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**Recruitment, training and knowledge
transfer in the London Dyers' Company,
1649-1826**

Volume 1

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Table of Abbreviations

CLRO	Corporation of London Record Office
GL	London Guildhall library
GL, MS	London Guildhall library manuscript
PRO	Public Record Office, Kew
s and d	shillings and pence

Appendix

The appendix is bound as volume 2. It includes two types of data: Table A.1 includes 258 graphics demonstrating chains of transmission; Table 2.9 shows, in five-year periods from 1650-1744, the number of apprentices bound to an individual master.

Table A.1 Graphic presentation of generations of dyers, by occupational specialisation, including hats, linen, mixed, silk, stocking, stuff, and general.

The boxes on each line of the graphics show all the apprentices bound to a master, with the first date the date of binding. The second date is that of joining, or the statement did not join. For those who joined and bound apprentices, the graphic shows all the apprentices they bound as a master. Each line in the graphic indicates a generation from the original master, so those graphics with 9 lines shows a chain of 9 generations.

The graphics are arranged in the appendix by specialty (as indicated in Table 5.2a), and within specialty, by the number of generations. For those chains which were too large for presentation on a single A-4 sheet, the presentation is on longer paper.

Table 2.9 For each master, the numbers of apprentices bound, by 5 year periods, 1649-1746 and the total number bound in a lifetime.

Abstract

This thesis studies the role of a craft guild as a training organisation. The study looks at the London Dyers' Company binding and joining records over 150 years, available from the mid seventeenth century to the early nineteenth century. The study initially deals with transmission of knowledge from master to apprentice, a single generation. It then looks at factors associated with chains of transmission over several generations, taking advantage of available occupational specialization data.

The Dyers' Company records of membership are estimated to be at least 94 percent complete from 1710-1792, and probably similarly complete in the earlier period 1660-1710. In 1750, 93 percent and in 1792 81 percent of dyers in livery companies were members of the Dyers' Company. In those same years, 34 percent in the livery of the Dyers' Company were not practicing dyers.

Chapters 2 and 3 describe the dynamics of the Dyers' Company from binding and joining information. The apprentice binding data includes information about families of apprentices, their places of residence, their father's occupation, along with what premia were paid when they were bound. Information is presented about time as a journeyman, about how many apprentices an individual master bound in a lifetime, and about women apprentices and women who bound apprentices.

Scattered information about specialized dyeing occupations allowed categorisation of chains of transmission by occupation. One specialty, calico printing, potentially the most innovative of any in the dyeing trade, was not fully represented in the Dyers' Company records.

Sixty one percent of all chains were no more than three generations long. Chains involving silk dyers were more often longer than those involving dyers with no stated specialty. Long chains might either be evidence of technological conservatism, a more technically difficult craft, greater use of innovation, or increased economic activity.

Preface

This thesis developed from an interest in natural dyes and their movement throughout the world. From 1964-8, I lived in a small village south of Vellore, Tamil Nadu, South India, which, I discovered, had once been an indigo plantation. As a result, my interest in the economic history of dyes grew. It expanded still further between 1974-7, when I was living in El Salvador, once a major source of indigo for the Spanish Empire. Not long afterwards, after spending much time reading about indigo production and marketing, while I was climbing with three friends in New Hampshire in 1982, I announced that I was going to write a book on the economic history of indigo. Much has changed since that statement of intention.

When I retired from teaching public health medicine at the London Hospital Medical College in 1996, I thought I would be able to carry out the earlier stated intention. I was brought up short when my brother Paul Feldman, an economist, asked what was my hypothesis, and how would I organise the data. That led to an MSc at the London School of Economics (LSE), which I thought would help me frame an hypothesis. Getting accepted at LSE was an almost insurmountable hurdle, made possible when Eddie Hunt pointed out that if I was registered as a part-time student, I could be accepted, even though my sole, brief exposure to economics took place in 1948.

The result of the MSc was the realisation that I needed a greater understanding of economic history before beginning any further effort on a book. So, I tried to register for a PhD. This, too, was a hurdle, since the thesis advisor I choose hesitated to accept me as a candidate. Not only was I too involved with data; I also had little background in either history or economics. However, after getting into the programme, I got involved in a medical project, which took far more time than I anticipated. So the thesis has taken much longer than the usual three years.

As I look back at the more than 20 years since 1982, I realize the gulf between the naively stated intention to write a book and the reality of organising thoughts for such a task.

To the three friends from the climb in New Hampshire, I say: It was harder than I thought, took longer than I expected, but was clearly worth the all the effort (even though it needed more than a little help from my friends).

Roger Feldman, August 2005

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This thesis would not have been possible without the encouragement, patience, strained confidence, and extraordinary assistance in organisation and writing that I received from Larry (Stephan R) Epstein, who has finally brought me to produce a thesis, albeit after far too long.

There were a large number of people who influenced me in the development of a thesis topic, and helped in my work. Being unable to mention them all, I start with those whose early and continuing contributions have sustained me over this long period.

David Mitchell, who worked with textile production and marketing, and with craft guilds, was always willing to help me deal with my own technical problems. His example in reading Orphan Court inventories, daily, weekly and over long periods was one that made my task seem small. His encouragement, and assistance was always available, and of immense significance.

Clifford Webb, whom I met at the Guildhall library, working with what seemed to be undecipherable documents, was an example of kindness and encouragement. His work with apprentice registers made my project possible.

As someone from outside the field of economic history, Negley Harte's continuing encouragement was important to me, as was his introduction to his seminar at the Institute of Historical Research. Those meetings brought me into contact with others interested in textile history.

Professor Stanley David Chapman, whom I met through Negley Harte, had retired before we met. His encouragement is not forgotten.

David Marsh, a Guildhall library regular, was thoughtful enough to take time to record what information he thought might be useful to me, while working on his own thesis.

Therese Tillin, my co-worker at the London Hospital Medical College, taught me the intricacies of many computer programmes, helped me use them, and was the willing source of assistance when my knowledge failed to solve a problem. The task would have been impossible without her support. Her daughter, Jane Tillin, was employed for several months to assist with initial data entry, an essential first step in the thesis.

Stephen Emmott, in the Website Department at LSE, introduced me to the Visio program, which made possible the preparation of the charts in the appendix. He was also my mentor when the program seemed a mystery to me. Mike Wren, Paul Tarrington and the team at Screaming Colour Ltd made the long-page printing possible.

Olwyn Myhill introduced me to the computer files at the Centre for Metropolitan History, from which I found useful occupational data.

Ian Mackintosh, the archivist of the Dyers' Company, made possible my efforts to find London-trained dyers in Gloucester and Stroud. Much more could have been done, outside of London, but that is for later.

As I was working on the final chapter of the thesis, which deals with chains of transmission, I spoke with Joyce Brown and Gloria Clifton about their earlier work with instrument makers. The contact and conversations were important in the development of the final chapter.

Finally, I have been a PhD candidate at LSE since 1998. Throughout this time I have seen annual entry cohorts and witnessed their excitement when they finish. I have benefited from conversations and assistance from this remarkable student group. One classmate from my MSc, Jun Youl Tae, has followed my progress over the years, and his continuous encouragement has helped me through difficult times.

It is impossible to say enough about the librarians in the manuscript room at the Guildhall library. Their willingness to help me decipher handwritten documents meant I could proceed, occasionally with confidence.

As the thesis was reaching its conclusion, the librarians and information technology staff at LSE saw far too much of me, but it was their help with bibliographic and formatting problems which allowed me to get past some otherwise impossible tasks.

My brother, Paul Feldman, prevented me initially from attempting the impossible, and has wondered, often out loud, how anyone with my background had the nerve to believe that he could produce a PhD in economic history. I share his wonder.

My wife lived through all my stumbling efforts, foregone vacations, loneliness, irritation, anger, then the final dash to finish, while dealing with her own work and with all the other tasks of daily living. Without her support, this effort would never have reached a conclusion.

Chapter 1 Introduction and sources

1.0 Introduction

This thesis deals with how one learned to dye in the pre-modern period, and how one learned to dye fibres and fabrics, with new dyes, and/or new procedures.

In the pre-modern period, apprenticeship was the most important manner by which technical knowledge was acquired. Because London guilds maintained apprenticeship records for almost three centuries, studies of apprentices in the Worshipful Company of Dyers of London (hereinafter Dyers' Company) offered a unique opportunity to study the process of transmission of knowledge from master to apprentice over a long time period. In addition, and a major important advantage for the study, guild regulations restricted the teaching of apprentices to those who had joined the guild, so it is possible to study transmission of technical knowledge as two processes: the initial transmission between master and apprentice (a first generation) and the subsequent inter-generational transmission from a trainee-turned master to other trainees, building up chains of transmission. This thesis looks at both these processes.

Because London was growing rapidly, both as a centre for excellence and innovation in dyeing and in population, the trainee-turned-master dyers had significant opportunities to find employment in London, and bind apprentices. This meant that there was a good chance that chains of transmission could be followed over long periods within London itself, using the records of the Dyers' Company.

Many craft guilds, the goldsmiths, instrument makers, and clock makers among them, have been well studied, while the Dyers' Company has generally been ignored, even though dyeing was a significant variable in the economic development of the textile trade. This meant that the initial Chapters of the thesis bring to light new data on the Dyers' Company, in addition to being the basis for a study of generations of transmission.

There were obstacles to studying the process of learning how to dye in London over the three centuries. It took some time before the 1563 statutory regulations were uniformly followed. Apprenticeship processes were interrupted by the Civil War. The Fire of London in 1666 destroyed records of some London Guilds and was followed by relaxation of apprenticeship restrictions as London was rebuilt.

Although the intention of the 1563 statute (5 Elizabeth C. 4, 12 January, 1562) had been to limit each craftsmen to a single occupation, the fact that entry to a guild was allowed by patrimony and by redemption meant that, over time, not all dyers were in the Dyers' Company, nor were all members of the Dyers' Company practicing dyers. And those who were dyers, but outside the control of the municipal authorities, could, over time, be a larger and larger percent of the practicing dyers in any region. Measurement of effective transmission of technology within a geographic area could be underestimated, as would occur when London-trained apprentices, rather than joining the Dyers' Company, carried the new technology outside London, perhaps to their regions of origin¹

The technical knowledge of pre-modern craftsmen was most effectively transmitted by direct contact. As a result, another obstacle to pre-modern technical diffusion and innovation was the cost of person-to-person teaching and demonstration.²

Apprenticeship allowed trainees to receive subsidized training. Some masters reduced the subsidy by requesting a premium, to be paid in advance of the training. The time period of the training (seven years) was sufficient to allow masters to recoup their investment. The effective rate of technology transfer could depend on the ability to teach the new technology to craftsmen as individuals or in groups.³ And the time involved in successful training shows why masters might wish to retain their apprentices after the 7-year term was completed. As will be seen later in Chapter 2, in spite of the potential payback, only a limited number of masters made the initial investment in training.

¹ Fox 1998, pp. 89-90.

² Epstein 2004b, p. 382.

³ Jackson 1998, pp. 129-157.

To overcome externalities in human capital formation, craft guilds such as the Dyers' Company had regulations dealing with supervision of training, enforcement of contracts through compulsory membership and penalties for failure to follow the rules. These regulations dealt with masters who, though they had not invested in training, used labour trained by others. The regulations also helped reduce poaching of other master's apprentices.

In the pre-modern period, a demonstration of the importance of person-to-person contact was evident in the frequency with which apprentices were selected from among family members or others with prior craft knowledge.⁴ Nevertheless, apprenticeship and guild membership in Europe were non-ascriptive and individualistic, that is, there was no cultural, kin, or other non-contractual obligation to remain tied to one's master, birth group, or community.

One of the factors associated with transferring tacit knowledge is that once such knowledge is successfully transferred, competition among those who have learned successfully may result in more efficient firms driving others out of business. Alternatively, if firms are equally efficient, the result of the new technology will be many small efficient firms.⁵ This observation is relevant to the duration of inter-generational transmission of knowledge discussed in Chapter 5.

One major element in the development of technological leadership was location within an area with a widespread trading network.⁶ Within such areas, tacit knowledge could readily be shared or distributed.⁷ London had a widespread trading network, and attracted many who were involved in textile production and dyeing.

⁴ Grassby 2001, pp. 277-79, describing London businessmen from 1580 to 1740, notes that the majority of businessmen had served an apprenticeship, with 3-4 percent with no formal training in those born between 1600 to 1700. The highest percent of businessmen without apprenticeship were in businesses with capital less than £500. Only 1 percent of known apprentices were bound to their father from 1580-1659, rising to 4.6 percent from 1660-1740. The binding of a son to his father was highest in families with businesses of greater than £50,000, and highest from 1661-1700. The proportion of businessmen apprenticed to kin was 5-6 percent from 1540 to 1660, and rose to 11 percent in those born after 1660 to 1700. The proportion of all those apprenticed to masters outside the family fluctuated around 50 percent. However, while apprentice binding within the family was common, it was less frequent as a common behavior after 1660.

⁵ Jin, Perote-Peña et al. 2004, pp. 85-98.

⁶ Davids 1995, p. 339.

⁷ Audretsch, Lehman et al. 2004; Aydogan and Lyon 2004; Epstein 2004b, p. 383; Howells 2002; Jovanovic 2003.

There were large numbers of dyers in a limited geographic area, dealing with a variety of different fabrics, colours, and dyes. Communication among these dyers could allow rapid transmission of information about new technology.⁸ Similarly, effects of kinship and cultural groupings might be expected to be important in the spread of new technological advances in dyeing.⁹

1.1 The role of the guild

Little time in the discussions of the role of guilds is devoted to them as a resource in training, except to discuss the length of the training contract.¹⁰ Perhaps this is because little information is available concerning the elements of a guild training program.¹¹ There is often a mention of the proof-piece as a way to maintain standards, but most often in the context of limiting guild membership.

Apprenticeship occurred outside guilds, but the persistence of apprenticeship into modern times demonstrated that it was craft proficiency, certified by completion of apprenticeship, that resulted in a recognized market value.¹² Elbaum suggests that apprenticeship allowed financially constrained youths to exchange indentured labour services in return for employer financing of training investments. This permitted increased efficiency, but entailed various constraints and inefficiencies. It was important that the apprentice not quit before completion, which would mean, to the master, a loss of a skilled worker and loss of the investment in training. To reduce the frequency of this problem, there was an indenture agreement, with a joint commitment to a fixed term of employment as well as provision of training. Ideally, to maintain the system, each party should live up to the agreement.¹³

⁸ Evans and Ryden 1998, pp.188-206. Kinship, and close-knit cultural groups were important in the acceptance and spread of innovative development of the iron-smelting industry in Britain and Sweden in the later eighteenth century.

⁹ Scoville 1951, pp. 347-60.

¹⁰ Berlin 2006; Bindoff 1961; Epstein 2004a; Epstein 2004b; Gadd and Wallis 2001; Gadd and Wallis 2006; Kahl 1956; Kahl 1960; Ogilvie 2004; Turner 2006; Unwin 1927; Wrightson 2000.

¹¹ Ben-Amos 1994, pp. 114-124.

¹² Elbaum 1991; Elbaum and Singh 1995.

¹³ Elbaum and Singh 1995, pp. 593-97. In the 1970s, apprenticeship was most extensive in Germany, Austria and Switzerland, where it occupied 5 to 6 percent of civilian employees and one-third to one-half of person ages fifteen to eighteen. In describing the British apprenticeship system in 1925-6, it was noted that 91.5 percent of apprentices completed their term.

The guild, as long as it could, enforced the rules of apprenticeship.¹⁴ This meant that those without a completed apprenticeship were constrained from working freely in the urban environment. And within limits, it meant that those working in a particular craft were members of that craft's guild. It also meant that migrant journeymen and masters were able to join a functioning organization, develop local contacts, and were available to demonstrate innovative practices to those who could appreciate them and use them.

“Special-interest organizations” inexorably tend to slow down capacity to adopt innovations in technology.¹⁵ Although some recent literature concerning the decline of guilds restates the view that inhibition of innovation was the result of the guild activities,¹⁶ there is also an alternative point of view. A recent review suggests that many guilds formed in the seventeenth century to support and expand new technology, with some guild structures acting as adjuncts rather than hindrances.¹⁷ It is possible that, within the guild structure, innovations were protected, at least for a period of time, in a way that was more significant than the protection offered by patents. This it is argued that craft-based apprenticeship, non-ascriptive membership of craft associations, and increasing movement of skilled workers defined a set of necessary and sufficient conditions for the accumulation of reliable technical knowledge.¹⁸ In this interpretation, a main focus of pre-modern technical innovation was the craft guild.

1.2 Migration and innovation

There were many social and institutional impediments to the successful uptake of innovations. Migration of trained craftsmen could increase the rate of uptake of the innovations they brought with them, but descriptions of the effect of such migrations

¹⁴ Berlin 1997; Bindoff 1961; Cooper 1970; Crawford 1987; Davies 1956; Dunlop and Denman 1912; Epstein 2004a; Greif, Milgrom et al. 1994; Hamilton 1995; Kellett 1958; Kramer 1927; Snell 1985; Unwin 1966; Ward 1997.

¹⁵ Davids 1995, p. 346.

¹⁶ Ogilvie 2004, dealing with the Wurttemberg worsted weaving industry from the late sixteenth century to the early nineteenth century, reviewed what she called rehabilitation approaches to guild activities, and how they did not explain what had happened in Wurttemberg.

