wireless telegraphy all around the year—or, as the Post Office reminds us at the appropriate time, despatch Christmas greetings at the 'festive season'. The price of all these things, it is true, is very high;

but—and it is worth repeating—that was not Marconi's wish.

'I have striven,' he said in his broadcast to Australia in December 1935, 'to give the world improved and cheaper means of communication by electrical transmissions through space . . .'

As Sir Rowland Hill is remembered for having given Britain the boon of the penny post—now also gone for many years—so Marconi, if he had had his way, might have been famous for giving the whole world electrical communication within the reach of all.

Marconi, the man, has gone; but in spite of the failure, through no fault of his own, of that ambition, by the abundant and varied uses of his invention his name still echoes around the earth, and probably will through the ages. And, for comforting the lonely, for aiding the sick, and perhaps above all, for guarding the mariner against the worst perils of the sea, the name 'Marconi' is also fastened in gratitude on the hearts of men.

APPENDIX A

The Morse Code

Letters

a	· –
ä	· – · –
à or å	· – – · –
b	– · · ·
c	– · – ·
ch	– – – –
d	– · ·
e	·
é	· · – · ·
f	· · – ·
g	– – ·
h	· · · ·
i	· ·
j	· – – –
k	– · –
l	· – · ·
m	– –
n	– ·
ñ	– – · – –
o	– – –
ö	– – – ·
p	· – – ·
q	– – · –
r	· – ·
s	· · ·
t	–
u	· · –
ü	· · – –
v	· · · –
w	· – –
x	– · · –
y	– · – –
z	– – · ·

Figures

1	· – – – –
2	· · – – –
3	· · · – –
4	· · · · –
5	· · · · ·
6	– · · · ·
7	– – · · ·
8	– – – · ·
9	– – – – ·
0	– – – – –

THE SPACING AND LENGTH OF SIGNALS

A dash is equal to three dots.

The space between signals forming the same letter equals one dot.

The space between two letters equals three dots.

The space between two words equals seven dots.

The above are international signals, used by all nations. There are other signals for punctuation, preceding and ending messages, etc.

APPENDIX B

The Origin of CQD and SOS, and Distress Procedure

The British Post Office used the letters CQ (in Morse code) as a general call to all telegraph operators who might be listening, to stand by for a message. CQ preceded the morning time signal and all important notices.

Many of the Marconi operators had come over to wireless after working as Post Office telegraphers. So it was natural for them to bring their Post Office signals, including CQ, to their work in wireless.

The question of an international distress call was discussed at a wireless conference in Berlin in 1903, but nothing was decided. In the following year, the Marconi Company issued this notice:

> 'It has been brought to our notice that the call "CQ" (All stations), while being satisfactory for general purposes, does not sufficiently express the urgency required in a signal of distress. Therefore, on and after the 1st of February, 1904, the call to be given by ships in distress, or in any way requiring assistance, shall be "CQD".'

Then followed conditions under which the signal should be sent.

It was often thought that the initial letters of the words '*C*ome *Q*uick *D*anger' suggested the call; but in fact, as noted above, CQ was used for many other calls, in which

there was no question of 'danger'. The D, it is true, was added by the Marconi Company (an English business) as the first letter of the word 'Distress'.

CQD after February 1904, was regarded as an international call for help.

But in the international conference also held in Berlin in 1906, the Germans suggested that their general call SOE, which was quicker to send than CQD, should be accepted as the international distress call.

Objection was raised that the letter E, which in Morse Code is a single dot (see Appendix A, p. 139) might be lost in the atmosphere with its many noises—apart, of course, from ship noises.

Finally, it was decided to use SOS, which in Morse is three dots, three dashes, three dots, and was distinctive and considered to be unmistakable for any other call.

The letters are sent as a single call, SOS, and not, as is often wrongly reported, 'S. O. S.' Nor do the letters stand for '*S*ave *O*ur *S*ouls' or '*S*ave *O*ur *S*hip', as was first and frequently said after the sinking of the *Titanic*, and almost half a century later remains a popular and picturesque piece of misinformation. It is worth remembering that the origin of the call was German, and in that language the words 'Save Our Souls' do not all begin with the same letters as in English.

