Sir Robert Moray - Soldier, scientist, spy, freemason and founder of The Royal Society

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When Modern Science was Born

In the seventeenth century England suffered a devastating Civil War. It began as an argument about the relative importance of the Stuart Kings and their English Parliament, and ended with Charles I having his head cut off. During this turbulent period, magic died and science began.

Somehow, in the midst of the battles between King and Parliament, modern, experimental science popped into being. A country, which burnt alive at least 100 elderly women a year on suspicion that they were causing disease by casting the 'evil eye', spontaneously developed a critical mass of discerning, logical scientists.

When, how and why did this happen?

The 'when' and 'how' is easy it was Wednesday 28 Nov, 1660, at Gresham College. This was the first meeting of the Royal Society, held after a Gresham College public lecture, such as the one we are assembled for this evening.

The 'why' is a more difficult question. Old beliefs in magical forces did not die instantly, not even among the founders of the Royal Society. In 1657 when founder Christopher Wren, gave his inaugural lecture as Professor of Astronomy, here at Gresham, he spoke of how London was particularly favoured by the 'various celestial influences of the different planets, as the seat of the mechanical arts and trade, as well as the liberal sciences'. No modern Professor of Astronomy would make such an astrological claim today.

As a young scientist I learned that one of the highest honours a member of the scientific community can aspire to is to become a Fellow of the Royal Society (FRS). The Royal Society is the oldest and most respected scientific society in the world, its early members' names living on amidst the indexes of physics textbooks I studied. We physicists still learn Hooke's Law, Boyle's Law, Huygen's construction, Newton's Laws, Leibniz's theorem and Brownian motion. And we still looked with interest at the works of lesser scientists such as Christopher Wren, John Evelyn, John Wilkins, Elias Ashmole, John Flamsteed and Edmund Halley.

The men who founded this society were not just the first scientists, they were also the last sorcerers. Ashmole belonged to a society of Rosicrucians and was a practising astrologer; Newton studied and wrote about the Rosicrucian concepts of alchemy; while Hooke carried out magical experiments involving spiders and unicorn's horns.

What inspired an unlikely group of refugees from both sides of the Civil War to meet; form the world's oldest and most respected scientific society; and then go on to develop the tools of modern science? This is the question which started me off on a quest to understand how the Royal Society came to be formed. I wanted to know where this odd mixture of clergymen and politicians got the idea to forbid discussion of religion and politics at their meetings. In an age dominated by politics and religion it seemed a weird thing to do. But as I looked at the sequence of events the role of one man, Sir Robert Moray, stood out. He was not much of scientist but he was a first rate fixer and a born survivor. He brought together men with money and men with knowledge, and got them to work together. This lecture is a celebration of his achievement.

With the hindsight bred of a scientific education it seems inevitable that the logic of science should succeed in banishing myth and superstition. At the beginning of 1660, however, this outcome was not so certain. Was it just good fortune that brought so many important fathers of modern science together at this difficult time and inspired them to develop a new positive logic? Or was it an intentional act on somebody's part?

Only five months after Charles II returned to the throne of England this small group of men kick-started modern science. For scientific method to develop out of a community that believed in magic is an unlikely event. When you add into the mix that almost equal numbers of the founder members of this Royal Society had recently fought on opposite sides of the brutal Civil War, such a fortuitous meeting of minds seems not just improbable, but impossible.

In the history of ideas there is usually a path which can be followed backwards, showing where they first appear and how they develop. However, if traditional accounts of the formation of the Royal Society are to be believed, the concept of experimental science was developed, and fully formed, independently but simultaneously, on both sides during the Civil War. Then, through a common interest in public lectures, all the members of the two groups happened to meet for tea at Gresham College on a misty November afternoon. This rest is history.

The survivors of a civil war do not seem the most likely people to start a new science club. After the death of Oliver Cromwell the country tottered on the brink of fresh conflict, until the controversial decision was taken to invite the King to return. He had, however, to promise to behave himself. Yet in this chaotic atmosphere of Restoration London the Royal Society began. And it was not cheap to take part. It had an extremely high joining fee and a hefty weekly refresh fee, to be paid whether or not you attended.

During the Civil War sons had been fighting their fathers; brothers trying to kill each other; great estates had been despoiled; a King had been publicly beheaded; and royal princes had fled to exile. For twelve years the country had been run on the personal whim by a military dictator and only the immediate threat of another civil war had persuaded Parliament to restore the King. Yet, like an eye of calm in the midst of these furious storms, we are supposed to accept that these learned men had sat calmly chatting about how to develop a radical new philosophy of experimental science. Only the perfect vision of hindsight can make this seem natural.

The founders of the Royal Society questioned the basic premises of religion and theology. Yet they managed to avoid fighting the extreme fanatics who were forcing their views on everybody else. Having successfully avoided the attentions of the Covenanters, the Levellers, the Fifth Monarchists, the Papists and the followers of the Book of Common Prayer, they seemed free to investigate such heretical matters as the practicality of witchcraft and nobody challenged them.

They seemed to avoid the problems of faith by accepting the Church's view on God and the soul, but questioning everything else. But, if they had been developing such questioning views during the time of Matthew Hopkins, (who as Witch-Finder General in 1647 executed 200 old women for practising witchcraft) they must have kept quiet about them or they too would have been persecuted. Yet for these ideas to appear twenty three years later fully-formed, suggests they must have been around for a considerable time. By 1660, the members of the Royal Society were giving no credence to witchcraft and were publicly laughing at 'Popish miracles', as proof of superstition.

