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978-1-108-06159-9 - The Life of Sir William Crookes

Edmund Edward Fournier D'Albe with a foreword by Oliver Lodge

Excerpt

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The Life of Sir William Crookes

CHAPTER I

INTRODUCTORY

*But in his peaceful cell, the Sage draws significant circles,
Ponders the hidden plan, thinks the Creator's thought;
Tests elementary powers, the loves and hates of the magnets,
Follows the sound through the air, tracks the ethereal ray,
Traces the friendly Law among Chance's terrible wonders,
Gropes for the constant pole guiding the flight of the world.*

SCHILLER.

THE LATE PROFESSOR POYNTING, of Birmingham, used to say of himself that he was generally taken for a prosperous farmer. His chubby face and square figure did, indeed, effectively counterpoise the massive brain and penetrating eye of the renowned physicist. But the scientific type is difficult to identify. Of the four greatest living English physicists, one might easily be taken for a futurist painter, another for a Labour leader, a third for a thriving member of the Stock Exchange, and yet another for a Hebrew prophet. We have to go back to the time of Franklin, Priestley, or Davy before we arrive at the figure of the typical "natural philosopher."

The gulf which separates the old "natural philosopher" ("very much wrapped up about the throat," as Heaviside remarks) from the modern representative of physical and chemical science is effectively bridged by two

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vivid personalities—Michael Faraday, the illustrious successor of Humphry Davy at the Royal Institution, and William Crookes, the subject of this biographical essay. And though the history of Faraday, the bookbinder's apprentice who became the foremost discoverer of his time, is full of human as well as scientific interest, there is no doubt that Crookes, more than any other man, represents the popular idea of the scientific investigator of the nineteenth century.

For to the general public the man of science is a man of mystery, a man of inhuman and somewhat unaccountable tastes. Not everyone goes so far as to maintain that he is a freak because he indulges in an activity “with no money in it.” But it seems to be generally agreed that the “scientist” is a being living outside ordinary human spheres, not amenable to ordinary human standards, a being who is usually harmless but may quite conceivably become dangerous—a sort of well-meaning revolutionary who plays with fire and other forces without much regard for the safety and stability of existing institutions, and who is therefore best kept at work along recognised lines under the general supervision of the more orthodox leaders of the community.

My own youthful idea of a *savant* was largely based upon Jules Verne's romances. The amiable and enthusiastic scientific leader of impossible expeditions figuring in those wonderful stories appealed irresistibly to my imagination, and I figured myself as a recluse, working mysteriously for years in a wonderful private laboratory of my own at some world-shaking problem and finally bursting forth with a *fait accompli* involving far-reaching consequences for the whole of mankind. I saw myself tackling the most fundamental and formidable problems, exploring the hidden mysteries of the universe with the

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THE TYPICAL MAN OF SCIENCE

lamp of science, clearing away encumbrances and obstacles to knowledge, advising and guiding my fellow-beings, and growing old in wisdom and honours.

Translate this dream into actual fact in modern England and you get—William Crookes.

Crookes is the very type and symbol of English science at its best. His career embodies the emergence of the scientific man as a force in English life. He was not of the governing class. His education could not be epitomised as of “Eton and Christchurch,” or “Rugby and Trinity.” According to early Victorian standards, he had no rightful part to play in English polity at all. His long life of eighty-seven years saw the advance of science from the humble rank it held in 1832 to the all-embracing position to which it attained in 1919, and his own activities and achievements contributed not a little to the astonishing transformation.

Crookes was no linguist. He had no university education, nor did he hold a professorship. His work was partly journalistic and partly that of a consultant. He stood primarily for the widening and dissemination of chemical knowledge and its application to the manifold problems of human life. But his outlook went far beyond that narrow range. He was a keen fighter, but the enemies he preferred to fight were the enemies of the human race. Thus he enlisted in the ranks against cattle plague and cholera when these pests were raging in England, and rapidly gained the higher command by his industry and keen insight. He studied disinfectants and water supply and sewage disposal, leaving a mark on his generation in the shape of a substantial reduction of the death-rate. He threw his whole weight into the development of the photographic art, devised new processes, invented new apparatus, and applied the art to

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the investigation and recording of scientific phenomena such as meteorological changes and solar eclipses. He even attempted—somewhat prematurely—to photograph a projectile fired from a heavy gun and thus to record its trajectory.

All this was done in the first flush of youthful ardour. But as his experience ripened and his resources increased we find him seeking for hidden treasures at deeper levels. Selenium—an element destined for a career of exceptional interest—had fascinated him from his earliest student days. In examining its spectrum with the newly invented “spectroscope,” he found a beautiful green line which nobody had seen before. It belonged to an unknown element, and the story of how Crookes tracked down this substance and triumphantly established its elementary nature in the face of much criticism forms one of the most romantic chapters of his life.

