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Churchill's Bomb

A hidden history of science, war and politics

Written by Graham Farmelo

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CHURCHILL'S BOMB

A hidden history of science, war and politics

GRAHAM FARMELO

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For Lindsey Jones, FS

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'In the next fifty years mankind will make greater progress in mastering and applying natural forces than in the last million years or more. That is a fearsome thought. And the first question we must ask ourselves is, "Are we fit for it? Are we worthy of all these exalted responsibilities? Can we bear this tremendous strain?"'

WINSTON CHURCHILL, 14 November 1937[1]

'Scientists on the whole are a very docile lot. Apart from their own particular job they do just what they are told and are content to sit down and be very minor entities.'

MARK OLIPHANT, 20 April 1940[2]

Devil: 'In the arts of life Man invents nothing; but in the arts of death he outdoes Nature herself . . . his heart is in his weapons. This marvellous force of Life of which you boast is a force of Death: Man measures his strength by his destructiveness.'

GEORGE BERNARD SHAW, *Man and Superman*, 1903

PROLOGUE

FEBRUARY 1955

Churchill, his nuclear scientists and the Bomb

> 'I do not pretend to be an expert or to have technical knowledge of this prodigious sphere of [nuclear] science. But in my long friendship with [Frederick Lindemann] I have tried to follow and even predict the evolution of events.'
>
> WINSTON CHURCHILL to the Commons, 1 March 1955[1]

His swansong was sure to have a nuclear theme. In February 1955, when Churchill was eighty years old and inching reluctantly towards his resignation as Prime Minister, he set his heart on making one last great speech in the Commons. The hydrogen bomb, his obsession, supplied the perfect theme – it made all the other business of the day look trifling. As he had told his doctor a few months before: 'I am more worried by [the H-bomb] than by all the rest of my problems put together.'[2]

The H-bomb was, Churchill believed, the greatest threat to civilisation since the Mongols began their conquests three-quarters of a millennium before.[3] This threat had become a monomania for him, driving his final great diplomatic initiative: to bring the Soviet Union and the United States together to ease the tensions of the Cold War and so minimise the risk that H-bombs would be used.[4] He was certainly going to mention that campaign in his speech, but his main task was to argue that the UK must acquire the weapon he feared so much, as a deterrent to the Soviet Union. This argument was almost certain to win the day in the Commons – his main challenge was to give his country a sense of hope at a time

when the world seemed to be careering towards a nuclear holocaust.

He threw himself into the speech, researching the nuclear story and his role in it, all the way back to the articles he had written in the 1920s and 1930s about the potential of nuclear energy to change the world. Among the best of the pieces was 'Fifty Years Hence', a four-thousand-word speculation on the effects science might have on life in the future, first published in late 1931. In it, he drew attention to the likely advent of nuclear weapons and the challenges their invention would pose. He even glimpsed the destructive power of the H-bomb, which would be detonated for the first time twenty-one years later:[5]

> High authorities tell us that new sources of power, vastly more important than any we yet know, will surely be discovered. Nuclear energy is incomparably greater than the molecular energy which we use today . . . If the hydrogen atoms in a pound of water could be prevailed upon to combine together and form helium, they would suffice to drive a thousand horse-power engine for a whole year . . . There is no question among scientists that this gigantic source of energy exists . . .

Churchill had based the article on a draft by his scientific Grand Vizier, Frederick Lindemann, an acid-tongued professor of physics at the University of Oxford. Lindemann was 'one of the best scientists and best brains in the country', in Churchill's opinion, a view not shared by many leading academics.[6] To most of them, 'the Prof', as Churchill called him, was a distinguished scientist with a gift for summarising complex arguments simply and accurately, but not a deep or imaginative thinker and certainly not an expert on nuclear science.

One of the services the Prof rendered to his admiring friend was to nourish his inquisitive mind with briefings on the latest advances in basic science. In the spring of 1926, when the

new and revolutionary quantum theory of matter was the talk of physicists, Lindemann sent Churchill – then Chancellor of the Exchequer – a book on how the structure of atoms can be understood using basic quantum ideas. The text grabbed Churchill's attention so completely that, for a few hours, he was incapable of concentrating on his Budget.