¹⁷ Berlin 2006, p. 9.

¹⁸ Epstein 2004b, p. 386.

have shown the importance of: (1) the size of the migrating group;¹⁹ (2) the level of skill present in the receptive area; (3) the response of local craftsmen to the immigrant groups; (4) the availability of markets for the new products;²⁰ (5) governmental reactions to the immigrants as well as to the loss of craftsmen by migration; (6) and the strength of local institutions enforcing rules and regulations.^{21 22}

Transfer of innovation associated with migration was greatest within areas that were institutionally, economically and culturally active in the specific craft. London, for example, which was already a centre of dyeing, was able, because of the presence of a sufficient number of trained, technically competent workers, to take advantage of the knowledge of migrants with dyeing skills.

Rarely does something borrowed diffuse unmodified, when there are different environments, materials, skills, markets, needs, and institutional patterns. Such transfer follows two routes: radiation and migration. Radiation is almost imperceptible, involving imitation, observation and occasionally direct contact. Migration is more spectacular, and may be essential for rapid diffusion, allowing a break with one's social and cultural environment. Transfer of technology, as a result of migration, can occur from an individual, from a few people in a group, or from a

¹⁹ Coleman 1969, p. 427. Because cost reduction was difficult in most textile production, and production techniques were traditional, significant diversification of product might be most successful when innovations were injected from outside. And to bring effective transformation to so labour-intensive an industry as rural textiles of the time, a considerable influx of workers with the new skills was necessary, as occurred at Norwich and Colchester, with the new draperies.

²⁰ Coleman 1969, p. 429. "New, with textiles, might not be an invention but something seen as new by contemporaries. Neither cost reduction nor factor substitution were the direct stimuli for the "invention" of *new draperies*, or other new fabrics, unless you consider that the innovation resulted from an attempt to find a substitute for English wool, or perhaps, the result of a change in the character of the English wool supply, which led to greater use of worsted fibres. The use of foreign technology, in association with foreign labour, may have allowed the development of the innovation, but it is possible that the real impetus came from market forces in association with change in fashion. Rather than economic forces, the diffusion of the technical changes that did occur may have been the result of war and religious persecution."

²¹ Ashtor 1989, pp. 20-21. "The importance of the migration of skilled workers for the spread of technological innovations is indicated by the strength and universality and frequency of measures taken against such migration by various governments. The great number of decrees enacted bear testimony to the apprehension of the rulers of industrial centres. The Senate of Venice forbade the teaching of glassmaking to foreigners, and ship patrons were warned not to accept as passengers skilled artisans who wanted to emigrate from Venice. Craftsmen who emigrated were threatened by many governments with heavy punishment, and sometimes even threatened with the death penalty. Those who would kill them were often promised a reward. However, once departed, there were occasions when there were facilities offered to emigrated workers in order to induce them to return.

²² Ashtor 1989, pp. 26-27. Counter measures were initiated, in the statutes of the silk guild of Florence, which contained the stipulation that foreign inventors be encouraged to settle.

large group. In relation to dyeing technology, spread of knowledge rarely came with a single individual carrying a technique, or from an industrial spy bringing back knowledge. Group migrations occurred, as when the government encouraged technically advanced dyers to migrate, something which happened regularly in Italy, or when artisans went from city to city, in association with financial inducement, wars, or trade restrictions.²³ Within the textile industry, cultural responses affected the rate of innovative change. Sometime, technology transfer was difficult because of linguistic difference.²⁴

Large numbers migrated to England from the Netherlands, Spain and France for religious, cultural, social or economic reasons. Because the groups were large, they had a more pervasive and rapid effect on economic life than smaller groups.²⁵ The Prussian ambassador at The Hague, in 1686, wrote of the "prodigious success of the migrant-French manufactories, which resulted in the fall of prices of silk textiles, from 50 to 36 sous, and beaver hats, from 10 to 6 ecus."²⁶

The importance of migration is not discussed further in describing the transfer of knowledge in the Dyers' Company.

1.3 Textiles, dyes, colour and quality

In the study of how one learned to dye and of technology transfer across more than one generation, several variables concerned the decision to study the London Dyers'

²³ Scoville 1951, pp. 355. The Huguenots in Ireland, welcomed by the government, vitalized the Irish linen industry, imported new varieties of flax seed, taught cultivation of the crop, set up schools to show women how to spin better thread, familiarised weavers with the foreign looms, erected bleaching houses so the material would not have to be exported to be bleached, and the export of cloth and thread increased from a value of £49,000 in 1700 to £275,000 in 1725 and £787,000 in 1750.

²⁴ Solo and Rogers 1972, pp. 85-101; Hunter 1981, pp. 190-191.

²⁵ Scoville 1951, p. 357. "Silk workers from Tours, Lyons, and Nimes settled in London and Canterbury, and produced damasks, alamode silks, lustrous black taffetes, brocades, moires, satins, and velvets which in richness of colour and fineness of quality at least rivaled those imported from France." A report by two diplomats from France in 1713-1714, wrote "It is principally since the epoch of the Prince of Orange's reign that one must report the decadence of our trade with the English. The privileges and favours which he accorded our Protestants who withdrew to England in great number and who carried there our manufactories of silk, hats, hardware, paper, sail-cloth, and several other commodities have broken their usage in England of all similar imported goods which they formerly obtained from us. And they have carried the manufactories to such a degree of perfection that even we begin now to import some of their output. There is reason to fear that they may cause our manufactories to fail by offering their output at lower prices."

²⁶ Scoville 1951, p. 358.

Company. They included: whether a newly trained dyer would find London a good place to start in business; whether there were increasing (or decreasing) opportunities to practice as a dyer in other parts of the country; whether London was a good place to learn about new dyes and dyeing techniques; and whether London had representatives of all occupational specialties in dyeing.

By 1750, London was the largest city in Europe. Between 1550 and 1700, London alone accounted for half the urban population increase in England. An estimate of the population growth of London as compared to the rest of England, by half century, shows the continued growth of London, even when England's growth between 1650-1700 was negative.²⁷ During this period of London's rapid urban growth, there was a very large internal migration, about 8000 persons/year from 1650-1750. A significant number of the London immigrants were apprentices.²⁸

Estimates of the numbers of apprentices in London in the mid seventeenth century - 11,000-30,000 for a population of about 300,000 - suggest that 5-10 percent of the population were apprentices.²⁹ There was a positive relationship between an increase in export of cloth, from 1530-1550, and the rate of entry of apprentices to the three largest cloth-related companies.³⁰ London had characteristics that suggest it was a good place for a newly trained dyer. The rate of entry of apprentices into the dyeing industry might predict upturns and downturns in the industry in London

²⁷ Finlay and Shearer 1986, Table 1, p. 39. **Population, in thousands, for London and England from 1550 to 1750, based on estimates from Wrigley, and Corfield.**

Date	Population of England	Percent increase	Population of London	Percent increase	London as a percent of England
1550	3,010		120		4.0
1600	4,110	37	200	67	4.9
1650	5,230	27	375	88	7.2
1700	5,060	-3	490	24	9.7
1750	5,780	14	675	38	11.7

These estimates are based in part on the birth and death registers of 30 parishes between 1540 and 1700, which appear to have been consistent enough to allow good estimates. A second test of consistency was based on using the 30-parish sample for extrapolation, and testing the result in 1660 with that obtained from hearth tax estimates in 1664. In 1700, Norwich had a population of about 30,000 and Bristol 20,000, when the London population was 500,000. Vanessa Harding (The population of London, 1550-1700: a review of published evidence, *London Journal*, 15, 1990, pp 111-128) found the 1550 estimates were possibly too high and the 1700 estimates too low.

²⁸ Beier and Finlay 1986, p.10

²⁹ Smith 1973, p. 198.

³⁰ Rappaport 1989, p. 96.

In the early years of the 16th century, London's cloth exports accounted for 43 percent of the country's total woollen exports; by the mid 1540's, London's share doubled to 86 percent.³¹ Dyed cloths formed only a small proportion of exports. They came mainly from Suffolk, Gloucestershire and Kent, and were for the most part shipped directly to Spain, Russia or the Baltic.³²

The basic characteristic of textile fashion is that it is ever changing, occasionally quickly.³³ Success in industries that are affected by fashion is greatest when there is flexibility in the characteristics of the output.³⁴ If dyed woollen cloth, or light weight cloth of mixed fibres, or coloured cottons became fashionable, those producers who could obtain the dyes and adapt their procedures to the new fashion fast enough would be the most successful, and conversely there would be more frequent failures among those who could not rapidly adapt.³⁵ Dyeing could itself be an element of change in fashion, often by the introduction of a new colour, or a wider colour palate. But dyeing could also be the bottleneck, with inability to reproduce a specific colour, or when new fabrics, woven differently, or made from different or mixed fibres, involved much trained labour, or unique dyes, or patented processes.

London was a centre of many things important in the dye industry: it was the major market for entry of dyes; a major production centre for some specialty textiles; an area for dyeing of high prices fabrics; a place of exchange for fabrics produced throughout the country. It was also a place with sufficient numbers of dyers with different skills for interaction between dyers to increase the opportunities for innovation, and a place importantly involved in the growth and development of the dye industry within and

³¹ Cobb 1978, pp. 607-608.

³² Ramsay 1975, pp. 38-9.

³³ Lemire 1991, describes the rapid growth of the use of cotton after the mid seventeenth century.

³⁴ Sabel 1997, pp. 37-74. Poni demonstrates, in the story of the Lyon silk industry, many ways to deal with fashion change, including setting the fashion as a survival mechanism.

³⁵ Smith 1747, The silk weavers of Stepney and Canterbury complained they were being outdone by cheap labour in these (probably India, and China) countries, but an alternative explanation was: "when the English weavers have made lustrings for the spring dress trade, they find themselves outsold by the EIC damasks and satins, which makes the mode for the spring, so they are constrained, with vast costs and charges, to alter their fashion for the next year, when in comes more East Indian ships with goods of quite another form, and all the weavers are in the dirt again. Thus, for several years, the Canterbury and London weavers are disappointed."

outside England. It is possible that the procedures for use of the new dyes were introduced initially in London, or that experimentation went on in greater depth in London, or that a competitive advantage resulted from dyers in London being closer to supply (since the dyes entered England primarily through the London markets), with differential costs the basis for the development of a competitive advantage. This meant that a study of transmission of technology could anticipate that there would be a steady entry into the Dyers' Company, and those who completed their training would be likely to join the London Dyers' Company, rather than going elsewhere to practice their trade.

Although dyeing was carried out in many other parts of England, London was a place with a reputation of higher quality dyeing. There is an interesting example from Winchester, which shows that the reputation of London as a centre of excellence in dyeing was of long standing. Historically, "of all of the cloth-manufacturing trades in the medieval period, that of the dyer, with its elaborate dye-houses, containing expensive water-heating apparatus, and its requirements for exotic and imported dyestuffs, was probably the one which required the greatest capital investment and highest degree of entrepreneurial enterprise."³⁶ "In contrast to fulling, the dyeing of cloth and wool was an activity of great social importance, due to the cost of investment in the form of dyestuffs and the fact that first-rate traditional dyeing techniques were quite expensive."³⁷

In Winchester, before the fourteenth century, dyers appear to have been the wealthiest of the cloth-working craftsmen. In the twelfth century they were conspicuous as property-owners. But Winchester was not the place of the greatest expertise, and "the products of the Winchester dyer would certainly be ranked in the second class in comparison with the best works of London."³⁸ By the 15th and 16th centuries, fullers had displaced the dyers as major property owners. "That it should be the fullers rather than the dyers who rose to prominence may be a reflection of the nature of the cloth produced by the expanding urban industry of the 14th century." Previously, the better quality fulled cloth was imported from Flanders, while English fullers may only have

³⁶ Keene 1985, pp. 303-6, 309-10.

³⁷ Peeters 1988, pp. 175-76.

³⁸ Keene 1985, pp. 303-6. He notes that their apparent lack of a guild in the fourteenth century implied a secure economic and social status.

worked on a cheaper product.³⁹ And this pattern, of higher quality cloth being finished in a place different from weaving, had later influence on the place of dyeing and finishing of West Country broadcloth.

1.3.1 Dyes and dyeing

Techniques in dyeing vary significantly with the colours that are needed, and with the fibres used. As a result, when a dyer indicated a specialty, he often mentioned not only the fibre but also the colour, as scarlet dyer, or woad dyer, or calico printer. This meant, in addition, that the techniques learned as an apprentice might relate to a particular colour and/or fibre.

The major dyes for red and blue in England in the seventeenth century were madder, cochineal and kermes for reds, and woad, and indigo for blues, all predominantly imported, though indigenous growth of woad was expanding in the seventeenth century.. Even when the major cloth export, English broadcloth, was sent out of the country undyed and unfinished, there were significant English importations of woad, madder, cochineal and alum for use in local dyeing of cloth.⁴⁰

Woad and indigo, which both yielded the same dye, were vat dyes, that is, they dyed directly, without the use of a mordant. When used, the dye was in a chemically reduced state and was colourless when soluble, and only became coloured when exposed to air, when it precipitated, and was then insoluble. Woad came predominantly from France, Italy and Germany, while indigo was imported from the Caribbean, Central America, India, and Indonesia. During the seventeenth century, indigo displaced woad as the major source of blue dye as indigo became more readily available from the new world, and later from Asia.

Knowing how innovative changes in dyeing were introduced into practice helps understand how technology was transferred.⁴¹ An example is what happened when

³⁹ Keene 1985, p. 306.

⁴⁰ Ponting 1971, p. 23.

⁴¹ Brunello 1973, pp. 178-182. The first example of a printed book of (dye) formulas did not come from Germany or Italy, the source of most printed books in the 16th century, but came from Flanders, printed in Brussels in 1513, and deals with dyeing wool in the fleece, thread and cloth stages, and also with silk, linen, velvet and fustian. However, it was not for the craftsman, but rather for home dyers..

attempts were made to print with indigo.⁴² Indigo is soluble and colourless when in a reduced state, and is so maintained while it is in a hot bath. For its use as a dye, it has to be absorbed by the textile, while soluble, and then allowed to become blue and insoluble when exposed to air. If the indigo was to be absorbed on a textile during printing, something had to be done to retard or prevent oxidation until the cloth absorbed the soluble and colourless dye. Initial adaptations were made which allowed dyeing with lower temperatures, rather than in a hot bath.⁴³ A further innovation was the use of a chemical (arsenic tri-sulphide) to retard the rate of oxidation of reduced indigo, and allowed drawing of blue lines on white textiles with indigo (pencilling). English dyers played a leading role in development of these innovations, some of the most decisive advance in the early history of European textile printing.

A patent concerning an innovative way to print on cotton (calico) was granted to William Sherwin, in 1676, was for a period of 14 years. More is said about this process in Chapter 4. By 1700, there were calico printers in East London (Hackney, Stepney, Bow, Poplar and West Ham) as well as several locations south of the Thames.

There were a variety of dyes (madder, grain or grana⁴⁴, kermes⁴⁵, and cochineal⁴⁶) that could produce reds, and variants of red. They differed in cost, concentration and in

A later Italian book, *Plictho de larte de Tentori che insegna tenger pani telle banbasi et sede si per larthe maggiore come per la comune*, written in 1548 by a Venetian, Giovanventura Rosetti, was to "benefit those .. who wish to turn it [dyeing] to their financial advantage, by removing the information from the hands of those who despotically kept it hidden.

⁴² Floud 1960, pp. 346-348. The first step was using indigo rather than woad. Woad was used in a hot bath (170 degrees) which melts wax and other resists. With indigo, it was possible to use a lower dye bath temperature. It was then found that using ferrous sulphate (copperas) and calcium carbonate, you could use a cold dye bath. Then you could put on wax resists by using blocks, rather than doing it by hand. However, the main reason for the early disappearance of wax-resist printing in England was the fact that the English printers were the first to discover satisfactory methods for printing indigo direct, and thus dispensing with resists - whether painted or printed. There were two techniques, one, with arsenic trisulphide, called orpiment, allowed indigo to be pencilled onto a cloth, a little at a time. This developed in the early 1700's perhaps around 1730. This early technique had side effects, which included the toxicity of the arsenic, and the inability to use it with block printing, because it produced an unevenness of colour. The second method, printing by a mechanical device, had two variations. One was a block printing method that kept the dissolved indigo in a box, which appeared to be a modification of the method using mordant, except that the thickened indigo was not exposed to air. The other was to print insoluble indigo onto the fabric, and then make it soluble while on the fabric, called a China-blue process. The China-blue yielded a blue colour that was even throughout, and could be printed with a copper plate, when that became common.

⁴³ Mokyr 2002, would probably have described this as a micro invention.

⁴⁴ Red dyes, called grana or grain, from North Africa, Spain (Seville and Valencia), the Balearic Islands (Majorca), Southern France (Provence) and Greece (Crete and Corinth) were produced by the insects

quality, but were similar chemically. They all required a mordant to be effective. Without a mordant, the red colour could easily be washed off. The common mordant, alum, was effective with madder as well as the other, chemically similar dyes used to produce reds. The choice of mordant and how it was used could radically change the character of the colour produced.⁴⁷ Madder, a vegetable red dye, was produced in many countries, but the highest quality came from the Netherlands. Madder was initially the commonest dye used for red in England.

