Chemistry, The Handmaid of Medicine 1711-1844

Chapter 1

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In the seventeenth century, chemistry was very much tied up with both alchemy and medicine. Robert Boyle, who died in 1691 and is often said to be the 'Father of Chemistry', had an abiding interest in alchemy and spent much of his time pursuing alchemical experiments. So did Isaac Newton. As well as their search for gold, the alchemists devoted a major part of their effort towards discovering potions that could cure diseases. Many of these potions were derived from plants, and in preparing them the alchemists developed techniques such as distillation, sublimation, crystallisation, and filtration. These techniques were taken over by the early chemists, who thus became involved in the development of medicines, and because of this important role chemistry was often said to be 'The Handmaid of Medicine'. Its study in universities became part of the standard medical curriculum, and Trinity was no exception to this trend. Chemistry in Trinity started out as an adjunct to medicine and remained so for nearly a century and a half.

In 1609 the University of Marburg founded what is said to be the first ever Chair of Chemistry and during the seventeenth century several other old European universities followed suit. Oxford, for example, appointed a Professor of Chemistry in 1683, chemistry in Cambridge began at about the same time, while Edinburgh's School of Chemistry was the first in Scotland, founded in 1713. Trinity in 1711 built a laboratory and appointed a Lecturer in Chemistry and so our School of Chemistry can claim to be amongst the oldest in the world.

Trinity from its foundation in 1592 had been empowered to grant medical degrees but until the end of the seventeenth century there had been little or no formal medical instruction. Neither had there been any instruction in chemistry until in 1711 Trinity built the aforementioned laboratory for the training

of students in medicine and this building included facilities for teaching chemistry. Early documents called it the 'Elaboratory'. The decision to build it was made on 14 June 1710, when the Board minutes recorded that 'ground be laid out at ye South East corner of the Physick Garden sufficient for erecting a Laboratory and an Anatomick Theatre thereupon,'[1] and the new Elaboratory was built on the site where the Berkeley library stands today. The earliest reference to chemistry in the College records refers to the purchase of pantiles (roof tiles) said to be 'for work done on the Cimistry of ye Colledg' but this was in 1707, three years before the Board decided to proceed with the Elaboratory, and it is not clear for what building the pantiles were intended.[2]

Money for erecting the new Elaboratory may have been scarce. At any rate, the Board adopted an unorthodox method for raising the necessary funds. It ordered that the cost of the new building was to be taken out of the hundred pounds 'given by the widow Parsons for the maintenance of a poor scholar'[1] and that the poor scholar was to be maintained instead by charging each of the two lecturers in anatomy and chemistry six pounds per annum. Since the two lecturers thus to be deprived had not yet been appointed, they could have had no say in the matter.

On 16 August 1711 a formal ceremony saw the official opening of the new building. Lecturers were appointed in anatomy, botany, and chemistry, and the opening proceedings were recorded in the Board minutes as follows.[3]

> The Elaboratory was opened, ye Provost and Fellows and many others being present, and several publick exercises were performed by ye several persons following: Sir Thompson spoke a copy of verse, Dr Helsham lectured in Natural Philosophy, Dr Hoyle lectured in Anatomy, Dr Nicholson lectured in Botany, Dr Molyneux Professor of Physick lectured in Physick, Dr Griffith lectured in Chemistry.

Dr Griffith was our first ever lecturer in chemistry. On the other hand, 'Sir' Thompson who spoke the verses at the official opening had no chemical connections. In 1711 he was a young man in his early twenties who had been elected a scholar in 1707 and had taken his bachelor's degree in 1709. (The term 'Sir'

was often used in those days for men with bachelor's degrees.) Soon after, in 1713, he was elected a Fellow of Trinity and a little later in 1723 he was co-opted a Senior Fellow. He ran into a spot of bother in 1714 when at a candidates' feast held on the eve of Commencements he proposed a toast, in which he

> drank to those that made no difference between Oliver Cromwell that took the father's head off and KW [King William] that dethroned the son.[4]

Such disloyalty to the King could not be overlooked and the affair reached the Archbishop and the Chief Justice before it fizzled out. He was fortunate, because several other young gentlemen at the time were expelled from the College for expressing Jacobite opinions. 'Sir' Thompson had specially composed the Latin verses that he read out at the opening ceremony and for his trouble the Board ordered that he be given five guineas. His verses were lost for over two hundred years, but a partial copy was discovered in a deed box in a Dublin solicitor's office and an English translation was published in 1962 by Wormell.[4] One theme was that Nature, no matter how she tries, cannot for ever remain hidden. She will be tracked down and captured and her secrets will be revealed by the 'tormenting fires' of Chemistry.