Why did nobody notice these ideas developing? Why within the first few weeks of the Restoration, did science suddenly break free of the stifling dogma of religious belief and the repressive superstition of magic, and never look back?

The change can be traced directly to those men who met at Gresham and set up a society to study the mechanisms of nature. It was an inspired move to forbid the discussion of religion and politics at their meetings as this made sure they were not distracted by dogma. From this group modern experimental science grew.

It seems simple enough. A number of gentlemen met up by accident as they regularly attended the Gresham public lectures in London. They so much enjoyed talKing about science that they set up a scientific society to amuse themselves. They weren't short of money so they fixed a ten shilling joining fee and a shilling a week contribution to pay for their amusement (this would equate to about £500 to join and an ongoing fee of £50 per week in today's terms).

But, who exactly were these men who founded the Royal Society? Well their most important common factor is that they were all regular attendees at Gresham public lectures, something they share with us this

evening. So I'll begin by looking at each in turn starting with the man who took the chair at the first meeting of the Royal Society, John Wilkins.

The Right Revd John Wilkins - Parliamentarian

Wilkins was born in 1614 at Fawsley in Northamptonshire. He was the son of an Oxford goldsmith and the grandson of country vicar, John Dodd. He went on to be a successful churchman himself. By the time he died, in 1672, he was bishop of Chester.

During the Civil War, Wilkins was a great supporter of Parliament. He got his reward. On 12 April 1648, (after Charles I's surrender to the Scots at Newark), he was made Warden of Wadham College, Oxford. The job was vacant because Parliament threw out the previous warden, for holding Royalist sympathies. Eleven years later Wilkins successfully sought a special ruling from the Lord Protector, Oliver Cromwell, that he might 'be relieved of the prohibition against marriage' that was a requirement of his post. As soon as this was granted he married Cromwell's sister Robina.

Whatever Wilkin's motive for getting wed, the match helped his career. One of Cromwell's last acts before dying was to order Parliament to appoint him Master of Trinity College, Cambridge. This was confirmed by Robina's nephew Richard Cromwell, who briefly became the Protector after his father's death.

Wilkins plan for rapid preferment fell apart, however, when Charles II returned to the throne. He was deposed as Master of Trinity College and the once favoured brother- in-law to Cromwell was reduced to preaching for coppers. He was struggling to live, crammed into the squalid lodging of yet another deposed cleric and reduced to acting as a chaplain for the penny pinching lawyers of Gray's Inn. Wilkins presented such a sorry spectacle that he was beginning to attract voyeurs to the Temple church, just to marvel at the extent to which the family of the late Lord Protector could be humiliated.

So when Wilkins chaired that fateful meeting on Wednesday 28 November, 1660, he was in dire circumstances. He was an object of curiosity for the more literate men of London; he had lost his Mastership; he was homeless; and he had been driven from his new job in Cambridge. Reduced to sharing the lodgings of Seth Ward, Wilkins must have been hard pressed to find the substantial subscription needed to join the new Society.

Viscount William Brouncker - Royalist

Brouncker was a Royalist who had kept his head down during Cromwell's rule. He spent his time translating Descartes theories about music into English. He was also a capable mathematician. Brouncker had studied under John Wallis, the Savilian professor of Geometry at Oxford, who was a friend of John Wilkins. As a signatory of the Declaration of 1660, Brouncker had played his part in the Restoration when he was returned as MP for Westbury in the Convention Parliament.

Brouncker wanted to be sure that the newly restored King knew of his loyalty, so he made Charles a gift of a small pleasure craft, which he named The Greyhound. He had designed it on radical new lines, and gave the King this gift 'to mark his restoration to the throne of England'. He was on the opposite side of the political fence to John Willkins and his fortunes were moving in the opposite direction. Brouncker had just recovered political power while Wilkins was a discredited down and out.

The Right Honourable Robert Boyle - Parliamentarian

Robert Boyle was thirty-three years old and had spent most of the Civil War writing theological tracts in the depths of Dorset. During the early part of the Protectorate he moved to Ireland but in 1653 John Wilkins, wrote to him inviting him to Wadham College, to continue his studies of nature and science. Boyle moved to Oxford in 1654. He proved an extremely competent physicist and gave his name to the law that relates the pressure and the volume of a gas. He stayed in Oxford until 1668 when he moved to London. If he was a regular attendee at the Wednesday afternoon lectures at Gresham College he must also have been a regular traveller. Gresham College, then in Bishopsgate Street, was a 120 mile round trip from his home, near the Three Tuns public house in Oxford. With more than a day's ride each way he would have had little time left for anything else, so it seems safe to assume Robert Boyle did not make it his usual custom to attend the lectures on Wednesday afternoons. But he did sometimes come up to London to stay with his

sister in Chelsea, as John Evelyn visited him there on 7 September 1660. However, the lecture to be given by Christopher Wren must have attracted him enough to make the journey and somebody may have encouraged him to come. Who might that have been? As his ex-tutor, perhaps it was John Wilkins.

