

I Esprit de Corps

Beginning my studies the first step pleas'd me so much,
The mere fact consciousness, these forms, the power of motion,
The least insect or animal, the senses, eyesight, love,
The first step I say awed me and pleas'd me so much,
I have hardly gone and hardly wish'd to go any farther,
But stop and loiter all the time to sing it in ecstatic songs.

A son of the British Empire, Alan Turing's social origins lay just on the borderline between the landed gentry and the commercial classes. As merchants, soldiers and clergymen, his ancestors had been gentlemen, but not of the settled kind. Many of them had made their way through the expansion of British interests throughout the world.

The Turings could be traced back to Turins of Foveran, Aberdeenshire, in the fourteenth century. There was a baronetcy in the family, created in about 1638 for a John Turing, who left Scotland for England. *Audentes Fortuna Juvat* (Fortune Helps the Daring) was the motto of the Turings, but however brave, they were never very lucky. Sir John Turing backed the losing side in the English civil war, while Foveran was sacked by the Covenanters. Denied compensation after the Restoration, the Turings languished in obscurity during the eighteenth century, as the family history, the *Lay of the Turings*¹, was to describe:

Walter, and James and John have known,
Not the vain honours of a crown,
 But calm and peaceful life –
Life, brightened by the hallowing store
Derived from pure religion's lore!
And thus their quiet days passed by;
And Foveran's honours dormant lie,

Till good Sir Robert pleads his claim
To give once more the line to fame:
Banff's castled towers ring loud and high
To kindly hospitality
And thronging friends around his board
Rejoice in TURING's line restored!

Sir Robert Turing brought back a fortune from India in 1792 and revived the title. But he, and all the senior branches of the family, died off without male heirs, and by 1911 there were but three small clusters of Turings in the world. The baronetcy was held by the 84-year-old eighth baronet, who had been British Consul in Rotterdam. Then there was his brother, and his descendants, who formed a Dutch branch of Turings. The junior branch consisted of the descendants of their cousin, John Robert Turing, who was Alan's grandfather.

John Robert Turing took a degree in mathematics at Trinity College, Cambridge, in 1848, and was placed eleventh in rank, but abandoned mathematics for ordination and a Cambridge curacy. In 1861 he married nineteen year old Fanny Boyd and left Cambridge for a living in Nottinghamshire, where he fathered ten children. Two died in infancy and the surviving four girls and four boys were brought up in a regime of respectable poverty on a clerical stipend. Soon after the birth of his youngest son, John Robert suffered a stroke and resigned his living. He died in 1883.

As his widow was an invalid, the care of the family fell upon the eldest sister Jean, who ruled with a rod of iron. The family had moved to Bedford to take advantage of its grammar school, where the two elder boys were educated. Jean started her own school, and two of the other sisters went out as schoolteachers, and generally sacrificed themselves for the sake of advancing the boys. The eldest son, Arthur, was another Turing whom fortune did not help: he was commissioned in the Indian Army, but was ambushed and killed on the North-West Frontier in 1899. The third son Harvey² emigrated to Canada, and took up engineering, though he was to return for the First World War and then turn to genteel journalism, becoming editor of the *Salmon and Trout Magazine* and fishing editor of *The Field*. The fourth son Alick became a solicitor. Of the daughters only Jean was to marry: her husband was Sir Herbert Trustram Eve,

a Bedford estate agent who became the foremost rating surveyor of his day. The formidable Lady Eve, Alan's Aunt Jean, became a moving spirit of the London County Council Parks Committee. Of the three unmarried aunts, kindly Sybil became a Deaconess and took the Gospel to the obstinate subjects of the Raj. And true to this Victorian story, Alan's grandmother Fanny Turing succumbed to consumption in 1902.

Julius Mathison Turing, Alan's father, was the second son, born on 9 November 1873. Devoid of his father's mathematical ability, he was an able student of literature and history, and won a scholarship to Corpus Christi College, Oxford, from where he graduated with a BA in 1894. He never forgot his early life of enforced economy, and typically never paid the 'farcical' three guineas to convert the BA into an MA. But he never spoke of the miseries of his childhood, too proud to moan of what he had left behind and risen above, for his life as a young man was a model of success. He entered for the Indian Civil Service, which had been thrown open to entry by competitive examination in the great liberal reform of 1853, and which enjoyed a reputation surpassing even that of the Foreign Office. He was placed seventh out of 154 in the open examination of August 1895.³ His studies of the various branches of Indian law, the Tamil language and the history of British India then won him seventh place again in the Final ICS examination of 1896.

He was posted to the administration of the Presidency of Madras, which included most of southern India, reporting for duty on 7 December 1896, the senior in rank of seven new recruits to that province. British India had changed since Sir Robert left it in 1792. Fortune no longer helped the daring; fortune awaited the civil servant who could endure the climate for forty years. And while (as a contemporary writer put it) the district officer was 'glad of every opportunity to cultivate intercourse with the natives', the Victorian reforms had ensured that 'the doubtful alliances which in old days assisted our countrymen to learn the languages' were 'no longer tolerated by morality and society.' The Empire had become respectable.

With the help of a £100 loan from a family friend he bought his pony and saddlery, and was sent off into the interior. For ten years he served in the districts of Bellary, Kurnool and Vizigapatam

as Assistant Collector and Magistrate. There he rode from village to village, reporting upon agriculture, sanitation, irrigation, vaccination, auditing accounts, and overseeing the native magistracy. He added the Telugu language to his repertoire, and became Head Assistant Collector in 1906. In April 1907 he made a first return to England. It was the traditional point for the rising man, after a decade of lonely labour, to seek a wife. It was on the voyage home that he met Ethel Stoney.