> Escape she [nature] cannot: the thousand hiding-places
> And thousand changing shapes shall not avail.
> We follow at her heels and track her down
> And capture her, binding her fast with chains;
> Then summon Chemistry's tormenting fires,
> And force her to reveal her mysteries
> Even against her will.

The new Elaboratory came to be known as 'the Anatomy House'. It is shown in eighteenth-century pictures of the College where it appears as a substantial two-story building, erected on the site of the Berkeley library, between the Old Library and Nassau Street (Figures 1.2 and 1.3).

It was designed by Thomas Burgh, who was the Chief Engineer and Surveyor-General of Fortifications in Ireland, and for him the Anatomy House (the Elaboratory) must have been but a modest little project compared to the Old Library, which

Figure 1.2

Prospect of the Library by Joseph Tudor (1753) showing the Elaboratory (the two-story building to the right of the old library), courtesy of the National Library of Ireland

he also designed, and the construction of which began in 1712, the year after the Anatomy House was completed. The new building contained a dissecting room, a lecture room, a herbarium, and an anatomical museum, but as well was equipped with a chemical laboratory, and although it did not have running water or proper drainage it did seemingly have a reasonable collection of chemical apparatus. The College muniments include invoices for the supply of laboratory equipment that included a pump, a copper still, and iron pots, as well as an invoice for erecting a furnace in the laboratory.

The building was greatly significant in that it was the first in Trinity expressly designed for medical and chemical training. It lasted for over a hundred years, and it must have commanded some status in College because on Tuesday 13 September 1768 the Duke of Bedford paid it a formal visit. He was in Dublin for his installation on 9 September 1768 as Chancellor of the