A few years later, Lindemann kept Churchill abreast of the headline-making advances in nuclear physics made by Ernest Rutherford and his colleagues at Cambridge University, including the first artificial splitting of the atom. Soon afterwards, Churchill marvelled at the scientists' achievements and said so after chairing one of Lindemann's non-specialist talks on nuclear physics: 'Here is this great study of science proceeding.'[7] The Prof ensured that Churchill had been aware of the opportunities and threats of nuclear technology for longer than any other leading politician, living or dead. In return, Churchill made his friend one of the most politically influential scientists ever to serve in government.

The speech Churchill was preparing in late February 1955 was part of his final bid for a glorious place in Britain's post-war history, having positioned himself as a link between the reigns of the British Empire's two most recent queens.[8] During the closing years of Victoria's reign, he had read about the widely publicised discovery of radioactivity, which involved the release of nuclear energy, as scientists later understood. Now, in the new Elizabethan era, he was commissioning a weapon that would release this energy with a destructiveness he had first fully appreciated only a year before, when he read a front-page article in the *Manchester Guardian*, 'Devastation and the Hydrogen Bomb'. It almost made the eyes stand out of his head, as he told President Eisenhower a few months later.[9]

His colleagues in Parliament were now expecting a great speech from him, to round off his second premiership. Although

they all knew of his obsession with the H-bomb, few of them appreciated the full extent of his involvement in the development of nuclear weapons. The handful in Whitehall who were familiar with the details of his record knew that it had been not been especially distinguished by his standards. He had almost always responded to events rather than shaping them, had shown poor judgement in his choice of advisers, and demonstrated none of his fabled vision and imagination until it was too late.

It was without doubt a misfortune for him that he had to think about the possibility of nuclear weapons when he was also deeply involved in the tumult of a global war. The news from Birmingham that two 'enemy aliens' – as the government classified them – had discovered a viable way of making a nuclear bomb arrived in Whitehall less than two months before he first became Prime Minister in May 1940. During most of the next two years, Churchill's pool of nuclear advice was too narrow and too shallow. Most damagingly, he froze out Henry Tizard, Britain's leading expert on the application of science to military problems – a decision that dismayed many leading scientists. The computer pioneer and former radar engineer Sir Maurice Wilkes later remembered: 'Scientists offered the Prime Minister the man best able to give their consensus, but he chose a maverick.'[10] Churchill discussed the new 'explosives', as he usually called nuclear weapons before they became a reality, only with Lindemann and with their colleague Sir John Anderson, keeping it secret from almost the entire Cabinet for most of the war. He demonstrated neither his usual sure-footedness nor any of his habitual enthusiasm for innovative new weapons, such as – during World War I – the tank.[11]

In August 1941, when Churchill endorsed plans to build the Bomb, he had not grasped the transformative qualities of a

weapon that could be delivered by a single aeroplane and wipe out a city in seconds. British nuclear scientists, then far ahead of their American colleagues in this field, had given him a high-value bargaining chip to play in his dealings with Roosevelt, who wrote to suggest that they embark on an equal-harness collaboration to develop the Bomb. Churchill as good as threw the chip away. He did not reply to the President's generous note for several weeks and even then appeared unenthusiastic about a nuclear collaboration. By that time, the United States had entered the war and was gearing up to begin its gargantuan Manhattan Project, which it pursued with a self-interest so ruthless that it left Churchill floundering. It seems that he first appreciated the strategic significance of the nuclear project only in the early spring of 1943, some eighteen months after Roosevelt. One consequence of the myopia Churchill shared with his closest advisers was that British physicists played only a minor role in the leadership of the project, and the influence they had on the application of their pioneering ideas was limited.

Churchill's lack of vision about the Bomb was embarrassingly clear in May 1944, when he met the Danish theoretical physicist Niels Bohr in 10 Downing Street. By common agreement, Bohr was the world's most accomplished nuclear scientist and a man of exceptional wisdom, though not an articulate speaker. When Bohr mumbled his suggestion that the US and Britain should share the secret of the Bomb with their Soviet allies to help build trust and avert a post-war arms race, Churchill was dismissive, having shown him none of the respect and attentiveness he gave to Lindemann. Roosevelt also had no time for the Dane's ideas. Had the leaders thought more deeply about his views, it is at least possible that the worst excesses of the post-war arms race might have been averted.