Alexander Bruce, Second Earl of Kincardine - Royalist

Bruce was a Scotsman and the younger brother of Edward, the first Earl of Kincardine. Edward Bruce had been made an earl by Charles I in 1647. The Bruce family supported the Stuarts throughout the Civil War. After Charles II's abortive attempt to drive out Cromwell, in 1650, Alexander was forced to flee to exile in Breman. He remained there until 1660, when he went to The Hague to join Charles II for his return to London. He travelled back to London with Charles's entourage and set up house in Charing Cross.

Bruce's health was poor after his return from exile and he stayed in London recuperating until 1662. That year he succeeded to his brother's title and returned to live in Culross, Scotland. A series of Wednesday afternoon lectures on science sounds just the sort of thing to cheer him up, during his convalescence, so he might have been 'regular attendee', at least after the Restoration. Or was he invited by his close and long time personal friend Sir Robert Moray?

Dr Jonathan Goddard - Parliamentarian

Goddard was a medical man, who had obtained his doctorate of medicine from Cambridge in 1643, at the age of 26. He was been appointed Professor of Physic at Gresham College in 1655, but had been Warden of Merton College, Oxford. Goddard had the best of both worlds. Perhaps he was allowed such license because he was Oliver Cromwell's personal physician. He held his Gresham appointment in absentia and continued to live in Oxford, and to draw the warden's stipend, until Charles II summarily dismissed him. Goddard was friendly with Wilkins while he was at Oxford. But when Charles purged Oxford of Parliamentarians, Goddard decided it was time to fall back on his Gresham professorship, and he moved back to live in his College rooms. Many of the early Society meetings were held in his rooms at Gresham. The college was important when the Royal Society was being formed and I couldn't help wondering why so many Gresham professors came to support a 'Royal' Society so soon after being thrown out of better paying University posts by the newly restored King.

Sir Paul Neile - Royalist

Neile was born in 1613 and had been a courtier to Charles I. For his service as an usher of the Privy Chamber he had been knighted in 1633. In 1640 he was elected MP for Ripon during the Short Parliament but during Cromwell's rule Neile wisely lived quietly near Maidenhead, keeping a low profile. He remains almost invisible until the minute books of the Royal Society start to report some of his activities. It is clear that he was very much an amateur scientist whose particular skill was the grinding of optical glasses for use in telescopes. It was this private interest in the production of high quality optics which first brought together the, then disgraced, courtier and the powerful Warden of Wadham College. Indeed Neile had such skill at grinding lenses that John Wilkins preferred to spend his honeymoon with Sir Paul, talking about the grinding process, rather than with his new bride. Perhaps this was a wise move, considering the advanced age of Robina Cromwell (she was a widow of sixty-two years of age at the time of her marriage).

Dr William Petty - Parliamentarian

Petty invented the craft of statistics. He developed techniques of recording and analyzing the detail of political events involving large numbers of people, and laid the basis for the modern Office of Government Statistics. Born in 1623 he served as ship's boy before joining the Royal Navy. He retained an interest in ships and shipping for the rest of his life. When the Civil War broke out, Petty left England. He went to Paris to study medicine and chemistry and while he was there he met Thomas Hobbes and Decartes. He returned to London, after the defeat of the King, and was well placed when Parliament removed many of the incumbents of high office at the Universities and replaced them with its own supporters. He became a fellow of Brasenose College, Oxford and was awarded an MD. By 1650 he occupied the Chair of Anatomy at Brasenose and was also created the Professor of Music at Gresham College. His real success, however came when he took two year's leave of absence from his academic positions to go to Ireland as chief

physician to Cromwell's army. There he earned a good reputation as a military medic. Once Cromwell's army had subdued Ireland the seized lands had to be redistributed and new titles of ownership created. In December 1654 he offered to complete a new survey of the whole of Ireland within thirteen months. He succeeded brilliantly and his 'Down Survey' still forms the basis of the legal record of title for a large proportion of the land holdings of Ireland.

During his time in Ireland Petty met Robert Boyle, who became his patient and friend. Through Petty, Boyle met the 'Parliamentary High Table Group' (including Wilkins). These were academics who had replaced Royalists and now held all the senior positions at Oxford. Petty became independently wealthy from his successful survey of Ireland. However, he still held his Oxford and Gresham College appointments 'in absentia' and drew both stipends. In the late fifties Petty began to take a practical interest in the design of efficient sailing vessels. He started to work on designs for double hulled (catamaran type vessels) which had the potential to greatly outpace contemporary ships.

He had been such a strong supporter of Parliament, during the period of the commonwealth, that in late 1660 he was stripped of the Vice-presidency of Brasenose College, Oxford. He went to live in Gresham, keeping his head down with the other refugees. The Chair of Music at Gresham College was the only academic post he managed to hold onto. Perhaps it is hardly surprising that he met up with his old colleagues, who had also been ousted from their cosy University posts by the newly returned King. As he was in residence at Gresham College his attendance at Wren's lecture on 28 Nov 1660 did not surprise me, but why he wanted to help found a Royal Society was a puzzle. He had no reason to like the King or hope for the monarch's patronage.

Mr William Ball - Royalist

Ball, was an amateur scientist and a Royalist. Charles II chose him to be the Royal Society's first treasurer. Prior to the 28 Nov meeting Ball had been co-operating with John Wallis to study the rings of the planet Saturn. Between 1656 and 1659 Wallis wrote a series of letters to the Dutch astronomer and mathematician, Christiaan Huygens. In these letters he reported the results of Ball's observations. Huygens went on to quote Ball's work in his own theory of the nature of Saturn and its satellites. Huygens visited Ball's London home on 1 May 1661. On the evening of that visit Mr Ball held a dinner to celebrate the first anniversary of Parliament's reading of Charles II's Declaration of Breda. The acceptance of this statement by Parliament paved the way for the King's return from The Hague in May 1660. Sir Robert Moray, who had spent some years in the Nederlands, was also invited to the dinner.