SOS was ratified as the international distress call in 1908, but the British, perhaps for sentimental reasons, clung to their own old CQD—which Jack Binns sent in 1909—and as late as April 1912, Jack Phillips sent out his first call for help from the *Titanic* under the old signal (see p. 91).

Nowadays, the International Radio Regulations prescribe the procedure to be followed when sending out calls for help.

The procedure naturally is different in form for wireless, or radiotelegraphy, to use its modern name, and radiotelephony.

In *radiotelegraphy*, the *Alarm Signal* usually precedes the Distress Signal, and consists of a series of twelve dashes, lasting a prescribed time. The object of this signal is to set the automatic alarm going, when there is no listening watch on the distress frequency, which by international agreement is 500 kc/s.

This special signal is used in only three cases, as a preliminary warning to the imminent announcement of (1) a distress call; or (2) a cyclone warning from an authorised coast station; or (3) a person or persons overboard.

The *Distress Signal* comes after the Alarm Signal, and, of course, is SOS.

In *radiotelephony*, the *Alarm Signal* is two audio frequency tones, of 2,200 and 1,300 cycles per second, sent alternately. The result is a distinctive warbling sound, which can be heard amid many other noises, from ship, weather, etc. The object is, of course, the same as in radiotelegraphy, to attract the attention of the person on watch, or to set off the automatic alarm.

The radiotelephony *Distress Signal* is the word MAYDAY, pronounced like the French *m'aider* ('to help me').

The radiotelephony *Distress Call* is MAYDAY spoken three times, the words THIS IS, and the name or other identification (such as the radio call sign; that of the *Titanic*, for instance, was MGY) of the ship or station in distress, also spoken three times.

The radiotelephony *Distress Message* contains the above, with the addition of the position, the nature of the distress, and the kind of help wanted, with, of course, any other information to help the work of rescue.

APPENDIX C

The Radio Equipment of a Modern Liner

The largest vessel of the Union-Castle Line is the *Windsor Castle*, 37,640 tons.

I have chosen her, because, although she is by no means the biggest ship afloat, the range of her communications equipment and radio aids to navigation is typical of that carried by the large modern liner.

It is illuminating to compare her equipment with that of the *Titanic*, the greatest liner of fifty years ago. In addition to the wireless described in the text (p. 86), the *Titanic* also carried the Submarine Signal Company's apparatus for receiving signals from submarine bells. Small tanks containing microphones were placed on the inside of the hull below the waterline, on port and starboard sides. These were connected by wires to receivers in the navigating room on the port side of the officers' deck house. And that was all.

The following description of the *Windsor Castle*'s comparable resources, all of it the product of Marconi Marine, indicates the extent of the progress made by 'wireless' in half a century.

Two 'Globespan' transmitters (and the name is significant) and two 'Atalanta' receivers handle medium and high-frequency radiotelegraph traffic, and provide passengers with long-range, intermediate or high-frequency radio-telephone service.

One of the 'Atalanta' receivers is incorporated in a special radiotelephone terminal assembly which links the radio installation to the liner's internal telephone system. First Class passengers are thereby enabled to make telephone calls from their cabins to telephone subscribers ashore. There are also direct lines to the radio installation from the Captain's cabin and from a telephone kiosk. This last is available to Tourist Class passengers as well. Speech inversion equipment (which 'scrambles' talk) ensures privacy of radiotelephone conversations.

One of the 'Globespan' transmitters is normally used for radiotelegraphy and the other for radiotelephony; but each transmitter is capable of operating either service and provision is also made for simultaneous operation of both transmitters, special rejector circuits being incorporated in the receivers.

There are two transmitting aerials and four receiving aerials. Two of the latter are remotely sited to achieve maximum separation between transmission and reception, and special aerial matching units are employed. The aerial selector switch unit incorporates control of the motor-operated matching system, permitting rapid selection of aerials for optimum, that is, the best, operating characteristics.

A 'Salvor' emergency transmitter with an 'Autokey' device and an 'Alert' guard receiver are installed together in a compact auxiliaries rack. One of the liner's Class 'A' motor lifeboats is equipped with a 'Salvare' radio installation, and a 'Salvita' portable transmitter/receiver is carried for use in any boat.