Mordant dyeing was conducted in totally different establishments, by different dyers, requiring boiling to dissolve the alum or other mordants, then boiling with madder or

Kermes ilicis and *Kermes vermilio*, which are parasitic on the oak in the Mediterranean basin, and contained *kermesic acid*. The sale of this dye had once been a monopoly of the Jews of Arles for buyers from other parts of Europe. Wischnitzer 1965, pp. 78-80, citing A Schaube, *Handelgeschichte der romanische voelker*, Munich, 1906, p. 473.

⁴⁵ Red dyes were produced by a group of insects, *Porphyrophora hameli*, living on wild grass in the Caucasus, and *Porphyrophora polonica*, which lives on the roots of a small plant in central, and eastern Europe. These insects produced *kermes*, which contains the dye carminic acid. Kermes cost twice as much as grain, and there were specialists in each. The silk threads dyed with kermes were more wear-resistant than those with madder. The variety of tonal gradations on the scale of red colours widened so much from the 14th century onward that many dyers were able to produce "false" colours, using combinations of dyes. Because one of the main elements in textile marketing was dyeing, dye centres established rules prohibiting certain dye mixtures. Problems arose when different cities had different rules.

⁴⁶ A further insect-generated red dye, *Nochezli*, was made from an insect growing on cactus. It was called in Spanish "*cochinilla*" and in English "*cochineal*." Cochineal is similar chemically to kermes, and as a result of the similarities chemically, techniques for the use of all these dyes were similar. The resulting red colours were not identical, as cochineal allowed greater variations in the red colours produced. Cochineal, which was the most expensive of the red dyes, had variations in quality, some as the result of adulteration.

⁴⁷ A colour-fast dyeing process called Turkey Red was finally introduced into London from the Levant in the mid 1700s. Tarrant 1987, pp. 37-38. The dye they used was the commonly available madder. The colour Turkey Red resulted from the use of a partially or fully saturated fatty acid (oxyoleic or trioxyoleic acid) to fix the aluminum mordant to the fibre. Using other fixing agents (biarsenate of soda, chalk, sodium phosphate, or sodium silicate) produced Alizarin Red rather than Turkey Red. In practice, Turkey Red-dyed yarn or cloth should be able to retain colour through 2 and a half years of British daylight, and withstand pressure boiling with sodium carbonate, followed by bleaching with sodium hydroxide, as well as weak caustic soda and soap boiling, as these were finishing processes used for many textiles. Its introduction is an example of the difficulty in transferring dyeing secrets to England. Costs were reduced in weaving checks since you could use unbleached cotton for the white, do the dyeing, and then the fabric was bleached once. Only cotton takes the dye to produce a vividness of colour and fastness that made the process worthwhile commercially. The secrets of the process reached Leiden in 1747, and France and England somewhat later. It would be surprising if the secrets were learned from publication of the recipes, since it took so long for the process to be understood, but it is possible it was learned from exporters of the dyers from Greece or Turkey. In 1760, the Society of Arts of England offered a premium of £50 for being able to produce Turkey Red. Even 20 years later, British dyers were still unable to reproduce the results, perhaps because they did not understand the importance of pure ingredients, and the chemical nature of the process was poorly understood. It was only in 1786, when French dyers Louis and Henry Borelle arrived in Manchester, that the English were able to duplicate the Levant process successfully, and the Borelles received a premium of £2500 from Parliament for showing the method in Manchester.

other red dyes.⁴⁸ Besides the colour, the output was different, since "dyeing in the piece was commoner with mordant dyes than with indigo because if the same quantity of mordant were used on the wool, it would, in the greater number of colours, render it unfit for spinning, weaving and fulling."⁴⁹

Those who dealt with vat dyes, the indigo dyers, developed their own special techniques. Wax resist indigo dyeing, used with linen or cotton, was separate from the use of mordant printing and madder dyeing. During the seventeenth and early eighteenth centuries, blue printing was specifically in the hands of the dyers of blue and black. Despite this specialisation, there were those who did both red and blue dyeing.

Logwood, made from boiling blocks of heartwood from the Caribbean tree *Haematoxylon campechianum*, produced a blue or black, depending on its concentration.⁵⁰ In England, in 1580, an act of Parliament prohibited the use of logwood, but this legislation was consistently ignored because of the difficulty otherwise in producing a good black dye. The dye was particularly important for hat dyers.

Other new dyes from the New World included *quercitron*, which produced fast yellows, and *annatto*, which produced yellows and reds. Innovations with use of these dyes were carried out by many dyers, but there is a written description of experiments carried out in the early and mid 1600s by Sir Theodore Turquet du Mayerne, in association with a London dyer, Fletcher. The results of the experiments were reported to the early meeting of the Royal Society.⁵¹

⁴⁸ Munro 1988, p. 24.

⁴⁹ Munro 1983, pp. 13-70.

⁵⁰ James I 1604; Gardner 1892; Fortune 1984; Wilson 1996.

⁵¹ Trevor-Roper 1993, described Du Mayerne, while the notebook with data about experiments in dyeing, in French, are in the British Library, Sloan 3423, titled *Experiments & operations en matiere de teinture faites par moi*. The British Library index says *Experiments in dyeing, described by a London dyer, Fletcher, in Chelsea, Middlesex, in 1639-50*, though the handwriting in the notebook is in French, and often signed M.

Silk dyers faced difficult problems with dyeing because of the expense of the raw silk. To obtain uniform colour, they dyed in the thread.⁵² This meant that those who learned to dye silk were learning techniques different from those dealing with wool or linen.

The rapid growth of interest in dyed cotton fabrics put all European dyeing centres on an equal footing. In such a situation, London dyers had just as great an opportunity as dyers in the Netherlands, France, Germany, Austria or Switzerland.⁵³ Although calico had been sold in England since 1550, it was not until the 1650's, when the Indian chintz was made with white backgrounds, that there was a big increase in the amount of imported Indian chintz. The change was in response to a change in fashion, but also involved changes in dyeing practice. It was easier to produce patterns with a blue (indigo) background, but fashion change led to an interest in light backgrounds, which necessitated changes in production procedures.

There was a long-standing distinction between a dyer and a colourist, with the colourist involved in printing colours, in books and on textiles, while the dyer worked only with textiles. Some cotton printers may have considered themselves colourists rather than dyers, and this distinction between dyer and colourist was embedded in guild structure, with printers (read colourists) involved in a different guild than the dyers.⁵⁴ When the technological changes of cotton printing became associated with printing mordants followed by madder dyeing, and then with indigo printing, the process often became associated, in some countries, with printers and painters.⁵⁵

The results of successful textile printing affected cotton spinning, cotton sales, and other aspects of the textile industry besides dyeing and calico printing also "served as a principal channel for creating links between technology and science."⁵⁶

⁵² I visited a modern silk dyeing firm in Suffolk in 2003, and learned that even today, with water purifiers, and careful control of acidity and temperature, variations occur with the source of the silk, the way it has been wound, the processes of degumming, in addition to the purity and quality of the dyes used, so that it is difficult to reproduce a particular colour. These problems must have been more significant for silk dyers over 300 year ago.

⁵³ Homburg 1999, pp. 219-244.

⁵⁴ Homburg 1999, p. 227.

⁵⁵ Homburg 1999, pp. 228-9.

⁵⁶ Thomson 1991, p. 57.

Many London dyers were small operators, capable of little increased output if there was increasing demand. The equipment involved kettles, stoves, water, and space for storage of dyes, coal, and the hanging of wet cloth. There were, however, some larger firms in the calico printing business. Organizational changes in the use of labour and space might allow some economy of scale. Water was important in defining a useful location, and dyers' premises in the seventeenth century clustered near the Thames and other rivers flowing into the Thames.⁵⁷ Availability of water may have been a limiting factors in relation to economies of scale. A location south of the Thames was particularly important for calico printers, as places in which to bleach and dry cotton.

However, available clean water may have led to more dyers working south of the river Thames. This may explain a redrafted Dyers' Company charter of 1685 which authorised a search of six miles, and in 1704 was further modified to authorise searches up to 10 miles around the city (LG, MS 8164, vol. 1, p. 105 and LG, MS 177).

1.3.2 Textile production and dyeing

The relation of English textile production to dyeing in London depended on a variety of circumstances. Regional textile production could produce: undyed cloth, sold for export or sent from local production centres to other centres for dyeing; cloth dyed locally, and then either sold locally or sent for export; or cloth sent to London for dyeing, and their either exported or sold locally. It is unclear how to measure demand by regionally produced textiles for work by London-based dyers.

"The European cloth industry of the sixteenth and seventeenth centuries was not a single industry but a congeries of industries whose relationships and fortunes were the result of continual competition for markets by their varied and changing products. Technology, patterns and fashions were borrowed (or purloined), raw materials bought, sold and smuggled, and finished products marketed, all on a massive scale, involving Italian, Dutch, French, Polish, Silesian and German industries, as well as English."⁵⁸ Along with changes associated with differential costs of production, and profits from sale, a third variable was the interaction of the markets and production. As a result (although the local market was

⁵⁷ Mitchell 1995a, pp. 153-175.

⁵⁸ Wilson 1960, p. 209-11.

important, and without understanding the local circumstances one cannot understand the whole), to understand changes in the cloth industry in England, one needs also to know about changes in other countries.

As an example, when the Dutch were unable easily to obtain English wool supplies, they turned to wool from Spain. In the process, since Spanish wool was more expensive, and finer, the Dutch produced expensive woollens, competing with those from Wiltshire, and built up their market, relinquishing their market in New Draperies to the English, except for a portion, which they could actually do better.

And with production changes, there was also labour movement. Those Flemish weavers who had gone earlier to Colchester, making bays and says, were lured back to Leiden in 1577, and they then developed a similar industry in Leiden, having originally come from what is now Belgium.

“With the spread of the skills in English dyeing and finishing, a large volume of British cloth exports found its way to world markets via the Dutch entrepot, while the Dutch function became increasingly restricted to distribution.”⁵⁹

1.3.2.1 Wool and dyeing

From the twelfth century to the end of the seventeenth century, wool and woven woollen cloth provided the major sources of income from English exports.^{60 61} The

⁵⁹ Wilson 1960, p. 220.

⁶⁰ Ponting 1971, p. 14-15. Wool quality is almost equated to the fineness of the fibre diameter. A 64s wool, the most common of Spanish Merino qualities, is 20.9 microns in diameter, while a 56s, common for a crossbred English sheep variety, is 26.4 microns, and there are coarser wools down to 28s. Within wide limits, it is the length of the fibre that determines what kind of yarn and cloth can be made. Short wool fibres make woollens, while long fibres make worsteds, but both fabrics can be made from wool fibres of the same diameter, ie, quality. However, it is only recently that fine wool is used for worsteds. In the seventeenth century, fine wools were used for woollens and coarse ones for worsteds. Short wool is usually fine, while long wool is coarse. A 28s quality wool may be 15 inches long, while a 70s wool from a Merino will not exceed 2 inches. Again, the shorter wool has more coiling, or crimp, with the number of crimps proportional to the fineness of the fibre.

⁶¹ Kerridge 1985, p. 3. Although all sheep might yield both kinds of fibre, sheep kept fat, used for mutton, and in folds yielded predominantly short fibre used in woollen cloth, while sheep that roamed, were kept lean, and were not used predominantly for mutton yielded longer fibres, used in worsted. "So it came about that the division in agriculture between permanent tillage and permanent grassland was reflected, in 14th century Flanders, in a split between draperie and saiterie, between the carding of short wools and the combing of long wools, between carded and combed woollens. ...Two kinds of land (use) gave rise to two kinds of sheep, two kinds of wool, and two kinds of woollens".

word "cloth" was reserved, in the English language of that time, for materials made from the shorter-fibre wools, while other fabrics, some made from mixed fibres, were given many other names.⁶² Worsted was the name, not of a cloth, but of a type of yarn.

Over the course of the seventeenth century, there developed English niche-product textile production from four dominant areas: the West Country producing fine woollens; Devon producing serges and pepetuanas; East Anglia producing bays and worsted stuffs (made in Essex and Norwich respectively) and Yorkshire producing cheap versions of the finer woollens, serges and bays. The markets served by these production centres were similarly segmented, with the West Country's fine woollens sent to markets in southern Europe and the Levant, while Yorkshire's cloth was almost exclusively exported to Holland. There was an overlap with both Devonshire's serges and East Anglia's bays and worsteds going to Holland, Germany and the Western Mediterranean.⁶³

During the first third of the eighteenth century, fashion change was affecting trade patterns, particularly evident in the export sector. There was expansion of the stuff trade of Norfolk (dyed locally or using dyed yarns, perhaps dyed elsewhere) at the expense of the Devonshire serge and pepetuanas and Essex's bays, while the West Countries fine woollens in the Levant suffered at the expense of French woollens, also made with Spanish wool. And Yorkshire-made cloth was increasingly able to compete with all three varieties of woollens, worsteds and mixed fibres. In association with the changes in marketing centres were changes in the structure of the production entrepreneurs, with producers taking a greater role in marketing. Dyeing was important because of rapidly changing market factors. Producers tried to know, in advance of production, what colour, and what finish was needed in order to sell.

⁶² Munro 1994, p. xi. The true woollen [is] a generally heavy and dense fabric, thoroughly fulled and shorn, and necessarily woven in both warp and weft from short-stapled wools, greased to avoid damaging the delicate fibres. This is, in contrast to much lighter-weight fabrics, woven with coarser, straighter, long stapled "dry" wools, in both warp and weft, generally uncurled and unshorn. In English tradition, the two were contrasted as woollens and worsteds, while the Franco-Flemish (Netherlands or Low Countries) traditions distinguished between "greased and dry" draperies, or *draperies ointes* and *les draperies sèche* or *légères*.

⁶³ Smail 1999, pp. 15-31.

The West Country (Wiltshire-Gloucestershire) production process included dyeing, if they were Stroudwater reds or Uley blues, but most production was not dyed at all. Production was under the control of the clothier, who sold to a London factor, who sold on the cloth, mostly undyed. When dyed for export in London, it was done for members of the Levant Company. A difference between Wiltshire and Gloucester producers was that in Wiltshire, goods were made from dyed-in-the-wool material, or occasionally with threads dyed single colour or medley (mixed colour). Almost all of the Wiltshire cloth was sold locally in Bristol or Salisbury. The Levant Company merchant was able to choose the colour and finish based on his knowledge of the market. This indicates the continued importance of the London dyers.

Devonshire serges and perpetuanas were lighter than the woollens of the West Country, and were relatively cheap. Production was carried out by small and medium sized manufacturers, with a rather decentralized system. With the exception of goods sold at regional fairs, these producers were not involved in finishing and marketing of the cloth, which was sold in Tiverton or Exeter, and there dyed and finished, or perhaps sold in Bristol for export. The merchants in Exeter were often London merchants who were buying for export to southern Europe, and had the cloth dyed and finished in London. In "contrast, most goods destined for Holland and Germany (the other major export market for the region's cloth) were finished in Exeter before being exported. In terms of value, half of the export came from Exeter, and half from London. In terms of value, £800,000 to 900,000 pounds a year was one quarter of the export value of textiles from England."⁶⁴ As the percentage dyed in London changed to favour London in the mid eighteenth century, presumably there were fewer jobs for Exeter dyers, and more for London dyers. Devonshire exports of serges to southern Europe increased in value from 1700 to 1760, while the exports from London decreased after 1730 to insignificant amounts.

When the London trade declined after 1730, so did the dyeing of serges and perpetuanas in London. One wonders if London-trained apprentices returned to Devonshire at this time. Or did other changes make up for the difference?

⁶⁴ Smail 1999, p. 19, with data from Hoskins 1935, pp. 43-4 and 67-9.

This depended on who did the training of dyers in Devonshire (Exeter) and Gloucestershire (in Stroudwater and Uley)

Stuffs, from East Anglia, were a family of thin cloths, made with a worsted warp and weft. Within this frame, there were many different stuffs. The Norwich weavers were in the forefront of those campaigning for the banning of import of calicos from India. The marketing of the product, mostly producers by small manufacturers, went into the hands of London merchants who handled the export to southern Europe. Little is written about the dyeing of yarns for the stuffs.

Another East Anglian product, Suffolk cloth, "was true blue, dyed in the wool." The clothiers used woad, or from about 1580, a mixture of woad and indigo, to give their wools a range of shades called, in descending order of darkness, sad blue, blue, azure, watchet, plunket and huling.⁶⁵ It is not clear where the dyers were trained.

The West Yorkshire producing firms were small, and rural. The whole marketing scheme was to imitate other well known cloth products, but be cheaper."⁶⁶ One Halifax merchant tried to sell directly to the Philadelphia market, rather than going through a London middleman, but failed miserably. Being timely with production, having credit available, and producing the right colours made marketing through London more profitable than his direct effort.⁶⁷ Producers and merchants learned to shift from maximizing profits by manipulating the marketing system to maximizing profits by changing the mode of production, keeping up with fashion changes, and using existing information systems to be more responsive to demands for colour, and for timely delivery.

"There is a temptation to assume that change in the dyeing and finishing sectors was somewhat peripheral to the development of the industry as a whole. For many types of cloth it was, after all, an operation quite distinct from spinning and weaving, often carried out by different people possessing a quite circumscribed, if crucial, set of skills. But that temptation should be resisted, not only because the dyeing and

⁶⁵ Kerridge 1985, p. 17.

⁶⁶ Smail 1999, pp. 22-7.