Alan's mother⁴ was also the product of generations of empire-builders, being descended from a Yorkshireman, Thomas Stoney (1675–1726) who as a young man acquired lands in England's oldest colony after the 1688 revolution, and who became one of the Protestant landowners of Catholic Ireland. His estates in Tipperary passed down to his great-great-grandson Thomas George Stoney (1808–1886), who had five sons, the eldest inheriting the lands and the rest dispersing to various parts of the expanding empire. The third son was a hydraulic engineer, who designed sluices for the Thames, the Manchester Ship Canal and the Nile; the fifth emigrated to New Zealand, and the fourth, Edward Waller Stoney (1844–1931), Alan's maternal grandfather, went to India as an engineer. There he amassed a considerable fortune, becoming chief engineer of the Madras and Southern Mahratta Railway, responsible for the construction of the Tangabudra bridge, and the invention of Stoney's Patent Silent Puncak-Wheel.

A hard-headed, grumpy man, Edward Stoney married Sarah Crawford from another Anglo-Irish family, and they had two sons and two daughters. Of these, Richard followed his father as an engineer in India, Edward Crawford was a Major in the Royal Army Medical Corps, and Evelyn married an Anglo-Irish Major Kirwan of the Indian Army. Alan's mother, Ethel Sara Stoney, was born at Podanur, Madras, on 18 November 1881.

Although the Stoney family did not lack for funds, her early life was as grim as that of Julius Turing. All four Stoney children were sent back to Ireland to be educated. It was a pattern familiar to British India, whose children's loveless lives were part of the price of the Empire. They were landed upon their uncle William Crawford, a bank manager of County Clare, with two children of his own by a first marriage and four by a second. It was not a place for affection or attention. The

Crawfords moved to Dublin in 1891, where Ethel dutifully went to school each day on the horsebus, crushed by a regimen that permitted her a mean threepence for lunch. At seventeen, she was transferred to Cheltenham Ladies College, 'to get rid of her brogue,' and there she endured the legendary Miss Beale and Miss Buss, and the indignity of being the Irish product of the railway and the bank among the offspring of the English gentry. There remained a flickering dream of culture and freedom in Ethel Stoney's heart and for six months she was sent, at her own request, to study music and art at the Sorbonne. The brief experiment was vitiated by the discovery that French snobbery and Grundyism could equal that of the British Isles. So when in 1900 she returned with her elder sister Evie to her parents' grand bungalow in Coonoor, it was to an India which represented an end to petty privation, but left her knowing that there was a world of knowledge from which she had been forever excluded.

For seven years, Ethel and Evie led the life of young ladies of Coonoor – driving out in carriages to leave visiting cards, painting in water-colours, appearing in amateur theatricals and attending formal dinners and balls in the lavish and stifling manner of the day. Once her father took the family on holiday to Kashmir, where Ethel fell in love with a missionary doctor, and he with her. But the match was forbidden, for the missionary had no money. Duty triumphed over love, and she remained in the marriage market. And thus the scene was set, in the spring of 1907, for the meeting of Julius Turing and Ethel Stoney on board the homebound ship.

They had taken the Pacific route, and the romance was under way before they reached Japan. Here Julius took her out to dinner and wickedly instructed the Japanese waiter to 'bring beer and keep on bringing beer until I tell you to stop.' Though an abstemious man, he knew when to live it up. He made a formal proposal to Edward Stoney for Ethel's hand, and this time, he being a proud, impressive young man in the 'heaven-born' ICS, it was successful. The beer story, however, did not impress his future father-in-law, who lectured Ethel upon the prospect of life with a reckless drunkard. Together they crossed the Pacific and the United States, where they spent some time in the Yellowstone National Park, shocked by the familiarity of the young American guide. The wedding took place on 1 October 1907 in Dublin. (There remained a certain edge to the

relationship between Mr Turing and the commercial Mr Stoney, with an argument over who was to pay for the wedding carpet rankling for years.) In January 1908 they returned to India, and their first child John was born on 1 September at the Stoney bungalow at Coonoor. Mr Turing's postings then took them on long travels around Madras: to Parvatipuram, Vizigapatam, Anantapur, Bezwada, Chicacole, Kurnool and Chatrapur, where they arrived in March 1911.

It was at Chatrapur, in the autumn of 1911, that their second son, the future Alan Turing, was conceived. At this obscure imperial station, a port on the eastern coast, the first cells divided, broke their symmetry, and separated head from heart. But he was not to be born in British India. His father arranged his second period of leave in 1912, and the Turings sailed *en famille* for England.

This passage from India was a journey into a world of crisis. Strikes, suffragettes, and near civil war in Ireland had changed political Britain. The National Insurance Act, the Official Secrets Act, and what Churchill called 'the gigantic fleets and armies which impress and oppress the civilisation of our time,' all marked the death of Victorian certainties and the extended role of the state. The substance of Christian doctrine had long evaporated, and the authority of science held greater sway. Yet even science was feeling a new uncertainty. And new technology, enormously expanding the means of expression and communication, had opened up what Whitman had eulogised as the *Years of the Modern*, in which no one knew what might happen next – whether a 'divine general war' or a 'tremendous issuing forth against the idea of caste'.

But this conception of the modern world was not shared by the Turings, who were no dreamers of the World-City. Well insulated from the twentieth century, and unfamiliar even with modern Britain, they were content to make the best of what the nineteenth had offered them. Their second son, launched into an age of conflicts with which he would become helplessly entangled, was likewise to be sheltered for twenty years from the consequences of the world crisis.

He was born on 23 June 1912 in a nursing home in Paddington,* and was baptised Alan Mathison Turing on 7 July. His father extended

* Warrington Lodge, now the Colonnade Hotel, Warrington Crescent, London W9. His baptism was at St Saviour's Church, immediately across the road.

his leave until March 1913, the family spending the winter in Italy. He then returned to take up a new posting, but Mrs Turing stayed on with the two boys, Alan a babe in arms and John now four, until September 1913. Then she too departed. Mr Turing had decided that his sons were to stay in England, so as not to risk their delicate health in the heat of Madras. So Alan never saw the kind Indian servants, nor the bright colours of the East. It was in the bracing sea winds of the English Channel that his childhood was to be spent, in an exile from exile.