Of all the wartime agreements Churchill made with the American administration, he was especially proud of the one

he struck on the Bomb when he met Roosevelt in Quebec during the summer of 1943. This agreement brought British scientists into the Manhattan Project after almost a year of exclusion and enshrined an undertaking that Britain and the US would not use the Bomb against another country without each other's consent. The problem was that this was not a treaty but a private agreement that both Churchill and Roosevelt withheld from all but a tiny number of their colleagues. The leaders regarded the Bomb as an essentially private matter, but after the war the plan predictably backfired, with serious consequences for Britain. Churchill's successor as Prime Minister, Clement Attlee, discovered that Truman and his administration had no wish to continue with the Quebec Agreement: in 1946, the American government passed a brutally self-interested Act forbidding collaboration on nuclear matters with any foreign country.[12] Attlee eventually decided to cut his losses and set up a team of nuclear scientists to build the British Bomb, using the skills and scraps of information retrieved from the Manhattan Project, with virtually no assistance from the United States for several years. Rarely had the relationship between the US and Britain, so special to Churchill, been so devoid of practical value.

It was inevitable that the Soviets would have the Bomb soon after the war, as Churchill knew. Appalled by their military adventurism and their repressive regimes in Eastern Europe, he made the astonishing argument that if there was no rapprochement – his preferred option – then America should stage a pre-emptive nuclear attack on Russia.[13] President Truman wanted nothing to do with this, and Churchill quickly changed his line when the Soviets tested their first nuclear weapon in August 1949. The arms race foreseen by Niels Bohr was now well under way and the world appeared to be sliding into an age of mutually assured destruction.

Beginning in October 1951, the prospect of an imminent nuclear war gradually became the great theme of Churchill's second premiership. He spent most of his final two years in office trying to avoid such a catastrophic conflict, believing that he could bring the Soviets and Americans to the conference table and talk them into a more rational approach to living with the 'frightful' H-bomb.[14] Churchill pursued his perhaps quixotic cause with all the tenacity and courage he had shown in 1940, against widespread derision and after a stroke that, he boasted, 'would have killed most men'.[15] Only when it was clear that there was no chance that either the Americans or the Soviets would cooperate, and that his hopes of becoming a latter-day global saviour were over, did he finally throw in the towel. His failure to make headway in what was – at that time – a hopeless cause was one of the tragedies of his political career, though its prosecution did him credit and helped to erase his reputation as a warmonger. This was the defeat of a statesman years ahead of his time – he was trying too early to hurry along the détente agenda that brought such credit to later leaders, notably Ronald Reagan and Mikhail Gorbachev.

One curiosity of Churchill's second term was that at first he showed no interest in developing nuclear power, which he had foreseen and discussed in widely read articles decades before. As usual, he trusted in the goodwill of the Americans – he wanted his country to piggy-back on their technology, but was persuaded to change his mind by Lindemann, who became one of the godfathers of the nuclear industry in Britain. By that time, Churchill felt comfortable in the company of several senior scientists other than the Prof, even with a few leading nuclear physicists. In the four months before he began to prepare his valedictory speech on the H-bomb, he had talked at length three times with Sir John Cockcroft, one of the duo

that first artificially split the atom. Two of these discussions on nuclear policy were held over long, bibulous lunches, with the Prime Minister in fine form.

By late February 1955, Churchill was spending most mornings polishing the text of his speech, sitting up in his silk dressing gown. He was still an imposing figure, though he was small in stature and looked like an outsize doll, with skin as smooth and shiny as pink celluloid.[16] Usually holding a cigar, he dictated for hours on end to his secretary Jane Portal, later Lady Williams of Elvel, who sat a respectful distance away with her pen and notepad.[17] She now remembers that 'he was absolutely determined to go out on a high, to prove that he was still on top of his job, dealing with the biggest threat to the world'. He was in no doubt that he was better equipped than any other international leader to deal with the crisis.