⁶⁷ Smail 1999, pp. 79-80.

finishing processes were crucial to the cloth's sale, but because these processes were integral to the relationship between production and marketing."⁶⁸

1.3.2.2 Silk and dyeing

A review of the English silk industry in 1776, long after the early years of this study, found it consisted of 50 masters, 600 journeymen and 250 apprentices. The average size of a firm was 20 individuals, with 2 apprentices, allowed by statute, and the rest journeymen. The observer wrote that the owners were prosperous, owned buildings and equipment, and bought their dyes. At this time, apprentices were asked to pay a premium of about 30 guineas.⁶⁹ In the few silk dyer wills mentioned, Thomas Triquet's estate was valued at GBP 1000, John Peck, a scarlet dyer of silk, son of Edward Peck, also a silk dyer, had an estate in 1749 valued at £ 40,000 in 1749.⁷⁰ In the period 1731-66, when there is information that there were several long chains of silk dyers, five silk dyers went bankrupt. They included: John King (1734) E. Tilbury (1742); J. May (1749); D. Franckling (1766) (Franckling seems to be the same person in the Dyers' Company as D Franklin and D. Franklyn) and W. Smith (1766).⁷¹

1.3.2.3 Linen fabrics and dyeing

Linen and woollen cloths were the two principal textiles of early modern Europe.⁷² Linen was the most important manufactured import into pre-industrial England. Until the end of the eighteenth century, imports of linen ranked second only to imported groceries in total value.⁷³ Linen accounted for about 15 percent of total imports in 1700 and roughly the same in 1750, falling thereafter to about 5 percent in 1800, when its place was overtaken by cotton imports. Cotton and linen played interchangeable roles in the history of European textiles. When undyed, both were relatively inexpensive to produce, and unlike coarser wool fabrics, they were

⁶⁸ Smail 1999, p. 137.

⁶⁹ Rothstein 2003, in a recent review of the silk textiles in the pre modern period.

⁷⁰ Rothstein 1961, pp. 144-8, citing a 1776 report by Ancker.

⁷¹ Rothstein 1961, Appendices 2.3 and 2.5.

⁷² Clarkson 2003, p. 473. While Clarkson does not mention dyeing, she cited Kellenbenz 1976, pp. 121-2, who mentioning that in the late sixteenth century linen goods were "bleached, dyed and finished." in southern Germany, and further mentioned that Swabian weavers, brought to Saxony, went over to coloured linens and black-dyeing was started.

⁷³ Harte 1973, p 75.

relatively inexpensive to produce, and unlike coarser wool fabrics, they were comfortable to handle and wear. Both were composed of cellulose fibers, making them amenable to bleaching rather than the more involved and costly process of dyeing. However, although imports were growing, and linen thread was playing a role in the development of fustian, little can be found that described the places linen was dyed, and the role of London dyers in dyeing of linen for users outside of London. Descriptions of the linen industry mention dyeing of thread to make checks, and printing on linen. The original finishing centres for linen in Britain were around London.⁷⁴ Until the latter-day experiments with dyeing of and printing on cotton, in imitation of the Indian calicos, Europeans concentrated instead on a diverse line of serviceable, attractive and low priced products, "mostly light-to-medium weight cloth suitable for undergarments, bedding and summer clothing, and fustian, which had a linen warp and a cotton weft."⁷⁵ It is unclear what London linen dyers were dyeing, and for whom, and how this changes over time.

1.3.2.4 Stockings and dyeing

There was great variety in the methods used in production of knitted stockings, with changing locations depending on available machines and materials, which included silk, wool and worsted, among others.⁷⁶ Some stockings may have been piece dyed, while others used dyed yarns.⁷⁷ "Men's knitted stockings could be yellow, red, green, blue or violet, white, black or grey. Women's stockings were more daring in their colour, of green, red, white, russet, tawny and what else not."⁷⁸ Since many were knitted with designs, those were mostly probably yarn-dyed. It is unclear whether the dyeing was done locally, where the stocking were knitted, or whether the yarn was purchased from yarn merchants who themselves bought from larger centres. In Chapters 4 and 5, when dyers indicated they were stocking dyers, it is unclear whether they were dyeing yarn or dyeing stockings in the piece. By the end of the seventeenth century, the hand knitting industry was geographically widely dispersed, with the commonest locations rural communities, with large populations of

⁷⁴ Durie 1979; Evans 1985.

⁷⁵ Schneider 1989, p. 180.

⁷⁶ Kerridge 1985, pp. 133-37.

⁷⁷ Kerridge 1985, pp. 164-68.

⁷⁸ Thirsk 1973, p. 58, citing P. Stubbs, *The Anatomie of Abuses*, 1595, pp. 9-10, 31, 47.

smallholders. The towns, which were renowned stocking centres, were the markets lying within or near the farm regions.⁷⁹

1.4 Main primary sources

Original data concerning dyers in London, for portions of the period 1632-1826, are available from the records of the Worshipful Company of Dyers of London. Other sources have been used to amplify the Dyers' Company data. The following is a survey of the primary sources that were used

1.4.1 Livery Company records

Dyers' Company register of apprentice binding (Guildhall Manuscript MS 8169).⁸⁰

This register deals with the period 1706-1746. It records not only the name of the apprentice and master, but also the name of the apprentice's father, the father's residence by town and county, the father's occupation, and whether the father was dead at the time of apprentice binding. From 1710 through 1746, there are occasionally notations concerning the premium paid at the time of apprentice binding, indicating the failure to pay a premium, or the amount paid. On some occasions, when the premium was high, the figure is also spelled out, as, for example, "eight hundred sixty pounds." A further entry in this register records whether an apprentice binding, once begun, was turned over to another master, and gives the name of that other master, and the date of turnover. The Genealogical Society of London published data from this register⁸¹, and I was able to obtain the file they used. Because it was not part of the standard data set, the publication did not include information about premia. However, I added information about premia to the published data. Data from this register are discussed in Chapters 2, 3, 4 and 5

⁷⁹ Thirsk 1973, p. 63

⁸⁰ London Dyers 1706b.

⁸¹ Webb 1999.

Dyers' Company register of apprentice binding (Guildhall Manuscript MS 8171).⁸²

There are three volumes under this number, arranged alphabetically and by year of binding. They begin in 1649 and continue up to 1826. The data before 1706 do not have information about the father's residence or occupation. These data are discussed in Chapters 2,3,4 and 5.

Dyers' Company registers of freedom admissions (Guildhall Manuscript MS 8167).⁸³

The first three volumes of this register cover from 1650 to 1826. The second volume, 1706-1735, indicates whether entry to the Company was by apprenticeship, by patrimony, redemption, patrimony and redemption, apprenticeship and redemption, or special decisions made by the Mayor and/or Council. In the second volume are notations of payment of a premium and the amount. The third volume, 1735-1826,⁸⁴ is similar to the second, but does not include data on premia. Entry by apprenticeship and redemption occurred when the master was apprenticed in a livery Company but not the Dyers' Company. Occasionally, someone who joined the Company by apprenticeship did not appear in the record of apprenticeship bindings. These individuals may have been apprenticed outside the Company, or the records were incomplete. The latter was particularly true around 1703-1705. These data are discussed in Chapters 2,3,4 and 5.

Volume 1 of MS 8167 occasionally records an occupation (or **dyeing specialty**), which the new freeman planned to join. The first data concerning occupation appear on 4 October 1651, with an entry as silk dyer. Although the majority of the intended occupations were given simply as dyer, they also included: hat dyer, linen dyer, litho dyer, silk dyer, black silk dyer, stocking dyer, stuff dyer; other

⁸² London Dyers 1649a; London Dyers 1649b; London Dyers 1706c.

⁸³ London Dyers 1650; London Dyers 1706a; London Dyers 1735.

⁸⁴ London Dyers 1735.

the seventeenth century. Additional data concerning the dyeing specialty of the masters are found in the Renter Wardens register (MS 8154), in the tables that concern housekeepers, and is occasionally in the quarterage records (MS 8172).⁸⁴

Dyers' Company registers of freeman admissions, arranged alphabetically and by year of admission (Guildhall Manuscript MS 8168).⁸⁵

There are three volumes, the first of which begins in 1649. The earlier registers were destroyed in the Great Fire of London in 1666. Although the dates of binding and of entry into the Company are given as day, month, year, I transcribed only the year. This means that, since the recordings considered a year ended in March rather than December, some 7-year periods of apprenticeship were recorded as either 8 or 6. The data from 1649-1705 are occasionally incomplete. To attempt to rectify this, I have used the registers dealing separately with apprentice binding and entry into the Company.

Dyers' Company Court minute books (Guildhall Manuscript MS 8164).⁸⁶

This register is in three volumes, beginning in 1682, and going up to 1746. It records actions taken by the Company against members who refused assignments in the livery, were behind in their fee payments or had other difficulties, and other activities of the Court.

In the Minute Book for 1682-1700, financial data appear for each meeting of the the Company officers, along with comments about the regulatory activities of the

⁸⁴ London Dyers 1632.

⁸⁵ London Dyers 1706b.

⁸⁶ London Dyers 1682b; London Dyers 1695; London Dyers 1726.

Company in relation to individual masters. The financial data relate both to those being bound, those made free, as well as quarterage payments. Because the remaining quarterage books are incomplete, ending in 1667, these quarterage data were only analysed as a way to determining the size of the Company in 1683 and 1684. The results are presented in Chapter 3.

Dyers' Company Renter Warden's account books (Guildhall Manuscript MS 8154).⁸⁸

This register is in three volumes, beginning in 1682 and going up to 1771. The volumes record, in annual format, with some omissions, fees paid to bind an apprentice, fees paid to become free of the Company, other expenses, and monies received from housekeepers. The Renter Warden's book for 1682-1720 has summaries of income and costs of the Dyers' Company, including annual lists of the names of apprentices who were presented to the Officers of the Company, and for whom a payment was made (2 shillings 6 pence). This is also a separate entry of names of those who joined the Company and were made free of the City, for whom a payment was made (3 shillings 4 pence); and a listing of those masters who became housekeepers, with a payment of 10 shillings, which is a fee to authorise apprentice binding. The term "housekeeper" is used in Dyers' Company records rather than the more standard householder, but the two terms appear to be synonyms. The relevant individuals are identified by occupation and location, with almost all of them being identified as dyers; however, they also included one cook, one tobacconist and one heelmaker in 1683 and 1684. Information about housekeepers is recorded in a separate table in Chapter 3. After 1684, information concerning housekeepers only includes their name. The number of housekeepers is about 7 to 10 per year. In almost all instances, the names in any year do not repeat those of the previous year. MS 8185,⁸⁹ in 1721, records Company properties. The names and addresses are similar, in several instances, to those given to addresses used by housekeepers.

Dyers' Company biennial quarterage list (Guildhall Manuscript MS 8172).⁹⁰

⁸⁸ London Dyers 1682a; London Dyers 1720; London Dyers 1729.

⁸⁹ London Dyers 1721.

⁹⁰ London Dyers 1632.

This register records payments of quarterly dues to the Company by masters, and journeymen, biennially, from 1632 to 1667, with some years missing. In 1640, the clerk recorded, for that year only, not only the payment but also the residence and whether the person was employed, and if so, by whom. This single year's data allows some measure of the activity of **journeymen**. No other quarterage books are available. These data are discussed in Chapter 3.

1.4.2 Other primary sources

Other sources that include occasional references to dyers were also consulted. These include: probate inventories from 1665-1736; baptism, marriage and death registers in several parishes; the 1692 London quarterly tax poll; the 1696 petitions to Parliament; the 1719 petition to Parliament; the 1721 jury poll in several London Wards; livery polls in London elections for 1700-1792

1.4.2.1 Dyers' Company membership list (1696).

At the head of the City stood 26 aldermen, one for each ward, who were elected for life. There was a Common Council, with 230 representatives. In 1625, there were 4,000 liverymen in the City, which included about around 50-100 (1-2 percent) from the Dyers' Company.⁹¹

A listing of the livery in the Dyers' Company in 1696 shows one warden, one renter warden, 21 Assistants (whose names are presumably given in order of their seniority), 96 livery, again in order of seniority, and 216 freemen.⁹² The spelling of some names

⁹¹ Doolittle 1982, pp. 3-4.

⁹² Dayners 1965, p. 83. *Prime Warden*: Richards, William; *Renter Warden*: Waldo, Joseph. *Assistants*: Watt, Tyrone; Wilson, Archibald; Mandsell, Richard; Wilmot, William; Lacton, Owen; Foord, George; Houblon, J.A.; Weekes, John; Devon, James; York, Roger; Clemens, Walter; Cradd, Robert; Andrews, Matthew; Houblon, Peter; Marshal, Christopher; Henley, William; Bowens, Richard; Stocke, John; Jones, Henry. *Livery*: Collins, William; Ebbett, Edward; Hamblin, Isaac; Morris, Philip; Langbridge, John; Spence, Henry; Jurin, John; Kenrick, Matthew; Solomon, Lazarus; Bill, William; Burghill, Charles; Allin, George; Grimshaw, John; Simonds, Henry; Greene, Thomas; Gingrell, Henry; Donne, Robert; Wasling, Leonard; Reade, Stephen; Harbin, Joseph; Chapman, Ezra; Appleburg, Thomas; Baker, Thomas; De Tiller, Jacob; Denew, John; Chappel, Richard; Jones, Matthias; Carbonnel, J.N.; Houghton, Gilbert; Ashwin, William; Weeks, Thomas; Carrington, Edmund; Woolley, William; Mandrellson, William; Beale, Robert; Howlett, John; Baker, Thomas; Ledward, John; Allen, Thomas; Holland, Ferdinando; Riggs, Edmund; Weissfeldt, John; Andrews, William; Allen, James; Bagwell,

in this listing differs from that found in other Dyers' Company records, with examples like: Mandsell rather than Mansell, Cradd rather than Tradd, Lazarus Solomon rather than Lazarus Coleman, Appleburg rather than Applebury, De Tiller rather than De Lillier, Cleers rather than Cleese, Dudley Heighham rather than Beddingfield Heighham, but the identity is clear.

1.4.2.2 Post-mortem inventories and accounts from the London Orphans Court.

From 1665 through 1736, post-mortem inventories (similar to probate inventories) and accounts of the London Orphans Court identify the specialty of 24 dyers.⁹³ They included twelve wool dyers, six silk thread dyers, three dyers of mixed fabrics, one linen dyer, one hat dyer, and one cotton-ribbon dyer. These data show that some of the wool dyers specialized in reds, others in blues. In addition to specialization in fibres, some specialized in using cheap dyes for red or cheap dyes for blue. Among the silk thread dyers, two of the six specialized in cheap dyes for red. The data are tabulated below, and the analysis is presented in Chapter 4 on occupations.

1.4.2.3 Data from wills identifying occupation as a dyer.

The Index to **Testamentary Records in the Archdeaconry Court of London**, (1363-1649 and 1661-1700) identifies dyers in **7** wills from 1300-1399, **4** from 1400-1499, **8** from 1500-1599, and **56** from 1600-1697, for a total of **75** wills.⁹⁴ Occupational data from wills are discussed in Chapter 4.

The Index to **Testamentary Records in the Commissary Court of London** (London Division, 1571-1625, and 1626-1649 and 1661-1700)⁹⁵ records, under trades and conditions, the **name, status a citizen, occupation, parish, and year**. The indices

Samuel; Whiston, James; Coleman, John; Bayley, Thomas; Soames, John; Mead, William; Wilkinson, John; Wood, John; Davies, Richard; Burton, Robert; Pawle, Daniel; Atkins, Henry; Rose, Stephen; Pullen, Jacob; Saunders, Richard; Litchfield, Edward; Keay, John; Pascall, James; Lethieullier, Abraham; May, Henry; Spooner, Jacob; Bayley, John; Wyld, James; Robinson, Thomas; Willington, Richard; Monk, John; Noble, Benjamin; Russell, John; Baker, William; Lethieullier, William; Cole, George; Leman, Neville; Read, Major; Sherwood, John; Cleers, Stephen; Singleton, John; Wintle, William; Hayward, Robert; Gregory, William; Broomfield, Thomas; Webster, William; Mooney, John; Davis, Edward; White, Thomas; Betterds, William; Trymmer, John; Hammersley, Thomas; Keay, James; Wright, John; Heigham, Dudley; Benson, John.

⁹³ Mitchell 1995b.

⁹⁴ Fitch 1979; Fitch 1985a.

⁹⁵ Fitch 1985b; Fitch 1992; Fitch 1996; Fitch 1998.

list **13** wills from 1571-1599, **54** wills from 1600-1699, and **1** will in 1700, for a total of **68** wills. The dyers included those identified only as dyers, one dyer and joiner, cloth dyers and silk dyers. Occupational data from these wills are discussed in Chapter 4.

1.4.2.4 Baptism, marriage and burial registers in several parishes.

From London Parish registers, four silk dyers were identified, two in the period for which I have Dyers' Company records.⁹⁶ Dr. David Marsh has noted that when searching for information on occupations in these records much depended on the parish tradition of recording and the parish clerk, and sometimes the minister. Occupation is only sometimes mentioned in these records, often for blocks of several years, but only in some parishes. Even when occupation is mentioned, there is no necessary link with a given company. Overall, it was less common to record occupation/company membership in the earlier part of the century, but perhaps because of a growing interest in recording/classifying etc. There appear to be more examples of blocks of occupational recording towards the end of the seventeenth century; however, even then it remains erratic.

1.4.2.5 Tax records

London first quarterly poll tax (1692).