Mr Turing had farmed out his sons with a retired Army couple, Colonel and Mrs Ward. They lived at St Leonards-on-Sea, the seaside town adjoining Hastings, in a large house called Baston Lodge just above the sea front. Across the road was the house of Sir Rider Haggard, the author of *King Solomon's Mines*, and once, when Alan was older and dawdling along the gutter in his usual way, he found a diamond and sapphire ring belonging to Lady Haggard, who rewarded him with two shillings.

The Wards were *not* the sort of people who dropped diamond rings in the street. Colonel Ward, ultimately kindly, was remote and gruff as God the Father. Mrs Ward believed in bringing up boys to be real men. Yet there was a twinkle in her eye and both boys became fond of 'Grannie'. In between lay Nanny Thompson, who ruled the nursery which was the boys' proper place, and the governess of the schoolroom. There were other children in the house, for the Wards had no fewer than four daughters of their own, as well as another boy boarder. Later they also took in the 'Turing boys' cousins, the three children of Major Kirwan. Alan was very fond of the Wards' second daughter Hazel, but hated the youngest Joan, who was intermediate in age between him and John.

Both Turing boys disappointed Mrs Ward, for they scorned fighting and toy weapons, even model Dreadnoughts. Indeed, Mrs Ward wrote to Mrs Turing complaining that John was a bookworm, and Mrs Turing loyally wrote to John chiding him. Walks on the windswept promenade, picnics on the stony beach, games at children's parties, and tea before a roaring fire in the nursery were the most that the Ward environment had to offer in the way of stimulation.

This was not home, but it had to do. The parents came to

England as often as they could, but even when they did, that was not home either. When Mrs Turing returned in spring 1915, she took the boys into furnished and serviced rooms in St Leonards – gloomy places decorated by samplers embroidered with the more sacrificial kind of hymn. By this time Alan could talk, and proved himself the kind of little boy who could attract the attention of strangers with precocious, rather penetratingly high-pitched comments, but also a naughty and wilful one, in whom winning ways could rapidly give way to tantrums when he was thwarted. Experiment, as with planting his broken toy sailors in the ground, hoping they would grow afresh, was easily confused with naughtiness. Alan was slow to learn that indistinct line that separated initiative from disobedience and resisted the duties of his childhood. Late, untidy and cheeky, he had constant battles with his mother, Nanny and Mrs Ward.

Mrs Turing returned to India in the autumn of 1915, saying to Alan, ‘You’ll be a good boy, won’t you?’, to which Alan replied ‘Yes, but sometimes I shall forget!’ But this separation was only for six months, for in March 1916 Sahib and Memsahib together braved the U-boats, wearing lifebelts all the way from Suez to Southampton. Mr Turing took his family for a holiday in the Western Highlands, where they stayed in a hotel at Kimelfort, and John was introduced to trout fishing. At the end of his leave, in August 1916, they decided not to risk travelling together again, but instead to separate for the next three-year period. Alan’s father returned to India, and his mother resumed a double exile at St Leonards.

The Great War had remarkably little direct impact on the Turing family. The year 1917, with the mechanised slaughter, the U-boat siege, the air raids, the appearance of America and the Russian revolution, set up the pattern which was to be the newborn generation’s inheritance. But it had no private meaning except in keeping Mrs Turing in England. John was packed off to a preparatory school called Hazelhurst near Tunbridge Wells in Kent in May of that year, and thereafter Mrs Turing had only Alan about her. Church-going was one of her favourite pastimes, and in St Leonards she adopted a certain very high Anglican church, where Alan was dragged every Sunday for the communion service. He did not like the incense, and called it ‘the church with the bad smells’. Mrs Turing also pressed on with her water-colours, for which she enjoyed a definite talent.

She took Alan out on her sketching parties where, with big eyes and sailor hat, and with quaint expressions of his own like ‘quockling’ for the screech of seagulls, he delighted the lady art students.

Alan taught himself to read in about three weeks from a book called *Reading without Tears*. He was quicker, however, to recognise figures, and had an infuriating habit of stopping at every lamp post to identify its serial number. He was one of those many people without a natural sense of left and right, and he made a little red spot on his left thumb, which he called ‘the knowing spot’.

He would say that he wanted to be a doctor when he grew up – an ambition that would have been agreeable to the Turings, for his father would approve of the fees, and his mother of the distinguished clients and the practice of good works. But he could not learn to be a doctor on his own. It was time for some education. And so in the summer of 1918 Mrs Turing sent him to a private day school called St Michael’s, to learn Latin.

George Orwell, who was born nine years earlier but likewise to an ICS father, described himself⁵ as from ‘what you might describe as the lower-upper-middle-class.’ Before the war, he wrote:

you were either a gentleman or not a gentleman, and if you were a gentleman you struggled to behave as such, whatever your income might be... Probably the distinguishing mark of the upper-middle class was that its traditions were not to any extent commercial, but mainly military, official, and professional. People in this class owned no land, but they felt that they were landowners in the sight of God and kept up a semi-aristocratic outlook by going into the professions and the fighting services rather than into trade. Small boys used to count the plum stones on their plates and foretell their destiny by chanting ‘Army, Navy, Church, Medicine, Law’.

The Turings were in this position. There was nothing grand about the life of their sons, except perhaps on the few Scottish holidays. Their luxuries were the cinema, the ice rink, and watching the stuntman dive off the pier on a bicycle. But in the Ward establishment there was an incessant washing away of sins, washing away of smells, to distinguish them from the other children of the town. ‘I

was very young, not much more than six,' recalled Orwell, 'when I first became aware of class-distinctions. Before that age my chief heroes had generally been working-class people, because they always seemed to do such interesting things, such as being fishermen and blacksmiths and bricklayers. . . . But it was not long before I was forbidden to play with the plumber's children; they were "common" and I was told to keep away from them. This was snobbish, if you like, but it was also necessary, for middle-class people cannot afford to let their children grow up with vulgar accents.'