Mr Laurence Rooke - Parliamentarian

Laurence Rooke was the host of the meeting of 28 November. At the time he was Professor of Geometry at Gresham College and aged thirty-eight years. He had gained his degree from King's College Cambridge in 1643 and then retired for three years to live in the country. He seems never to have enjoyed good health. Indeed, he was not even fit enough to graduate. His degree was awarded 'in absentia' as he was not strong enough to attend the ceremony. He went to live in Kent after completing his degree. This retirement to the country seemed to strengthen him and in 1650 he moved to Wadham College, to study under John Wilkins and Seth Ward. He also met, and worked, with Robert Boyle. The fact he was acceptable at Oxford confirms he was a Parliamentary supporter, as all Royalists were ousted from the universities. After two years working at Oxford he was offered the Professorship of Astronomy at Gresham College, a post he held for five years until he became the Gresham Professor of Geometry in 1657.

Rooke's main area of interest was the measurement of longitude. His first ideas were to use sightings of the moon or the movements of the moons of Jupiter. He wrote papers on methods for observing lunar eclipses for 'the geographical purpose of determining terrestrial longitude'. Rooke knew that the movement of shadows on the moon's surface can be used as an accurate clock. The jagged peaks of the mountains of the moon act like the pointer on a sundial and he thought that the various craters and rifts could make up the scale of this celestial clock. As the moon was visible from everywhere on the earth's surface the moment of shadow contact happened at the same time for every watcher. Rooke recognised the moon as a giant sundial hanging high in full view of the whole world. All that was needed to know your longitude was to measure the altitude of a first magnitude star and compare it with its altitude at the same time for the home port.

Charles II was so impressed with the idea that he asked for a demonstration showing this effect. His instructions, sent via Sir Robert Moray, asked for a large scale globe model of the moon to be constructed 'representing not only the spots and various degrees of whiteness upon the surface, but the hills, eminences and cavities moulded in solid work.' The model was built by Christopher Wren and presented to the King's private museum. It was set up on a rotating stand so that it could be illuminated and turned to reveal all the phases of the moon 'with the variety of appearances that happen from the shadows of the mountains and valleys.'

The idea is ingenious and works well, if the sky is clear enough to allow a detailed view of the moon and the mariner is a skilled astronomer, familiar with the surface features of the moon. In addition, the sailor would need an emphermis showing the positions of the main stars.

Rooke was an intensely practical man, capable of original thought. His practicality, however, did not extend to taking care of his own health. He caught a chill, while walking home without his coat, after a visit to the house of his patron the Marquis of Dorchester, and died on 26 June 1662.

Sir Christopher Wren - Parliamentarian

Christopher Wren was born on 20 October 1632 in a little village about sixteen miles from Salisbury. His mother died when he was only two years old and the following year his father, also called Christopher, was appointed Dean of Windsor and Registrar of the Order of the Garter. The earliest memories of young Christopher would have been those of living in the grounds of Windsor Castle and mixing with its Royal occupants. The Installation of Charles II, a boy only slightly older than himself as the Prince of Wales and a Knight of the Garter must have impressed him. As Dean of Windsor, his father took part in the ceremony on 12 May 1638.

Prince Charles Louis, the exiled Elector Palatine was also staying at the Deanery of Windsor. The Elector had as his personal chaplain a young clergyman who has already figured in this story, John Wilkins. At this stage of Wren's life both he and the Revd Wilkins were clearly in the Royalist camp.

Something happened, in 1642 that decided Wilkins that he would fare better on the side of Parliament whilst young Christopher was celebrating his tenth birthday. A troop of Roundhead soldiers, led by a Captain Fogg, seized the Deanery of Windsor and ransacked it. The Wren family fled first to Bristol and then to Bicester, near Oxford. (Wilkins fled to London. He did not side with the Royalists again until after the 28 November meeting and the Restoration forced his hand.)

Christopher Wren senior remained a firm supporter of the King. First, at Bristol, and then, after Bristol had fallen to Lord Fairfax, in Oxford. (Charles had moved his Parliament to Oxford at that time.) In an attempt to keep his son out of the hostilities Wren senior sent Christopher to school in London, where he met up with John Wilkins, now a supporter of Parliament and Warden of Wadham College, Oxford. In 1650, aged eighteen years, Christopher went up to Wadham College to study. Wilkins became Wren's protector, something he certainly needed in those difficult times as his father had faced serious charges from Roundhead purists. They said that the decorative plaster work he had created in his Church at East Knoyle, was too ornate and papist! Wren senior was severely censured and lost his living while Wren junior prospered at Oxford, under the patronage of Wilkins.

In 1657 Christopher Wren was appointed to the Gresham Chair of Astronomy. To mark his preferment Sir Paul Neile, an old friend of the Wren family from their days in Windsor, gave Christopher a new telescope. Wren used it to good effect during the four years he stayed at Gresham. Wren left Gresham, in 1661, to take up the job of Savilian Professor of Astronomy at Oxford. This was the post Seth Ward had been ejected from by Charles II only twelve months earlier.

