DE MOIVRE’S KNOWLEDGE COMMUNITY: AN ANALYSIS OF THE SUBSCRIPTION LIST TO THE MISCELLANEA ANALYTICA

by

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In 1730 Abraham De Moivre published Miscellanea Analytica, a book containing research results in several areas of mathematics, but especially in probability theory. Subscribers to the book have been identified from the subscription list and personal information about these individuals has been collected and stored in a database. Once data collection was completed, the data were retrieved, graphed and analysed to look for connections between the subscribers. On the basis of the connecting links that we found, De Moivre’s career as a tutor has been partly reconstructed and some of his relationships within the Royal Society have been established. It was found that the heart of De Moivre’s knowledge community and support was based on Whig political connections combined with aristocratic family connections. A reconstruction is suggested for how De Moivre was able to develop this knowledge community beginning in about 1689.

Keywords: knowledge networks; mathematical tutoring; scientific patronage; Royal Society; Whig politics

INTRODUCTION

After the publication of the first editions of The Doctrine of Chances (1718) and Annuities upon Lives (1725), Abraham De Moivre published Miscellanea Analytica in 1730 by subscription. The work contains several research results in diverse areas of mathematics, but especially work related to probability theory. There were 158 individual subscribers to the book, and also five libraries from Cambridge University. Our basic question is as follows: can the Miscellanea Analytica subscription list tell us anything new about De Moivre and his career, or at least give further detail to any partial information we may already have about him?

We begin with some basic observations about the publication of books through subscription. Typically, a subscriber paid part of the price of the book in response to the initial advertisement of the publishing project. The balance was paid on the completion of the publication. Names of the subscribers often, but not always, appeared in a list that was

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published with the book. Such a list can provide some information about the readership of that book. Consequently, an analysis of the subscription list for Miscellanea Analytica might provide information on the interest in higher-level mathematics, particularly as it relates to probability theory circa 1730. This view is bolstered by a brief examination of the subscription lists to two near-contemporary scientific books to which De Moivre himself subscribed. Henry Pemberton’s 1728 book A View of Sir Isaac Newton’s Philosophy was meant to be a popular science book that would make Newton’s work accessible to the general public. Excluding libraries, there were about 2150 subscribers on the list, with a wide representation of the literate population ranging from aristocrats to the professions to merchants; about 40 of the subscribers were women. The book did not achieve its promise; Lord Percival recorded in his diary, ‘none can understand it that did not understand Sir Isaac’s book’. Luke Trevigar’s 1731 Sectionum conicarum elementa methodo facillima demonstrata was a mathematics textbook for young scholars, written while he was at Cambridge. Many of the 156 subscribers were Cambridge students, fellows and professors, with some representation from Oxford as well. Presumably De Moivre subscribed to this book because of his role as a tutor in mathematics. Of the 158 individual subscribers to Miscellanea Analytica, 70 also subscribed to Pemberton’s book, whereas only 5 subscribed to Trevigar’s. At first glance these numbers might be interpreted as a strong general interest in the new developments of science (Pemberton’s book) with a significant subset interested in new developments in mathematics and Sectionum conicarum dismissed by this group as a lower-level school book.

Great care must be taken with such a simple interpretation of the raw numbers. Only a dozen or so of the individuals on the Miscellanea Analytica subscription list actually did any mathematical work. As Hugh Amory has noted in general about book subscriptions, ‘Nothing in the list proves that they [the subscribers] ever paid the second half of their subscription, much less that they ever read their copies if they did’. Michael Suarez has further commented, ‘For many, subscribing may have been more an exercise of patronage or vanity than a manifestation of the desire to own and read the book itself’. Patronage may have been the primary reason among the baronets and aristocrats, which we broadly define here as British peers, their spouses and children. Here are some further statistics. There are 63 aristocrats and 21 baronets on Pemberton’s list. Of this number, 19 subscribed to Miscellanea Analytica. Another 11 aristocrats and three baronets subscribed to the Miscellanea Analytica but not to Pemberton’s book.

With these caveats in mind we analyse the list of individual subscribers with a view to discovering the nature and extent of De Moivre’s circle of friends, colleagues and students. Through our analysis we expand the list of De Moivre’s students and gain insight into the type of student he tutored. We find that a large number of the subscribers are interconnected, mostly through blood, marriage and politics. Further, these connections overshadow the connections De Moivre maintained within the Royal Society. Our major new discovery is the extent of De Moivre’s connection to the Whig political establishment. We use the list to provide a reasonable conjecture about how De Moivre initially gained access to this establishment.

THE BOOK

As noted already, Miscellanea Analytica is a book containing research in diverse areas of high-level mathematics. Some of the results given in the book are extensions of work that De Moivre had previously published. For example, Book VII is devoted to centripetal forces
and follows on from work that De Moivre published in 1717. Chapter 1 in Book IV is an expansion of De Moivre’s geometrical solution to the duration of play problem in probability that was published in 1722. Another part of the book is a response to the French mathematician Pierre Rémond de Montmort concerning their dispute over the probability calculus that had played out in Montmort’s *Essai d’analyse sur les jeux de hazard* and De Moivre’s *Doctrine of Chances*. Montmort had died in 1719, several years before the publication of *Miscellanea Analytica*. Still another part of the book deals with calculations, for large numbers of trials, related to the binomial distribution. This part also puts forward an approximation to factorial numbers obtained by De Moivre and later completed by James Stirling, as well as correspondence with Stirling on the problem. Yet another part of the book contains results on the factorization of trinomials that had been tackled earlier by Roger Cotes. This book was not intended for the general public but rather for a very specialized audience.

Plans for the publication of *Miscellanea Analytica* were probably underway early in 1728. An advertisement from April 1729 states that De Moivre had obtained subscribers for the book ‘some time ago’. Five of the subscribers died before the book was actually published; the earliest death was John Freind on 26 July 1728. At the time of the advertisement, it was stated that the book was in press and that anyone else interested in making a subscription was requested to do so by the following 1 June. The amount for a subscription was one guinea. It was not until May 1730 that the book was delivered to the subscribers. De Moivre intended to print only a few more copies than there were subscribers, which in the end turned out to be 163 in number, including libraries. Some subscribers bought multiple copies so that the print run was about 250 books.

The price of the book and the time to its publication indicate the difficulty in publishing mathematical books at the time. The main issues were most probably typesetting mathematical formulae and the saleability of such a specialized book. De Moivre handled the second issue by printing only enough copies to meet known demand. The first issue shows up in the price. Several books at the time were priced at 3 shillings with some ranging as high as 10 shillings. A good comparison to *Miscellanea Analytica* is volume 3 of Catrou’s *The Roman History*, published in 1729. Both books were at the high end of the price range for books. The comparison shows that the cost of typesetting a mathematics book was higher than a standard typeset book with several engravings. The price of *The Roman History* was 1½ guineas. Printed in folio, Catrou’s book is more than 690 pages in length. In addition, there are more than 50 engraved pictures. By comparison, *Miscellanea Analytica*, printed in quarto, runs to 275 pages so that a more than 4½-fold increase in the amount of type and paper used was followed by only a 50% increase in the price. This crude analysis does not, of course, take into account any profits taken by the authors and publishers.

**DATABASE CONSTRUCTION AND EXTRACTION FOR THE SUBSCRIPTION LIST**

With the help of biographical dictionaries, Internet searches and other sources, many of the names on the subscription list for *Miscellanea Analytica* were readily identified. Other names were more difficult and required some ‘educated guesses’. In all we encountered the same problems mentioned by David Hunter and Rose Mason in their work with subscription lists to some of George Frideric Handel’s published works. These problems include variant name spellings, the omission of titles, and multiple individuals with the same name. We started subscriber identification in a fashion similar to that of Hunter and Rose. As they did, we used
a version of Biography Database: 1680–1830 that was first put together by Peter and Ruth Wallis in the 1970s. This database, which indexes most eighteenth-century book subscriber lists, is now available online as part of a database package that can be purchased from Ancestry.com. We also made extensive use of Musgrave’s Obituary, and the Oxford and Cambridge alumni lists. Aristocrats and their families were identified by using Collins’s Complete Peerage. Knowing De Moivre’s strong connection to Isaac Newton, as well as his involvement in the Royal Society, we consulted Newton’s published correspondence and the Royal Society’s Sackler Archive Resource, an online database containing biographical information on Fellows. De Moivre was a Huguenot refugee, and some of the names on the list are Huguenot names. For these people we consulted the Huguenot Society Archives at University College London. Once we had made identifications for nearly all the people on the list we checked the online Oxford Dictionary of National Biography and other sources for further biographical information. During our research we found that many people on the list were either Members of Parliament or held state offices. Consequently, we consulted volumes published by the History of Parliament Trust and an online database of court officers put together by R. O. Bucholz.