The Turings could afford very little, since even in the well paid ICS it was always necessary to save for the future. What they *had* to afford could be summed up in two words: public school. In this respect the war, the inflation, the talk of revolution changed nothing. The Turing boys had to go to public schools, and everything had to be subordinated to this demand. Never, indeed, would Mr Turing allow his sons to forget the debt they owed him for a public school education. Alan's duty was to go through the system without causing trouble, and in particular to learn Latin, which was required for entrance to a public school.

So as Germany collapsed, and the bitter armistice began, Alan was set to work on copy-books and Latin primers. He later told a joke against his own first exercise, in which he translated 'the table' as *omit mensa* because of the cryptic footnote 'omit' attached to the word 'the'. He was not interested in Latin, and for that matter he had great difficulty in writing. His brain seemed barely coordinated with his hand. A whole decade of fighting with scratchy nibs and leaking fountain-pens was to begin, in which nothing he wrote was free from crossings-out, blots, and irregular script which veered from stilted to depraved.

But at this stage he was still the bright, jolly little boy. On Christmas visits to the Trustram Eves in Earls Court, his uncle Bertie liked making Alan the butt of his practical jokes because of his innocent giggly humour. These occasions were more of a trial for John, who was now considered to be responsible for his younger brother's appearance and behaviour – a responsibility that no human being would ever lightly shoulder. To make matters worse, as John saw it,⁶

he was dressed in sailor suits, according to the convention of the day (they suited him well); I know nothing in the whole range of the cursedness of inanimate objects to compete with a sailor suit. Out of the boxes there erupted collars and ties and neckerchiefs and cummerbunds and oblong pieces of flannel with lengthy tapes attached; but how one put these pieces together, and in what order, was beyond the wit of man. Not that my brother cared a button – an apt phrase, many seemed to be off – for it was all the same thing to him which shoe was on which foot or that it was only three minutes to the fatal breakfast gong. Somehow or another I managed by skimping such trumpery details as Alan’s teeth, ears, etc., but I was exhausted by these nursery attentions and it was only when we were taken off to the pantomime that I was able to forget my fraternal cares. Even then Alan was quite a nuisance, complaining loudly of the scene of green dragons and other monsters in ‘Where the Rainbow Ends’. . . .

The Christmas pantomime was the high spot of the year, although Alan himself later recalled of Christmas ‘that as a small child I was quite unable to predict when it would fall, I didn’t even realise that it came at regular intervals.’ Back at dreary Baston Lodge, his head was buried in maps. He asked for an atlas as a birthday present and pored over it by the hour. He also liked recipes and formulae, and wrote down the ingredients for a dockleaf concoction for the cure of nettle-stings. The only books he had were little nature-study notebooks, supplemented by his mother reading *The Pilgrim’s Progress* aloud. Once she cheated by leaving out a long theological dissertation, but that made him very cross. ‘You spoil the *whole thing*,’ he shouted, and ran up to his bedroom. Perhaps he was responding to the uncompromising note of Bunyan’s plain-speaking Englishman. But once the rules were agreed then they must be followed to the bitter end, without bending or cheating. His Nanny found the same when playing with him:⁷

The thing that stands out most in my mind was his *integrity* and his *intelligence* for a child so young as he then was, also you couldn’t camouflage anything from him. I remember one day Alan and I playing together. I played so that he should win, but he spotted it. There was commotion for a few minutes. . . .

In February 1919, Mr Turing returned after three years’

separation. It was not easy for him to re-establish his authority with Alan, who had a good line in answering back. He told Alan once to untwist his boot-tongues. 'They should be flat as a pancake,' he said. 'Pancakes are generally rolled up,' piped back Alan. If Alan had an opinion, he said that he *knew*, or that he *always knew*; he always knew that the forbidden fruit of the Garden of Eden was not an apple but a plum. In the summer, Mr Turing took them for a holiday at Ullapool, in the far north-west of Scotland, this time a distinctly posh holiday, complete with gillie. While Mr Turing and John lured the trout, and Mrs Turing sketched the loch, Alan gambolled in the heather. He had the bright idea of gathering the wild bees' honey for their picnic tea. As the bees buzzed past, he observed their flight-paths and by plotting the intersection point located the nest. The Turings were vividly impressed by this direction-finding, more than by the murky honey he retrieved.

But that December his parents steamed away and Alan was left again with the Wards, while John returned to Hazelhurst. Their father was transferred at last to the metropolis of Madras to serve in the Revenue Department, but Alan stagnated in the deathly ennui of St Leonards-on-Sea, concocting recipes. His development was so held back that he had not even learnt how to do long division by the time of his mother's return in 1921, when he was nearly nine.

His mother perceived him as changed from 'extremely vivacious – even mercurial – making friends with everyone' to being 'unsociable and dreamy'. There was a wistful, withdrawn expression in photographs of his ten-year-old face. She took him away from St Leonards and, after a summer holiday in Brittany, somewhat spoilt by the constant counting of francs, she taught him herself in London, where he alarmed her by looking for iron filings in the gutter with a magnet. Mr Turing, who in May 1921 had again been promoted to be Secretary to the Madras Government Development Department, responsible for agriculture and commerce throughout the Presidency, returned once more in December and they all went to St Moritz, where Alan learnt to ski.

Miss Taylor, the headmistress of St Michael's, had said that Alan 'had genius', but this diagnosis was not allowed to modify the programme. In the new year of 1922, Alan was launched on the next stage of the process and was sent off to Hazelhurst like his brother.