The liner's power supply is 220 volts DC, and supply conversion units are employed with the 'Globespan' transmitters, operating on 115 volts AC, and with the radiotelephone terminal equipment, operating on 230 volts AC.

The emergency power supply is the same voltage as the main supply, so that all main communications equipment, including the telephone terminal assembly, can be operated from the emergency switchboard. The 'Salvor' emergency transmitter and 'Autokey' device are operated from a duplicated 24-volt battery supply; and the main 'Atalanta' receiver and 'Alert' guard receiver can employ mains or battery power.

The radar equipment chosen for the *Windsor Castle* is Marconi Marine 'Radiolocator IVB' with a 15-inch display unit and a maximum range of 40 miles; and True Motion facilities are provided by radar track indicator equipment which enables the navigator to see the true course and estimated speed of every target on the display. The control of the track indicator is installed above the display unit in the wheelhouse, and the computer unit is fitted in the chartroom. The radar transmitter is housed in a special cabin at the base of the mast.

Other radio aids to navigation include a 'Lodestone' long range direction-finder, a 'Seagraph III' dry paper recording echometer, and a 'Seavisa' visual depth indicator. The two sounders are fitted in the chartroom, the 'Seavisa' being easily seen through the door from the wheelhouse.

A MIMCO master communicator system is employed for boat orders and for rapid communication between the the bridge, forecastle head and other working areas. The master control unit is incorporated in the bridge console installed in the wheelhouse, and remote loudspeakers with 'talk-back' facilities are fitted at outstations. A powerful reflex horn loudhailer can also be operated from one of the MIMCO amplifiers, and facilities are provided for using the loudhailer on a swivel mounting on either side of the bridge.

Three 'Patenna' communal aerial units were installed by the shipyard, and these ensure that personal radio receivers can be operated efficiently by passengers and crew from a common aerial, without interfering with each other or with the ship's radio installation.

The radio call sign of the *Windsor Castle* is GVTG.

APPENDIX D

The Career of a Radio Officer

Marconi's inventions created not only a new means of communication in the form of wireless telegraphy, but, as a by-product, a new career for young men; and, more recently, in advanced countries such as the United States, Scandinavia and the Soviet Union, for young women as well. The career, of course, is that of a Radio Officer. In earlier years, he was familiarly known as 'Sparks' or the 'Marconi man', and we have seen something of the low pay and hard working conditions endured by the pioneers in the profession.

Some fifty years later, conditions have greatly improved. Pay is much higher, though probably not yet as high as it should be. Hours of work are shorter, living conditions generally more agreeable; and the Radio Officers' Union exists to look after the interests of the men who have followed F. S. Stacey, Jack Binns, H. J. Tattersall, Jack Phillips, Harold Bride and the rest.

On the other hand, with the greatly increased complexity of the equipment and instruments for which the Radio Officer is responsible, and which form the tools of his trade, including radar, wireless telephone, direction finder, echometer and visual depth indicator, the requirements of a candidate for the position of Radio Officer have also increased, and standards of attainment are necessarily higher.

A Radio Officer occupies a very responsible and im-

portant job aboard ship, and he has to be an expert in the use and maintenance of the electronic equipment. This means he must be much more than a telegraphist and repair man, as he was exclusively in the early years.

The large majority of Radio Officers in Britain are employed by the Marconi International Marine Communication Company, Limited, and are assigned by them to the different shipping companies.

The route to some extent, at least, is the choice of the R.O. himself, though, of course, as in every other occupation, it must depend on where the openings exist. The job offers opportunity for travel, and it is possible to change direction too. A man who has the itch to see strange parts of the world need not be permanently tied, for instance, to the North Atlantic passage. There is a good deal of leave with pay, and, after a number of years at sea, the possibility of a job ashore.

A successful candidate for the position of Radio Officer must possess either a First or Second Class Certificate of Competence in Radiotelegraphy. This is issued by the Postmaster-General to candidates who pass the examination set in his name.