To keep track of the large amount of information that we collected, we entered the data from our sources into a directed database written in the open-source program MySQL. Once data entry was completed, we extracted information from the database to draw network graphs. By examining the graphs it was our intention to reconstruct paths of influence that would give more substance to De Moivre’s general relationship to his subscribers. It was also of interest to try to discover who was on the periphery and who fell outside the major connections, and why. Once we began to analyse the graphs, we found, on the basis of the historical background and additional source material, that the graphs by themselves were incomplete. A simple social network analysis of the data assumes a closed system comprising the nodes of the network, in this case the names on the subscription list. Within that mode of closed-system analysis we found a few highly influential individuals that explained some of De Moivre’s career trajectory. In addition, by making connections outside the subscription list, we found that there were non-subscribers, some dead and some alive by the time of publication, who were definitely influential in building and maintaining De Moivre’s knowledge network. We could also make an informed guess as to their level of influence.

Figure 1 shows the first step towards an analysis. The small circled numbers in the graph identify the subscriber names by the order in which they appear on the subscription list. When any names from the list are mentioned in the analysis that follows, they are followed by their identification number from the list. The numbered subscription list with a brief description of each entry is given in the Appendix. A reproduction of most of the list can be found in an article by Stephen Stigler, and the full list may be found online through Eighteenth Century Collections Online.

In view of the fact that De Moivre had been a member of the Royal Society for at least 30 years before gathering subscriptions for his book, we expected that there would be a sphere of interest in Miscellanea Analytica among Royal Society members. A brief glance at the list also shows a number of names that, from their titles, were from the British aristocracy. From the ‘M.D.’ following their names, others were identified as physicians, and still others seem to have Huguenot names. After completing the database we discovered that a large number of subscribers were Members of Parliament at some time during their lives. Several subscribers had also received a university education. We decided to construct the graph initially as a Venn diagram showing sets of subscribers as members of various groups. Venn diagrams
with several groups are difficult to draw unless some of the sets of individuals are mutually exclusive. Consequently we drew circles or ellipses to encapsulate the major groups and then used letters to identify membership in some smaller groups. The circles or ellipses define groups of members of the Royal Society, members of the aristocracy and baronets (which we have labelled for simplicity ‘aristocrats’), fellows of Cambridge University, professors at universities or colleges and Members of Parliament. We used three different letters to identify other groups. An identification number that is followed by the letter ‘u’ indicates that the subscriber attended a university, usually—but not always—Oxford or Cambridge. The letter ‘m’ indicates a physician and the letter ‘h’ indicates a Huguenot name. The interior of the circles and ellipses in figure 1, excluding the professors who were not Fellows of the Royal Society, accounts for 75% of the subscription list.

The book’s publisher

Before any detailed analysis of the subscription list is given, it is useful to examine the book’s publishers, Jacob Tonson and John Watts. First, there were two Jacob Tonsons, both publishers. The elder Jacob (1655–1736) was an eminent London publisher; the younger (1682–1735) was his nephew, who took over the Tonson publishing house in 1720 after the retirement of the uncle, although the latter remained active in editing and in giving advice to his nephew. In about 1713 the elder Tonson went into partnership with John Watts for several printing ventures. The partnership continued into the nephew’s tenure as publisher.
Tonson senior was a founder and permanent secretary of the Kit-Cat Club, which was established around the beginning of the eighteenth century and remained active until about 1720. Its membership included both leading literary figures such as Jonathan Swift and prominent Whig politicians such as Robert Walpole. The club was formed to promote the Whig agenda in politics. Slightly more than half of the members were aristocrats. Of the 55 members identified by Catherine Howells, 11 are either on the Miscellanea Analytica subscription list or died before 1728 but have a son on the list. With the exception of Robert Walpole (156), who was created 1st Earl of Orford in 1742, the remaining 10 Kit-Cat members with connection to Miscellanea Analytica were all aristocrats.

Why was Tonson chosen as publisher? William Innys was the printer for Philosophical Transactions, a publication that contained mathematical formulae on a regular basis during the eighteenth century. Innys (86) was also a subscriber to Miscellanea Analytica; his subscription was made on behalf of the Swiss mathematician Gabriel Cramer. Further, the Tonsons tended to publish literary books, although they did publish some scientific work, primarily medical treatises. Before 1730, their main foray into non-medical aspects of science concerned Newton, namely the 1722 (second) edition of Commerium Epistolicum, which represented Newton’s side of the priority dispute with Leibniz over the calculus, and a 1728 edition of Newton’s De Mundi Systemate, an easier-to-read version of the third book of Newton’s Principia. In terms of mathematical notation, Miscellanea Analytica is the most technical book that the Tonsons ever published. From the arguments that follow about Newton’s relationship to the subscribers on the Miscellanea Analytica list, it is likely that Tonson was chosen or persuaded to publish the book because of De Moivre’s political connections rather than his connection to Newton. It will be argued that Whig politics and political connections formed a major factor in De Moivre’s circle of friends and associates.

AN ANALYSIS OF THE DATA

We begin our analysis with one of the smaller groups shown in figure 1, the Huguenots. Born in France into a Huguenot family, Abraham De Moivre became a refugee at the age of 20 years, arriving in England with his brother in 1687. De Moivre’s brother Daniel, whose name does not appear on the list, died in 1733; his will was written originally in French so that there is some evidence of the maintenance of Huguenot culture in the family and perhaps continued connections with other Huguenot families. This shows up in a very muted way in the subscription list. There are only a small number of Huguenot names on the list, nine in total. Of these nine, Hector Berenger de Beaufain (8), Peter Davall (39) and Francis Fauquier (50) were Fellows of the Royal Society, and Isaac Leheup (96) was an MP. These four fall within the majority pattern of De Moivre’s community. The remaining five probably had some personal connection to De Moivre. Unfortunately, nothing is known about Michel Bouyer (12). The other four have some interesting connections. John Buissiere (19) was the nephew and heir of Paul Buissiere, an eminent Huguenot surgeon who arrived in England at about the same time as De Moivre. Perhaps the older Buissiere knew De Moivre’s father, also a surgeon, or perhaps De Moivre tutored the nephew. Thomas Garnier (63) was an apothecary who married Eleanor Carpenter. She was the sister of Lord George Carpenter, to whom De Moivre dedicated the second edition of The Doctrine of Chances published in 1738. Isaac Guion (68) is one of a father-and-son pair. The father died in 1733 after operating as a distiller living in the parish of St Martin-in-the-Fields, the parish in which De Moivre lived. The son attended Oxford University, from which he received a BA in 1720. The son could have been one of De Moivre’s...
students and the father may have been a personal friend. It is impossible to tell which of the two is actually on the list; for the purposes of analysis we chose the son. Finally, Abraham Meure (104) is the son of another Abraham Meure. The father taught Greek and rhetoric at the Protestant Academy at Saumur, where De Moivre had studied for about two years until he left in 1684. The academy was suppressed in 1685 or 1686 after the revocation of the Edict of Nantes. The Meure family migrated to England at about the same time as De Moivre.