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Hazelhurst was a small establishment of thirty-six boys of ages from nine to thirteen, run by the headmaster Mr Darlington, a Mr Blenkins who taught mathematics, Miss Gillett who taught drawing and music of a Moody and Sankey variety, and the Matron. John had loved his time there, and now in his last term was head boy. His younger brother proved to be a thorn in the flesh, for Alan found the Hazelhurst regime a distraction. It 'deprived him of his usual occupations,' as his mother saw it. Now that the whole day was organised into classes, games and meal-times, he had but odd minutes in which to indulge his interests. He arrived with a craze for paper-folding, and when he had shown the other boys what to do, John found himself confronted everywhere with paper frogs and paper boats. Another humiliation followed when Alan's passion for maps was discovered by Mr Darlington. This inspired him to set a geography test to the whole school, in which Alan came sixth, beating his brother, who found geography very boring. On another occasion Alan sat in the back row at a school concert, choking himself with laughter while John sang *Land of Hope and Glory* as a solo.

John left Hazelhurst at Easter for Marlborough, his public school. In the summer, Mr Turing again took the family to Scotland, this time to Lochinver. Alan exercised his knowledge of maps on the mountain paths, and they fished in the loch, Alan now competing with John. The brothers had a good line in non-violent rivalry, as for instance when they played a game to alleviate the awfulness of their grandfather Stoney's visits. This depended upon winning points by leading him on, or heading him away from one of his well-rehearsed club bore stories. And at Lochinver Alan defeated his family in what Mrs Turing considered the rather vulgar after-dinner sport of throwing discarded gooseberry skins as far as possible. Cleverly inflating them, he made them soar over the hedge.

Life when off duty, in this early afternoon of the Empire, could be very agreeable. But in September his parents saw Alan back to Hazelhurst, and as they drove away in their taxi, Alan rushed back along the school drive with arms flung wide in pursuit. They had to bite their lips and sail away to Madras. Alan continued to maintain his detached view of the Hazelhurst regime. He gained average marks in class, and in turn held an unflattering view of the

instruction. Mr Blenkins initiated his class into elementary algebra, and Alan reported to John, 'He gave a *quite false impression* of what is meant by x .'

Although he enjoyed the feeble little plays and debates, he hated and feared the gym class and the afternoon games. The boys played hockey in winter, and Alan later claimed that it was the necessity of avoiding the ball that had taught him to run fast. He did enjoy being linesman, judging precisely where the ball had crossed the line. In an end-of-term sing-song, the following couplet described him:

Turing's fond of the football field
For geometric problems the touch-lines yield

Later another verse had him 'watching the daisies grow' during hockey, an image which inspired his mother to a whimsical pencil sketch. And although intended as a joke against his dreamy passivity, there might have been a truth in the observation. For something new had happened.

At the end of 1922, some unknown benefactor had given him a book, called *Natural Wonders Every Child Should Know*.⁸ Alan told his mother later that this book had opened his eyes to science. Indeed, it must have been the first time that he became conscious that such a kind of knowledge as 'science' existed. But more than that, it opened the book of life. If anything at all can be said to have influenced him, it was this book which, like so many new things, came from the United States.

The book had first appeared in 1912 and its author, Edwin Tenney Brewster, had described it as

... the first attempt to set before young readers some knowledge of certain loosely related but very modern topics, commonly grouped together under the name, General Physiology. It is, in short, an attempt to lead children of eight or ten, first to ask and then to answer, the question: What have I in common with other living things, and how do I differ from them? Incidentally, in addition, I have attempted to provide a foundation on which a perplexed but serious-minded parent can himself base an answer to several puzzling questions which all children ask – most especially to that most difficult of them all: By what process of becoming did I myself finally appear in this world?

In other words, it was about sex and science, starting off with 'How the Chicken got inside the Egg', rambling through 'Some Other Sorts of Eggs' until arriving at 'What Little Boys and Girls are Made Of'. Brewster quoted 'the old nursery rhyme' and said that:

It has this much truth in it, that little boys and little girls are far from being alike, and it isn't worth while trying to make either one over into the other.

The precise nature of this difference was not revealed, and only after a skilful diversion on to the subject of the eggs of starfish and sea-urchins did Brewster eventually arrive back at the human body:

So we are not built like a cement or a wooden house, but like a brick one. We are made of little living bricks. When we grow it is because these living bricks divide into half bricks, and then grow into whole ones again. But how they find out when and where to grow fast, and when and where to grow slowly, and when and where not to grow at all, is precisely what nobody has yet made the smallest beginning at finding out.

The process of biological growth was the principal scientific theme of E. T. Brewster's book. Yet science had no explanations, only descriptions. In fact on 1 October 1911, when Alan Turing's 'living bricks' were first dividing and redividing, Professor D'Arcy Thompson was telling the British Association that 'the ultimate problems of biology are as inscrutable as of old.'

But equally inscrutable, *Natural Wonders* conspicuously failed to describe where the *first* cell in the human process came from, only dropping the elusive hint that 'the egg itself arose by the splitting of still another cell which, of course, was part of the parent's body.' The secret was left for the 'perplexed but serious-minded parent' to explain. Mrs Turing's way of dealing with the thorny topic was, in fact, highly consonant with Brewster's, for John at least was the recipient at Hazelhurst of a special letter starting with the birds and the bees, and ending with instructions 'not to go off the rails'. Presumably Alan was informed in the same way.

In other ways, however, *Natural Wonders* was indeed 'very modern', and certainly no little 'nature book'. It conveyed the idea that there had to be a reason for the way things were, and that the reason came not from God but from science. Long passages

explained why little boys liked throwing things and little girls liked babies, and derived from the pattern of the living world the ideal of a Daddy to go out to work at the office and a Mama to stay at home. This picture of respectable American life was rather remote from the training of the sons of Indian civil servants, but more relevant to Alan was a picture of the brain:

Do you see now why you have to go to school five hours a day, and sit on a hard seat studying still harder lessons, when you would much rather sneak off and go in swimming? It is so that you may build up these thinking spots in your brains. . . . We begin young, while the brain is still growing. With years and years of work and study, we slowly form the thinking spots over our left ears, which we are to use the rest of our days. When we are grown up, we can no more form new thinking places. . . .