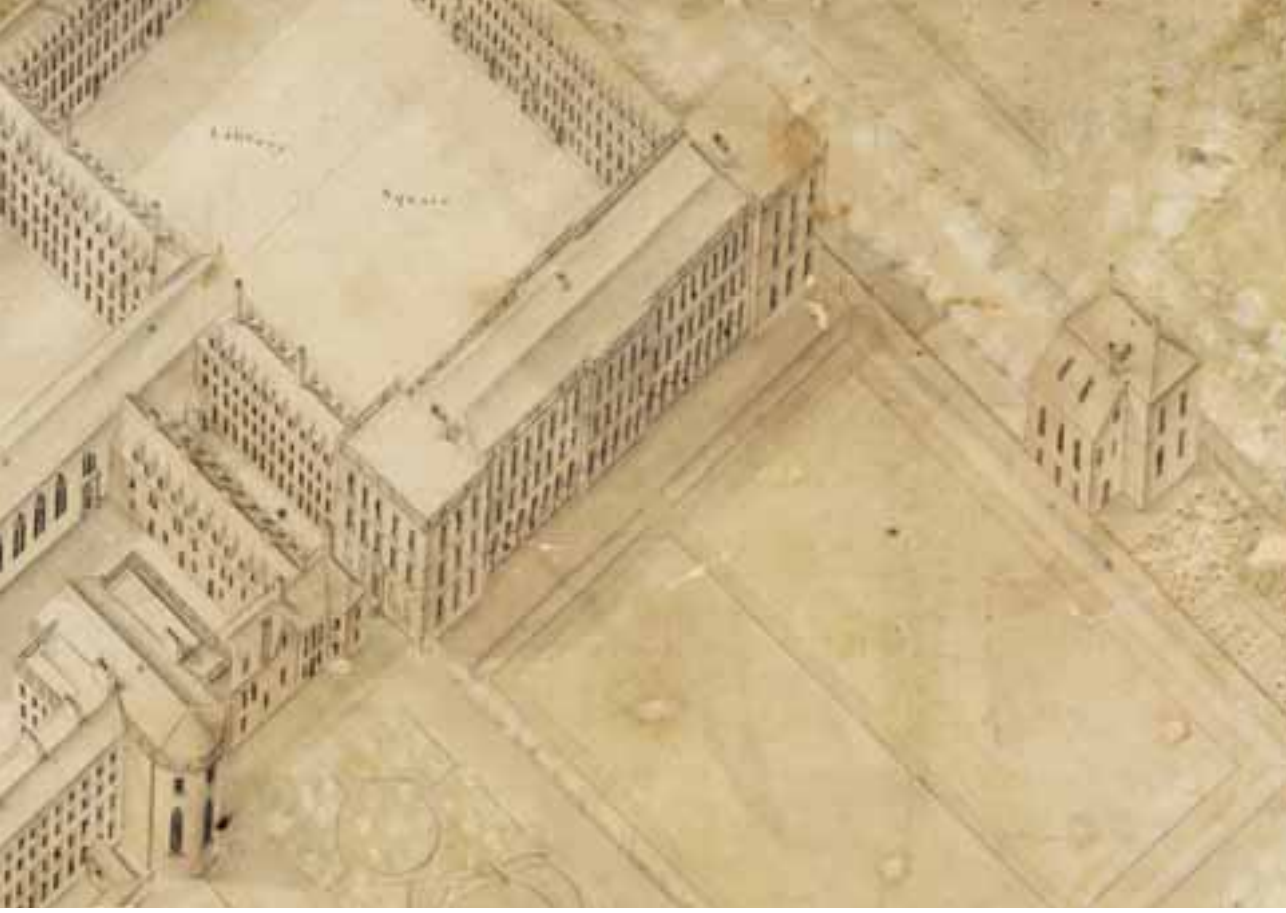


Figure 1.3

Detail from Samuel Byron's Isometric Map of Trinity College (1780) showing the Old Library and the Elaboratory, courtesy of the Board of Trinity College

University, an event that was accompanied by some of the most lavish entertainments that the College has ever seen. The Board minutes recorded that 'His Grace the Chancellor attended by the Provost, Fellows, Professors etc. habited in their proper robes visited the Elaboratory Anatomy school.'[5]

When the new Anatomy School was opened, it became a requirement that medical students must study and be examined in chemistry, and Trinity's first lecturer in chemistry, Robert Griffith, has already been mentioned as presenting a talk at the official opening. But Griffith was not a chemist, rather he was a highly successful doctor. He was born in Cheshire, and studied in Trinity where he was a sizar in 1684 and where he graduated with an MA degree in 1693 and an MD in 1699. He also studied at Oxford and received an incorporated Oxford degree in 1712. Later he became President of the College of Physicians in Ireland. He was clearly a medical man of some standing, but

we know nothing about his activities as a chemist and he resigned his position in 1717 when he was appointed the first King's Professor of the Practice of Medicine in Trinity. He died in 1719. Griffith was the first of a line of Trinity 'chemists' who were primarily medical men and not chemists, for although they held the title of Lecturer in Chemistry and later Professor of Chemistry, their qualifications were in medicine. However, while they may have had little status in chemistry, many of them were outstanding doctors.

Griffith's immediate successor in the chemistry lectureship was William Smyth, appointed by the Board on 17 December 1717. Smyth's father was the Rev. William Smyth of Armagh, where Smyth was educated.[6] There is an alternative suggestion that his father was the Rev. James Smyth and that he was born in Dublin,[7] although a search of the list of clergy for Dublin and Glendalough[8] did not reveal any Rev. James Smyth (or Smith) of appropriate date. William Smyth entered Trinity in 1684 at the age of nineteen, graduating with MB and MD degrees in 1688 and 1692 respectively, and in 1692 he became a Fellow of the King and Queen's College of Physicians in Ireland. He went on to become a prominent Dublin doctor, although (perhaps like every doctor) his treatments were not always successful. There is an account of his prescribing chinchona bark (Jesuit's bark) to a Mrs Hemming who was suffering from 'distemper'. Sadly, however, the lady died, and the College of Physicians investigated the circumstances of her death. Fortunately for Smyth, the enquiry determined that the dose prescribed by him 'could not only doe her noe prejudice but that if she had taken thrice that quantity it could not possibly do her any harme.'[7]