According to his biographer Matthew Maty, five years or so after De Moivre arrived in London, he met Isaac Newton; over time they became close friends. Consequently, we expected to see Newton in a prominent place in our analysis, although he falls outside the subscription list because he died in 1727. Newton was President of the Royal Society from 1703 until his death, and he would have known most, if not all, Royal Society members on the subscription list, about 55 of whom were Fellows during his lifetime. Because Newton died before De Moivre began gathering subscriptions, it might be considered that he appears on the list in the guise of John Conduit, the husband of Catherine Barton, Newton’s niece. Conduit bought 15 copies of the Miscellanea Analytica, more than anyone else on the list. Despite his connections to De Moivre, Newton provides only a partial explanation for the people on the subscription list. When we examined Newton’s correspondence, we found that he was connected to only a handful of the subscribers. Among the mathematicians on the subscription list, Newton was most closely associated with John Craig (34), William Jones (84), John Machin (100), Colin Maclaurin (95), Henry Pemberton (124), Nicholas Saunderson (135) and Brook Taylor (148). John Arbuthnot (3) also had strong connections with Newton; in most biographical material he is usually described as a physician and satirist, but he was also a skilled mathematician. Another physician on the list, Richard Mead (103), was Newton’s doctor. Among the non-mathematicians, Newton’s main correspondence with individuals on the list was in his capacity as Master of the Mint, specifically with those who were in power as Lords of the Treasury. These include at various times, as they took power, John Campbell (2), Richard Edgecomb (45), Charles Townshend (146) and Robert Walpole (156). A few fathers of aristocrats on the list appear from time to time in this capacity as well. The one name that does stand out is that of John Francis Fauquier (or Fauquier), a Huguenot. He was Newton’s deputy at the Mint from the time Newton joined the Mint in 1696. Until his death in 1726, Fauquier handled Newton’s finances. His son, Francis Fauquier, is on the subscription list. Two reasonable interpretations can be attached to this connection. The first is that on Newton’s recommendation to the father, De Moivre tutored the son. The second relates to De Moivre’s finances. At his death De Moivre owned £1600 in South Sea annuities. Francis Fauquier was one of the directors of the South Sea Company, beginning in 1748. Through his deputy at the Mint, Newton also invested in the South Sea Company. Perhaps De Moivre’s investment was started, helped and promoted by the Fauquières, father and son. Given this limited set of connections to the subscriber list, Newton clearly had a minor impact on the development of De Moivre’s network as expressed by the list. Other explanations must be found for the composition of the subscription list.

We turn next to the physicians on the subscription list, of which there are 13 in number. All but four were Fellows of the Royal Society. The main connecting links for these physicians are two Scots who are not on the list: David Gregory (1659–1708) and Archibald Pitcairne (1652–1713). Gregory was a mathematician who was appointed to the Savilian chair in astronomy at Oxford, and Pitcairne was a physician who eventually was given a chair in medicine at the University of Leiden. Pitcairne was also interested in the application of mathematics to medicine, and in at least two instances he applied probability theory to medical
Gregory and Pitcairne were good friends; both were Tories by political persuasion; both were keenly interested in Newton’s work in natural philosophy; both gathered around them a scientific circle of students; and both were dead well before 1730, so that only the circle of former students remained. Six of the nine physicians from the list in the Royal Society belonged to this circle: John Arbuthnot (2), George Cheyne (25), John Freind (61), Richard Mead (103), Thomas Pellet (123) and Charles Steurt (144). There is one other member of the Pitcairne–Gregory circle on the *Miscellanea Analytica* list who was not a physician: John Craig (34). Arbuthnot, Mead and Craig were interested in probability. In 1692 Arbuthnot had translated *De Ratiociniis in Ludo Aleae*, Huygens’s work in probability; about 20 years later another translation of the same work by another translator was dedicated to Mead. Craig applied probabilistic arguments to theological questions. Cheyne’s relationship to De Moivre was through integral calculus and had been quite rocky. In 1703 Cheyne had written the first book on integral calculus. Probably through Newton’s instigation, De Moivre criticized the work heavily and Cheyne responded bitterly. Twenty years later, Cheyne withdrew his remarks and apologized to De Moivre in print. Subscription to *Miscellanea Analytica* may have been a peace offering as well as an indication of his mathematical interest in the work. The Pitcairne–Gregory group as a whole was probably more interested in De Moivre’s mathematics than in his friendship. We have seen hints already through De Moivre’s publisher, Tonson, that De Moivre saw his bread buttered on the Whig side of politics. The Pitcairne-Gregory group were Tories. There is further circumstantial evidence of personal distance from this group, or at least from Arbuthnot, in the first edition of *The Doctrine of Chances*. In the preface, De Moivre mentions several people by name. For example, William Jones (84) and Edmond Halley are recognized as friends; Thomas Woodcock (162) is described as ‘a Gentleman whom I infinitely respect’; and a scientific rival in probability, Nicholas Bernoulli, is described as ‘the Worthy Professour of Mathematics at Padua’. When it comes to Arbuthnot, De Moivre makes no mention of his name but describes him as ‘a very ingenious Gentleman, who, tho’ capable of carrying the matter [work in probability] a great deal farther, was contented to follow his Original [Huygens’s work]’. By comparison with the others, this is not the way that De Moivre treats his friends.

Among the remaining physicians on the list there are some interconnections. Richard Mead sponsored Henry Pemberton (124) for Fellowship of the Royal Society and taught Noel Broxholme (16). Mathematically very capable, James Wilson (159) was Pemberton’s close friend and in the 1750s edited and published the scientific works of Benjamin Robins (131). De Moivre’s close friend, Martin Folkes (55), sponsored Benjamin Hoadley (76) and James Jurin (87) for Fellowship of the Royal Society. Jurin, along with Arbuthnot, had probabilistic-statistical interests in the question of inoculation against smallpox. Henry Plumptre (125) corresponded with Jurin on the subject of smallpox. That leaves Daniel Duncan (43) as the last physician on the list. Of Scottish descent, he was a prominent Protestant in France and was known for the assistance he gave to other Protestant refugees.

With the physicians we have established connective paths between them that sometimes originate with individuals not on the *Miscellanea Analytica* subscription list. The next step in our analysis was to establish relationships, beyond membership of the same group, between individuals within the list. We began this phase with relationships within the Royal Society. The directional lines in figure 2 show who sponsored whom for Fellowship of the Royal Society. All the elections shown in figure 2 date from 1730 or before, and consequently not all sponsorships may have been recorded. Election certificates for all new Fellows date only from 1731 after a Society statute was passed requiring nomination forms to be signed by at least three members. Despite this drawback of possible missing information, on
examination of figure 2 two influential people in the Royal Society within De Moivre’s circle stand out: Martin Folkes (55) and Williams Jones (84). This observation from figure 2 coincides with the fact that both Folkes and Jones were members of the Royal Society’s council for many of the years between 1716 and 1730. Later Folkes served as President and Jones as Vice-President. Both were close friends of De Moivre. Folkes is mentioned in that role in Maty’s biography of De Moivre. Further, De Moivre dedicated the *Miscellanea Analytica* to Folkes. Of the seven copies of the *Miscellanea* that Folkes bought, three remained in his library at his death in 1754. One of the copies was probably a presentation copy. It was printed on large pages with gilt edges and bound in Turkish leather. Folkes also owned the 1725 and 1743 editions of *Annuities upon Lives* and the 1718 and 1738 editions of *The Doctrine of Chances*, as well as a manuscript by De Moivre. In *The Doctrine of Chances* De Moivre described Jones as ‘my Intimate Friend, and very skilful Mathematician’. Both Jones and De Moivre served on the Royal Society committee to investigate, and confirm, Newton’s priority to the discovery of the calculus, and both were tutors to George Parker (117), later 2nd Earl of Macclesfield.

There is one Royal Society Fellow who is of interest and who is missing from the subscription list. In 1695 Edmond Halley introduced some of Abraham De Moivre’s mathematical work to the Royal Society. De Moivre later described Halley to Johann Bernoulli as ‘my good and dear friend’. Halley is directly connected to five Royal Society Fellows on the subscription list. He proposed for Fellowship James Bradley (13), Colin Maclaurin (95), Henry Pemberton (124) and James Sherard (139). The fifth Fellow, George Graham (64), was a scientific instrument maker who supplied Halley with instruments. There may have been some falling out between Halley and De Moivre after 1725. The catalogue to
Halley’s library at his death in 1742 shows that he possessed copies of four of De Moivre’s books: the *Animadversiones* written in 1704 to criticize George Cheyne’s book on integral calculus, a bound version of *De Mensura Sortis* separate from *Philosophical Transactions*, the 1718 edition of *The Doctrine of Chances* and the 1725 edition of *Annuities upon Lives*. Because Halley was in his early seventies and not a wealthy man, there could be other explanations for his not subscribing.