Mr Abraham Hill - Uncommitted

Hill seems a very odd choice for a founder of the Royal Society. His main virtue was that he was rich. He was only twenty-five years old but early in 1660 both his parents died leaving him a moderate fortune. He had no need to work to keep himself and as he had not benefited from a University education he decided to take advantage the public lectures offered by Gresham College.

He was a regular listener to Gresham lectures and so perhaps it was natural for him to be invited to the discussions afterwards. He was certainly keen on the early experimental proceedings of the new Society, serving on many committees and assisting the more learned members with various experiments

Sir Robert Moray - Covenanter/French Spy/Royalist

Sir Robert Moray was also a Scot. He was born 10 March 1609 and educated at St Andrews University before serving with the Scots Guards of Louis XIII in 1633. Towards the end of Cardinal Richelieu's life Moray became his favourite and then acted as a spy for him. In 1638 the General Assembly of the Covenanters in Scotland were rebelling against Charles I. Richelieu gave Moray a commission, promoting him to Lieutenant-Colonel in Louis's elite Scots Guards, and dispatched him to Scotland. Ostensibly he was supposed to recruit more Scots soldiers but he also admitted that he had the objective of assisting his fellow countrymen in their dispute with Charles, by causing trouble for England.

Moray was appointed quartermaster-general of the Covenanter's Army, in 1640. He was responsible for laying out camps and fortifications, where his knowledge of mathematics and surveying would have been extremely important. He marched south with the Scottish Army towards the Tyne and played his part in defeating the Earl Stafford's English conscript Army at Newcastle. On 20 May 1641 Moray was initiated in to Freemasonry whilst garrisoned at Newcastle the Masonic officers who initiated him were General Alexander Hamilton, commander of the Coventantor' Army in Newcastle and John Mylne, Master Mason to King Charles I.

By 1643 he was acting as a liaison officer between the Covenanters' Army and Charles I, in his court at Oxford. On 10 Jan 1643, Charles knighted him. Soon afterwards Sir Robert returned to France and was promoted to full Colonel in the Scots Guards. He was captured by the Duke of Barvaria while leading his regiment into battle on the 24 Nov 1643 and was imprisoned for eighteen months. He was freed on 28 April 1645 when the French decided to pay a ransom of £16,500 for him.

After the execution of Charles I, and at the request of the Earl of Lauderdale, Moray opened negotiations that led to Charles II going to Scotland to be crowned King of Scots at Scoon in 1650. Charles's campaign, with a Scots army, to recover England from Cromwell failed at the Battle of Dunbar and, after hiding for a while in an oak tree, Charles fled to France. Moray stayed in Scotland.

Soon after Charles's flight Moray married Sophia Lindsey, the sister of the Earl of Balcarres. In July 1652 the newly married Morays returned to Edinburgh for the birth of their first child, and also to help organise a rising to restore Charles to the throne of England, but neither was to be. Sophia suffered a protracted and agonising labour before finally dying, on 2 Jan 1653, with the still born child.

The Scots were defeated by Cromwell at the battle of Loch Garry in July 1654. Moray was accused of betraying the King but was cleared after writing directly to him and appealing his innocence. Moray returned to France, he never remarried.

By 1655 Moray was back in Paris. At 46 he was getting too old for the Scots Guards. He resigned his commission and after spending a year in Bruges went to Maastricht where he spent his time studying science and carrying out that protracted correspondence with Alexander Bruce. In September 1659 he went to Paris to meet with Charles and proceeded to take part in the negotiations with General Monck to have Charles restored to throne of England.

When the King returned to England, in late June 1660, Moray stayed on in Paris for some months. When he travelled to London, in August, contemporaries reported the King greeted him warmly. 'His Majesty received Robert Moray with crushing and shaking of his hand.' Charles immediately found him a grace and favour house within the grounds of the Palace of Whitehall. A drawing of Whitehall in 1680, held by the London Topographical Society, shows Sir Robert's quarters to be a small house situated just inside the Horse Guards Gate and looking out over the privy garden. The site of this house was exactly opposite where Dover House now stands on the present Whitehall.

It was from this house that Sir Robert set out to Gresham College on 28th November. He had been living in London for three months, having spent the previous ten years in exile. He could hardly have been a regular attendee of the Gresham meetings during this time. By now I was very interested to try to discover why he decided to attend Gresham College for Wren's lecture. But I also wondered just how did a French spy come to know Oliver Cromwell's brother in law? Let alone be invited to a meeting with so many disgruntled Parliamentarians, who so history tells us, unanimously elected Cromwell's brother in law to chair them.

The original founders of the Royal Society split into two major groupings. About half were Royalists who had kept out of public life during the rule of Cromwell and returned to London to seek advancement at the court of King Charles II; whilst the other half were Parliamentarian academics who had taken control of the Universities under Cromwell but had been thrown out of virtually everywhere, except Gresham College, when Charles had returned. Add into this mix one independently wealthy young man who was following a voluntary course in self education, again at Gresham, and you have a pretty clear picture of the founders. Now let's look at the role of Robert Moray in bringing them together.

The Role of Sir Robert Moray

Only one of these original founders had any real influence with the King and that was Sir Robert Moray. But this ex-French spy and monarchist rabble-rouser seems out of place among the Parliamentary Puritans of the Gresham set. How did he come to be involved with them?