Smyth was a friend of Dean Swift and is mentioned several times in Swift's letters. It seems as if he occasionally offered medical advice to the Dean, who, however, did not always take it. In a letter to Mrs Dingley on 17 June 1712 Swift wrote 'I suppose Smith [sic] is one of your physicians.' And then he wrote 'I am against Dr Smith, I drink little water with my wine, yet I believe he is right. Dr Cockburn told me a little wine would not hurt me; but it is hot and dry, and water is dangerous.'[9]

Smyth was very active as a member of the College of Physicians, serving as its Registrar, its Vice-President, and no less than five terms as its President, so obviously he was a distinguished man. But once again Trinity's chemistry lecturer was not a chemist and Smyth's chemical activities may have been minimal because on 22 February 1718 the Board employed a Dublin man called William Maple as 'operator' in chemistry (Figure 1.4). Maple was the first to hold this position and while the job was not clearly defined, presumably he was employed to assist in the teaching of chemistry to the medical students. Maple was a chemist, in contrast to Smyth, and was well known in Dublin intellectual circles.[10,11] He was said to have known Isaac Newton. When a small group met in rooms in Trinity on 25 June 1731 to found the Dublin Society, later to become the Royal Dublin Society, he was one of the group. He was Registrar and Curator of the Society for many years until his death in 1762 and he was awarded a gold medal for his services. Amongst his scientific activities we know that he discovered a new method for tanning leather, for which the Irish parliament granted him £200. He provided chemical evidence on the composition of the metal in Wood's halfpence, and he carried out experiments on stone collected from the Giant's Causeway. Somerville has given us a detailed account of Maple's life[12] and there is a bust of Maple in the Royal Dublin Society.

Figure 1.4

William Maple, operator in chemistry 1718-45, courtesy of David Bridgewater

Maple was a man of substance in his own right and although we know little about his teaching of chemistry in Trinity it is likely that he made a worthwhile contribution to the development of the subject in the College. He continued working in Trinity as 'operator in chemistry' until he retired in 1745. His place was taken by Edward Croker, son of a wealthy apothecary in Capel St who had been a Master of the Apothecary's Corporation. When Croker died in 1771,[13] a Mr Hastings was 'elected operator to the Chymistry lecture in the room of Mr Croker'.[14]

When Smyth died in 1732 the Board appointed William Stephens in 1733 as Lecturer in Chemistry (Figure 1.5). (The Board Register records his name as 'Steevens'.) Although employed as a chemist and qualified as a doctor, Stephens

seems to have contributed more to botany than to chemistry, and an account of his life and contribution to botany has been published by Nelson.[15] Stephens was born in 1696, came from a Wexford family, studied natural philosophy in Glasgow, graduated with first-class honours in 1715, and then moved on to Leiden, the oldest university in Holland, where in 1718 he was awarded an MD degree. He must have been already making his mark because that same year, when he was only twenty-two years old, he was elected a Fellow of the Royal Society. He next returned to Ireland, entered Trinity, and graduated with MB and MD degrees in 1724.

Soon after his return to Dublin he took over the management of the Physick Garden in Trinity, and he seems to have assumed

Figure 1.5

William Stephens, Lecturer in Chemistry 1733-60, courtesy of the Trustees of the Edward Worth Library Dublin

the title of Professor of Botany although there is no record of his ever having been appointed to such a post, nor did such a chair exist until 1785. Nevertheless, by 1726 he had compiled a remarkable catalogue of all the plants in the garden (over 500 taxa). He also stocked the garden by purchasing new plants and he opened up contact with the Botanical Society of London from whom he received about 180 packets of different seeds, including some unusual ones.[15] As well as looking after the garden he also gave lectures in botany, and in 1727 he published *Botanical Elements: published for the use of the Botany School in the University of Dublin.*