There exists another list *circa* 1730 that reveals many of the major players, mostly living in Britain, interested in British higher-level mathematics at that time. The list is associated with James Stirling’s 1730 book *Methodus Differentialis*, which covered subjects related to interpolation, summation and infinite series. Most on the list were at the time, or later became, Fellows of the Royal Society. The list, reproduced by Ian Tweddle, appears in Stirling’s notebook and contains the names of those to whom Stirling gave a copy of his book, including De Moivre, and of those to whom he intended to give a copy. The names that appear on this list and the *Miscellanea* subscription list are Arbuthnot (3), Bradley (13), Campbell (24), Cramer (his *Miscellanea* subscription was obtained through Innys (86)), Folkes (55), Graham (64), Jones (84), Klingenstierna (91), Maclaurin (95), Montagu (105), Pemberton (124), Saunderson (135), Smith (141), Steurt (144) and Taylor (148). Three names on Stirling’s list have no known De Moivre connections. These are an unidentified Dr Johnston, Alexander Ouchterlony and Robert Simson. Johnston and Simson are the only non-members of the Royal Society. Simson came to own a copy of *Miscellanea Analytica*; his copy survives in the Simson Collection at Glasgow University. The remaining two names of those receiving a copy of *Methodus Differentialis* are Edmond Halley and Nicholas Bernoulli. Halley’s copy was in his library at the time of his death, thus raising again the question of a rift between him and De Moivre. The Stirling list provides stronger evidence of a rift between De Moivre and the Bernoulli family. De Moivre had corresponded with Johann and Nicholas Bernoulli until about 1714. The rift with the Bernoullis, if it occurred, was probably over the Leibniz-Newton priority dispute. The Bernoullis sided with Leibniz, while De Moivre was a member of the committee that supported Newton.

De Moivre earned his living primarily as a tutor in mathematics. The earliest recorded evidence of this is his involvement in the Royal Academies scheme of 1695, where he is listed as one of the teachers of mathematics. This activity probably continued for much of the rest of his life. In a 1710 letter to Leibniz, Johann Bernoulli described De Moivre’s pupils as ‘adolescentum’, essentially teenagers. Maty talks of De Moivre’s work as a tutor and names some of his pupils, four of whom are on the subscription list. These are Cavendish (22), Davall (39), Folkes (55) and Parker (117). Maty picked the most prominent individuals to name as De Moivre’s students. Can we find some of his other students by examining the subscription list? The first thing to look at is the position of tutor. As exemplified by a 1711 advertisement in *The Tatler*, there were two types of tutoring position that were generally sought after. The young man who was offering his tutoring services in *The Tatler* was willing to accompany his charge on the grand tour or, alternatively, he wanted ‘to be a Tutor in a Man of Quality’s family’. It was in the latter position that De Moivre made his living. Further, De Moivre had more than one student at any one time; he once complained to Johann Bernoulli that he taught from morning to night, and had to walk to where his students lived at various locations in London. Because De Moivre was a successful and well-respected mathematician, it is reasonable to assume that tutoring success with one son in a family would lead to re-engagement for another son or to a positive reference to tutor a relative in another family. Consequently, we use the following model to construct a larger list of De Moivre’s
students. We note that among the four listed students in Maty’s biography, two have close relatives—siblings or uncles—on the list. On the basis of that observation, we assume that any close family groupings seen on the list will have at least part of that group tutored by De Moivre. We take the occurrence of additional source material that helps to point in that direction as stronger evidence for a teacher-student relationship between De Moivre and someone else on the list.

To establish family groupings we performed genealogical investigations for those on the list for whom it was relatively easy to establish family connections. The aristocracy were the easiest to trace. The results of our investigations are shown in figure 3. If one goes back only three generations, one finds that many English aristocrats on the Miscellanea Analytica list are related by blood or by marriage. Some, particularly baronets and the Scottish peers, fall outside the family links we have established. There are only two family groupings in the subscription list that do not have aristocratic ties. These are the Fellowes and Folkes families. The aristocratic family connections spill over into the group of MPs; several sons and grandsons of the aristocracy ran for Parliament. The Royal Academies of 1695 had the backing of several prominent, but unnamed, citizens and aristocrats. Clearly, De Moivre had some connections to the aristocracy going back at least 35 years before the publication of Miscellanea Analytica.

We illustrate our model for identifying De Moivre’s students with three families: Folkes, Cavendish and Montagu. In two of these families, Folkes and Cavendish, there is a De Moivre student mentioned in the list of students given by Maty. The Montagu family is an extended family of brothers and cousins. Within that family there is direct evidence of a student-teacher relationship with one individual and some indirect evidence for another. For the cases in
which we have been able to estimate an age when the pupil began to work with De Moivre, the age turns out to be about 16 or 17 years, which corresponds to Johann Bernoulli’s use of ‘adolescentum’ to describe De Moivre’s students.

Martin Folkes (55) appears with his brother William (56) and his uncle Thomas (57). The father of Martin and William, also named Martin Folkes, was an eminent barrister of Gray’s Inn who died in 1706 when the younger Martin was about 16 years old. In the case of the Folkes family, a possible reconstruction of De Moivre’s involvement with the family can be made. Because the uncle appears on the subscription list, it was Thomas Folkes who hired De Moivre to tutor his nephews in mathematics beginning at the age of 16 years or so. De Moivre may have been hired on the recommendation of another Huguenot, Jacques Cappel. This Cappel had been the younger Martin’s tutor for seven years from the age of nine. Cappel had been a professor of Hebrew at the Protestant academy at Saumur before its suppression in the mid 1680s. De Moivre attended Saumur during Cappel’s time there.

There are three Cavendishes on the subscription list: William Cavendish, the 2nd Duke of Devonshire (37), James Cavendish, the 2nd duke’s younger brother (21), and Charles Cavendish, the 2nd Duke’s younger son (22). Maty gives only the surname ‘Cavendish’ as one of De Moivre’s students. This means either James or Charles; otherwise the name on the list would have appeared as ‘Devonshire’. We have interpreted the ‘Cavendish’ on the list as Charles Cavendish, because he was the more prominent scientific Cavendish in the first three generations. Maty gives an anecdote of De Moivre’s paying his respects to the 1st Duke of Devonshire in 1686. As we argue below, the year was more probably 1689, when the 2nd duke was 17 years of age and not yet a duke. It is likely that one result of De Moivre’s paying his respects to the 1st duke in 1689 is that he was taken on as a tutor in mathematics for his sons. The eldest son, the 2nd duke, then hired De Moivre to teach his sons. Consequently, our interpretation is that all three Cavendishes on the list were at one time students of De Moivre.

Another aristocratic student of De Moivre is John Montagu, 2nd Duke of Montagu (97). Household accounts for the family show that De Moivre was hired by the 1st duke in 1706 to tutor his son in mathematics. At the time John Montagu was 16 years old. There are several Montagu cousins and siblings of various generations on the subscription list: William Montagu, 2nd Duke of Manchester (98), Edward Montagu (105), Colonel John Montagu (106) and Richard Edgecomb (45). Edward and the colonel were brothers. Each of the members of this extended family could easily have been a De Moivre student. The strongest evidence, which is threefold, is for Edward Montagu. This Montagu was a capable mathematician who corresponded with De Moivre. Although his cousin, the 2nd Duke of Montagu, is at the head of the list of sponsors for his membership in the Royal Society in 1745, De Moivre’s name appears further down that list. Edward Montagu also presented De Moivre’s portrait to the Royal Society in 1769. On the basis of the model of close family relationship it is then likely that Colonel John Montagu was also a De Moivre student.

What these families have in common are landed interests. For the aristocracy, landed interests are obvious. For the Folkes family there are connections to the gentry: Martin Folkes senior married into the landed gentry, and the family eventually inherited land in Hillington, Norfolk. The increasing importance of mathematical knowledge for landed interests is underlined by A. J. Turner, who notes:

From the late sixteenth century on, it was becoming increasingly clear that if a gentleman were to maintain his position and engage in the activities traditional to his class, a measure of skill in mathematics was essential.
De Moivre's knowledge community

For the landlord, mathematics was necessary for mapping and surveying. For younger sons entering the army, navy or some kind of government position, a good grounding in mathematics was essential for gunnery, navigation and finance, for example.