But the strangest interlude in Crookes’s career occurred in 1870, when he commenced his four years’ investigation of “the phenomena called spiritual.” He was then thirty-eight, and had been married fourteen years. It was quite a new departure for him. He threw himself into the investigation with his usual energy and resource, and achieved the same prominence as a psychical researcher as he had done as a chemist and physicist. His results, taken at their face value, are the most amazing things ever obtained by a trained man of science, and, if fully accepted by the scientific world, would bring about a revolution in our views of the universe such as has not been witnessed since the days of Copernicus.

It was but an interlude. Crookes found himself struggling with unfamiliar conditions in a turbulent atmosphere, which made it impossible to convince his colleagues of the reality of phenomena which he had

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A BRILLIANT CAREER

established to his own satisfaction in his laboratory. Such a state of things is not unknown even in purely physical investigations, but it almost always signifies some flaw in the reasoning, some neglected source of error. Crookes did not feel justified in sacrificing more years to such a fruitless investigation—fruitless of that appreciation by his peers which is so powerful an incentive towards scientific endeavour. And so Crookes closed that chapter, regretfully perhaps, but fully determined to devote all his strength to ultimate problems of a nature open to accepted scientific methods.

And then came that wonderful chapter of researches in high vacua, leading to “radiant matter,” the Radiometer, and the “Crookes tube,” which incidentally solved the problem of electric lighting, and is now universally represented by the electric lamp found even in humble homes.

Here we find Crookes at the very height of his career. He was, indeed, the outstanding discoverer of the day and of his generation. Working mostly alone and apart in his great laboratory, he wrested many a secret from Nature and laid bare his hard-won treasures before an astonished world. For the next thirty years honours fell thick upon him from all sides. The presidency of the Chemical Society, of the Institution of Electrical Engineers, of the British Association for the Advancement of Science, and finally of the Royal Society fell to him in succession, thus giving him some of the most coveted distinctions open to science in England. The knighthood conferred upon him in 1897 was but the Royal assent to a full measure of recognition already earned and received. With a mind untrammelled by dogmatic preconception and a position independent of academic punctilios, he was free to seek the truth wherever it was likely to be found and to promulgate it without fear or favour. As the Victorian era

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approached its end, and science gradually advanced to a position of greater influence and importance, the position and authority of a man like Crookes assumed an ever-increasing prominence. When finally the European War fell upon the world, the silent revolution completed itself dramatically. The world stood face to face with stark reality. Rhetorical subtleties lost their charm, and men and systems were valued according to the extent to which they harmonised with fundamental truths. It was inevitable that the scientific ideal and outlook should then prevail. For the true man of science worships but one god—truth. He despises the ecclesiastic for teaching half-truths for the sake of moral influence ; the politician for dressing up truth in a partisan guise ; and the business man for subordinating truth to personal gain. Science represents a new aristocracy based upon a new power, but an ascendancy *ouverte aux talents* and attainable by anyone who will go through the necessary mental and physical labour. Like all aristocracies, it is “tempered by revolution,” and one is not surprised to hear the “tyranny of experts” denounced as the worst tyranny of all. But any such revolution could only replace one expert by another expert of greater reputation for knowledge and honesty, and therefore endowed to a greater extent with the ideal attributes of the scientific mind. We thus get a close approximation to that “benevolent despotism” which has been advocated as the only cure for the evils of democratic government.

Not that Crookes even remotely resembled a despot. In his later years he gave one the impression of a shrewd and kindly personality, venerable with his white hair and beard. His married life was serene and fruitful, and culminated in a diamond wedding. Up to the last years of his long life he worked away at scientific problems in