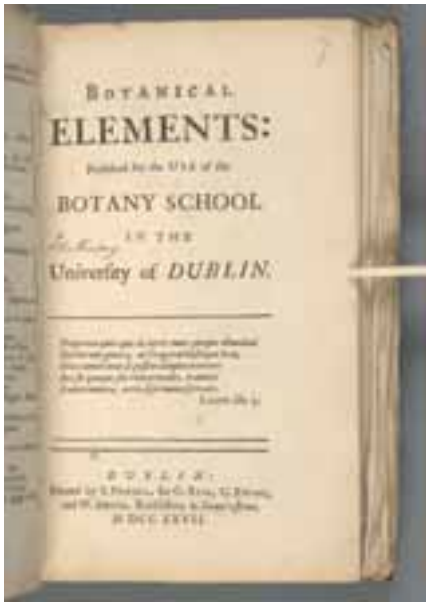
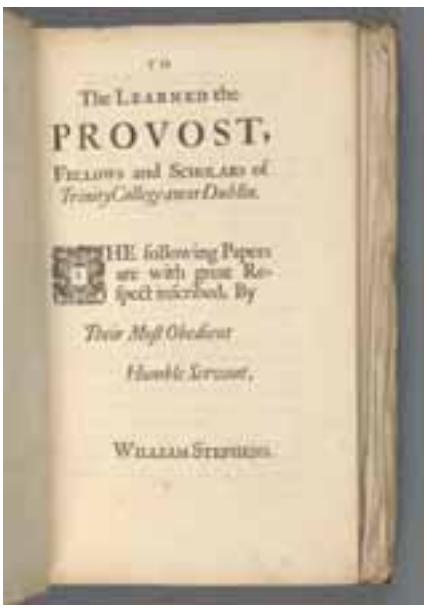

BOTANICAL
ELEMENTS:
BOTANY SCHOOL
IN THE
University of DUBLIN.

Figure 1.6

Botanical Elements by William Stephens (1727)), courtesy of the Board of Trinity College

As already mentioned, Stephens was appointed in 1733 as Lecturer in Chemistry, succeeding Smyth who had died the year before. He was a man of remarkably wide interests. He chaired the meeting in Trinity in 1731 at which the future Royal Dublin Society was founded, and he was to serve the Society as its secretary for five years. He read a paper to the Dublin Society on 'Roman inscriptions found in Graham's Dyke in Scotland',[16] and in a letter written on 3 April 1722, he describes how he developed a theorem for 'determining the distance and time in the load [lode] Stone's attraction'.[17] He also became one of the leading doctors in Dublin, being physician to both Mercer's and Dr Steevens' hospitals and serving five terms as President of the College of Physicians. Such was our Professor of Chemistry. He died in 1760.


TO
The LEARNED the
PROVOST,
FELLOWS and SCHOLARS of
Trinity College near Dublin.
THE following Papers
are with great Re-
spect inscribed, By
Their Most Obedient
Humble Servant,
WILLIAM STEPHENS.

Francis Hutcheson succeeded Stephens in 1760 as Lecturer in Chemistry. Born in 1721, he was rooted in sound Presbyterian stock, for both his grandfather and his great-grandfather were Presbyterian ministers in Northern Ireland. His father, also called Francis,[18,19] was born in Drumalig, Co. Down, in 1694, and graduated in 1711 (old style)[20] from Glasgow University with an MA degree, followed by a course in divinity. Francis Hutcheson (the father) had intended to enter the Presbyterian

ministry but his liberal approach to Calvinism rendered church work in Northern Ireland uncongenial to him, and when a group of non-conforming Presbyterians invited him to set up a private dissenting Academy in Dublin he accepted their invitation. Although the penal laws were in force, the 1719 Bill of Toleration had eased conditions for Presbyterians, and in Dublin he was allowed to found his Presbyterian Academy in Drumcondra Lane (now Dorset Street). He was an accomplished scholar and soon he was able to cultivate good relationships with many of the leading establishment figures in Dublin, such as Lord Molesworth, Archbishop King, and Lord-Lieutenant Carteret. Such was his status with them that he was offered attractive positions in the Church of Ireland if he agreed to convert to the established church. It was even rumoured, although almost certainly without any substance, that if he converted he might be considered for the Provostship of Trinity.[21] But he resisted these blandishments, holding that the Anglican position was not biblical, and in 1730 he moved to Glasgow and became Professor of Moral Philosophy in the university there. He was to fill this position with great distinction, becoming one of the leading philosophers in the Scottish Enlightenment. He was tutor to Adam Smith, and he corresponded with notable philosophers of his day, including John Hume. Unfortunately, while on a visit to Dublin in 1746, he contracted a fever to which he succumbed, and he died on 8 August that year. He lies buried in St Mary's churchyard in Dublin.