There are five more groups of siblings on the *Miscellanea Analytica* subscription list, and with one exception the father of each set of siblings was dead by the mid 1720s. Coulson (51), Martin (52) and William (53) Fellowes were all brothers. Robert Spencer, 4th Earl of Sunderland (132), and Diana Spencer (134) were a brother-sister pair. Thomas Pelham-Holles (108) and Henry Pelham (122) were also brothers, as were the pairs Henry (59) and George (60) Furnese and Thomas (151) and William (152) Townshend. It is in the Townshend case that the father was alive in 1730, and the father, Charles Townshend (146), is also on the list. In most of these families it is likely that the father engaged De Moivre to tutor his sons. These were all families with landed interests. The aristocrats again need no explanation. In the case of the Fellowes brothers, their father had strong legal connections. He was a Master in Chancery and Justice of the Peace for the County of Kent. After a legal career like his father's, Coulson Fellowes subsequently entered the ranks of the landed gentry. In the Furnese family, Henry owned land, and his brother George was a commissioned officer in the army.

The one problematic case related to our model of siblings as students is the Spencer family. The 3rd Earl of Sunderland, Charles Spencer, died in 1722, when his son Robert was aged 22 years and his daughter Diana 12 years. They were children of the earl's second marriage, to Anne Churchill, daughter of the Duke of Marlborough. When Charles Spencer died, the Duchess of Marlborough took great interest in her granddaughter's education. The tutor to the Marlborough son, the Marquess of Blandford, was the mathematician Nicholas Mann (101), who is on the subscription list. He would have been the duchess's likely candidate for tutoring her grandchildren after 1722. It is unlikely that De Moivre tutored Diana Spencer. He may have tutored Robert Spencer. If he did so, it would have happened in about 1716, when Robert was 16 years of age. There are three connections that lead to considering the possibility of De Moivre as a tutor for the son. Charles Spencer was a Fellow of the Royal Society from 1698 until his death. Perhaps related to a mutual friendship and Royal Society membership, or perhaps to curry favour with the earl, is the fact that De Moivre gave Spencer a presentation copy of *De Mensura Sortis* after its publication in 1712. The friendship may have come from a mutual interest in chess. De Moivre played well; Spencer was an avid and expert chess player, one of the best in England. Spencer played at Slaughter's Coffeehouse, which De Moivre also frequented. Failing a tutor-student relationship, the Spencers may have decided to patronize De Moivre on the basis of his long-standing relationship with their father.

Among the remaining subscribers who were not mathematicians, physicians, Huguenots or members of the Royal Society, it is difficult to determine whether their interest in the book was in the form of a desire to bestow patronage on an eminent mathematician or whether it stemmed from the student-teacher relationship. There are two subscriptions, from George Parker (117) definitely and from John Buckworth (17) probably, that resulted from studying with De Moivre. Again, both were from families with landed interests. We have already mentioned that Parker appears on Maty's list of De Moivre's students. The Sir John Buckworth on the list, a baronet, was the grandson of another Sir John Buckworth, this time a knight. The elder Buckworth was deeply involved early on in Edmond Halley's financial affairs. During a family dispute over the estate of Halley’s father, the younger Halley nominated the knight as one of the administrators of his father’s estate. It is possible that Halley recommended De Moivre as a tutor for the baronet in his youth.
In addition to the Townshends, there is another father-son set on the subscription list. These are Robert Walpole (156) and his son Edward (157). The Walpoles and Townshends were connected through marriage; Robert Walpole and Charles Townshend were brothers-in-law. They were also closely connected politically. It is likely that De Moivre was Edward’s tutor in mathematics. If we take 16 years as the typical age at which De Moivre began tutoring the son of a landlord, then William Townshend’s lessons began in about 1717, Thomas Townshend’s in 1718 and Edward Walpole’s in 1722.

What is more important than the student-tutor relationship is Robert Walpole’s political position and influence. He is considered to be Britain’s first Prime Minister. By about 1705 Walpole was the leading Whig in the House of Commons. From 1715 to 1717 he was First Lord of the Treasury and from 1721 to 1742 he was Chancellor of the Exchequer. He became the centre of government patronage in Britain. Jeremy Black describes Walpole and his patronage practices in the following way:

The key to Walpole’s ministerial longevity was not simply his policies. Much was due to his parliamentary management and his control of government patronage. As the Duke of Portland observed in 1725, ‘he never does anything for nothing’.

In view of Walpole’s use of patronage, it is of interest to plot his patronage connections to others on the subscription list. Figure 4 shows all those subscribers to Miscellanea Analytica who received a government patronage position while Robert Walpole was in power. His web of influence within the list is substantial. Clearly, through Walpole De Moivre was well connected to the Whig establishment as they appear on the list. In addition to the connections given in figure 4, the vast majority of the aristocrats on the subscription list were Whigs, which also puts them into a relationship with Walpole.

How did De Moivre make his connection to Walpole? By 1730 the relationship was probably long-standing. Through tutoring we have suggested that it went back to at least the early 1720s. Here is another suggestion that it went back to at least the mid-teens of the eighteenth century. Robert Walpole’s youngest son, Horace, was at most 13 years of age at the time of the Miscellanea’s publication. From his letters we know the identity of his mathematics tutors and that he claimed not to be good at mathematics. Yet at his country home at Strawberry Hill he kept a copy of the first edition of The Doctrine of Chances, which was published when he was only one year old. Because this book was sold by subscription, it is likely that Robert Walpole was a subscriber and that his copy passed to his son. Can we go back further than 1718 in the De Moivre-Walpole relationship? The possible connection is through the 1st Duke of Devonshire, and the time is shortly after Walpole became a Member of Parliament in 1701. Here is what William Coxe says of Walpole during the first few years of the eighteenth century:

At this period of his life, Walpole began to be held in high estimation by the great leaders of the Whigs, and was particularly noticed by the duke of Devonshire, the earl of Sunderland, lord Halifax, and lord Somers. Among the persons of his own age, with whom he entered into habits of close intimacy, were James afterwards earl Stanhope, Spencer Compton, afterwards earl of Wilmington, the marquis of Hartington, eldest son of the duke of Devonshire whose family uniformly proved themselves his first friends and adherents, and viscount Townshend, who was then just beginning to acquire political importance.

The Marquess of Hartington is William Cavendish (22), 2nd Duke of Devonshire on the subscription list. Consequently, De Moivre’s connection to Walpole may go back to the early years of the eighteenth century.
The one remaining major group in De Moivre’s knowledge community that has not been discussed comprises those who attended a university. This is a very diverse group containing professors, aristocrats, clergymen, lawyers and miscellaneous others. Some may have been tutored by De Moivre; some may have been interested in the mathematics that De Moivre produced. It is impossible to say.

In figure 5 we have put together all the connections made in figures 1–4. Most subscribers on this list are connected through education, birth or marriage, Huguenot background, interest in science and involvement in politics. There is a small group, 13 in number, that lie outside on the periphery. They appear as circled numbers outside the ellipses of the Venn diagram and without the designations ‘u’, ‘m’ or ‘h’, namely university, medical or Huguenot. Among these subscribers we have little or no information on 10 of them. Two can be easily accounted for. Charles Brent (14) was an astronomer and was probably interested in De Moivre’s mathematics generally or in his work on centripetal forces that appears in *Miscellanea Analytica*. As already mentioned, William Innys (86) purchased his book for the mathematician Gabriel Cramer. That leaves the Marquis Visconti (154) as the one remaining person. This is probably Scaramuccia Visconti, who was a diplomat based in London representing the Austrian Emperor. Charles Townshend (146) had Visconti’s mail opened on at least two occasions, probably in the normal course of spying on diplomats. Visconti had family connections in Britain; his aunt was the Duchess of Shrewsbury.

On the basis of our analysis we can now try to answer these questions: How did De Moivre make his aristocratic connections? And how did his tutoring business spread? As with much of the analysis given here, there is no source material that provides definitive answers. There is, instead, reasonable conjecture based on the source material and on historical background.
There are two Huguenot names on the subscription list that may provide the link to the English aristocracy: Abraham Meure (104) and John Buissiere (19). As mentioned already they are, respectively, the son of Abraham Meure (d. 1716), who taught at Saumur, and the nephew and heir of Paul Buissiere (ca. 1655–1739), a Huguenot surgeon like De Moivre’s father. Either of the two may have provided De Moivre with a letter of introduction to the Duke of Devonshire for the meeting between De Moivre and Devonshire that Maty describes, a meeting that was preceded by a meeting between Newton and Devonshire.