So even school was justified by science. The old world of divine authority was reduced to a vague allusion in which Brewster, having described evolution, said that ‘why it all happens or what it is all for’ was precisely ‘one of those things that no fellah can find out.’ Brewster’s living things were unequivocally *machines*:

For, of course, the body is a machine. It is a vastly complex machine, many, many times more complicated than any machine ever made with hands; but still after all a machine. It has been likened to a steam engine. But that was before we knew as much about the way it works as we know now. It really is a gas engine; like the engine of an automobile, a motor boat, or a flying machine.

Human beings were ‘more intelligent’ than the other animals, but were not accorded a mention of ‘soul’. The process of cellular division and differentiation was something no one had *yet* begun to understand – but there was no suggestion that it required the interference of angels. So if Alan was indeed ‘watching the daisies grow’, he could have been thinking that while it looked as though the daisy knew what to do, it really depended upon a system of cells working like a machine. And what about himself? How did *he* know what to do? There was plenty to dream about while the hockey ball whizzed past.

Besides watching the daisies, Alan liked inventing things. On 11 February 1923 he wrote:⁹

Dear Mother and Daddy,

I have got a lovely cinema kind of thing Micheal* sills gave it to me and you can draw new films for it and I am making a copy of it for you for an easter present I am sending it in another envelope if you want any more films for it write for them there are 16 pictures in each but I worked out that I could draw 'The boy stood at the tea table' you know the Rhyme made up from casabianca I was 2nd this week again. Matron sends her love GB said that as I wrote so thick I was to get some new nibs from T. Wells and I am writing with them now there is a lecture tomorrow Wainwright was next to bottom this week this is my patent ink

There was nothing about science, inventions, or the modern world in the Common Entrance examination – the public school admission test, which was the *raison d'être* of schools like Hazelhurst. *Casabianca* was nearer the mark. In the American *Natural Wonders* everything had to have a reason. But the British system was building different 'thinking spots' – the virtue of *Casabianca*, the boy on the burning deck, was that he carried out his instructions literally, losing his life in the process.

The masters did their best to discourage Alan's irrelevant interest in science, but could not stop his inventions – in particular, machines to help him in the writing problems that still plagued him:

April 1 (fool's day)

Guess what I am writing with. It is an invention of my own it is a fountain pen like this: – [*crude diagram*] you see to fill it scweeze E [*squishy end of fountain pen filler*'] and let go and the ink is sucked up and it is full. I have arranged it so that when I press a little of the ink comes down but it keeps on getting clogged.

I wonder if John has seen Joan of Arc's Statue yet coz it is in Rouen. Last monday we had scouts v cubs it was rather exiting there was no weeks order this week I hope John likes Rouen I don't feel much like writing much today sorry. Matron says John sent something.

This provoked another couplet, about a fountain pen that 'leaked enough for four'. Another letter in July, written in green ink which

* Alan's spelling and punctuation, here and throughout, is faithfully reproduced.

was (predictably) forbidden, described an exceedingly crude idea for a typewriter .

John's stay in Rouen was part of a general alteration in the Turing family arrangements. Before going to Marlborough, he had told his father that he would like a change from the Wards, and this was agreed. The parents found a Hertfordshire vicarage to be their home as from the summer of 1923. Meanwhile, at Easter, John had parted from his brother for the first time, going to stay with a Mme Godier in Rouen. This went quite well, and in the summer Alan ('simply longing to go there') went with him to imbibe the culture and civilisation of France for a few weeks. Alan made a great impression on the *petit-bourgeoise* Mme Godier. It was '*comme il est charmant*' when he had been persuaded to wash behind the ears, and a telling-off for John if he had not. John loathed Mme Godier, and her fawning on Alan came as a relief, enabling him to slip off to the cinema. Both Turing boys, in fact, were singularly good-looking, with a subtle, vulnerable appeal; John rather the sharper, and Alan dreamier. The stay was not a great success. John had refused to take his bicycle this time because of the prospect of navigating wobbly Alan through the cobbled Rouen streets. So they were marooned listlessly in the *maison Godier*, or were obliged to take long walks. '*Il marche comme un escargot,*' declared Mme Godier of Alan, an observation which fitted Alan's snail-like progress along the gutter, but also the Turing family's picture of itself – that of the slow Turings, the gloomy Turings, always fighting on the losing side, and coming in last if not least.

Much happier was the new home in Hertfordshire, to which the boys went for the rest of the summer. It was the Georgian red-brick rectory at Watton-at-Stone, seat of the old Archdeacon Rollo Meyer, a charming and mellow man whose environment was that of the rose-bed and the tennis court, rather than the well-scrubbed, brisk discipline of the Wards. John and Alan both responded with joy, John to girls on the tennis court (he being fifteen and decidedly interested), Alan to being left alone, allowed to cycle in the woods and make his own mess as he pleased as long as he met minimum standards in the house. Alan's standing also went up in Mrs Meyer's eyes when a gypsy fortune teller at the church fête said that he would be a genius.

The Meyers' guardianship was shortlived, for Mr Turing

suddenly decided to resign from the Indian Civil Service. He was angry at his rival, a certain Campbell who had come out with him in 1896 and had obtained a lower grade in the entrance examination, being promoted to be Chief Secretary to the Madras Government. So he abandoned his own chances of further advancement, and Alan's parents never returned as Sir Julius and Lady Turing,* though they had the more tangible benefit of a £1000 per annum pension.

It was not a return to England, for Alan's father adopted a new role as tax exile. The Inland Revenue allowed him to escape the income tax if he spent only six weeks in the United Kingdom each year, so the Turings installed themselves in the French resort of Dinard, opposite St Malo on the Brittany coast. Henceforward the boys were to travel to France for Christmas and Easter vacations, while the parents would come to England for the summer.

Technically, Mr Turing did not resign until 12 July 1926, and in the meantime he was on leave, the development of Madras somehow continuing without him. But he lost no time in establishing a new sense of economy. Mrs Turing had to submit accounts detailing the housekeeping expenses to the centime. Holidays in St Moritz and Scotland were declared henceforth out of the question.