The test is not easy, and is based on a comprehensive syllabus, for which training is provided in a large number of Radio Colleges in different parts of the country.

A boy who holds the General Certificate of Education, or who is up to that standard, and has an aptitude especially for such subjects as physics and mathematics, is usually capable of obtaining the Postmaster-General's Certificate of Competence. He must, of course, be healthy and certainly have perfect hearing; but the necessity of wearing glasses does not automatically disqualify.

There is no minimum age limit, but in practice a boy who has finished his schooling and gone on to study for

the Certificate will probably be 17 to 18 years old.

Salary rates, allowances, etc., vary considerably with the period of service, and, after three years, with the class of ship. It will be remembered that board and lodging at sea are supplementary to the salary. The lowest salary paid during the first six months of service is £37 per month.

There is, and has been for some time, an acute shortage of Radio Officers, and the Radio Officers' Union insist that salary and working conditions are not yet good enough. It would seem likely that both may improve.

Full details about the career of a Radio Officer may be obtained from:

The Marine Staff Recruitment and Welfare
Superintendent,
The Marconi International Marine Communication
Co., Ltd.,
Marconi Wing, Strand,
London, W.C.2.

The telephone number is COVent Garden 1234.

The Radio Officers' Union, which was established in 1912, is affiliated to the T.U.C., and federated to the Officers' (Merchant Navy) Federation, and other organisations. The Head Office of the Union is at:

Radio House,
4–6 Branfill Road,
Upminster,
Essex.

The telephone is Upminster 2321.

APPENDIX E

A Note on the Rise of Fascism in Italy

The Socialists were against Italy's entering the 1914–18 war, but Mussolini loudly supported intervention. He joined the army after Italy declared war, and served at the front until he was seriously injured in a training accident on 23rd February 1917.

After the war, during the period of discontent and disturbances, Mussolini, who was a fluent and forceful speaker, made many speeches playing up Italy's sense of grievance. She wanted colonies, she wanted 'glory', she wanted wealth.

Many former soldiers, who felt the same way, joined Mussolini, and they were organised into groups called in Italian '*Fasci di Combattimento*', or 'Groups (Bundles) of Combatants', but they soon became known simply as *Fascisti*, or in English, 'Fascists'. They dressed themselves in uniform, the most notable feature of which was a black shirt. This was similar to that worn by the *arditi*, the front-line volunteers of the war.

So the Fascists soon became known as the 'Blackshirts'.

They also very soon proved that they were lawless ruffians.

They went about in squadrons and were called *squadristi*, the men of the squadrons. They beat up their opponents, and often dosed them with castor oil as well. At first

sight, that may seem a rather funny idea; but in practice it was less so. The castor oil was never given as a joke, but always to injure; and it often killed.

A corner grocer who believed in socialism, or an old woman who kept a flower shop and said Mussolini was talking rubbish, were among those killed by a combination of kicks and castor oil.

'We the survivors, who have returned,' Mussolini wrote, 'demand the right of governing Italy.'

More often than not, 'those who had returned' from the war were actually against the Fascists——

'*Capella——! Capella——!*'

The Blackshirts shouted at the ex-soldier who stood watching the Fascist procession and did not take his hat off to the party flags—and in a moment the man who had risked his life for Italy was left bleeding in the gutter . . .

And always after these incidents the *squadristi* went strutting on their way roaring their songs, while Mussolini proclaimed a new 'triumph' over Italy's 'enemies'.

'Fascist Outrage In Milan . . .'

'Mussolini's Hoodlums In Turin Riot . . .'

'The Squadristi Again—Ex-Soldier Stabbed . . .'

Headlines such as these were almost a permanent feature in the world's newspapers from about 1919 on, and for many years afterwards.

'Why didn't the police interfere? Why didn't they, or the Government, or *somebody*, protect the people?'

The answer to that obvious question is, the Government were weak; and all the police, the armed forces, the rich aristocrats, the rich factory owners, the rich leaders of the Roman Catholic Church—all had one great hate and fear: Communism.

It was said of the first firing at the beginning of the American Revolution in 1775, 'The shot was heard

around the world'. Similarly, the Russian Revolution in November 1917 was 'Ten days that shook the world'.