The interesting question then arises as to how this man's son, Francis, with such a Presbyterian background, came to be offered the chemistry lectureship in Trinity. In the 18th century Trinity was an uncomfortable place for Catholics and Dissenters for it was not until 1793 that an Act of Parliament removed all legal impediments to them taking a degree in Trinity. It would therefore seem probable that, unlike his father, the chemist Francis Hutcheson converted to Anglicanism, thus opening the way for him to be offered the Lectureship in Chemistry. It has been claimed that he did indeed convert.[22]

Francis Hutcheson, Lecturer in Chemistry in Trinity and son of Francis Hutcheson Professor of Philosophy, took medical degrees from both Glasgow (MA 1744, MD 1750)[23] and Trinity (BA 1745, MA 1748, MD 1762) and was appointed by the Board of

Trinity in 1760 to succeed Stephens. He went on to establish himself in Dublin as a prominent doctor, being physician to the Rotunda and the Meath hospitals, and President of the College of Physicians on two occasions, 1777 and 1780. A charming portrait of him survives (Figure 1.7) showing him relaxing in front of an open book, dressed in crumpled informal clothes, cloth cap on his head, and a self-satisfied expression on his face. He seems to be either falling asleep or thinking great thoughts.

Figure 1.7

Francis Hutcheson, Lecturer in Chemistry, 1760-1767

The picture suggests a dilettante character, but in fact Hutcheson was quite the opposite and although he was a leading doctor in Dublin, in his role as chemistry lecturer he was the first person in Trinity to display a serious interest in the subject. He saw it as part of his mission to further an interest in chemistry outside the confines of the College and he published the following advertisement in the *Public Gazetteer* on Monday 13 October 1761.

> Trinity College. General Lectures in Chemistry, Shewing its Connection with Natural Philosophy and Arts, will begin at the Laboratory on Monday the 16th of November, at one

> o'clock and be continued every day Saturday and Sunday excepted. The Doors will be open to all Gentlemen who choose to attend. After these are finished, which will be before Monday the 7th of December, at the same Place will begin a Private Course of Experimental Chemistry, consisting of about Sixty Lectures, in which its Principles and Operations will be practically applied to Arts, Manufactures, Agriculture, and especially to Pharmacy and Medicine. Price Three Guineas. By Francis Hutcheson M.D. Prelector of Chemistry in the University. Gentlemen who propose to attend the Private Course are expected to give in their names before the Public Lectures begin.

As can be seen above, the three weeks of daily lectures in general chemistry were open to the public and free of charge (that is, open to gentlemen members of the public, ladies were not then supposed to have an interest in chemistry). The subsequent intensive course of sixty lectures in experimental chemistry for a fee would have been delivered by Hutcheson himself. Note that he described himself as 'prelector' in chemistry. This is an impressive record for he had extensive medical duties as well as his work in chemistry and the following ditty appears to pay tribute to his efforts.[24]

> Th'accomplished, well instructed Hutcheson,
> Of learned father is the learned son,
> Can well harangue in professorial chair
> Th'elements, earth, water, fire, and air.
> He first in chemistry to light has brought
> Full many secrets th'ancients vainly sought;
> To system regular he can reduce
> Of arts and sciences the most abstruse.

There is an irony here in that despite all his efforts in chemical education Hutcheson is better known as a musician. He appears in the Oxford Dictionary of National Biography primarily as a composer rather than as a chemist, composing under the name 'Francis Ireland'. Many of his part-songs were published and still exist, and he won prizes for them at the Nobleman's and Gentleman's Catch Club. He played the violin and performed as a violinist in Lord Mornington's Musical Academy.[24]

As well as taking his medical and chemical duties seriously,

Figure 1.8

The Westmoreland Lock Hospital, Townsend Street, Dublin, 1792-1955, courtesy of the Wikimedia Foundation

Hutcheson also interested himself in charitable work and for a while he was physician to the Westmoreland Lock Hospital in Dublin.[25] The Lock Hospitals were built to provide shelter and treatment for the diseased prostitutes that were endemic amongst the troops of large garrison towns such as Dublin and Kildare. The women were usually destitute, lived wretchedly impoverished lives, and were wide open to infection by venereal diseases, usually syphilis. The Westmoreland Lock Hospital (Figure 1.8) was set up as an institution to help them. It was founded in Rainsford Street in 1755 and was relocated to Townsend Street in 1792 where it remained until it was demolished in 1955.