In many ways his premature retirement was a disaster. Both sons felt it was a mistake. Alan was to imitate in a particularly droll manner the huffy comments that his father would pass on 'XYZ Campbell', and his brother later wrote:¹⁰

I doubt if I should have found my father an easy superior or subordinate for by all accounts he cared nothing for the hierarchy nor his own future in the Indian Civil Service and spoke his mind regardless of the consequences. One example will suffice. For a while he acted as principal private secretary to mild Lord Willingdon in the Madras Presidency and when a difference of opinion developed between them my father remarked 'After all you are not the Government of India'. Such thumping, suicidal indiscretion one can but admire from a safe distance.

This particular incident was always held against Mr Turing by his wife, the more so as she was particularly in awe of Lady Willingdon. The truth perhaps was that despite all the endless talk of duty, the

* Unlike Sir Archibald Campbell.

qualities required in a district officer were very different from those of rule-book-keeping and deference to rank. Governing millions of people spread over an area equal to that of Wales called for an independent judgment and force of personality which were less welcome in the more courtly circles of metropolitan Madras. They were certainly little needed in his retirement, in which the busy intrigue of India assumed a retrospective appeal. His remaining years were dogged by a sense of loss, disillusion, and an intense boredom which fishing and bridge parties could never alleviate. He was aggravated by the fact that his younger wife found the return to Europe an opportunity to emerge from the constricting mental atmosphere of Dublin and Coonoor. For he had little regard for her more intellectual ambitions, combined as they were with a rather nervous, fussy domesticity; while she suffered from his obsessive penny-pinching and sense of being betrayed. They were both emotionally demanding, but neither met the other's demands, and they came to communicate in little but planning the garden.

One result of the new arrangement was that Alan now saw some point to learning French, and it became Alan's favourite school subject. But he also liked it as a sort of code, in which he naively wrote a postcard to his mother about '*la revolution*' at Hazelhurst that Mr Darlington was not supposed to be able to read. (The joke was on their Breton maid at Dinard, who often spoke of a socialist revolution being imminent.)

But it was science that entranced him, as his parents discovered when they arrived back to find him clutching *Natural Wonders*. Their reaction was not entirely negative. Mrs Turing's grandfather's second cousin, George Johnstone Stoney (1826–1911), had been a famous Irish scientist whom she had once met as a girl in Dublin. He was best known as the inventor of the word 'electron' which he coined in 1894 before the atomicity of electric charge had been established. Mrs Turing was very proud of having a Fellow of the Royal Society in her family, for ranks and titles made a great impression upon her. She would also show Alan the picture of Pasteur on the French postage stamps, which suggested the prospect of Alan as a benefactor of humanity. Perhaps she recalled that doctor missionary in Kashmir, all those years ago! – but there was also the simple fact that although she herself pressed her ideas into a suitably ladylike

form, she still represented the Stoneys who had married applied science to the expanding empire. Alan's father, however, could well have pointed out that a scientist could expect no more than £500 a year, even in the Civil Service.

But he also helped Alan in his own way, for when back at school in May 1924 Alan wrote:

. . . You (Daddy) were telling me about surveying in the train, I have found out or rather read how they find out the heights of trees, widths of rivers, valley's etc. by a combination of both I found out how they find heights of mountains without climbing them.

Alan had also read about how to draw a geographical section, and had added this accomplishment to 'family tree, chess, maps etc. (generally my own amusements)'. In the summer of 1924 the family stayed for a time at Oxford – a nostalgic exercise on Mr Turing's part – and then in September they holidayed at a boarding house in North Wales. The parents stayed on awhile when Alan went back by himself to Hazelhurst ('I tipped the porter all right and the taxi too . . . I did not tip the Frant chap but that was not expected of me. Was it?') where he made his own maps of the Snowdonia mountains. ('Will you compare my map with the Ordnance one and send it back.')

Maps were an old interest: family trees he also liked, and the particularly awkward Turing genealogy, with its leaps of the baronetcy from bough to bough and its enormous Victorian families, exercised his ingenuity. Chess was the most social of his activities:

There was not going to be any Chess Tournament because Mr Darlington had not seen many people playing but he said that if I asked everyone who could play and made a list of everyone who had played this term we would have it. I managed to get enough people so we are having it.

He also found the work in class 1B to be 'much more interesting'. But all this paled before chemistry. Alan had always liked recipes, strange brews and patent inks, and had tried clay-firing in the wood when staying with the Meyers. The idea of chemical processes would not have been strange to him. And in the summer holidays at Oxford, his parents had allowed him to play with a box of chemicals for the first time.

Natural Wonders did not have much to say about chemistry, except in terms of poisons. A strong defence of Temperance, not to say Prohibition, flowed from Brewster's scientific pen:

The life of any creature, man, animal or plant, is one long fight against being poisoned. The poisons get us in all sorts of ways . . . like alcohol, ether, chloroform, the various alkaloids, such as strychnin and atropin and cocain, which we use as medicines, and nicotin, which is the alkaloid of tobacco, the poisons of many toadstools, caffen which we get in tea and coffee. . . .

There was another section headed 'Of Sugar and Other Poisons', explaining the effect of carbon dioxide in the blood, causing fatigue, and the action of the brain:

When the nerve center in the neck tastes a little carbon dioxid, it doesn't say anything. But the moment the taste begins to get strong (which is in less than a quarter minute after one starts running hard) it telephones over the nerves to the lungs:

'Here, here, here! What is the matter with you fellows. Get busy. Breathe hard. This blood is fairly sizzling with burnt up sugar!'

All this was grist to Alan's mill, although at this point what interested him was the more sober claim that:

The carbon dioxid becomes in the blood ordinary cooking soda; the blood carries the soda to the lungs, and there it changes to carbon dioxid again, exactly as it does when, as cooking soda, or baking powder, you add it to flour and use it to raise cake.