Near the beginning of his speech, he intended to quote a long passage from 'Fifty Years Hence' to underline how far ahead of his time he had been – almost a quarter of a century before – in appreciating how close scientists were to tapping huge reservoirs of nuclear energy. This was sure to impress his audience. One of the other far-sighted sections of the essay that he did not quote, about the demands new science would place on future democracies, would probably not be welcomed so favourably. So great were the challenges, he had written in 1931, that the current generation's leaders would probably not be up to the task:

> Great nations are no longer led by their ablest men, or by those who know most about their immediate affairs, or even by those who have a coherent doctrine. Democratic governments drift along the line of least resistance, taking short views, paying their way with sops and doles, and smoothing their path with pleasant-sounding platitudes.

This censorious passage may well have given him pause and led him to ask himself two obvious questions. How well had he risen to the nuclear challenge, having foreseen it so long in advance? And how effectively had he worked with the scientists who had created it?

1

TOWARDS THE NUCLEAR AGE

1894–1925

Wells and his liberating 'atomic bombs'

> 'Wells is a seer. His *Time Machine* is a wonderful book . . . one of the books I would like to take with me to Purgatory.'
>
> WINSTON CHURCHILL, 7 December 1947[1]

Winston Churchill almost certainly first heard about 'atomic bombs' from his friend and irritant H. G. Wells, who gave the weapons their enduringly inaccurate name. The term first appeared in Wells's novel *The World Set Free*, published in January 1914, a few months before the outbreak of the First World War. Churchill probably purchased the book shortly after it was published, as he was exceptionally interested in Wells's work. Almost two decades later, he wrote that he had 'shouted for joy' after wolfing down *The Time Machine* and afterwards read every book Wells wrote, twice.[2]

Later, neither Churchill nor Wells could remember their first meeting. It probably took place at one of the garden parties or gentlemen's clubs they frequented in the summer of 1900, cultivating their most talented and influential peers. Both were celebrity socialites, relatively new to the limelight and enjoying every minute of it in their different ways. Churchill, a twenty-five-year-old scion of one of the country's wealthiest political families, had trained as a soldier and fought in active service in Cuba, India, the Sudan and South Africa. In the Boer War, still raging in South Africa, he had been – in modern parlance – an 'embedded reporter'. After his recent return, he had been feted internationally as a hero, having escaped from prison and come home with a twenty-five-pound bounty on his head. Already

well known as a lively writer, his work showed the influence of Wells – in Churchill's modest debut novel, *Savrola*, his description of the universe ending as 'cold and lifeless as a burnt-out firework' echoed a passage in Wells's *Time Machine*.[3] Intent on a political career, Churchill had earlier told his mother that he was 'a Liberal in all but name', but was so fiercely opposed to their policy of granting self-rule to Ireland that he chose to stand as a Conservative.[4]

Wells, eight years older, was at the forefront of the new wave of novelists. A son of struggling shopkeepers, he was a proselytising Socialist and in his student days had sported a plain red tie to underline his political allegiance, though now his wardrobe was more discreet, even dapper. By 1900, he had several commercial successes under his belt, including his scientific romances *The Island of Dr Moreau* and *The Invisible Man*, works that showed him to be the kind of energetic, forward-looking thinker that Britain needed in the new century. Dismissing Thomas Carlyle's lament that the modern age had sacrificed its spirituality to machines and materialism, Wells looked forward to an age when scientists and engineers would sweep away the moth-eaten brocade of sentimentalism, replacing it with a sturdy infrastructure of new inventions and innovative methods of production.

He had been a talented student of science, taking a good combined honours degree in zoology and geology, albeit at the second attempt.[5] His principal scientific talent, however, was the one that shone through in his writings and impressed even the best and most conservatively minded scientists – his ability to see where their new theories might take society. Some of the period's finest writers admired him, too, including Henry James, who told him, 'You are for me . . . the most interesting "literary man" of your generation.'[6] Oscar Wilde had described him as 'a scientific Jules Verne'.[7] Although these

literary luminaries knew that Wells was no great stylist, they acknowledged him to be the new era's secular priest, praising science and materialism in prose that, though often pedestrian, had an appealing undertow of optimism. This quality is likely to have appealed strongly to Churchill.