Parliament approved the imposition of eight main poll taxes on England and Wales during the second half of the seventeenth century. Although they may appear as a series, no two poll taxes were the same.⁹⁷ The 1692-93 quarterly poll taxes and the 1694 4 shillings in the pound Aid have been used to collect information about occupations.^{98 99} A computer file, which includes occupational data from a thesis, is

⁹⁶ These data were obtained by David Marsh, as he was searching for information about gardeners.

⁹⁷ Arkell 1992, In a tabulation of the dates and titles of the Parliamentary acts, p. 179, concerning the poll taxes, item 7 relates to 1692 3 May, 3 August, 3 November, 3 February, 3 William & Mary c. 6 (1691) An act for raising money by a Poll payable quarterly for one year for the carrying on a vigorous war against France, and then, on 1693 April, 4 William & Mary c. 14(1692) relates to an Act for review of the quarterly Poll granted to their majesties in the last session of this present Parliament, called 4 shillings in the pound aid.

⁹⁸ Alexander 1992.

available at the Centre for Metropolitan History.¹⁰⁰ These occupational data are discussed in Chapter 4 on occupations.

1.4.2.6 Petitions

Petition concerning calico printing (1696).

In 1696, a petition to the House of Commons by those who printed on imported Indian cotton (calico) was signed by 50 men. However, few of the signatories' names appear in the registry of the Worshipful Company of Dyers of London; some of them are identifiable from a series of volumes, which record the freedom of the City of London after 1681.

Petition concerning calico printing (1719).

In 1719, another set of petitions related to further legislative efforts to limit use of calico. The potential legislation led to many publications, which were sent to those involved in reviewing the legislation, all of which were reviewed by Rothstein.¹⁰¹ One result of the 1719 petitions was the commissioning of a report, which appeared in 1721, concerning the size and character of calico printing firms in London. The report is described in Chapter 4 on occupations.

1.4.2.7 Jury poll in several London wards (1721).¹⁰²

A London jury duty poll in 1721 shows the results of a house-to-house survey, and lists the houses as they appear on the street. The records show name, house number

⁹⁹ Spence 2000, p. 129, tabulates occupations attributed to more than 100 individuals in the city of London in 1692. Although shoemakers, barbers, joiners, coopers, butchers, vintners, silk trades, tobacco trades were mentioned separately, dyers were not included because there were only 98

¹⁰⁰ Data base compiled from the 1692 poll Tax for the City of London (with additional information from the returns for 1694 and 1698) by James Alexander, 'The economic and social structure of the City of London, c. 1700', unpublished PhD thesis, University of London, 1989.

¹⁰¹ Anonymous 1719b; Anonymous 1719a; Defoe 1719; Defoe and Rey 1719; Merchant 1719; Rey 1719a; Rey 1719b; Anonymous 1720a; Anonymous 1720i; Anonymous 1720c; Anonymous 1720m; Anonymous 1720f; Anonymous 1720g; Anonymous 1720o; Anonymous 1720n; Anonymous 1720k; Anonymous 1720d; Anonymous 1720e; Anonymous 1720l; Anonymous 1720b; Anonymous 1720j; Anonymous 1720h; Defoe 1720a; Defoe 1720b; Eagleston and Gurney 1720; Elking 1720; Rothstein 1964.

¹⁰² CLRO 1721.

and occupations of the householder, and so allow definition of areas with many people following the same occupation.¹⁰³ The wards represented are Bassishaw, Bread Street, Castle Baynard, Cordwainers, Farringdon Within and Farringdon Without, Vintry and Walbrook. The householders included one hat dyer (John Ellery), one calico printer (John Perkins), three silk dyers (John Pearce, John Tatnall and John Thorne), and 20 dyers without an identified specialty, a total of 25 dyers. The occupational information is analysed in Chapter 4.

1.4.2.8 London directories with data about dyer's occupation.

Several London directories identify dyers and their specific occupational specialties. The Little London Directory of 1677 is a collection of names of the merchants living in and about the city of London, with an alphabetical list of names and addresses.¹⁰⁴

The Kent Directory of 1736 contains an alphabetical list of the names and places of abode of the directors of companies, persons in public business, merchants and other prominent traders in the cities of London and Westminster and borough of Southwark, and includes the names of 7 dyers.¹⁰⁵

The Intelligencer or Merchants assistant, 1738, contains an alphabetical listing the names and places of abode of all the merchants and considerable traders throughout the cities of London and Westminster and the borough of Southwark, includes 11 dyers, 6 of whom were identified in the Kent Directory. Five were not mentioned in the Kent Directory, and one from the Kent Directory is not included.¹⁰⁶ The occupations are used in Chapter 4.

¹⁰³ Laurie Lindly, a PhD student at the Centre for Metropolitan History, directed my attention to the 1721 manuscript, which includes furniture makers, which is her interest.

¹⁰⁴ Lestrangle 1677.

¹⁰⁵ Kent 1736. The names and occupations of the seven dyers were: John Couffmaker, scarlet-dyer, Wandsworth; Thomas Crutchley and Coleman, dyers, Deadman's Place, Southwark; Hodgson and Hawtaine, dyers, Wandsworth; William Keller, dyer, Deadman's Place, Southwark; Pugh and Willis, Dyers, Maze in Southwark; Selman and Warner, grain dyers, Old Ford; Thomas Wilson, grain dyer and Turkey merchant, at Bow or at the Sword-blade Coffee House.

¹⁰⁶ Meadow 1738. The names and occupations of the 11 dyers are: John Boyfield, dyer, Gravel Lane, Southwark; John Corner, dyer, Southwark; John Couffmaker, scarlet dyer, Wandsworth; Thomas Crutchley and Coleman, dyers, Deadman's Place, Southwark; Hodges and Boyfield, dyers, at the Old Swan; Hodgson and Hawtaine, dyers, Wandsworth; William Keller, dyer, Vauxhall (in 1734 it was Deadman's Place, Southwark); John Peck, scarlet dyer, Red Lion Street, Spitalfields; Selman and Warner, grain dyers, Old Ford; Thomas Smalley, dyer, Southwark; Willis, the Maze, Southwark. (presumably the Pugh and Willis of 1736)

1.5 Completeness of Dyers' Company records

One problem with using the Dyers' Company records to identify transmission of technology is uncertainty about completeness of the Company records, and how that changed over the period of study. In checking for completeness, the failure to find a name may result from lost record pages, incomplete record keeping, and difficulties with spelling, or errors in reading the records.¹⁰⁷

It is possible to check the completeness of the Dyers' Company recording by comparing a series of independent listings of Company members with information in the Dyers' Company registers themselves. Independent listings include records of livery company polls at the time of municipal elections. Moreover, since joining the livery generally occurred several years after joining the company, lists of liverymen can be used to test the completeness of the Dyers' Company registers. Two livery company polls, those of 1750 and 1792, identify not only the voter's company, but also the profession (occupation) of the voter. For dyers, this allows a measure of how often a Dyers' Company member was not practicing as a dyer, and how often a practicing dyer was not a member of the Dyers' Company. Both of these situations will be discussed later in this chapter.

Tabulation of the completeness of Dyers' Company records, using results from several livery Company polls, is given in Table 1.1. A separate column of Table 1.1 indicates the proportion of Company members who had joined by patrimony. This will be discussed further in Chapter 3.

A separate estimate of completeness from the entire Dyers' Company membership can be made from the results of a 1696 oath of allegiance to William III. In 1696, an oath was taken by all willing livery company members to defend the king, William III, against a suspected plot.¹⁰⁸ The clerk and beadle of the Company, and 319

¹⁰⁷ Beier 1986, pp. 142-7.

¹⁰⁸ The oath, signed by members of 80 livery Companies, included the signatures of 321 members of the Dyers Company. Its wording was: Whereas there has been a horrid and detestable conspiracy formed and carried on by Papists and other wicked and traitorous persons for assassinating his Majesty's royal person in order to encourage an invasion from France to subvert our religion, laws and

Dyers' Company members signed the oath. Overall, 91 percent (289/319) of the names were found in my Dyers' Company record review. There were signatures of one warden, 26 court assistants, 93 liverymen, and 199 yeoman dyers. Of these, the freedom records were present for 88 percent (23/26) of the assistants, 94 percent (88/93) of the liverymen, and 89 percent (177/199) of the yeoman dyers. For some of the missing records, apprentice-binding records were found.¹⁰⁹

Table 1.1 Dyers' Company recording of dyers' names compared with names in livery polls for London members of Parliament

Year of livery company Poll	Number of Dyers' Company liverymen	Percent of Dyers' Company names found	Percent joining the Company by patrimony
1700 ¹¹⁰	263		
1710 ¹¹¹	151	100	6
1722 ¹¹²	143	94	7
1727 ¹¹³	175	94	7
1750 ¹¹⁴	96	95	16
1768 ¹¹⁵	82	94	13
1781 ¹¹⁶	84	97	33
1792 ¹¹⁷	119	97	36

Sources: London Guildhall library, London livery polls in 1700, 1710, 1722, 1728, pp. 49-52, 1750, 1768, 1781, and 1792, and London Dyers, MS 8167 Vol.1-3, MS 8169, MS 8171 Vol.1-4.

liberty. We whose names are hereunto subscribed do heartily, sincerely and solemnly profess, testify and declare that his present Majesty King William is rightful and lawful King off these realms and we do mutually promise and engage to stand by and assist each other, to the utmost of our power in the support and defense of his Majesty's most sacred person and government against the late King James and all his adherents, and in case his Majesty come to any violent or untimely death (which God forbid), we do hereby further freely and unanimously oblige ourselves to unite, associate and stand by each other in revenging the same upon his enemies, and their adherents, and in supporting and defending the succession of the Crown according to an Act made in the first year of the reign of King William and Queen Mary, entitled 'An Act declaring the rights and liberties of the subject, and settling the succession of the Crown'.

¹⁰⁹ Of the three Assistants with missing freedom recording, two were apprenticed in the Company. Of the five liverymen with missing freedom records, two were apprenticed in the Company. Of the twenty two yeoman with missing freedom records, five were apprenticed in the Company.

¹¹⁰ Anonymous 1700, The numbers of dyers in the livery is greater than anticipated from other listings. In addition, some names in 1700 appear to be appropriate only for 1710. As a result, I have not used this listing for comparative purposes.

¹¹¹ Anonymous 1710, includes names but no addresses.

¹¹² Anonymous 1722, includes names but no addresses.

¹¹³ Anonymous 1728, pp. 49-52. includes both names and addresses.

¹¹⁴ Anonymous 1750, includes names, addresses, company and occupations.

¹¹⁵ Anonymous 1768, includes names and addresses.

¹¹⁶ Anonymous 1781, includes names and addresses.

¹¹⁷ Anonymous 1792, includes names, addresses, company and occupation, in whatever part of the Kingdom.

Combining the results of livery polls over one century, and the estimate based on the 1696 oath suggests that the Dyers' Company records can produce a meaningful measure of activities of dyers up to the 1750s, when increased entry to the Company, by patrimony and redemption, suggests that a significant proportion of new members might no longer be dyers.

1.6 How many London dyers worked outside the Company?

One weakness in using Dyers' Company records to study London dyers is that many dyers may fall outside the Company records, either because they were members of other livery companies or because they were not registered in any livery company. It is sometimes difficult to analyse the two possibilities separately. Some information is available from several separate sources.

1.6.1 London quarterly tax poll (1692).¹¹⁸

The 98 dyers identified in the 1692 quarterly tax poll included 18 silk dyers, 3 hat dyers, 9 journeymen and 68 dyers with no mentioned specialty. Seventeen percent (17/98) do not appear in my data file of the Dyers' Company members.

1.6.2 London jury poll (1721).¹¹⁹

Sixteen percent (4/25) of the 25 named dyers identified by a poll for members of the jury in 1721 were not in my data file of Dyers' Company members.

1.6.3 London livery polls (1750, 1792).¹²⁰

The 1750 poll of liverymen in several London Companies included 96 liverymen of the Dyers' Company. Four percent of the names (4/96) were not found in my Dyers'

¹¹⁸ Alexander 1992; Arkell 1992; Spence 2000.

¹¹⁹ CLRO 1721.

¹²⁰ Anonymous 1750; Anonymous 1792.

Company record review. Thirty four percent (33/96) were not dyers by occupation.¹²¹ Searching through the identified occupations in other livery companies polled, there were only 5 dyers who were not in the Dyers' Company.¹²² They included 2 hat dyers, one each in the Upholders and Feltmakers, and 1 scarlet dyer in the Sadlers, 1 calico printer in the Coach and Coach Harness Makers, and 1 silk dyer in the Bowyers. Using the total of 68 practicing dyers (63 in the Dyers' Company livery, and 5 dyers in other livery companies) suggests that 93 percent (63/68) of dyers in livery companies in 1750 were members of the Dyers' Company.

The 1792 poll of liverymen in several London Companies included 119 liverymen of the Dyers' Company. Three percent of the names (4/119) were not found in my Dyers' Company record review. Thirty four percent (40/119) were not dyers by occupation.¹²³ There were 18 with the occupation given as dyers who were liverymen of 8 other Companies. The occupations of these 18 dyers included 8 silk dyers (two each in the Clothworkers, Merchant Taylors and Skinners, and one each in the Cordwainers and Innkeepers), 5 scarlet dyers (three in the Saddlers and two in the Clothworkers), and 5 dyers (two in the Clothworkers, two in the Grocers, and one in the Merchant Taylors). There were no calico printers. Among the listed occupations of members of the Dyer's Company were 5 calico printers, 4 hat dyers, and 1 linen dyer. Using the total of 97 practicing dyers (79 in the Dyers' Company, and 18 dyers in other livery Companies) indicates that 81 percent (79/97) of dyers in livery Companies in 1792 were members of the Dyers' Company.

Table 1.2 summarises the results from the four sources. Both the 1692 quarterly tax poll and the 1721 jury poll may have identified incompleteness in the Dyers' Company records as well as dyers who were members of other Companies. If the occupations recorded in the livery polls are representative, then the Dyers' Company records appear to represent London dyers who are members of livery Companies quite

¹²¹ Anonymous 1750. The 33 non-dyer occupations were: 2 brokers, 1 coal merchant, 1 customs house officer, 3 distillers, 1 draper, 1 grocer, 4 hosiers, 1 lighterman, 3 linen drapers, 1 meterman, 1 merchant, 2 musicians, 1 officer in wood street, compter, 1 porter at bridewell, 1 stable keeper, 1 tallow chandler, 1 watchmaker, 3 weavers, 1 wine merchant, 1 woollen draper, 2 with no occupation stated. The dyers and their specialities were as follows: 5 calico printers, 51 dyers, 4 hat dyers, 1 linen dyer.

¹²² Anonymous 1750.

¹²³ The occupations included: attorney, chinaman, coal merchant, confectioner, cotton factor, distiller, gentleman, glass and china merchant, grocer, hosier, innkeeper, linen draper, mason, oilman and tallow chandler, ship broker, silkman, stock broker, tea broker, weaver, wine merchant.

accurately. By contrast, there is no easy way to measure the proportion of London dyers who were not members of livery Companies.

Scarlet dyers and the Sadlers Company appeared in both the 1750 and 1792 livery polls, which may indicate that some specialties, such as scarlet dyeing, are underrepresented in Dyers' Company records.

Calico printing was a rapidly developing occupation at the end of the seventeenth century and in the eighteenth century. It would therefore be interesting to know which livery companies included calico printers as their members, to estimate the proportion of calico printers who were not members of the Dyers' Company. This, however, was not possible. In 1792, there were no calico printers in the livery of any other livery company outside the Dyers Company. In 1750, there was one in 1750.

Table 1.2 Proportion of practicing London dyers in any livery Company who were Dyers'

Year		
1692	London quarterly tax poll	83 (81/98)
1721	Jury poll	84 (21/25)
1750	livery poll	93 (63/68)
1792	livery poll	81 (79/97)

Company members

Sources: CMH computer file; CLRO Mss 83/3; London Guildhall London polls, 1750 and 1792.

In the 1792 poll of liverymen, the Clockmakers' Company had 102 in the livery, and 13 percent (13/102) were not clockmakers by occupation. There were an additional 17 percent (17/102) who were liverymen in 12 other companies.¹²⁴ This suggests that livery members not involved in the occupation of the company were infrequent for

¹²⁴ Anonymous 1792.

companies whose members were involved in highly technical work, like the clockmakers and dyers, regardless of the occurrence of entry by patrimony and redemption. However, by 1792, even companies such as the Dyers' Company and the Clockmakers' Company were beginning to resemble other less technical companies, like the Mercers, Drapers, and Merchant Taylors, with an increasing proportion of livery members with occupations unrelated to the Company.

1.7 Chapter 1 Summary

Information from the Worshipful Company of Dyers of London (Dyers' Company) has been used infrequently, mostly because the earliest remaining Company registers, which begin in the early seventeenth century, have too many lacunae. More specifically, different kinds of records survive for different periods. This makes it hard to present a consistent picture for a long period. Despite these problems, Dyers' Company records spanning the period 1649-1826 have been reviewed. The Dyers' Company registers concerning apprentice binding and freedoms, including the name of the apprentice, his master, dates of binding and joining, the father's name, occupation, residence, and whether the father was dead at the time of binding, are complete only for 1706-1746. The 1706-1746 freedom register contains information about turnovers of apprentices from one master to another, and, after 1710, often records the amount of premium paid at binding. Earlier Dyers' Company data, from 1649-1703, lack information about the father, turnovers, and premia, and later data, after 1746, also lack some details.