Hutcheson edited some manuscripts which his father, the Glasgow philosophy professor, had used earlier in class lectures in 1737 but had never published.[26] Hutcheson collected these manuscripts, edited them, and published them in 1755, dedicating the book to Edward Synge, Bishop of Elphin, who was a friend of his father's. The title of the book was: *A System of Moral Philosophy in three Books, written by the late Francis Hutcheson, LL.D., Professor of Philosophy in the University of Glasgow, published from the Original Manuscript by his Son, Francis Hutcheson, M.D.*

Francis Hutcheson served seven years as Lecturer in Chemistry

from 1760-67 and he died in August 1784. He married Mary Card and the couple had three daughters and one son who was also called Francis and who was also a well-known musician.

On 3 November 1767 the Board Register recorded the appointment of his successor. 'This day Doctor James Span was elected Lecturer in Chemistry in the place of Doctor Hutchinson (sic).' Span was already the Lecturer in Botany, having been appointed to that position in 1765, so that he now held simultaneously two of the lecturer posts. (A subsequent Act of Parliament made it illegal for members of the School of Physic to hold two paid posts at the same time). Span was a Trinity graduate. He must have been born in Ireland because in 1752 he was elected as one of the 'native' Scholars of the House, from which it follows that he was Irish born. (From the time of Provost Temple in the seventeenth century a proportion of the Scholars was defined as 'native'. The regulations prescribed that they must have been born in Ireland, and at one stage they received the same salary as the Junior Fellows. The distinction was dropped in 1827). Span went on to take a BA degree in 1754, and MB and MD degrees in 1763, and like his predecessors in the chemistry lectureship he became a prominent doctor in Dublin, being elected a Fellow of the College of Physicians of Ireland in 1769. He was also a member of the American Philosophical Society. We are told that he may have kept a small garden, important because of the close connection of a herb garden with the medical school. Apart from this, little is known about his activities, chemical or otherwise, and he died in 1773.

Span's successor, appointed in 1773, was a tragic figure. His name was Dr James Thornton and he graduated in medicine from Trinity, being awarded a BA in 1739, an MB in 1748, and an MD in 1773. The Board Register for 19 October 1773 tells us that 'Dr Thornton was elected lecturer in chemistry.' But the appointment was an unfortunate one. His colleague, Edward Hill, Lecturer in Botany and Regius Professor of Physic, was scathing in his assessment. He wrote that

> Doctor James Thornton, educated, no man knew where, and coming, no man knew whence, presented himself as a Candidate for that place; and although he was neither a Man of

> learning, nor a Chymist, his deficiency in those points constituted no impediment to his solicitation, and he was elected.[27]

Hill went on to suggest that since Thornton was earning nothing as a doctor, and badly needed the salary that went with the chemistry lectureship, the Board felt sorry for him and gave him the job out of humanitarian motives. Thornton's problems climaxed in 1782 when Robert Perceval returned to Dublin. Perceval was the man destined to be Thornton's successor as Lecturer in Chemistry and was to emerge later as a powerful man in College politics. On 30 November 1782 the Board passed the following resolution

> that Mr Robert Perceval physician shall on the first opportunity be elected lecturer in chymistry, and that in the meantime he shall have permission to read lectures in that science in the College, and to make use of the laboratory.

Thornton was still the chemistry lecturer at this point, the implication was that he was not up to the job, and what happened next to the ill-fated man is graphically described in the words of two of his contemporaries. One was the famous Jackie Barrett who at the time was a Fellow of the College and who later became Vice-Provost. Barrett was renowned for his prodigious memory, and he said that he perfectly remembered

> the report of the College in 1782 and 1783 of quarrelling between Dr Thornton and Dr Percival (sic),

Barrett went on to say that when Thornton learned that he was to be displaced by Perceval he

> went and purchased an ounce of the tincture of opium which he drank in whey and was found dead in his bed next morning. He told his servant not to be in a hurry to awaken him next morning, for that he would sleep long enough.[28]

Thornton's other colleague, Dr Hill, was less sympathetic. He wrote that

> this Act of unprecedented supersession [by the Board] so shook the mind of the weak, irascible hypochondriac, that, on the 17th of the following May, he made his quietus, not with a bodkin [a needle or dagger], but with a copious dose of Opium.[29]