Why did De Moivre pay his respects to Devonshire? The duke seems to have had only a passing interest in science. He was an inactive Fellow of the Royal Society who was expelled in 1685 for non-payment of his dues over a 22-year period. First, it is useful to establish the year in which Newton and then De Moivre met the Duke (at that time the Earl) of Devonshire. The year 1686 for the visits is definitely incorrect. De Moivre did not arrive in England until 1687, at which time he and his brother presented themselves to the Savoy Church as Huguenot refugees. According to Maty, Newton was at Devonshire’s house to present a copy of the *Principia* to him. Because the *Principia* was published in 1687, that might make a reasonable year for the visit. It was, however, Edmond Halley who handled the publication of the *Principia* and distributed the presentation copies, including one to King James II. From the correspondence between Newton and Halley, it seems that Newton was in Cambridge, or at least not in London, during 1687. Newton was definitely in London early in 1689 as a member of the Convention Parliament that was held to confirm William and Mary as joint monarchs. This event ties in with Devonshire’s interests. Devonshire was one of the seven who had invited William of Orange to invade in 1688 and was a key player in the Convention Parliament afterward. It is likely that Newton and Devonshire were meeting primarily over
politics, not science; according to Maty the *Principia* was left in the antechamber and not in the room where the audience was held. Similarly, De Moivre’s meeting may have had political roots. Information may have been what Devonshire wanted. Maty describes De Moivre’s father as ‘not wealthy’, but the family did have some high connections. Abraham De Moivre knew Louis de Marolles, one of Louis XIV’s councillors. Louis had removed de Marolles from office, imprisoned him in 1686 and then sent him to the galleys for his refusal to convert to Catholicism. De Moivre visited de Marolles while he was in prison. Given Louis’s support of James II and the risk of a possible invasion of Britain, any information about Louis and his court would have been useful to Devonshire. After this initial meeting, De Moivre began to tutor the duke’s children, and through the duke’s Whig connections De Moivre expanded his tutoring business. Along the way, De Moivre picked up clients to tutor from other sources such as Newton and Halley. These sources were minor in comparison with connections made through Whig landed interests.

**De Moivre’s network**

The analysis of the *Miscellanea Analytica* subscription list shows four different groups of individuals, sometimes intersecting, that constitute De Moivre’s knowledge network. The smallest group is composed of De Moivre’s Huguenot friends. Although not on the list, his immediate family, including his brother, nieces and nephew, can be included in this group. Closeness to his family can be seen in his will and some papers of his nephew. The next largest group is the circle of close scientific friends in England. At any one time this set probably numbered at most 10 people. *Circa* 1730 his close friends would have included Folkes (55), Jones (84), Montagu (105), Pemberton (124) and Saunderson (135). It may also have included Edmond Halley. Before 1730 Isaac Newton and Edmond Halley definitely would have been part of this close circle. The next group in size comprises De Moivre’s scientific associates, mostly living in Britain but with a few on the Continent. The largest group is the one with political connections and landed interests. Some members of this group had scientific interests and some were former students of De Moivre. We will concentrate mainly on these latter two groups.

De Moivre gained access to the Royal Society through Edmond Halley. How Halley met De Moivre is unknown but is at times speculated on. For example, Alan Cook suggests that they met when Halley visited Saumur in 1681, a suggestion that has been refuted elsewhere. The more likely situation is that they met in London, probably through one or more of the many Huguenot acquaintances whom Halley had there. In view of his type of mathematical interests, establishing a large network for himself within the Royal Society after his admission might not have been an easy task for De Moivre. Before his work in probability and its application to some specific games of chance, De Moivre’s mathematical publications can be described as research into pure mathematics. In the words of Richard Sorrenson, ‘The extreme abstraction of pure mathematics little suited the Royal Society or its Fellows; thus very few examples of the subject appear in the Society’s records’. On the basis of Sorrenson’s data for the 1720s through the 1740s, at most 3.5% of the Society’s publications in *Philosophical Transactions* were devoted to pure mathematics. Consequently, De Moivre was an atypical member of the Royal Society; the vast majority of the membership did not share his research interests.

Once in the Royal Society, De Moivre actively fostered a network of scientific friends and associates both at home and abroad. He did this initially through his publications. For example, De Moivre used a dispute with George Cheyne (25) to promote himself. In 1703
Cheyne published a book on integral calculus, *Fluxionum Methodus Inversa*. De Moivre responded with his own book, *Animadversiones*, in 1704. De Moivre sent a copy of his book to Johann Bernoulli. Before that time Bernoulli did not know who De Moivre was. De Moivre’s initiative resulted in a 10-year correspondence between the two and in De Moivre’s spearheading Bernoulli’s election to the Royal Society. The relationship probably ended as a result of the Newton-Leibniz dispute. Not all of De Moivre’s networking attempts were successful. De Moivre also gave a copy of his *Animadversiones* to the astronomer John Flamsteed, who was uninterested and gave it to his mathematician friend Abraham Sharp. Sending other mathematicians copies of his own work, or of the work of other English mathematicians, at his own expense continued for several years. In 1722, at his own expense, De Moivre sent the mathematician Pierre Varignon a copy of *Harmonia Mensurarum*, a posthumous book by Roger Cotes. Varignon sent a letter to Isaac Newton suggesting a method whereby Varignon could pay for the book once he found out what the price was in his own currency.

The subscription list to *Miscellanea Analytica* shows that any major international network of mathematicians that De Moivre had established may have broken down by 1730. There are only three Continental mathematicians on the *Miscellanea* list: Cramer (86), Klingenstein (91) and de Maupertuis (102). All had been in London somewhere between the time that De Moivre began his subscription list and the publication of the book. De Moivre sponsored both Klingenstein and de Maupertuis for Fellowship of the Royal Society, the former in 1730 and the latter in 1728. As evidenced by Stirling’s list of the recipients of *Methodus Differentialis*, both Cramer and Klingenstein were interested in the high-level mathematics being conducted in Britain. In contrast, de Maupertuis was not impressed by British mathematics, commenting to Jean Baptiste Dortous de Mairin of the French Académie des sciences that ‘This business of series, the most disagreeable thing in mathematics, is no more than a game for the English; this book [Stirling’s] and that of M. de Moivre are the proof’.

Politics, landed interests and the Royal Society, both within De Moivre’s network and more generally, are closely interconnected. Michael Hunter has established that among active members of the Royal Society, near the beginning of our period, circa 1700, those he describes as ‘slightly, or more, active’ or as showing ‘some sign of activity’, about 30–40% were aristocrats, courtiers, politicians or gentlemen. Hunter has described De Moivre as being in the Society’s active nucleus. By the time of De Moivre’s death in 1754, the leaders of the Royal Society, known as the Hardwicke circle, were all prominent Whigs. De Moivre’s Whig connections in 1730 are evident in figure 4.

De Moivre actively assisted the upper classes with their scientific interests. The source material is spotty because none of De Moivre’s papers have survived. In 1705 De Moivre wrote to a duke or bishop explaining some point about Edmond Halley’s theory of comets. The note was written on the back of one of Halley’s 1705 pamphlets on comets; the salutation is ‘My Ld’, and in the body of the note there is a reference to ‘your Grace’. There were no dukes in the Royal Society at the time, but there were three bishops. The most likely candidate is Thomas Sprat, Bishop of Rochester, who wrote *The History of the Royal Society*. About 40 years later De Moivre wrote to a former pupil Philip Stanhope, 2nd Earl of Stanhope, clarifying work on trinomial divisors that had appeared in *Miscellanea Analytica*. De Moivre helped Stanhope in other ways. In 1738 Stanhope was the lead sponsor for Berlin physician Hermann Bernard for Fellowship of the Royal Society. The initial nomination was withdrawn and later made again. De Moivre was a sponsor on the second and successful attempt.
De Moivre’s network among the political and landed interests, mainly of England, is the largest yet the least known. The network was built on his work as a tutor to the sons of this group.

We have argued that his entry into this world was through the Duke of Devonshire and tied to events surrounding the 1688 revolution. De Moivre’s connections with this community may have been strengthened with his 1725 work on annuities. The evaluation of life annuities, especially for multiple lives, is related to the evaluation of estates and rent fines for leases based on lives, a topic of direct interest to this community.