The completeness of the available Dyers' Company records of membership has been independently verified by comparison with records from outside the Company, and estimated to be at least 94 percent complete from 1710-1792. It makes sense that the records are similarly complete in recording Company membership in the earlier period 1660-1710.

Although there was no measure to determine what percent of dyers were not members of a livery Company, there was a measure of the percent of dyers, members of other livery Companies, who were not in the Dyers' Company. In 1750, 93 percent of dyers in livery Companies were members of the Dyers' Company. In 1792, 81 percent

of dyers in livery Companies were members of the Dyers' Company. At the same time, it was possible to observe that in both 1750 and 1792, 34 percent in the livery of the Dyers' Company were not practicing dyers.

In the subsequent chapters of the thesis, Chapter 2 examines different aspects of recruitment and training processes; Chapter 3 discusses joining the Company, and measurement of the frequency with which those who started an apprenticeship in dyeing in London after 1640 became a journeymen, rather than starting in a business of their own; Chapter 4 discusses occupational specialisation among dyers, with data obtained from many different sources; and Chapter 5 develops information about chains of transmission of technology, using all the data accumulated concerning apprenticeship, joining the Company, and occupation.

Chapter 2 Recruitment of apprentices

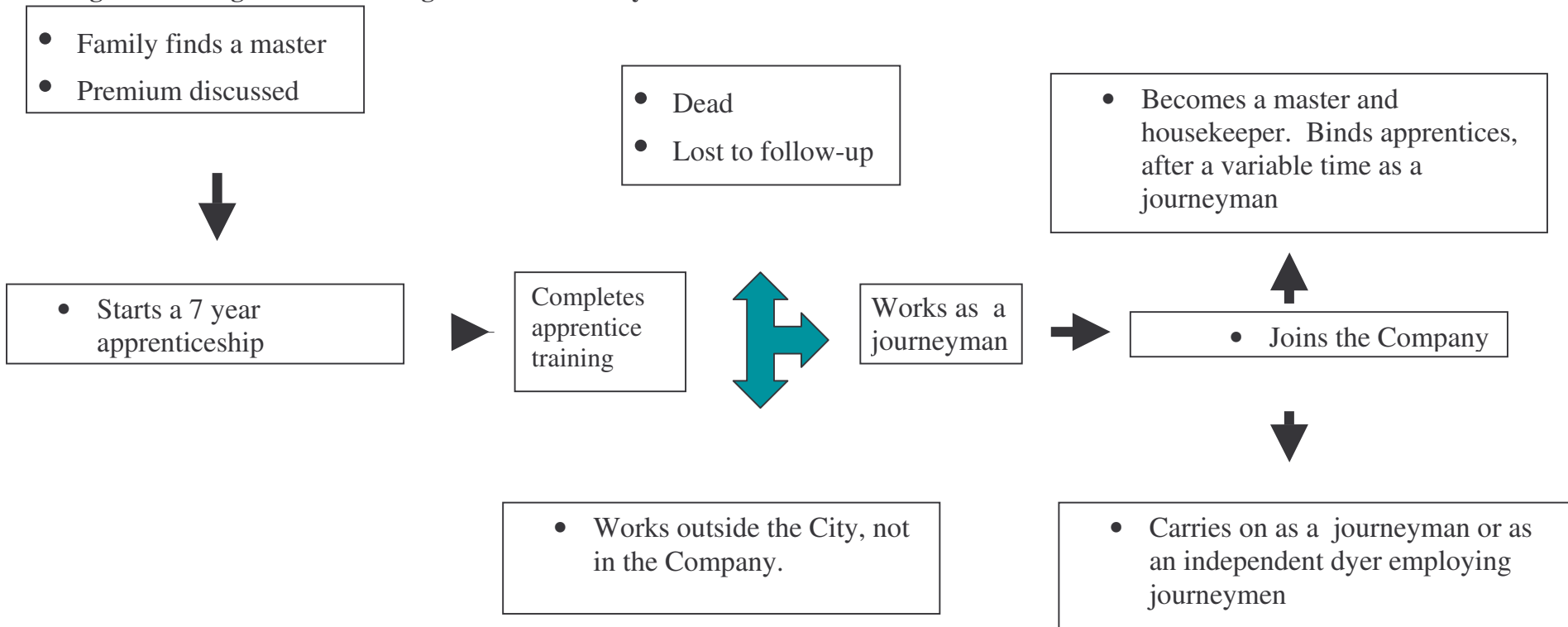
2.1 Becoming a dyer's apprentice in London

The most frequent officially sanctioned method of learning to be a dyer was by apprenticeship. Urban regulations required that a 7-year apprenticeship take place, under the tutelage of a recognized teacher, commonly a member of a guild. If the apprenticeship took place in London, this had to be a member of a livery company. The Dyers' Company official record of apprentice bindings made it possible to acknowledge the completion of an apprenticeship seven years later, and allowed entry into the Company.

This chapter concerns apprentice binding in the Dyers Company as a preliminary for a study of the transfer of dyeing skills. In the absence of biographies, letters, or other personal documents, answers to questions about how dyeing technology was transferred in London in the seventeenth and eighteenth centuries must refer to the Dyers' Company records, as we saw in Chapter 1. Some of these records show the numbers, family background, gender and premiums paid on binding of apprentice dyers. They also give an unfortunately incomplete indication of when and how often an apprentice changed masters through turnovers during the statutory seven years of training. This chapter begins with an example (2.1) of how one became a dyer's apprentice in London. The chapter continues with discussions of: (2.2) Numbers of apprentices bound, 1650-1829; (2.3) Family characteristics; (2.4) Premiums paid on binding; (2.5) Female apprentices; (2.6) Changing masters (turnovers); (2.7) Apprentices bound by individual masters, 1649-1746; (2.8) Selecting a master; (2.9) Chapter 2 summary.

Figure 2.1 illustrates the process of apprentice binding. The process of finding a master must have begun with investigations of all available opportunities, although perhaps an early decision was made to search for opportunities in dyeing. This aspect of the process would only be known from biographies, and none have been found. Once past these steps, selection of a master and discussion of a premium, the apprenticeship begins.

Figure 2.1 Stages in the training and career of a dyer



Subsequently, if there is completion of the 7-year contract, there is often work as a journeyman for some period, usually short but occasionally long. If the decision is made to join the Company, new opportunities exist, but more often further time is spent as a journeyman, before becoming a housekeeper and binding an apprentice. An example of the process concerns one apprentice chosen from among those in the records.

In 1710, there were 75 apprentices bound in the Dyers' Company. One was Humphrey Rock, son of John Rock, from Fownhope, Herefordshire. In this cohort of 1710, Humphrey was the only apprentice whose father was a carpenter. Eight of the 75 fathers were dyers, 8 husbandmen, 5 gentlemen, 3 mariners, and the others included a mercer, a merchant, a grocer and a haberdasher; for 8 of the 75 apprentices, no father's occupation was recorded. Fownhope lies in the Wye Valley, midway between Hereford and Ross-on-Wye. That year there were no other bound apprentices from Herefordshire, but during the next 30 years there were a total of 23, whose fathers' occupations were recorded as yeoman (11), farmer (4), shoemaker (3), and gardener (3); other occupations included a dyer, a gentleman, and one widow.

William Holland, Humphrey's master, had himself been bound in 1691 as an apprentice to Edward Aston, a member of the livery of the Dyers Company. When William Holland completed his apprenticeship in 1698, he joined the Company and went immediately into business for himself. He paid the Company a 10-shilling fee (recorded as a fee to become a master and housekeeper) to regularize his start in business. He bound Joseph Keen that same year, as his first apprentice; Joseph's father's occupation and place of origin are unknown because records of such data are available only after 1706. The fact that William set up in business immediately after completing his apprenticeship suggests that his family or connections had capital to help him, or that he started in partnership with his master or with some other senior figure. Moreover, the Holland family may have had previous connections with dyeing, as Ferdinando Holland, perhaps a relative, was an active member of the Dyers Company livery before William started his own training.

In 1703, William Holland bound his second apprentice, Edward Dinsdale. Again, there is no information about Dinsdale's family. The year of binding, only five years after that of the first apprentice, may mean that Joseph Keen left before completing his 7-year

apprenticeship, either by agreement or by abandonment; we do know that Keen never joined the Company. By contrast, when Edward Dinsdale completed his 7 years of training in 1710, he did join the Company, although he never became a housekeeper, nor do Company records show that he subsequently bound any apprentices. Thus, Edward Dinsdale probably became a journeyman and remained one all his life.

It thus appears that William Holland housed only one apprentice at a time, binding a new one soon after the previous one left. This suggests that an effective information system existed that made it possible to identify someone interested in becoming a dyer's apprentice, even from outside London, and for the binding to be completed within a short time.

In 1710, William Holland bound Humphrey Rock who by then was his third apprentice. In 1717, when Humphrey completed his apprenticeship, William Holland bound George Dinsdale, son of Thomas, a husbandman from "Winsingdale" (possibly Wensleydale), Yorkshire, as his fourth apprentice. Other Company records show two members of the same family bound to the same master, and it is probable that George and Edward Dinsdale (William's second apprentice) were related. No premium was paid, either for Humphrey Rock or his successors. George Dinsdale joined the Company in 1724. He did not become a housekeeper, or did he subsequently bind an apprentice in the Dyers' Company; he too, like Edward, may have become a journeyman.

Humphrey Rock paid his entry fees of 3s 4d and joined the Company in 1717. He was then required to pay a quarterly fee of 6d like all Company members. He did not become a housekeeper until 1740, however, and then bound his first and only apprentice. It is likely that Humphrey Rock worked for another dyer as a journeyman for the 23 years between 1717 and 1740. The late decision to become a housekeeper may have depended on accumulating sufficient capital to start a business.

Humphrey Rock was, none the less, comparatively successful. He was one of the 22 out of 75 (29 percent) of the apprentices of the 1710 cohort who joined the Company; and he was one of only five of those 22 (23 percent) whose name appears in the record books as having gone on to bind his own apprentice.

The example of William Holland and Humphrey Rock illustrates several points, which will be discussed in greater detail below. First, an effective information system existed to enable apprentice binding in the same year as a vacancy occurred in the training program. Second, many apprentices joined the Company but did not themselves subsequently bind apprentices, or waited a long time before doing so. Third, the Dyer's Company 10 shilling fee, which William Holland paid in order to become a master and housekeeper, may have restricted some from binding apprentices. Fourth, the time between joining the Company and becoming a master and housekeeper was probably spent as a journeyman dyer.

2.2 Numbers of apprentices bound, 1650- 1829

The fire of London in 1666 destroyed many Dyers' Company records, with remaining records of apprentice binding only available from 1649. Moreover, the register beginning in 1649 has only limited information. The standard form for recording information about apprentice binding, which includes the father's name, residence, and occupation, only becomes available in Dyers' Company records after 1706. The occasions when an apprentice left one master to continue his training with another one, a mechanism called a turnover, are also incompletely recorded.

The statute of artificers (5 Elizabeth C. 4, 12 January, 1562) mandated a 7 year apprenticeship. The 7 year term might affect the annual intake, as apprentices were bound to fill vacancies resulting from earlier apprentices leaving (Table 2.1). To adjust for this effect on annual figures, Figure 2.2 includes a 7-year moving average.

There were several years (1668-69, 1674, 1682-83, 1698, 1708, and 1714) when there were over 90 apprentices bound; the only year with over 100 bound was 1668 with 109 (Figure 2.2 and Table 2.1). The 7-year smoothing of the data reveals that the annual recruitment binding of apprentices in the Dyers' Company from 1649-1829 displayed four distinct periods. Annual entries rose from about 40 to about 75 from 1649-70, possibly following a previous reduction in recruitment as a result of the Civil War. From about 1670, annual recruitment fluctuated between 60 to 80 bindings per year for half a century. Within this steady state, there appears to have been a cyclical element of about 5 years (Figure 2.2 and Table 2.1). Assuming that the peak and trough years

measure a significant variation in demand for apprentices, one might expect an inverse variation in the amount of premium requested at the time of binding. If the variation in numbers bound led to differences in available labour when the 7-year training period of each cohort was completed, the percentage joining the Company might have been affected. That is, did a larger (smaller) number of bindings lead to a larger (smaller) number of individuals joining the Company? Second, did the cyclical nature of bindings reflect changes in the demand for apprentices, which might in turn be related to the business cycle? If so, might high (low) supply of apprentices relative to demand be reflected in high (low) premia? These two hypotheses were tested as follows:

The data for all apprentices bound in the peak years and for all apprentices bound in the trough years were compared, to see (1) if there was a difference in the percentage of apprentices in the two groups joining the Company; (2) how long it took, after finishing their apprenticeship, for them to join the Company, a period compatible with time spent as a journeyman; (3) if there was a negative relationship between premia and binding.

The years of peak binding (from Table 2.1) were: 1655, 1663, 1668, 1674, 1682, 1687, 1692, 1698, 1708, 1714, and 1722, while the trough years were: 1653, 1659, 1665, 1672, 1678, 1685, 1688, 1694, 1702, 1709, 1715, and 1727. There were 966 apprentices in the peak-years group and 564 in the trough-years group.

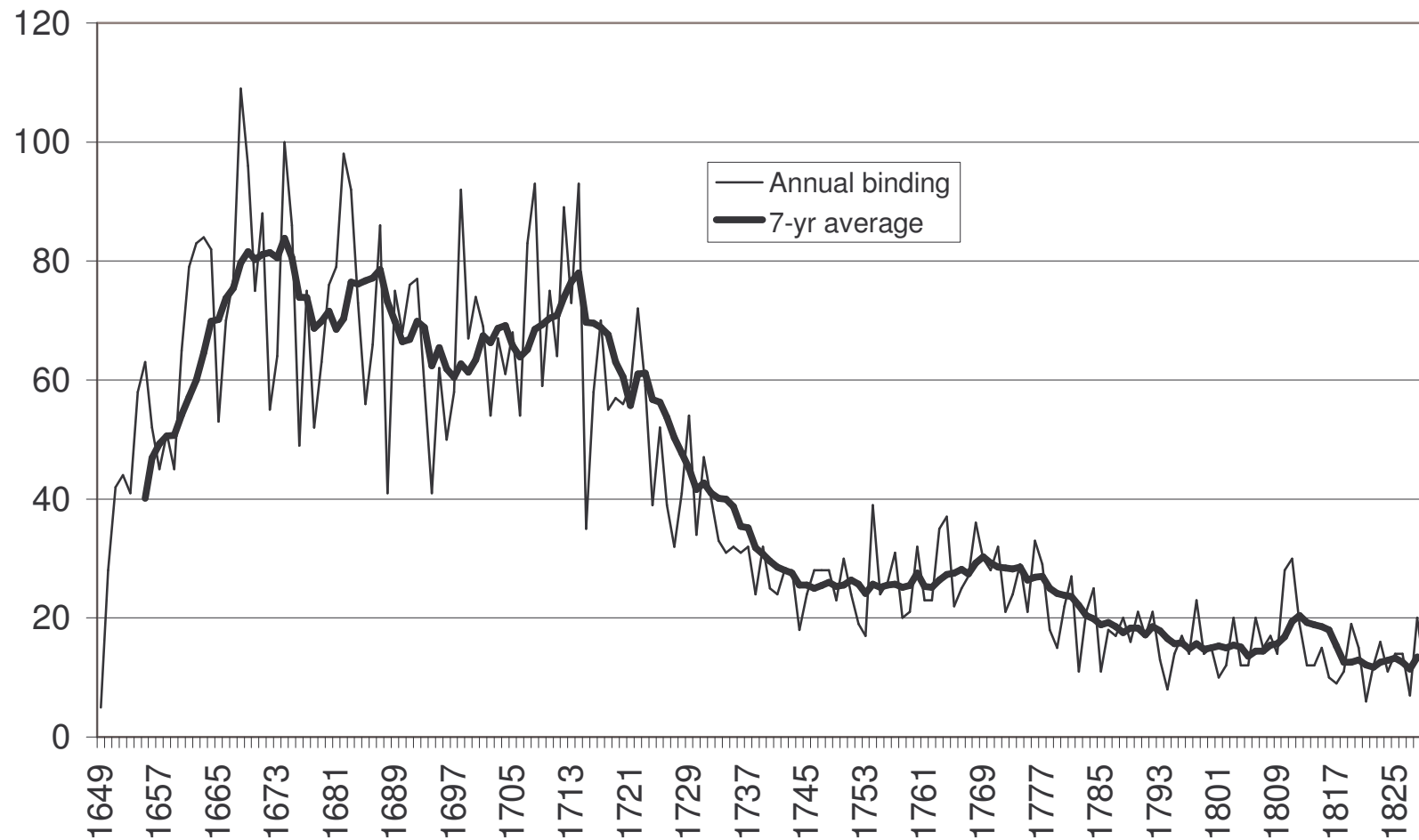
The evidence does not indicate any significant differences. First, 44 percent of the apprentices from the peak years (429/966) joined the Company in the peak-years group as compared to 46 percent (260/564) from the trough-years. Second, 23 percent (97/429) from the peak-years group joined the Company three or more years after finishing their apprentice training, as compared to 24 (63/260) from the trough-years.