THE DISCOVERER AS A REVOLUTIONARY

the hope of a solution which would benefit mankind, and when he attained a solution he gave it freely to the world. While his discoveries created, or assisted in creating, vast industries, he was content to do the work of the pioneer, who, as a rule, is notoriously ill rewarded. And therein he represented but another aspect of the scientific discoverer. While statesmen are at pains to control the forces which together make up the life of the nation, the silent investigator created new forces of incalculable import. While the agitator talks of revolution by violence or by stoppage of work, the chemist or physicist in his "peaceful cell" creates or destroys the work of millions of men, and fundamentally alters the status of both labour and capital. The discoverer is the real arbiter of the destinies of the world. The powers that ruled the Middle Ages knew better than to let him loose. And now it is too late, and we must accept the discoverer's revolutionary activity as we accept the earthquake and the tornado, and statesmen and politicians and Labour leaders must needs dance to the tune of the discoverer's pipe. The alternative is to stop the activities of the discoverer. This, indeed, has often been attempted, by bribery and intimidation and what not else. But it is futile, for the new aristocracy is in itself more democratic than any other human institution. There is no central authority—all scientific authority is provisional. It only exists until displaced by wider knowledge and deeper research. Unlike ecclesiastical authority, it is adaptable and amenable to new truth. It is intensely alive by that very fact, and is indestructible so long as it retains that adaptability. Kings and armies and financial combinations must bow before it. The new despotism is calmly accepted almost everywhere. It therein somewhat resembles the despotism of fashion—which, presumably, is also a "tyranny of experts."

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Sir William Crookes would probably have objected to being classed as a revolutionary. Standing at the head of the staircase at Burlington House and extending a Presidential welcome to the Fellows and friends of the Royal Society, he seemed to embody the dignity of an ancient, well tried and conservative institution, the conservatism of which had been painfully brought home to him during the spiritualistic interlude. It is fortunate for mankind that the youthful impetuosity of its budding "despots" is tempered by the mature wisdom of the elder men. The body of scientific workers has, so to speak, automatically secreted a cortex as the sap does in a tree, so as to add weight and permanence to the general structure. Crookes in his career passed through all the stages from sap to cortex, but when the Great War overtook him at the age of eighty-two he showed a return to his earlier stages, and served his country right through, retiring from the field only when his country had achieved victory and the land that bore him was ready to clasp him to her breast.

That was the man. And how he arose and lived and fought and won his laurels I shall endeavour to show forth in the chapters here following.

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CHAPTER II

EARLY DAYS

SIR WILLIAM CROOKES was born at 143, Regent Street, London, on June 17, 1832, and died on April 4, 1919, at 7, Kensington Park Gardens, in the eighty-seventh year of his age.

His father, Joseph Crookes, was born in 1792 in the little town of Masboro', Yorkshire, as the son of a local tailor, who apprenticed his most promising son—one out of a large family—to the trade he knew best. So young Joseph dutifully took to “the board,” devoting his scanty leisure to the pleasure of roaming the country to within sight of Sheffield, or joining the young manhood of Masboro' in “holding the bridge” over the Rother against the high-handed and impudent aggression of the lads of Rotherham, the neighbouring town.

But Joseph Crookes had ambitions which could not be compassed within the limits of a Yorkshire townlet. While yet in his teens, he came by coach to London, visiting on the way an uncle, who gave him two guineas as a start in life. Having already paid his fare, he had this sum intact on his arrival in London.

Joseph Crookes promptly entered the service of a West End tailor in Regent Street. Here young Joseph underwent the metamorphosis necessary to convert a Yorkshire country tailor into the master craftsman who dwells within the shadow of the throne.

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Joseph Crookes took root in London. Combining prudent foresight with great industry, he soon became sufficiently wealthy to lay the foundation of that fortune which his illustrious son put to such excellent use. His savings were mostly invested in ground rents, and subsequent events showed the wisdom of such a choice. He married twice. Of the five children of the first marriage, Henry Crookes, the eldest son, became a bookseller and Sir William's choice companion.

Joseph Crookes then married Mary Scott, who came from Aynhoe, in Northamptonshire, and of her he had no less than sixteen children, the eldest and longest-lived of whom is the subject of this biography. When Crookes was himself sixty-five years old, he wrote to *The Times* to say that his family memory reached back to the time of the Great Plague. He wrote :

My father, Joseph Crookes, died in 1884, aged ninety-two. I have frequently heard him relate how, when a boy, he was interested in hearing from his great-grandmother, Mrs. Lound, then over one hundred, anecdotes and incidents connected with the Great Plague of 1665, which had been told her by her grandfather, a participator in and eye-witness of the events of that year. The narrator, my great-great-great-great-grandfather, was born about the year 1639, and lived at Staveley in Derbyshire, where the Plague was brought in 1665 by refugees from London. He was one of the few who took the Plague and recovered, although it settled in his hip and made him lame. He was employed with a few others in going from house to house to bring out the dead and put them on horses and sledges, when they were taken to Marston for burial. He died in 1729, aged ninety. His granddaughter, born in 1710, married a Mr. Lound, and occupied a farm a few miles from Staveley. She died in 1814, aged 105, in full possession of all her faculties.

The following figures show that these lives overlapped, in one case nineteen years, and in the other case twenty-two years—more than enough to render the above statement probable :

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