In November 1901, ten months after Queen Victoria's death, Wells published his first work of non-fiction, *Anticipations*, a rambling rumination on the future of technology, the Western economy, education and warfare. The book was studded with exciting predictions and had irresistible verve, but was not without flaws – some of its more opinionated passages read as if they had been dictated from the top of a soap box. Less than a week after *Anticipations* appeared in bookstores, Churchill received a copy from the publishers. Only six months before, he had spoken thoughtfully on the future of warfare, commenting that in modern conflicts 'the resources of science and civilisation sweep away everything that might mitigate their fury'.[8] He found plenty in the book to nourish his military thinking, especially Wells's point that warfare was then being waged using strategies long out of date but 'is being drawn into the field of the exact sciences'.[9] It was time, Wells believed, for governments to stop thinking that wars could be won by drunken armies led by ignorant generals who were proud of their old-fashioned ways. Rather, conflicts should be run by technical experts, supported by aerial intelligence. He predicted the invention of aeroplanes ('very probably before 1950') and foresaw the crucial importance in war of dominating the sky, imagining civilians far below the coming aerial battles: 'Everybody, everywhere, will be perpetually looking up, with a sense of loss and insecurity.'

He was rather less convinced of the strategic importance of submarines. 'I must confess that my imagination, in spite even of spurring, refuses to see any sort of submarine doing

anything but suffocate its crew and founder at sea.' Predictions like that did not much trouble him in the coming years – he preferred to be specific and wrong rather than vague and correct.

Wells received an eight-page letter on his new book from Churchill, who had read it within days of its arrival.[10] 'I read everything you write,' Churchill began, before launching a thoughtful critique of Wells's technocratic view of government, demonstrating that he was not just another of the scientifically illiterate dullards Wells despised. One of Churchill's fundamental objections was that Wells seemed to assume that the advent of new technology would be accompanied by a concomitant improvement in human nature. 'It is the nature of the beast that counts,' Churchill insisted: 'You may teach a dog all kinds of tricks . . . but you can't improve the breed of a dog in a hurry.'

Churchill was stung by the suggestion that politicians should not be bumbling generalists, learning as they went along, but should come to their posts armed with a technical training. His response summarises a point of view that he held for the rest of his life, as politicians and scientists who worked with him would find out in the decades to come:

> Expert knowledge is limited knowledge: and the unlimited ignorance of the plain man who knows only what hurts is a safer guide than any vigorous direction of a specialised character. Why should you assume that all except doctors, engineers etc. are drones or worse? . . . Is not government itself both an art and a science? To manage men, to explain difficult things to simple people, to reconcile opposite interests, to weigh the evidence of disputing experts, to deal with the clamorous emergency of the hour; are not these things themselves worth the consideration and labour of a lifetime? . . . Wherefore I say, from the dominion of all specialists (particularly military specialists) good Lord deliver us.

That last line hit home with Wells.[11] He replied immediately, saying that he agreed on that point, adding that he should have said that 'the predominating people to come' should be properly educated, not necessarily technically trained. Wells did not agree, however, that he had overestimated the speed at which humans could progress, telling Churchill why he had got this wrong: 'You belong to a class that has scarcely altered internally in a hundred years. I really do not think that you people who gather in great country houses realise the pace of things.'

Soon afterwards, Wells accepted an invitation from Churchill to meet for dinner, replying with more than a touch of condescension, 'To me you are a particularly interesting & rather amiable figure,' adding that he expected humanity to have to face great challenges in the coming years, although he fancied that Churchill was 'a little too inclined towards the Old Game' to be able to deal with them.[12] It was not until the following year that they were able to get together, eventually agreeing to meet at 8 p.m. in the lobby of the House of Commons on 6 March 1902.[13] They then headed out into the fog of London, the horse-drawn carriages only rarely encountering one of the new-fangled automobiles on the city's reeking streets.