Table 2.1 Apprentices bound by year, 1650-1829

Year	Bound		Year	Bound		Year	Bound		Year	Bound		Year	Bound		Year	Bound		Year	Bound			
1650	28		1675	87		1700	74		1725	52		1750	30		1775	21		1800	15		1825	14
1651	42		1676	49		1701	69		1726	39		1751	24		1776	33		1801	10		1826	14
1652	44		1677	75		1702	54		1727	32		1752	19		1777	29		1802	12		1827	7
1653	41		1678	52		1703	67		1728	41		1753	17		1778	18		1803	20		1828	20
1654	58		1679	70		1704	61		1729	54		1754	39		1779	15		1804	12		1829	11
1655	63		1680	76		1705	68		1730	34		1755	24		1780	22		1805	12			
1656	52		1681	78		1706	54		1731	47		1756	26		1781	27		1806	20			
1657	45		1682	99		1707	83		1732	40		1757	31		1782	11		1807	15			
1658	51		1683	92		1708	93		1733	33		1758	20		1783	21		1808	17			
1659	45		1684	73		1709	59		1734	31		1759	21		1784	25		1809	14			
1660	65		1685	56		1710	75		1735	32		1760	32		1785	11		1810	28			
1661	79		1686	66		1711	64		1736	31		1761	23		1786	18		1811	30			
1662	82		1687	86		1712	89		1737	32		1762	23		1787	17		1812	19			
1663	84		1688	41		1713	73		1738	24		1763	35		1788	20		1813	12			
1664	82		1689	75		1714	93		1739	32		1764	37		1789	16		1814	12			
1665	53		1690	68		1715	35		1740	25		1765	22		1790	21		1815	15			
1666	71		1691	76		1716	58		1741	24		1766	25		1791	17		1816	10			
1667	77		1692	77		1717	70		1742	28		1767	27		1792	21		1817	9			
1668	109		1693	59		1718	55		1743	28		1768	36		1793	13		1818	11			
1669	96		1694	41		1719	57		1744	18		1769	30		1794	8		1819	19			
1670	75		1695	62		1720	56		1745	24		1770	28		1795	14		1820	15			
1671	88		1696	50		1721	59		1746	28		1771	32		1796	17		1821	6			
1672	55		1697	58		1722	72		1747	28		1772	21		1797	14		1822	12			
1673	64		1698	92		1723	59		1748	28		1773	24		1798	23		1823	16			
1674	100		1699	67		1724	39		1749	23		1774	29		1799	14		1824	11			

Sources: London Dyers, MS 8171 Vol.1, 2,3 and 4.

Figure 2.2 Annual apprentice binding and 7-year average, Dyers' Company 1649-1829



Source: Dyers' Company, MS 8171 Vol 1 2, 3, and 4.

Another measure analysed was the premium paid at the time of binding. As stated above, one might expect that when apprentice supply is high relative to demand, the premia requested would also be higher than average. The only available data concern years after 1710, when there are 2 peak years and 2 trough years. During these four years, 54 percent (49/90) of apprentices in the peak years group paid a premium of £ 5 or higher, compared to 42 percent (14/33) from the trough years. Although limited, the evidence does suggest that premia were, at least in part, determined by demand and supply of labour. Still unexplained is the possible significance of whatever cyclical activity is present. However, this aspect cannot be further explored with the present information on premia paid in the Dyers' Company; it might be usefully explored with more complete data from other Companies.¹

Returning now to the general trend (Figure 2.2), between 1720s and the 1750s, annual apprenticeship recruitment fell at a steady rate to about 25 per year; it then remained at this level until 1785, when the annual recruitment of apprentices fell again sharply to about 15 per year. There is no clear explanation for the changes in the 1720s and the 1780s, although weaker enforcement of regulations may have played an increasing role during the later years.

The decline from 1715 to 1744 may, however, be just measuring a reduction in the number of dyers trained in London, as an increasing number was probably being trained in other areas. It is also possible that the decline relates simply to a decrease in recorded bindings, as a result of weakening guild control of entry into the craft. Decreases in recorded bindings of apprentices have been observed in other Companies, but some began earlier and some began later than 1715. For example, the Grocers bound about 150 apprentices per year in the 1630s and only 60 apprentices per year in the 1690s, and bindings to the Weavers' Company and to the Butchers' Company display a similar trend²

¹ The Society of Genealogy has only recently (March, 2005) obtained a data set concerning premia that may allow a fuller analysis of premia.

² Grassby 1995, p. 141, notes an overall change in apprentice numbers bound in London from 1,250 per year in the 1650s, 1,850 in 1690, and 1,939-4,000 in 1700. Clearly, not all London Companies apprentice bindings declined.

2.3 Family characteristics

2.3.1 Economic background

In discussions of the aspirations of the so-called middling sort, it has been suggested that the choice of apprenticeship was influenced by the expectation of improving one's social standing.³ In defining the financial characteristics of those of the middling sort in London, Earle found dyers in the middle financial layer of the middling sort, along with shipbuilders, ropemakers, brewers, sugar refiners, soapmakers, coachmakers, and printers.⁴ One might expect, therefore, that dyers would try to improve their social standing by sending their sons to other occupations with greater opportunities for financial gain. But Riello, writing of the Cordwainers Company, which had a lower economic status than the Dyers' Company, noted that even after 1710 and continuing to the end of the eighteenth century a high proportion of sons followed the occupation of their father.⁵ Thus, the choice of to which occupation to apprentice one's son was the result of a compromise between the wish for greater financial opportunities, and exploitation of the social and economic contacts already established through the existing family business.

Within each field of activity, whether as a goldsmith, dyer, merchant tailor, or others, there were some specialties were more financially rewarding than others. Among the Goldsmiths, it might be goldsmith banking; among dyers, it might be silk or calico dyeing; while among merchant tailors it might be overseas cloth sales. It is difficult to establish whether there is a link between the family background of the apprentice, and the specialization present at final employment. Perhaps gentlemen and esquires tried to apprentice their sons to masters who had increased opportunities for financial gain. That is, did the esquire's children more commonly become silk dyers, or cotton printers? Unfortunately, for the Dyers' Company, data concerning specialization, which will be discussed in Chapter 4, are only available before 1696, while family data are only available after 1706. As a result, such a link between family background and career choice cannot be examined.

³ Mascuch 1994, pp. 182-183 found that 28 percent of a sample of those writing autobiographies in the period 1600-1750, (a group identified by Matthews 1950; Matthews 1955), followed the occupations of their fathers. None in the period were dyers.

⁴ Earle 1994, p. 145.

⁵ Riello 2002, p. 148.

2.3.2 Geographical origins of apprentice's families, 1706-1746

The migration field of apprentices to the London companies changed as the population of the metropolis increased. The regions that furnished apprentices to London guilds were scattered across much of England in the sixteenth century, but by the eighteenth century, a far greater proportion of apprentices were recruited from London itself and the surrounding counties.⁶ Wareing's summary of different Companies' data (Table 2.2) shows that from 1654-1690, the percent of apprentices coming from London itself rose from 18.9 to 31.4 percent. The percentage from the Midlands fell from 36.6 to 29.5 percent, and the percentage recruited from the Northern counties remained at about 10 percent. However, because data for the Dyers' Company are only available after 1706, none of the earlier studies of apprentice recruitment mentions the Dyers' Company. In one rather comprehensive study, Wareing placed Middlesex, Essex, and Surrey in the Home Counties, which include, in addition, areas adjacent to London, like Wapping, Spitalfields, Stepney, Shadwell, and Southwark.⁷ To make my evidence comparable with Wareing's, I have added a combined line to Wareing's table, for London plus the Home Counties, which takes this into account

Evidence for the Dyers' Company appears to match that collected by Wareing. In the period from 1706 to 1744, the largest number of Dyers' Company apprentices in each 5-year period came from the Home Counties, while the next highest number came from the Midlands, until 1720-24, when London itself took second place (Table 2.3)

⁶ Wareing 1980, p. 243, Table 1, which includes data from the Stationers, Fishmongers, Grocers, Cooks, Carpenters, Fletchers and Longbow string-makers.

⁷ Wareing 1980. The counties within regional divisions are those used by S. R. Smith (Smith 1973, in his study of London recruitment of apprentices in 1630-1660. The groups are:

Home Counties: Hertford, Essex, Middlesex, Surrey, Kent, and Sussex.

Midlands: Bedford, Buckingham, Oxford, Northampton, Huntingdon, Berkshire, Warwick, Leicester, Worcester, Stafford, Hereford, and Shropshire.

Northern counties: Northumberland, Durham, Cumberland, Westmoreland, York, Lancaster, Cheshire, Derby, Nottingham, Lincoln, and Rutland.

Eastern counties: Norfolk, Suffolk, and Cambridge.

South and West: Cornwall, Devon, Dorset, Somerset, Wiltshire, Gloucester, Hampshire, and Monmouth.

Wales by itself.

London by itself.

Other: Isle of Wight, Scotland, Ireland, and Jersey.

Table 2.2 Region of origin of apprentices and freemen in London, by number and percent (excluding dyers)

REGION	1654-74	1676-94	1690	1710-20	1740-50
London	341 (18.9)	213 (28.8)	486 (31.4)	387 (51.7)	245 (57.2)
Home counties	289 (16.1)	147 (19.9)	190 (12.3)	102 (13.6)	64 (15.0)
London and Home	630 (35.0)	360 (48.7)	676 (43.7)	389 (65.3)	309 (72.2)
South and West	271 (15.1)	94 (12.7)	186 (12.0)	63 (8.4)	29 (6.8)
Midlands	659 (36.6)	193 (26.1)	457 (29.5)	108 (14.4)	55 (12.9)
Eastern counties	40 (2.2)	19 (2.6)	38 (2.5)	22 (2.9)	8 (1.9)
Northern counties	162 (9.0)	59 (8.0)	157 (10.1)	55 (7.3)	19 (4.4)
Wales	33 (1.8)	8 (1.1)	25 (1.6)	4 (0.5)	0 (0)
Other	5 (0.3)	6 (0.8)	9 (0.6)	8 (1.1)	8 (1.9)
Total	1,800	739	1,548	749	428

Source: Wareing 1980: Table 1.

The percentage of apprentices coming from the combined London and Home Counties rose steadily from 33 percent in 1705-09 to 76 percent from 1740-44, while the proportion coming from the Midlands remained at an average of about 18 percent (range 12-21) (Table 2.3b). None the less, in the period 1710- 1750, London lagged almost 30 years behind in terms of its importance for dyer's apprentices compared to what Wareing found for other Companies. When from other Companies London's contribution was about 30 percent in 1690, for the Dyers' Company, it was 9 percent in 1705-09. In 1740-50, when the contribution from London to other companies was about 55 percent, the contribution from London for the Dyers' Company was 18 percent. There was also a difference in the contribution of Dyers' Company apprentices from the Home Counties as compared to other Companies. The Home Counties contributed a greater percentage of dyers than Wareing found for other companies in the period 1710-1750.

Table 2.3a Regions of origin of London Dyers' apprentices, 1706-44 (NUMBER)

Region/ Years	1705-9	1710-14	1715-19	1720-24	1725-29	1730-34	1735-39	1740-44
London	26	62	46	50	37	45	14	23
Home	71	155	123	122	104	86	89	73
London+Home	97	217	169	172	141	131	103	96
Midlands	62	80	54	48	33	27	31	15
Northern	25	28	18	14	8	10	6	7
Eastern	1	5	5	2	2	1	3	1
South & West	33	30	20	32	17	9	6	5
Wales	1	9	4	7	2	0	1	0
Other	1	1	3	3	3	1	1	0
Unknown	73	23	3	7	11	6	1	2
Total	293	393	276	285	217	185	152	126

Source: London Dyers, MS 8169.

Table 2.3b Regions of origin of London Dyers' apprentices, 1706-44 (PERCENT)

Region/ Years	1705-9	1710-14	1715-19	1720-24	1725-29	1730-34	1735-39	1740-44
London	9	16	17	18	17	24	9	18
Home	24	39	45	43	48	47	59	58
London+Home	33	55	62	61	65	71	68	76
Midlands	21	20	20	17	15	15	20	12
Northern	9	7	7	5	4	5	4	6
Eastern	0.3	1	2	1	1	1	2	1
South & West	11	8	7	11	8	5	4	4
Wales	0.3	2	1	3	1	0	1	0
Other	0.3	0.3	1	1	1	1	1	0
Unknown	25	6	1	3	5	3	1	2
Total Percent	100	100	100	100	100	100	100	100

Source: London Dyers, MS 8169.

For other companies, the percentage remained at about 14 percent, while for the Dyers' Company the percentage rose from 24 percent in 1705-09 to 58 percent in 1740-44. However, when the contributions of London and the Home counties are viewed together, the Dyers' Company and other Companies show a similar picture, with the percentages of apprentice bindings increasing from about 30 to 70 percent. Overall, it appears that for London families, becoming an apprentice dyer was relatively less attractive than becoming an apprentice in other trades and crafts. Alternatively, the contribution of non-London apprentices well into the eighteenth century suggests that London maintained its dominance of dyeing for a longer period than for other industries.

A different measure of interest in dyeing within the city relates to the families of dyers. An apprentice in dyeing coming from a dyer's family was not uncommon (12.9 percent), but a higher than the average percentage of those with the father a dyer came from London (23.5 percent) (Table 2.4b).

Table 2.4a Occupation of the apprentice's father, by region and occupation, 1705-1744 (NUMBER)

Regions/Occupation	Dyer	Textile related	Non-textile related	Not given	Total
London	73	60	169	8	310
Home	128	171	539	20	858
London+Home	201	231	708	28	1,168
Midlands	10	52	287	11	360
Northern	4	15	90	8	117
Eastern	1	5	12	2	20
South & West	7	44	96	9	156
Wales	3	2	17	3	25
Other	1	1	10	1	13
Unknown	38	10	23	120	191
Total	265	360	1,243	182	2,050

Source: London Dyers, MS 8169.

**Table 2.4b Occupation of the apprentice's father, 1705-1744
(PERCENT by region)**

Regions/Occupation	Dyer	Textile related	Non-textile related	Not given	Total
London	23.5	19.4	54.5	2.6	100
Home	14.9	19.9	62.8	2.3	100
London+Home	17.2	19.8	60.6	2.4	100
Midlands	2.8	14.4	79.7	3.1	100
Northern	3.4	12.8	76.9	6.8	100
Eastern	5.0	25.0	60.6	10.0	100
South & West	4.5	28.2	61.5	5.8	100
Wales	12.0	8.0	68.0	12.0	100
Other	7.7	7.7	76.9	7.7	100
Unknown	19.9	5.2	12.0	62.8	100
All regions	12.9	17.6	60.6	8.9	100

Source: London Dyers, MS 8169.

A slightly higher percent of apprentices from dyers' families came from London and the Home Counties (75.6) than from families with a textile related (64.0) or non textiles related (56.5) occupation, but this difference may be a statistical artefact of the higher proportion of those from a dyer's family without identified regional origin (23.9) (Table 2.4c).

**Table 2.4c Occupation of the apprentice's father, 1705-1744
(PERCENT by occupation)**

Regions/Occupation	Dyer	Textile related	Non-textile related	Not given
London	27.9	17.1	13.6	6.8
Home	47.7	46.9	42.9	17.1
London+Home	75.6	64.0	56.5	23.9
Midlands	3.9	14.6	23.1	9.4
Northern	1.6	4.3	7.5	6.0
Eastern	0.4	1.4	1.0	1.7
South & West	2.3	12.3	7.8	7.7
Wales	1.2	0.6	1.3	2.6
Other	0.4	0.3	0.8	0.9
Unknown	14.7	2.6	1.9	47.9
Total	100.0	100.0	100.0	100.0

Source: London Dyers, MS 8169.

Apprentices from families with the father in a textile-related occupation were more common (28 percent) from the South and West than the average for all regions (17.6 percent) (Table 24b). A possible interpretation of this regional difference is that these apprentices in the South & West region were more likely to return home after training, but there are no solid data to confirm this hypothesis. An additional explanation may be that the dyeing industry was dwindling in some areas of the south and west, while the textile trade remained active; those interested in dyeing would send their children to London rather than closer to home.

The more prestigious the Company, the greater the percentage of apprentices bound from well-to-do families.⁸ In the period 1630-1660, fewer than 6 percent of apprentices in several London Companies (Armourers, Bakers, Butchers, Carpenters, and Joiners) had fathers who were gentlemen or esquires. In the more prestigious Grocer's Company, almost 40 percent of apprentices had fathers who were gentlemen or esquires. The Dyers' Company resembled the first group closely: although just outside the most prestigious top 12 livery Companies, only 4 percent of apprentices bound in the Dyers' Company from 1706-1746 had fathers who were gentleman or esquires.

Several explanations for the change in geographic origins of early eighteenth century London apprentices have been suggested, since similar changes were seen in many London Companies. Enforcement of apprentice regulations was relaxing, so there was less pressure to register as an apprentice, even though apprenticing itself may not have been declining;⁹ training opportunities outside London were increasing, particularly in areas that had furnished large numbers of apprentices to London in earlier years; and London and the surrounding suburbs were of sufficient size to produce apprentices to fill the available places, so such persons were perhaps more likely to fill them than others from further away.

⁸ Smith 1973, p. 200.

⁹ Kellett 1958.