On 5 December 1660 the minutes of the Society show that:

'Sir Robert Moray brought in word from the Court, that the King had been acquainted with the designe of the Meeting. And he did well approve of it, and would give encouragement to it.'

This was only a week after the very first meeting. So Sir Robert was either extremely eager to please his new Puritan friends, or he had already prepared his ground.

As a boy, Robert Moray was fascinated by civil engineering and inspired by the undersea mine which George Bruce built under the Firth of Forth. After studying at St Andrew's University he became a soldier and then a politician. While serving in the Army he became a Freemason, and found that the ideas and philosophy of Freemasonry complemented his love of science and met his need for spiritual fulfilment which had been satisfied by conventional religion. Freemasonry encouraged his innate love of symbolism and helped him think things through for himself to develop distinct ideas throughout his life. His self-sufficiency often provoked his enemies but he had learnt from Freemasonry to be cautious in his responses. He once wrote of himself: 'I have been reported to be writing against Scripture, an Atheist, a Magician or Necromancer, and a malignant for ought I know by half a Kingdom.' It did not seem to bother him greatly. Nor did it seem to worry Charles II. The King was as cynical as Sir Robert. Charles II has been described as a King indifferent to religion who let Moray go his own way, remarking teasingly that he believed Moray to be head of his own church.

But accommodation with the Stuart Kings came later in Robert's life. As a young soldier he showed a talent for manipulation and espionage, and a weakness for the glamour of the French Court, which worked against Charles I.

As an agent for the French he was active in the events leading up to the impeachment of Charles. Moray used his membership of the Lodge of Edinburgh, which had among its members many of the Scottish courtiers of Charles I and General Hamilton (who had initiated into Freemasonry Moray at Newcastle), to improve his network of contacts. The Stuarts and their court had been involved with Freemasonry since 1601, when James VI(I) had been initiated into Freemasonry at Scoon as part of William Schaw's plan to establish Royal patronage for Freemasonry.

Moray was adopted by Cardinal Richelieu to spy against the English. He seems to have carried out this role with great relish for as long Richelieu supported him. Moray carried the news of Richelieu's death to Charles I at Oxford. Moray's connections with the Freemasons of Charles's Scottish Court may have persuaded the King that he could be trusted as in 1642 Charles knighted Sir Robert to give him sufficient status to act as the British King's messenger to the King of France.

When Moray returned to France and delivered Charles's message he was promoted for his efforts. Then he went on active service in Bavaria where he was unlucky enough to be captured and imprisoned. Louis XIII died and Cardinal Mazarin seized power over France. The new King, Louis XIV was too young to rule. Mazarin was not interested in Moray and left him to languish in prison. He was only ransomed when Mazarin, saw a chance to use him in the bargaining between Charles and his English Parliament. Moray's Masonic connections with the leading Covenanters were the key to his importance. Moray was sent to London where General Hamilton was leading the Scots delegation. Mazarin only bought Moray out of prison to use his Masonic connections and to work as an agent provocateur against Charles.

Sir Robert came close to persuading Charles I to flee to France, where he would have become a useful pawn for Mazarin. But Charles lost his nerve, after Moray dressed him up as a woman to try to get him passed the guards. Moray could have so compromised the Stuart line, by persuading Charles I to seek exile in France, that Cromwell would have created an enduring English Republic. However, Charles did not get to France, he was subsequently put on trial, found guilty of treason and executed.

After the death of Charles I, Moray left the French Army and returned to Edinburgh, and to renew his contacts with his Edinburgh Lodge, its minutes record his attendance at meetings. He married Sophia Lindsey and seemed to become less mercenary. Up to that time his talents had been for sale and France paid him well. But after his short, tragic marriage (Sophia died in child birth less than a year after the marriage) he became much more loyal. He got to know Charles II at a time when the young man was under tremendous religious and political pressure from the Presbyterians and warmed to him. From then on he seems to have used all his undoubted military and political skills to support the new Stuart King of Scots.

He assisted in the negotiations for Charles II's Coronation, at Scoon. After the death of his wife, Moray became closer to Charles II and organised an uprising on his behalf in the Highlands. When Lord Glencairn falsely accused Moray of plotting against the young King, Moray made a peculiar Masonic appeal to Charles to protest his innocence. After receiving this letter Charles spoke up in his defence. Moray's choice of words when appealing to the King drew attention to his ongoing involvement with Freemasonry. He wrote 'Your Majesty may, do with me as a Master Builder doth with his material':

Later Moray worked for Charles, against the Roundheads, in the Highlands and he remained loyal even after being imprisoned and falsely accused of plotting to kill the King. Once his name had been cleared Moray used his influence in France to help the King's cause. Charles had fled to France, to join his mother, after the Roundhead invasion of Scotland. Moray later became part of Charles' court in Paris and then moved with the King to Bruges.

After the death of Cromwell it looked likely that Charles II would be restored to the throne of England. Charles was close to his sister, who was married to the Duke of Orange and from her he knew that the naval war with the Dutch, that Cromwell had started, was likely to flare up again. Moray was either asked, or volunteered, to use his Masonic contacts to gain as much military information about intentions of the Dutch states as he could. He went to Maastricht, where he collected political and military information about the intentions of the Nederlanders. He used his Freemasonic links to join the local Masons and on the basis of this acceptance became a citizen of Maastricht. The purpose of Moray's spying missions was to size up the Dutch threat and then return to Paris to assess the likely French response before finally joining the King in London.