De Moivre’s networking attempts continued beyond 1730. One major source of information for this is the Sackler Archive of the Royal Society. Conveniently, election certificates for Fellowship of the Royal Society date from 1731. From these certificates we see that De Moivre remained active in the Royal Society right up to a year before his death in 1754. During that time he was one of the sponsors for 16 candidates for election to the Fellowship. Some, such as the musician and composer John Christopher Pepusch, were colleagues of sorts. Some of his pupils were among these candidates. These include George Lewis Scott (elected in 1737) and Peter Davall (elected in 1740). Some other possible De Moivre pupils emerge from the elections certificates. De Moivre was the lead sponsor for the mathematician Roger Paman (elected 1743) and the scientist Robert Symmer (elected in 1753). Still others could have been De Moivre’s personal friends: David Ravaud (elected in 1747), for example, lived in St Martin’s-in-the-Fields, the London parish in which De Moivre also lived. Ravaud is a Huguenot name.

In conclusion, we are left with a relatively clear picture of De Moivre’s teaching activities and of his networking within the British scientific community. We see as well the rise and fall, or a least a low plateau, in his international networking attempts. Finally, we have a first tantalizing glimpse into the extent of his connections into the political and landed elite.

**APPENDIX. THE MISCELLANEA ANALYTICA SUBSCRIPTION LIST**

1. Charles Beauclerk (1696–1751), 2nd Duke of St Albans
2. John Campbell (1680–1743), 2nd Duke of Argyll, army officer and politician
3. John Arbuthnot (1667–1735), physician and satirist
4. Thomas Archer (1668–1743), architect and courtier; held the position of Groom Porter
5. William Berkeley (1678–1741), third son of the 1st Baron Berkeley of Stratton
6. Allen Bathurst (1684–1775), 1st Baron Bathurst, treasurer to the Prince of Wales
7. Bennet (Corpus Christi) College Library, Cambridge
8. Hector Berenger de Beaufain (?–1767); became Collector of Customs in South Carolina
10. Thomas Blackwell (1701–57); the list gives John as the first name, but Thomas Blackwell was Professor of Greek at Marischal College in Aberdeen from 1723 until 1748
11. Charles Du Bois (1656–1740), botanist, treasurer of the East India Company
12. Michel Bouyer, unable to locate any information
13. James Bradley (1692–1762), Savilian Professor of Astronomy, Oxford
14. Charles Brent (1705–64), astronomer
15. William Brome (1689–1745), poet, translator and priest
16. Noel Broxholme (1686–1748), physician
17. John Buckworth (1700–58), baronet
18. James Burroughs (1691–1764), architect and antiquary
19. John Bussière (?–1781), nephew and heir of Paul Bussière FRS and surgeon
20. James Budyige (1674–1744), 1st Duke of Chandos
22. Charles Cavendish (1693–1783), third son of the William Cavendish, 2nd Duke of Devonshire
23. Charles Cornwallis (1700–62), 5th Baron Cornwallis and 1st Earl Cornwallis
24. George Campbell (?–1766), mathematician
25. George Cheyne (1671–1743), physician with interests in mathematics and theology
26. Robert Clarke (1683–1746), Member of Parliament
27. Anthony Collins (1676–1729), philosopher and freethinker
28. John Colson (1680–1760), Lucasian Professor of Mathematics, Cambridge
29. John Conduit (1688–1737), husband of Newton’s niece; succeeded Newton as Master of the Mint
30. Edward Cook (?–1733), barrister
31. John Coppindal (1700–?), Fellow of Trinity College Cambridge
32. William Cotterel (1698–1744), Dean of Raphoe and then Bishop of Ferns and Leighlin
33. Clare College Library, Cambridge
34. John Craig (1663–1731), clergyman and mathematician
35. John Crew (1709–52), Member of Parliament
36. Alexander Cuming (1691–1775), 2nd Baronet of Culter, traveller in America
37. William Cavendish (1672–1729), 2nd Duke of Devonshire
38. Lionel Cranfield Sackville (1688–1765), 1st Duke of Dorset
39. Peter Davall (1695–1763), barrister
40. Daniel Dering (?–1730), Commissioner for the Wine License
41. Edward Digby (1693–1746), trustee for the Colony of Georgia
42. James Douglas (1697–1751), Clerk of the Green Cloth to the Prince of Wales
43. Daniel Duncan (1649–1735), physician
44. Samuel Durham, teacher of mathematics
45. Richard Edgecomb (1680–1758), politician and close friend of Robert Walpole
46. John Eden, unable to locate any information
47. John Elde (1704–?), attended Trinity College, Cambridge
48. Emanuel [sic] College Library, Cambridge
49. Francis Eyles (?–1762); published on a variety of topics in Philosophical Transactions
50. Francis Fauquier (1703–68), a director of the South Sea Company and Lieutenant-Governor of Virginia
51. Coulson Fellowes (1696–1769), barrister
52. Martin Fellowes (?–1732), younger brother of Coulson Fellowes
53. William Fellowes (1705–75), younger brother of Coulson Fellowes and Fellow of the Royal Society
54. West Fenton (1699–1731), barrister
55. Martin Folkes (1690–1754), author and antiquarian, President of the Royal Society
56. William Folkes (1700–73), barrister and brother of Martin Folkes
57. Thomas Folkes (?–1730), barrister and uncle of Martin Folkes
58. John Fortescue (1670–1746), Solicitor-General to the Prince of Wales and to the King; knighted in 1717
59. Henry Furnese (1688–1756), Member of Parliament
60. George Furnese (?–1741), Captain of Horse, brother of Henry Furnese
61. John Freind or Friend (1675–1728), physician; wrote numerous medical works
62. Charles Fitzroy (1683–1757), 2nd Duke of Grafton
63. Thomas Garnier (?–1739), apothecary at Chelsea Hospital
64. George Graham (1673–1751), horologist and instrument maker
65. Robert Gray (?–1731), Fellow of the Royal Society
66. Thomas Green (?–1780), clergyman, chaplain to George II
67. James Gregory (?–1744), Professor of Mathematics, University of Edinburgh
68. Isaac Guion, distiller living in St Martin-in-the-Fields who died in 1733, or his son of the same name (1704–48), who received a BA from Oxford
69. John Hadley (1682–1744), mathematician and scientific instrument maker
70. William Hanbury (?–1768), Fellow of the Royal Society and of the Society of Antiquaries
71. John Hanbury (1664–1734), landowner and ironmaster
72. James Hammond (1710–42), politician and poet, equerry to the Prince of Wales
73. Richard Hassel (?–1770), Fellow of the Royal Society
74. John Hedges (1688–1737), Member of Parliament and Treasurer to the Prince of Wales
75. John Herring, unable to locate any information
76. Benjamin Hoadley (1706–57), physician and playwright
77. Henry Holmes (1696–1737), clergyman, vicar of Barrington
78. Gervase Holmes (1691–1776), clergyman, vicar of Fressingfield
79. Stephen Horseman (fl. 1702–37), scientific instrument maker
80. Edward Howard (1686–1777), 9th Duke of Norfolk
81. Robert Hucks (1699–1777), Member of Parliament
82. Archibald Hutcheson (1660–1740), barrister and Member of Parliament
83. Archibald Campbell (1682–1761), Earl of Islay and then 3rd Duke of Argyll
84. William Jones (1675–1749), teacher and mathematician
85. Peter Jackson, clergyman, rector of Lowth
86. William Innys (?–1756), bookseller and publisher
87. James Jurin (1684–1750), physician, mathematician and teacher
88. King’s College Library, Cambridge
89. Bulstrode Peachy Knight (1681–1736); took on the surname Knight on his marriage to the widow of William Woodward Knight, Member of Parliament
90. John Knight (1687–1733), Member of Parliament and Assistant to the Royal Africa Company
91. Samuel Klingenstein (1698–1765), Professor of Mathematics at Uppsala University
92. Henry Clinton (1684–1728), 7th Earl of Lincoln
93. Henry Lowther (1694–1751), 3rd Viscount Lonsdale
94. George Lynne (1676–1742), astronomer and antiquary
95. Colin Maclaurin (1698–1746), Professor of Mathematics at University of Edinburgh
96. Isaac Leheup (1686–1747), Member of Parliament
98. William Montagu (1700–39), 2nd Duke of Manchester
99. John Monson (1693–1748), 1st Baron Monson
100. John Machin (1686–1751), Professor of Astronomy at Gresham College
101. Nicholas Mann (1680–1753), mathematician and tutor
102. Pierre de Maupertuis (1698–1759), mathematician, philosopher and man of letters
103. Richard Mead (1673–1754), physician
104. Abraham Meure (?–1732), son of Abraham Meure, who taught at Saumur
105. Edward Montagu (1678–1761), mathematician and Member of Parliament, husband of author and literary hostess Elizabeth Montagu
106. John Montagu (1692–1734), Lieutenant-Colonel in the Foot Guards
107. Charles Morgan (1678–1736), clergyman, Master of Clare College, Cambridge
108. Thomas Pelham-Holles (1693–1768), Duke of Newcastle-upon-Tyne, Secretary of State for the North
109. John Noel (?–1753), son of Baptiste Noel, 3rd Earl of Gainsborough
110. William Nicolls (?–1774), clergyman, vicar of St Giles Church, Cripplegate
111. Edward Harley (1689–1741), 2nd Earl of Oxford
112. Crew Offley (1683–1739), Member of Parliament
113. Robert Ord (1700–78), barrister and Member of Parliament
114. Edmund Overall (?–1755), Secretary to the London Assurance Company
115. James Ord (1703–71); attended Cambridge University and Gray’s Inn
116. James Hamilton (1686–1744), 7th Earl of Abercorn
117. George Parker (1697–1764), 2nd Earl of Macclesfield
118. John Percival (1683–1748), 1st Earl of Egmont
119. Robert Parker, fellow of Queens’ College, Cambridge
120. Robert Paul (1697–1762), barrister
121. Edward Pawlet (?–1768), barrister
122. Henry Pelham (1694–1754), Member of Parliament
123. Thomas Pellet (1671–1744), physician
124. Henry Pemberton (1694–1771), physician, editor of the 3rd edition of Newton’s *Principia Mathematica*
125. Henry Plumptre (1690–1746), physician
126. Stephen Pointz (1685–1750), private secretary to Lord Townshend, envoy to Sweden
127. Uvedale Price (1685–1764), Member of Parliament
128. Charles Lennox (1701–50), 2nd Duke of Richmond
129. Andrew Ramsay (1686–1743), philosopher and Jacobite sympathizer
130. John Robartes (1686–1757), 4th Earl of Radnor
131. Benjamin Robins (1707–51), mathematician and engineer
132. Robert Spencer (1701–29), 4th Earl of Sunderland
133. Talbot Yelverton (1690–1731), 1st Earl of Sussex
134. Diana Spencer (1710–35), Duchess of Bedford
135. Nicolas Saunderson (1682–1739), Lucasian Professor of Mathematics at Cambridge
136. Exton Sayer (1691–1731), judge advocate in the Court of Admiralty
137. Augustus Schutz (1690–1757), Master of the Robes and Keeper of the Privy Purse
138. John Selwin (1688–1751), Member of Parliament
139. James Sherard (1666–1738), pharmacist and botanist, amateur musician
140. George Skene (1695–1758), 17th Laird of Skene
141. Robert Smith (1689–1768), Plumian Professor of Astronomy, Master of Trinity College, Cambridge
142. Ralph Snow (1670–1744), calligrapher and writing master
143. James Stevens, unable to locate any information
144. Charles Steurt (1682–1770), physician
145. James Stirling (1692–1770), mathematician and mine manager
De Moivre’s knowledge community