The Communists, who were then known by a Russian name, 'Bolsheviks', had seized power in Russia, and taken over all the land, factories and other wealth of the country. It was 'nationalised', and henceforth, said the Bolsheviks, to be used for the benefit of all the workers and peasants.

Now Italy was a poor country with far too many Italians needing work and food and clothes and houses for most of them to get anything but a very small share of the total quantity available; even if it had all been divided as fairly as possible—which it wasn't.

Many of the poor workers and peasants began to think they would be better off if the Italian land and factories were also nationalised.

The comparatively small number of very rich people in Italy therefore began to get very afraid that they would lose their property, as the rich Russians had lost theirs, if Communism grew stronger in Italy.

Mussolini and his Fascists were violently opposed to the Communists. So it is not surprising that very often the authorities of law and order looked the other way when the Fascists broke the law and created much disorder.

There were discontent, unemployment, strikes, decay everywhere.

Mussolini, who was now called the *Duce* or Leader of the Fascist movement, shouted again and again, louder and louder, that he and Fascism alone could restore order, get rid of strikes, Communism, save the country, make Italy 'glorious' . . .

How *exactly* it was going to be done, Mussolini wasn't too clear. There must be a strong government, of course.

'I shall make use of the maximum force available,' said Mussolini. 'Possibly, indeed, force may enable us to secure consent, and in any case if consent is lacking, there is always force.'

Parliament, as hitherto known, would go, and liberty with it.

'Liberty is a stinking corpse!' roared the *Duce*.

Later, after he had been in power for more than ten years, the new kind of 'Corporate' state was organised.

Trades and professions, workers, peasants, everybody would be in one of the twenty-two 'Corporations', tied together, so to speak, in separate bundles like the Roman fasces. Deputies in the new Parliament would represent not a place, but a trade or profession.

The Fascist state was largely artificial, and fitted on to the people, rather than growing naturally from their desires and needs. Partly for this reason, through having to be on parade, so to speak, all the time, many aspects of Fascism seemed wildly comic to an outsider.

There were the florid uniforms, the hysterical (and long-winded) jingoism, the grotesque version of the already absurd German goose step (called by the Fascists the '*Passo Romano*'), and the imitation Roman salute. Uncharitable critics remarked at the time that Mussolini had revived the ancient Roman custom of holding up one hand, because the Italians were tired of holding up two hands during the war—in surrender.

But, above all, was the strutting *Duce* himself, with his highly publicised and photographed wood-chopping and skiing, the man of action, ever using a hammer to crack a nut as a matter of high principle, and never forgetting to stick out his chin to make himself look more ferocious, while the adoring crowds of his tame followers chanted in rhythm, 'Doo-chay! Doo-chay! Doo-chay!'

This, and much more, might have been expected to put a strain on the self-control of men with much less humour than Marconi.

The laughable side of Fascism was, of course, but a cover for something which was not by any means funny.

At bottom, Fascism was a brutal system, which despised peace and its arts from its very beginnings, and, as it grew older, instead of becoming gentler, became more intolerant—taking on indeed German anti-Jewish feeling as well as other uncivilised qualities—more ignorant and more warlike.

This was the movement which began to govern Italy in 1922. It was on October 27th in that year that the so-called 'March on Rome' began. Mussolini and his gangs, having fought the Italian working class, now threatened the government itself. Mussolini himself 'marched' on Rome in a luxurious Pullman train, while some 50,000 blackshirts waited in the capital. The army stood aside, and on October 29th, the King invited Mussolini to take over the government.

This he did, and Anno I, or Year 1 of the New Era began.

If one thing, more than any other, can convey the savage flavour of Fascism, it is the supreme role in its philosophy assigned to war.

'War,' wrote Mussolini, 'alone brings up to its highest tension all human energy and puts the stamp of nobility upon the peoples who have the courage to meet it.'

'War,' wrote F. T. Marinetti, one of Mussolini's disciples, 'has a beauty of its own because it "serves towards the aggrandisement of the great Fascist Italy".'

Such was Benito Mussolini's Fascism, which Guglielmo Marconi joined in 1923.

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