Once Charles was settled back in Whitehall, Moray joined him. When he arrived in London he was greeted as an old friend, 'the King gripping and shaking his hand', like a brother and was given private apartments in the Palace of Whitehall with regular access to the King. Moray, brought back the worrying news that the Dutch navy outclassed Charles's fleet and that a resumption of the naval war was extremely likely. Charles had no money and little expertise to call on to improve his navy. He had a great enthusiasm for naval matters but no resources. What could be done, without any naval experts, or the money hire them?

Moray came up with an inspired solution. He renewed his Masonic contacts in and around London, probably with the idea of finding out just who was involved in studying 'the hidden mysteries of nature and science', the subject of the Masonic Second Degree to this day. Within weeks Moray had made contact with Masonic groups which were now supporting the 'poor and distressed' brethren who had been thrown out of academic office by the return of a Royalist Government.

He quickly discovered that the main centre for Freemasonry, in Restoration London, was Gresham College. Gresham was a public college which Sir Thomas Gresham had set up to support his Masonic ideals of study. Here Moray found the answer to Charles's dilemma. When the King had returned to England he had thrown many of the Parliamentarian scientists out of their University posts in an almost knee-jerk response, they were struggling to survive. An important group was based at Gresham College, surviving on the small stipends the College paid to either them or their friends. They represented a pool of expertise in naval technology that could be tapped into. But these 'scientists' were all politically out of favour as well as extremely short of money. And Charles could not afford to pay them.

Moray, however, was resourceful. He had many contacts with the Masonic Scottish nobles and knew many wealthy gentlemen Masons. These Freemasons were not only amateurs in the study of science but they

had money and influence. Moray saw a way of harnessing these two groups and persuading them to work together for the good of their King and country. He saw that he could use his Masonic contacts to solve the problems of Charles's navy.

Moray brought together Royalists with money and Parliamentarians with scientific skills, to set up a self-funding group to solve the pressing problems of sorting out the Navy. Moray, the soldier, was afraid of another war with the Dutch and he realised that their ship-building skills were far in advance of the English ones at the time. His solution touched the imagination of the newly restored Kingdom. He used the interest in science, which was shared by all Freemasons, as a basis for a new Society to focus the application of science on the problems of defence.

Sir Robert encouraged his friends and contacts to attend the weekly lecture, held by one of the bright stars of the Parliamentary scientists, Christopher Wren. It would seem that only two of the founder had no links to Freemasonry. These were Christopher Wren and Robert Boyle. They are recorded as being at the first meeting but have also been added to the list of members drawn up at the meeting to be the first to be invited to join. This omission can be explained if they had left before Moray and his Brother Masons got down to the detailed discussion of setting up a new society to study the Masonic objective of the hidden mysteries of nature and science. Although Wren almost certainly became a Freemason at a later date, Robert Boyle never joined the Craft as he would not take an oath under any circumstances.

To make his idea work Moray took from Freemasonry the injunction not to speak about religion or politics within the meetings. And he drew funds by appealing to the charity of those who could afford it, so enabling able, but poor, men to be able to carry out experiments.

Moray won the confidence of the Parliamentary Masons when he made sure that their deposed leader, John Wilkins, took the chair of that first meeting. Wilkins had been extremely close to Cromwell and his family. By rehabilitating him with the King, Moray showed the other Parliamentary scientists that they were all equal in the new Masonically inspired scientific body he was creating. He laid his ground carefully and, despite the King's busy schedule, Moray reported back to the group, within a week, that they would receive a Royal Charter.

For the first two years he drove and chivvied the group towards his vision of a new scientific Navy. He was satirised as this verse about him shows:

The Prime Virtuoso hath undertaken

Through all the Experiments to run

Of that learned man, Sir Francis Bacon

Shewing which can, which can't be done.

Moray made sure that most of the scientists, among these first members, had an interest in subjects that mattered to the Navy. He encouraged ship designers, navigation experts and weapons specialists to contribute to the early work. At first he made sure that he chaired the majority of the meetings, to establish a structured form of meeting. He followed an agenda and kept minutes; ways of working he had learned from the Schaw Freemasonic Lodges of Scotland. The two basic rules he laid down were; all men were welcome to join, irrespective of politics, race or religion; and during meetings only scientific matters were to be discussed, religion and politics being expressly forbidden.

Moray succeeded in creating something far greater than he had ever dreamed of. As the Society developed, it took on a life of its own and soon separated from its Masonic roots. Moray groomed others to take over the day to day tasks of running the meetings and devoted himself to drawing up a charter for his brain child. As the society grew it took in many others who were not Masons.

When the First Charter was delivered Moray stood back, putting forward the Naval enthusiast, Lord Bouncker as the First President, hoping that the Society would now continue under its own momentum. Perhaps he hoped to spend more time working on the History of Freemasonry which he had started to write and encouraging the free exchange of information through his proposed 'Transactions'. He was successful in establishing The Transactions, but his History of Freemasonry was lost when the Hanoverian Duke of Sussex 're-organised' the Royal Society's library at the beginning of the nineteenth century and purged it of any Stuart history.