There was nothing in *Natural Wonders* to explain chemical names or chemical change, but he must have picked up the ideas from somewhere else, for on arriving back at school on 21 September 1924 his letter reminded his parents 'Don't forget the science book I was to have instead of the Children's Encyclopedia,' and also:

In *Natural wonders* every child should know it says that the Carbon dioxide is changed to cooking soda in the blood and back to carbon dioxide in the lungs. If you can will you send me the chemical name of cooking soda or the formula better still so that I can see how it does it.

Presumably he had seen the *Children's Encyclopedia*, if only to reject it as too childish and vague, and could well have learnt the basic ideas of chemistry from its multitude of little 'experiments' with household substances. The prophetic spark of enquiry lay in his trying to combine the ideas of chemical formulae on the one hand with the mechanistic description of the body on the other.

Chemistry was not the Turing parents' forte, but in November he found a more reliable source of information: 'I have come into great luck here: there is an Encyclopedia that is 1st form property.' And at Christmas 1924 he was given a set of chemicals, crucibles and test-tubes, and allowed to use them in the cellar of *Ker Sammy*, their villa in the Rue du Casino. He heaved great quantities of sea-weed back from the beach in order to extract a minute amount of iodine. This was much to the amazement of John, who with different eyes saw Dinard as an expatriate English colony of the bright 1920s, and spent his time on tennis, golf, dancing and flirting in the Casino. There was an English schoolmaster in the neighbourhood, whom Alan's parents employed to coach Alan for the Common Entrance examination, who found himself plied with questions about science. In March 1925, back at school, Alan wrote:

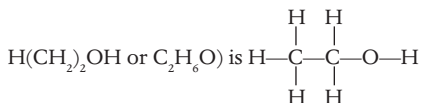
I came out in the same place in Common Entrance* this term as last with 53% average. I got 69% in French.

But it was the chemistry that mattered:

I wonder whether I could get an earthenware retort anywhere for some high-heat actions. I have been trying to learn some Organic Chemistry, when I began if I saw something like this

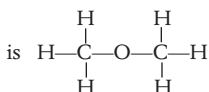


I would try and work it out like this $\text{C}_{21}\text{H}_{40}\text{O}_2$ which might be all sorts of things it is a kind of oil. I find the Graphic formulae help too, thus Alcohol is



while Methyl ether $\text{HCH}_2\text{O.CH}_2\text{H}$ or $\text{C}_2\text{H}_6\text{O}$

* These were practice papers



you see they shew the molecular arrangement.

And then a week later:

. . . The earthenware retort takes the place of a crucible when the essential product is a gas which is very common at high temperatures. I am making a collection of experiments in the order I mean to do them in. I always seem to want to make things from the thing that is commonest in nature and with the least waste in energy.

For Alan was now conscious of his own ruling passion. The longing for the simple and ordinary which would later emerge in so many ways was not for him a mere 'back to nature' hobby, a holiday from the realities of civilisation. To him it was life itself, a civilisation from which everything else came as a distraction.

To his parents the priorities were the other way round. Mr Turing was not at all the man for airs and graces; a man who would insist on walking rather than take a taxi, there was a touch of the desert island mentality in his character. But nothing altered the fact that chemistry was merely the amusement allowed to Alan on his holidays and that what mattered was that at thirteen he had to go on to a public school. In the autumn of 1925 Alan sat the Common Entrance for Marlborough, and to the surprise of all did rather well. (He had not been allowed to try for a scholarship.) But at this point John played a decisive part in the life of his strange brother. 'For God's sake don't send him here,' he said, 'it will crush the life out of him.'

Alan posed a difficult problem. It was not in question that he must adapt to public school life. But what public school would cater best for a boy whose principal concern was to do experiments with muddy jam jars in the coal cellar? It was a contradiction in terms. As Mrs Turing saw it,¹¹

Though he had been loved and understood in the narrower homely circle of his preparatory school, it was because I foresaw the possible difficulties for the staff and himself at a public school that I was at such pains to find the right one for him, lest if he failed in adaptation to public school life he might become a mere intellectual crank.

Her pains were not prolonged. She had a friend called Mrs Gervis, the wife of a science master at Sherborne School, a public school in Dorset. In spring 1926 Alan took the examination again, and was accepted by Sherborne.

Sherborne was one of the original English public schools, whose origins¹² lay in the abbey, which itself was one of the first sites of English Christianity, and in a charter of 1550 establishing the school for local education. In 1869, however, Sherborne had fallen into line as a boarding school on Dr Arnold's model. After a period of low repute, it had revived in 1909 when a Nowell Smith was appointed headmaster. By 1926 Nowell Smith had doubled the roll from two hundred to four hundred, and had established Sherborne as a moderately distinguished public school.

Mrs Turing paid a visit to Sherborne before Alan went there and was able to see the headmaster's wife. She gave Mrs Nowell Smith 'some hints about what to expect' and Mrs Nowell Smith 'contrasted her description with the more favourable accounts given by other parents of their boys.' It was probably at her suggestion that Alan was put down to board at Westcott House, whose housemaster was Geoffrey O'Hanlon.

The summer term was due to start on Monday 3 May 1926 which was, it so happened, the first day of the general strike. On the ferry from St Malo Alan heard that only the milk trains would be running. But he knew he could cycle the sixty miles west from Southampton to Sherborne:

so I cycled as programme left luggage with baggage master started out of docks about 11 o'clock got map for 3/- including Southampton missing Sherborne by about 3 miles. Noted where Sherborne was just outside. With an awful strive, found General Post Office, sent wire O'Hanlon 1/-. Found cycle shop, had things done 6d. Left 12 o'clock had lunch 7 miles out 3/6 went on to Lyndhurst 3 miles got apple 2d. went on to Beerley 8 miles pedal a bit wrong had it done 6d. went on Ringwood 4 miles.

The streets in Southampton were full of people who had struck. Had a lovely ride through the New Forest and then over a sort of moor into Ringwood and quite flat again to Wimborne. "EQPVK WGF '000