146. Charles Townshend (1674–1738), 2nd Viscount Townshend, politician and diplomatist
147. Thomas Trevor (1692–1753), 2nd Baron Trevor
148. Brook Taylor (1685–1731), mathematician and barrister
149. Henry Temple (?–1740), son of 1st Viscount Palmerston
150. Andrew Tooke (1673–1732), Professor of Geometry at Gresham College and Master of Charterhouse
151. Thomas Townshend (1702–38), Member of Parliament, Teller of the Exchequer
152. William Townshend (1701–80), Member of Parliament, Groom of the Bedchamber to the Prince of Wales
153. Trinity College Library, Cambridge
154. Scaramuccia Visconti, envoy of the Holy Roman Emperor
155. John Finch (1684–1729), 5th Earl of Winchelsea
156. Robert Walpole (1676–1745), 1st Earl of Orford, Prime Minister
157. Edward Walpole (1706–84), Member of Parliament, Clerk of the Pells
158. William Willis (1685–1732), baronet
159. James Wilson (1690–1771), physician and biographer
160. Thomas Windham (1686–1752), barrister and Member of Parliament
161. John White (1699–1769), Member of Parliament
162. Thomas Woodcock (?–1732), uncle by marriage to Thomas Pelham-Holles and Henry Pelham
163. Thomas Woodford (?–1759), solicitor to the East India Company

NOTES

7 Abraham De Moivre, ‘Proprietates Quaedam Simplices Sectionum Conicarum ex Natura Focorum deductae; cum Theoremate Generali de Viribus Centripetis; quorum ope Lex Virium Centripetarum ad Focos Sectionum Tendentium, Velocitates Corporum in Illis Revolventium, & Descriptio Orbium Facillime Determinantur’, Phil. Trans. R. Soc. 30, 622–628 (1717).
8 De Moivre, ‘De Fractionibus Algebraicis Radicalitate Immunibus ad Fractiones Simpliciores Reducendis, Deque Summandis Terminis Quarundam Serierum Aequali Intervallo a Se Distantibus’, Phil. Trans. R. Soc. 32, 162–178 (1722).
9 De Moivre’s work in this area and its relationship to Stirling’s approximation may be found in S. M. Stigler, The history of statistics: the measurement of uncertainty before 1900 (Harvard University Press, Cambridge, MA, 1986), at pp. 70–77.
11 Wilford’s Monthly Catalogue, April 1729.
13 Ibid., vol. 3, p. 393 (1729).
14 Hunter and Mason, op. cit. (note 1).
15 Their database resulted in publications such as R. V. Wallis and P. J. Wallis, Biobibliography of British mathematics and its applications, part II (1701–1760) (Epsilon Press, Newcastle upon Tyne, 1986).
17 Joseph Foster, Alumni Oxonienses, the members of the University of Oxford 1500–1714 (Kraus Reprint, Nendeln, Liechtenstein, 1968); Alumni Oxonienses, the members of the University of Oxford 1715–1886 (Kraus Reprint, Nendeln, Liechtenstein, 1968).
18 John Venn and J. A. Venn, Alumni Cantabrigienses: a biographical list of all known students, graduates and holders of office at the University of Cambridge, from the earliest times to 1900 (Cambridge University Press, 1922–54).
21 http://www.royalsoc.ac.uk
22 http://www.oxforddnb.com
24 http://www.luc.edu/history/fac_resources/bucholz/DCO/DCO.html
25 http://www.mysql.com
27 http://gale.com/EighteenthCentury/
30 British Library, Add. 23899 f. 36.
31 G. F. Papali, op. cit. (note 28), Appendix II.
32 Public Record Office PROB 11/661: will of Daniel De Moivre.
33 Benjamin Vaurigaud, Essai sur l’histoire des Églises réformées de Bretagne: 1535–1808 (Joël Cherbuliez, Paris, 1870), at p. 32.
37 [John Arbuthnot], Of the Laws of Chance, or, A Method of Calculation of the Hazards of Game (Benjamin Motte, London, 1692).
Christiaan Huygens, *Christiani Hugenii libellus de ratiociniis in ludo aleæ*. Or, the value of all chances in games of fortune (Keimer & Woodward, London, 1714).


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Royal Society Archives, Journal Book, Volume 9, 26 June 1695.


Glasgow University Library, Special Collections Department, Sp Coll Ea6-b.15.


*The Tatler*, 2 February 1710/11 (http://www.18thcjournals.amdigital.co.uk/).

G. W. Leibniz, op. cit. (note 52).


London Metropolitan Archives, E/BOL/004.


71 PRO SP 36/2 and SP 36/18.


77 PRO PROB11/811 and PRO C104/266 Bundle 38.

78 Cook, *op. cit.* (note 74), p. 119.

79 Bellhouse and Genest, *op. cit.* (note 34).


82 K. Wollenschläger, *op. cit.* (note 47).


91 For a list of Fellows at about that time, see John Chamberlayne, *Anglæ Notitia: or the Present State of England* (London, 1704), at pp. 610–611.

92 Centre for Kentish Studies U1590/C21.

93 Royal Society Archives EC/1738/01 and EC/1738/11.

94 http://www.roysoc.ac.uk/