They will have looked an odd pair. Little more than five feet tall, Wells was a weedy man with fiery eyes and a hirsute moustache. It never seemed quite fitting that the author of such astringent prose spoke in a hoarse squeak, which contrasted comically with Churchill's arresting baritone, marred slightly by a lisp and mild stutter.[14] Churchill was taller by six inches, already slightly stooped and with red hair that was starting to recede. Both men oozed ambition, especially Churchill, who had already made it plain that he wanted to be Prime Minister.[15]

No record of the conversation remains, but it is a fair bet that the two men explored each other's geopolitics, Churchill

as proud of the British Empire as Wells was ashamed of it. They will also have discovered that they had in common a restless confidence, an impatience for fame and a broad-mindedness that made it natural for them to befriend even some of their political opponents. The first seeds of their unlikely companionship had been sown. Wells next wrote to Churchill in the autumn of 1906, sending a copy of his latest book, *A Modern Utopia*. This explored how humanity might best function as a one-party state after it had solved its material problems, mainly by making intelligent use of new science and technology.

The new volume was not to Churchill's taste. He replied appreciatively, tactfully pointing out that the book's main weakness was its lack of a good story: 'I am always ready to eat your suet . . . but I must have the jam, too.' [16] For all its shortcomings, *A Modern Utopia* does appear to have encouraged Churchill to think about where technical developments were taking society – a subject that became one of his favourite themes. By then, he was recognised in Westminster as a conviction politician, unafraid of challenging party bosses. Two years earlier, the rise in support for Protectionism had led him to dramatically cross the floor of the Commons to join the Liberal Party, which supported free trade. In 1908, he married the radical Liberal Clementine ('Clemmie') Hozier – charming, attractive, loyal and firmly supportive of her husband, even though her political instincts went against his.[17] With her support, he became a leader of popular radicalism, introducing the first proposals for unemployment insurance, and minimum-wage rates in industries whose workers were especially vulnerable to exploitation.

Wells was so impressed with his friend's talent that he supported him in a by-election in April 1908, giving his reasons in a controversial newspaper article, 'Why Socialists Should Vote for Mr Churchill'.[18] Churchill was soon back in the House

of Commons and making swift progress, becoming a Cabinet minister as President of the Board of Trade when he was only thirty-three and, two years later, the youngest Home Secretary for almost a century.

Around this time, Wells appeared to turn his back on science fiction in favour of novels with social themes. Perhaps as a result of hints from his friend Joseph Conrad that he was squandering his talent, Wells returned to science and introduced 'atomic bombs' to his huge readership in the novel *The World Set Free*.[19] By early 1913, when he started writing the book, Wells was much talked about in literary circles as a self-styled feminist Lothario. The traffic of his bed comprised two wives and dozens of lady friends, most of whom served as muses, a role that seemed essential to maintaining his creative flow. He worked on his story during a stay in the Swiss Alps with a new mistress, the diminutive widow Elizabeth von Arnim, in her gorgeously situated chalet, built using the proceeds of her popular novels and plays.[20] Even by his standards, their relationship was intensely physical, he later recalled.

The World Set Free imagined the consequences of harnessing the energy released in radioactivity. The process had been discovered by the French physicist Henri Becquerel seventeen years earlier and had been the last global scientific sensation of the nineteenth century. Readers of newspapers, magazines and novels had long been gripped by stories of scientists uncovering secrets that would eventually bring the human race to a grisly end.[21] Radioactivity supplied rich material for authors attracted to the long-established Armageddon genre, and it was only a matter of time before it caught the eye of Wells. His interest was piqued by the book *The Interpretation of Radium*, written in 1909 by the English chemist and radioactivity pioneer Frederick Soddy, who based his account on popular public lectures he had given in Glasgow. The book

supplied Wells with just the type of raw material he loved to mould into fiction – exciting new science with the potential to revolutionise the way humans live.