The first sign that Moray's society was developing into something more than a specialised Masonic Committee to support the King, came when he presented the First Charter to his Royal Society. The fellows did not like the title, which perhaps was too much of an indication of Moray's intent. They wanted a title that linked them with science, not just with Royalty. Its members insisted on a title which made them more than just a 'Society for Supporting the King', they became a Society for the pursuit of knowledge, which was patronised by the King. However, the principle Moray had established of mixing together wealthy amateurs to provide the funds and less wealthy scientists, to do the work of experimentation proved to be sound for the next two hundred years.

Moray's Masonic philosophy was inherited by the new Society and it led to the nurturing of the most important scientific developments of all time. The problems faced by Charles' navy were the problems of understanding the Universe. By developing techniques to aid navigation the founders of the Royal Society created techniques and technology which enabled their members to study the stars. The policy of carrying out flamboyant demonstrations spread the ideas of science to the more influential layers of society. By using the microscope to investigate minute creature to amuse the nobility the science of biology was discovered. Finally the policy of publishing the results of studies and experiments increased the rate of innovation. In less than twenty years the study of the stars had moved from the lore of astrology to the practical application of Newton's Laws to predict the return of Halley's Comet. It is a whimsical thought that the first edition of Old Moore's Almanac was published just seven years before Newton's study of the heavens turned Francis Moore's science of Astrology into mere superstition.

The newly formed Royal Society was a potent package which took a lively group of thinkers and gave them funding; encouragement; and a means of sharing knowledge. Without the change in attitude to the study of the skies which the Royal Society had achieved Newton might never have been published. Less than a generation earlier, while Bacon was writing of his Solomon's House, Galileo was persecuted by the Church for daring to suggest the Earth might revolve around the sun!

All Freemasons today recite the formal statement of the Galileon heresy which forms part of the test questions of the Fellowcraft Degree. Perhaps this is a permanent memorial to the work of Bro Sir Robert Moray in putting into practice his Masonic Oath to 'study the hidden secrets of Nature and Science in Order to better know his Maker'.

Despite the evidence of his actions I find it hard to believe that Sir Robert set out to create the world's premier Scientific Society on 28 Nov 1660. He probably only expected the group to solve the military problems Charles could not afford to tackle. However, he used the Masonic principles of equality and the study of science to create a tremendous living force. His group was free from the shackles of religious dogma and had a unique democratic structure for its time. Whether by accident, or design, he used three of the most powerful ideas of Scottish Freemasonry and applied them to the development of technology.

These were the ideas he took from Freemasonry.

1. That the study of the works of nature can lead to an understanding of the underlying plan of God. i.e. that there is an underlying order of the laws of nature that can be determined by observation and experiment. This idea led directly to the work of Newton.

2. That all men are equal. If they come together to discuss learning, and forbid discussion of religion and politics they will be able to co-operate. This concentration on experimental science to the exclusion of all distractions helped the Royal Society become a major force in creating our modern scientific age.

3. That for Officers and Presidents to have true power, they must be elected by and have the support of the members they rule. William Schaw, the First Grand Warden of Freemasonry, had decreed that sixty years earlier, and Moray built the idea into the Charters of the Society, ensuring that the Fellows would elect their own leaders so that they would be loyal to them.

These principles proved to be a sound foundation for building a scientific institution. Moray's fourth principle, that wealthy amateurs could be brought into the Society to fund less wealthy scientists, encouraged scientists, who had been strong supporters of Parliament, to sit down and meet with wealthy Royalists, who in turn helped fund their work and assist their rehabilitation into Restoration society. But this idea only lasted until the Presidency of the Duke of Sussex. Now the Royal Society limits its members to scientists of world wide renown, without any wealthy amateurs.

This, then is my explanation of the unlikely success of the Royal Society. It was founded by an astute, politically motivated, street-wise Freemason. Its purpose was to solve a short term crisis in military

technology for a run down Navy. Sir Robert Moray took the structure and philosophy of Scottish Freemasonry and used it to build a totally new type of organisation. It soon outgrew Moray's limited aims and drew up for itself a much wider agenda, taking the best of Moray's ideas and applying them to its own choice of problems.

Its new attitudes to knowledge and the study of the hidden mysteries of nature and science led to the successful study of physics and the theories of Newton. Natural Philosophy became a predictive science and superstition flowered into technology.

We owe our modern society, and its many wonderful scientific gadgets, to the accidental success of Brother Sir Robert Moray. He saw the wisdom of the Masonic teachings, which had inspired him; he used the Scottish Schaw Lodge system and its methods of promoting Masonic harmony to bring together the opposing sides after the great civil war; and he provided a structure that enabled science to break free of the superstitious cage of religion.

No matter how carefully you analyse a complex situation you will not be able to foresee all the possible outcomes of your actions. This is certainly true of the founders of the Royal Society. This small group of Freemasons probably only expected to solve some of the problems of naval technology and so get back some of their lost position in society. What they did was much greater. They created a system that brought about a vast increase in human well-being, more than any other in recorded history.

Scientific method started with the work of the Royal Society and it in turn was inspired by the teaching of Scottish Freemasonry. Later political events may well have made it expedient for the Hanoverian Monarchy to forget the debt our society has to Scottish Jacobite Freemasonry and the United Grand Lodge of England may prefer to be coy about its Scottish roots but hasn't enough time now passed for the threat of a Jacobite revival which inspired this attitude to be discounted?

Surely now we can freely celebrate the story of the Masonic birth of modern Science and honour the memory of Brother Sir Robert Moray, the Freemason who conceived the Royal Society, nurtured it through nine months of early presidencies and finally gave it birth through its founding Charters.

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