Soddy pointed out that radium, a new chemical element, is unusual in 'giving out heat and light like Aladdin's lamp'.[22] If this energy could somehow be harnessed, then 'We stand today where primitive man first stood with regard to the energy liberated by fire.'[23] He foresaw some of the prizes awaiting societies that could capture this energy – they 'could transform a desert continent, thaw the frozen poles, and make the whole world one smiling Garden of Eden'. The problem was that radium and other radioactive elements are stubborn in the extreme – they give out their energy at the same rate, regardless of any attempt to change them. However they are treated – warmed, crushed or stretched – they decay at exactly the same rate and so slowly that it is not feasible to use the energy to drive turbines or do anything useful. Soddy surmised that if it were possible to utilise this energy, there would be huge benefits. He mentioned one consequence of this on the book's fourth page, in a phrase that captured Wells's interest: releases of radioactive energy 'could with effect be employed as an explosive incomparably more powerful in its activities than dynamite'.[24]

Wells read Soddy's account in the early spring of 1913, near the beginning of his stay with Elizabeth von Arnim. His imagination on fire, he asked friends for more information about radioactivity[25] and around May began a novel that he provisionally entitled *The Atom Frees the World*. It seems he was unaware that he was not quite the first to write about the idea of using radioactive energy to make weapons: five years earlier, the French writer Anatole France had published the satirical novel *Penguin Island*, featuring terrorists who make explosives using a gas from which 'radium evolves'.[26] Wells's vision was,

however, more graphic, more powerful and ultimately more influential.

Wells and von Arnim wrote in the mornings and then went on long mountain walks in the afternoons, often pausing to make love alfresco on beds of 'sun-flecked heaps of pine needles'.[27] He also read parts of the book to her on the slopes above her chalet, on one occasion offending her delicate sensibilities: punching him with her fur-gloved hands, she complained that he actually '*liked* smashing up the world'.[28]

In his story, Wells as usual let loose hostages to posterity by making absurdly precise predictions, this time about the future of nuclear physics. He imagined scientists in 1933 discovering how to make some chemical elements radioactive and, as a result, releasing large amounts of energy.[29] Twenty years later, a special engine brings 'induced radioactivity into the sphere of industrial production', making energy available at negligible cost and rendering fossil fuels such as oil and gas too expensive to bother with. Out of the economic chaos, incompetent governments wage war with the new 'atomic bombs'. Although quite small – three of them would fit into a coffin[30] – they are powerful enough to reduce a city the size of Chicago to a pile of radioactive rubble. This wipes the Earth's slate clean, enabling Wells to spell out his latest vision of Utopia: people finally realise that war is pointless, nations and races become obsolete, conventional politics ends while a new age of leisure begins, and the entire world becomes a single state that speaks only English. One measure the government takes is to keep radioactive matter under strict control so that no bomb-makers can get their hands on it.

Although not one of his best stories, it sold well and did nothing to harm his literary standing. Many critics admired his still-soaring imagination, though not his balsa-wood characters or the rickety plot. In one of the most complimentary

reviews, the *New York Times* saw beyond the limitations of *The World Set Free* and glimpsed why historians, if not literary scholars, would study this 'magnificent' book a century later: 'It is the development of the control and employment of radio-activity that lies at the root of the changes prophesied . . .'[31] Wells did not fully deserve this praise. In the next three decades, he did next to nothing to promote his notion that atomic energy could be important in war and peace. When he wrote a new introduction to the story in 1921, he scarcely mentioned the nuclear science underpinning it.[32]

In the year after *The World Set Free* first appeared, Wells was praised not so much for his scientific vision as for his prediction of the outbreak of what would become the First World War. A few days after the conflict began, his American publisher took out an advertisement boasting that 'the European conflict now in progress' had been 'foreseen and described' by 'the world's greatest imaginator'.[33] During the early stages of the conflict, Wells watched Churchill burnishing his own reputation as an orator of singular power and wit, running the Admiralty and eager – too eager for some – to learn the art of war.

Churchill was well qualified to play a leading role during the conflict. At the Royal Military College at Sandhurst, he had been trained in fortification and other military tactics, though he was never taught anything about bombs, he later wrote, as 'these weapons were known to be long obsolete'.[34] He had then served in the army, killed in battle and demonstrated a strong grasp of both geopolitics and military strategy. In Asquith's government, he had played a role in the founding of the British intelligence services MI5 and MI6 and repeatedly stressed the importance of equipping the country's fighters with the latest technology.[35] He had encouraged officials to get in touch with the Wright brothers in February 1909 to explore the military potential of their invention, the aeroplane – this

was four months after Wells published *The War in the Air*, which Churchill read with 'astonishment and delight'.[36]

According to Prime Minister Lloyd George, Churchill did more than anyone else in the Cabinet to promote Wells's idea of 'land ironclads', subsequently known as tanks.[37] Churchill invited Wells to see prototypes in action and helped to ensure that the vehicles became standard equipment for the army. Wells gave him great credit for this and Churchill later repaid it, testifying in court that the tank was solely his friend's idea.[38] Although the jury accepted the case, the truth was that several other inventors had independently hatched the concept.

Churchill's judgement at the top table in wartime proved to be erratic. Within nine months of the start of hostilities, after the disastrous campaign in the Dardanelles, he was obliged to resign his post in the Admiralty. He became so deflated and depressed that his wife thought he might die of grief, but he picked himself up, reported for duty in the army on the Western Front and developed his new hobby of painting, later his favourite pastime. Back in the government, as Minister of Munitions, in less than two years, he supplied the army with increasing quantities of guns, shells and tanks. His return to office in mid-1917 coincided with the first bombing raids on London by Gotha aeroplanes, when Wells stood defiantly on a balcony to witness the beginning of the aerial bombardment of cities that he and others had foreseen.[39] He had long been critical of the government's wartime deployment of scientists and new inventions, especially the aircraft.[40]

It was their views on the Soviet Union that first led Wells and Churchill to fall out, publicly and spectacularly. Wells had welcomed the Bolshevik Revolution of 1917 and supported Lenin's vision of an organised, godless society that embraced science and technology. Always fiercely anti-Communist, Churchill was the British government's most outspoken critic of the Bol-

shevik regime. It was a 'cancer', he said – a 'monstrous growth swelling and thriving upon the emaciated body of its victim' – and must be eradicated.[41] After he was appointed Secretary of State for War in January 1919, Churchill was fixated on the Soviet threat, hoping that the Allies would 'declare war on the Bolsheviks' and 'send huge forces there'.[42] His words, and the limited British Expeditionary Force sent to Russia, would return to haunt him some two decades later, when he had to work with Soviet leaders who remembered his vilification and his attempts to smother their regime before it could mature into an international force.

Wells took a very different view of the Bolsheviks. Although more critical than many British Socialists of the new Soviet government, he was prepared to excuse some of its failings as unfortunate consequences of a development that was for the best in the long term. Wells defended Lenin's administration as the only possible Russian government, and even defended the murderous Red Terror that accompanied the civil war.[43] In the autumn of 1920, he toured a number of Russian cities and described his experiences in a series of articles that called on other powers to help the Soviets create 'a new social order'.[44] Churchill snapped, attacking him for his naivety and for giving solace to evil fanatics. Wells's reply was weak, but he made one astute point:[45]

> [Churchill] believes quite naively that he belongs to a peculiarly gifted and privileged class of beings to whom the lives and affairs of common men are given over, the raw material for brilliant careers . . .

Churchill was a menace to world peace, Wells harrumphed – he should retire from public life and concentrate on his painting.[46] The two men, professional writers with skins of titanium, quickly put this spat behind them, neither bearing a grudge.

Afterwards their relationship was friendly, intermittently hostile but never poisonous – even after January 1923, when Wells published his political satire *Men Like Gods*, which featured a thinly disguised version of Churchill in the character Rupert Catskill, an Empire-obsessed warmonger, though 'fundamentally a civilised man'.[47]

In November 1922, Churchill lost his seat in the Commons. During his time away from Parliament, he edged back towards the Conservative Party and developed his parallel career as a writer, by far his main source of income. He had already published the first volume of his insider's account of the First World War, *The World Crisis*, described by former Prime Minister Lord Balfour as 'a brilliant autobiography, disguised as a history of the universe'.[48]

At the same time, Churchill wrote dozens of articles and regarded most of them as potboilers. He was, however, especially proud of one, which focused on the future of warfare.[49] This was his first attempt at Wellsian prognostication and it was here that he first alluded to his sometime friend's 'atomic bombs'.