2.3.3 Geographical clustering

In considering geographical recruitment patterns, a degree of clustering in smaller towns might be expected, on the assumption that immigration to London followed established networks of information. Data on original residence from 1706, concerning over 1,700 apprentices, does show some clustering in Reading (10), St Albans (8), Sherington, Bucks (8), Hertford (8), Bedford (8), Sherborne, Dorset (7), Oxford (6), Newport Pagnell (6), Loughborough (6), and Chipping Norton (6). Moreover, within these larger clusters, and also in smaller clusters, there were instances of individuals from the same town bound by the same master several years apart. For example, Richard Blackford and John Blackford, from Tilbrook, in Bedfordshire, were apprenticed in 1714 and 1719 respectively to John Pearson. John Jennings and Francis Jennings, from Aylesbury, Buckinghamshire, were apprenticed in 1727 and 1732 respectively to Gabriel Kent. In one case, Stephen Marshall, from Sherington, Buckinghamshire, was apprentice in 1711 to Joseph Hackney. Because Joseph Hackney was apprenticed in 1695, there is no record of his family's residence. After Stephen Marshall joined the Company in 1718, however, he bound William and Matthias Caves, in 1722 and 1728, who were both from Sherington. Not all such geographic clusters involved members of one family. Stephen Marshall also bound Thomas Dixon in 1733 and George Gill in 1741, both from Crayford, in Kent. What remains unknown is how often individuals returned to their place of origin after training.

2.4 Premia paid on binding

When a master bound an apprentice, a premium, to be paid at the time of binding, was sometimes requested; the size of the premium could influence the person or agency making the decision about where to place an apprentice. Sometimes a surety bond was requested, guaranteeing the completion of the apprenticeship.¹⁰ Preliminary bargaining might take

¹⁰ Lane 1996, pp. 19-27.

place, so that the final decision concerning the apprenticeship followed a trial period; however, neither the numbers rejected in this way nor the cause for rejection are known.

After premia began to be taxed in 1710, information about binding premia was frequently recorded. Premia generally rose across all London trades in the early part of the eighteenth century. In the 1660-1670s, the highest premium paid (to a London Levant Merchant) was £200, while by 1720, some premia were as high as £1,000. London masters mostly received higher premia than those outside London. In Wiltshire, in the early 1700s, the highest premium was £262, with only 2 percent (66 out of 3,000) over £100.¹¹ For the seven dyers in the Wiltshire data, the premia in Bradford, Bristol, Corsby and Salisbury in the 1710s were £5, 8, 12, and 20 (2), while those in the 1750s in North Bradford and Devizes were £1 and £1. Since these premia showed no rise over time, and since the area's dyeing industry was dwindling during this period (there was no mention in the Wiltshire data of calico printers, silk dyers, or thread dyers), these premia seem compatible with a falling demand for apprentices in dyeing.

Aliens might be required to pay higher premia, with Russian apprentices in the Birmingham metal trades in the early eighteenth century paying £40-120 when English apprentices paid about £10.¹² The guardians of pauper apprentices in general were asked for lower premia, and the percentage of paupers varied according to the craft. In Warwickshire in the 1700s, dyers were among the crafts which apprenticed fewer than 10 percent from the pauper category, along with clothiers, coopers, chandlers, and cabinet makers, while paupers made up more than half the apprentices bound in housewifery, husbandry, and in the companies of brick-makers, hatters and weavers.

It is possible that the rise in premia was related to changes in the value of money. Earlier analyses of real earnings during the period 1650-1750, updated by Officer, show an irregular but modest increase over the 100 year period, but not greater than 20 percent.¹³

¹¹ Williams 1961.

¹² Lane 1996, pp.19-27.

¹³ Brown and Hopkins 1981, Figure 1, p. 16 and Figure 3, p. 19, originally presented in 1955; Schwartz 1985; Boulton 2000; Officer February 2004.

Although premia were rising in the late seventeenth century, only a small proportion of the rise was attributable to changes in buying power.

One difficulty in using these scattered data to interpret changes in premia for the Dyers' Company is that the analyses concern occupations with a high potential for large financial gain, and it is not clear they are relevant to dyers (2.5a).

Table 2.5a Premia for English businessmen's apprentices, 1620-1700

Premia to masters in	Years	Premia	Years	Premia	Years	Premia
Foreign trade	1650/	£200-300	1670/	£300-400	1700/	£1,000
German, Dutch trade	1620-50/	£200-400				
Mediterranean trade	1620-50/	£400-600				
Exeter to France	1625/	£10				
Bristol to foreign ports	1650/	£100			1700/	£150-210
Liverpool to foreign ports					1700/	£130
Shopkeepers, London			1681/	£100		
Shopkeepers, elsewhere			1681/	£ 50		

Source: Grassby, 1995, pp. 68-69.

Whereas indentures for apprentices destined for business included details regarding the form of instruction and foreign residence, and could include fees for schooling, and instruction, if abroad, in foreign language,¹⁴ no such evidence is available for the Dyers' Company. What is more, no information concerning dyers' premia is available for 1650-94, when apprentices entering the Company indicated the specialty they planned to take up. By contrast, the binding register of 1706-1746 often included notes concerning the absence of a premium, or the amount paid. On a few occasions, when the premium was unusually high, the size of the premium was spelled out, as, for example, "eight hundred sixty pounds." Interestingly, in spite of the high premium, this apprentice did not join the Company.

¹⁴ Grassby 1995, p. 67.

In the following pages, we examine some variables that might be expected to have influenced the premium level. Four variables were tested: whether the apprentice was orphaned of his father or not; the father's occupational background; the father's geographical origin; and the probability of the apprentice joining the Company. Data on the apprentice's age are lacking, so the effect of age on premia could not be assessed.

Table 2.5b Variation in premia if father dead when bound, 1710-1744 (NUMBER)								
Father dead	1710-14	1715-19	1720-24	1725-29	1730-34	1735-39	1740-44	1710-44
No premium	26	32		23	32	35	20	168
Under £ 5	1	3	1	2		1	3	11
5-9 £	8	7	7	8	7	5	4	46
10-14 £	8	4	1	13	3	4	1	34
15-19 £	1	1	2	1			1	6
20-49 £	5	3	2	4	3	1	2	20
50-99 £	1			1			1	3
100-860 £			1	1	1	1		4
Total	50	50	14	53	46	47	32	292
No death	1710-14	1715-19	1720-24	1725-29	1730-34	1735-39	1740-44	1710-44
No premium	81	104	1	45	86	83	40	440
Under 5 £	5	5	4	1	1	2	1	19
5-9 £	34	23	17	18	10	3	3	108
10-14 £	32	19	23	13	8	8	4	107
15-19 £	5	3	6	2	2			18
20-49 £	12	2	8	4	4	2	2	34
50-99 £	3	2	1	4	2	1	1	14
100-860 £		2			1		2	5
Total	172	160	60	87	114	99	53	745
Source: London Dyers, MS 8169.								

Table 2.5c Premia if father dead when bound, 1710-1744 (PERCENT)								
Father dead	1710-14	1715-19	1720-24	1725-29	1730-34	1735-39	1740-44	1710-44
No premium	52	64	0	43	70	73	65	58
Under £ 5	2	6	7	4	0	2	8	4
5-9 £	16	14	50	15	15	10	12	16
10-14 £	16	8	7	25	7	10	3	12
15-19 £	2	2	14	2	0	0	3	2
20-49 £	10	6	14	8	7	2	6	7
50-99 £	2	0	0	2	0	0	3	1
100-860 £	0	0	7	2	2	2	0	1
Total percent	100	100	100	100	100	100	100	100

No death	1710-14	1715-19	1720-24	1725-29	1730-34	1735-39	1740-44	1710-44
No premium	47	65	2	52	75	83	76	60
Under 5 £	3	3	7	1	1	2	2	3
5-9 £	20	14	28	21	9	4	6	15
10-14 £	19	12	38	15	7	8	7	14
15-19 £	3	2	10	2	2	0	0	2
20-49 £	7	1	13	5	4	2	4	5
50-99 £	2	1	2	5	2	1	2	2
100-860 £	0	1	0	0	1	0	4	1
Total percent	100	100	100	100	100	100	100	100
Source: London Dyers, MS 8169.								

First, as table 5.2c indicates, the percent of premia greater than £10 was unchanged (23 compared to 24 percent) if the father was dead at the time of binding. Orphan status did not reduce an apprentice's economic opportunities; whether it affected the quality of master one could aspire to is, however, unclear. Second, the father's occupation was significant (Tables 2.6a and 2.6b). If the father was a dyer, almost 80 percent paid no premium, while the proportion for other occupations was about 50 percent. This may have been a measure of the possibility of having a knowledgeable apprentice who could provide the master with an earlier return on his training costs. Alternatively, it may have been due to greater interpersonal contact among dyers, which reduced the likelihood of evasion or cheating by the apprentice. The new master may have been more likely to know the apprentice's father, so the uncertainty (information asymmetry) involved in the contract could be reduced. Thirdly, the apprentice's geographical origin did not affect the premium requested; it may be noted, however, that the highest percent of high premia (38 percent) were paid by fathers

from the Eastern region (Table 2.7). Lastly, did the payment of a higher premium increase the chances of professional success, defined (perhaps narrowly) as joining the Company on completion? This will be discussed in Chapters 3 and 5.

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Table 2.6a Premia, by father's occupation and region, 1710-1744 (NUMBER)

Occupation	Premia	Regions									Total	
		London	Home	London +Home	Midlands	Northern	Eastern	South & West	Wales	Other		Unknown
Dyer	No premium	31	61	92	3	2		1	1	1	4	104
	Under 5 £		1	1								1
	5-9 £	5	8	13								13
	10-14 £	4	4	8	1							9
	15-19 £			0				1				1
	20-49 £	1	1	2	1						1	4
	50-99 £		1	1								1
	100-860 £		1	1								1
	Total	41	77	118	5	2		2	1	1	5	134
Textile related	No premium	19	60	79	24	2	1	9	2		1	118
	Under 5 £		3	3	1							4
	5-9 £	7	15	22	3			2				27
	10-14 £	7	18	25	5			1				31
	15-19 £		4	4	1			1				6
	20-49 £	2	3	5		1	2	4				12
	50-99 £		1	1	1							2
	100-860 £	1	2	3								3
	Total	36	106	142	35	3	3	17	2		1	203
Non-textile related	No premium	36	179	215	93	35	4	20	5	3	4	379
	Under 5 £	8	12	20	3						1	24
	5-9 £	23	52	75	21	4	1	6	1	2	1	111
	10-14 £	16	45	61	20	3		9	1			94
	15-19 £	1	9	10	3	1						14
	20-49 £	6	15	21	10	1	1	2	1	1		37
	50-99 £	3	9	12			1	1				14
	100-860 £	3	1	4			1					5
	Total	96	322	418	150	44	8	38	8	6	6	678
Not given	No premium	2	3	5	2	2	2	2				13
	Under 5 £	1		1								1
	5-9 £	1		1	1	1		1				4
	10-14 £	1	2	3	1	1		2	1			8
	15-19 £		1	1		1		1				3
	20-49 £		1	1								1
	Total	5	7	12	4	5	2	6	1			30

Source: Dyers' Company, MS 8169.

Table 2.6b Premia by father's occupation and region, 1710-1744 (Percent in each region)

Occupation	Premia	Regions										All
		London	Home	London+Home	Midlands	Northern	Eastern	South & West	Wales	Other	Unknown	
Dyer	No premium	76	79	78	60	100		50	100	100	80	78
	Under 5 £		1	1								
	5-9 £	12	10	11								
	10-14 £	10	5	7	20							
	15-19 £							50				
	20-49 £	2	1	1	20						20	
	50-99 £		1	1								
	100-860 £		1	1								
	Percent	100	100	100	100	100		100	100	100	100	
Textile related	No premium	53	57	56	69	67	33	50	100		100	58
	Under 5 £		3	2	3							
	5-9 £	19	14	15	9							
	10-14 £	19	17	18	14							
	15-19 £		4	3	3			50				
	20-49 £	6	3	4		33	67					
	50-99 £		1	1	3							
	100-860 £	3	2	2								
	Percent	100	100	100	100	100	100	100	100		100	
Non-textile related	No premium	38	56	51	62	80	50		62	50	67	56
	Under 5 £	8	4	5	2				13		17	
	5-9 £	24	16	18	14	9	12		12	33	16	
	10-14 £	17	14	15	13	7						
	15-19 £	1	3	2	2	2			13			
	20-49 £	6	5	5	7	2	12			17		
	50-99 £	3	3	3			12					
	100-860 £	3	0.3	1			12					
	Percent	100	100	100	100	100	100		100	100	100	
Not given	No premium	40	43	42	50	40	100	33				43
	Under 5 £	20		8								
	5-9 £	20		8	25	20		17				
	10-14 £	20	29	25	25	20		33	100			
	15-19 £		14	8		20		17				
	20-49 £		14	8								
	Percent	100	100	100	100	100	100	100	100			

Source: London Dyers, MS 8169.

Table 2.7 Distribution of premia by region (NUMBER and PERCENT), 1710-1744

Premia (number)	London	Home	London+Home	Midlands	Northern	Eastern	South & West	Wales	Other	Unknown	Total
No premium	88	303	391	122	41	7	32	8	4	9	614
Under 5 £	9	16	25	4	0	0	0	0	0	1	30
5-9 £	36	75	111	25	5	1	9	1	2	1	155
10-14 £	28	69	97	27	4	0	12	2	0	0	142
15-19 £	1	14	15	4	2	0	3	0	0	0	24
20-49 £	9	20	29	11	2	3	6	1	1	1	54
50-99 £	3	11	14	1	0	1	1	0	0	0	17
100-860 £	4	4	8	0	0	1	0	0	0	0	9
15£ or greater	17	49	66	16	4	5	10	1	1	1	104
Total	178	512	690	194	54	13	63	12	7	12	1045

Premia (percent)	London	Home	London+Home	Midlands	Northern	Eastern	South & West	Wales	Other	Unknown	Total
No premium	49	59	57	63	76	54	51	67	57	75	59
Under 5 £	5	3	4	2	0	0	0	0	0	8	3
5-9 £	20	15	16	13	9	8	14	8	29	8	15
10-14 £	16	13	14	14	7	0	19	17	0	0	14
15-19 £	1	3	2	2	4	0	5	0	0	0	2
20-49 £	5	4	4	6	4	23	10	8	14	8	5
50-99 £	2	2	2	1	0	8	2	0	0	0	2
100-860 £	2	1	1	0	0	8	0	0	0	0	1
15£ or greater	10	10	10	8	7	38	16	8	14	8	10
Total	100	100	100	100	100	100	100	100	100	100	100

Source: London Dyers, MS 8169.

2.5 Female apprentices

Although women were seldom apprenticed in the craft trades, marriage to a member of a livery company conferred upon the woman her husband's rights and privileges, which were retained for a period after his death. A Royal ordinance (25 Charles II) stated that a widow could continue to do the work of her husband, so long as she continued a widow, and followed Company rules. Within fourteen London Companies that bound apprentices in instrument making, the majority of women members were widows who took up the rights of their husband, retained the apprentices bound to their husband, and bound new apprentices in their own name.¹⁵ This means one should not be surprised if there are more women members of a Company than there had been apprentices. For example, in the London Stationers' Company (which at one time included stationers, booksellers, binders and printers), between 1641 and 1700, only one percent of apprentices (51/4293) were women. However, from 1553-1640, nearly 10 percent of Stationers' Company members were women, possibly all (or almost all) entering as a result of rights associated with marriage and widowhood. In the Stationers' Company, family rights passed to the widow even if she remarried, so that printing as an occupation remained in a few families for a long period.¹⁶ In the Booksellers' and Printers' Companies, four percent (79/1740) of apprentices were women.¹⁷

Women dyers were unusual. Searching names as a way to determine gender, almost all the apprentices in the Dyers' Company had men's names. Some women joined the Company by patrimony, rather than by apprenticeship, and were accepted on the basis of belonging to a family that already had a Company member. Occasionally, on the death of a master, the widow took over the mastering, without the records indicating she had joined by patrimony.

In the period 1650-1746, there were almost 5,800 recorded apprenticeship bindings; only 16 of these were women. Five of the 16 were apprenticed to a female master; only one joined the Company. A total of eight women joined the Company by patrimony; six of the

¹⁵ Crawford 1987, p. 331.

¹⁶ Clark and Erickson 1992, pp. 161-7.

¹⁷ Grassby 1995, pp. 150-153.

eight did so after 1712. An additional ten women became free of the City because they were widows of freemen dyers. The names of these women are recorded in my data set only because they bound apprentices, sometimes with a note that they were widows of recently deceased masters.

It is, however, possible that entry to the Company by patrimony or as widow of a Company member is under recorded. There are records of 86 women who bound apprentices during 1650-1746. During this same period there were approximately 1600 masters, meaning that about 5 percent of the masters were women, but just 2.2 percent of bindings were.

Of the 86 women who bound apprentices, 2 were among the eight recorded as entering by patrimony. Only one of the 86 was among the 16 women who had completed an apprenticeship. One of the two who joined by patrimony had completed an apprenticeship under a master who was not her father, but was nevertheless recorded as joining by patrimony, via her father. Thus, almost none of the active women dyers are on record as having formally joined the Company.

Of the 86 women master dyers recorded as binding apprentices in the Dyers' Company, 76 bound only one. Of the remaining ten, four bound 3 apprentices, one bound 4, two bound 5, one bound 6, one bound 9 and one bound 11. As we shall see, this distribution of the bindings per master is significantly more skewed to smaller numbers than the distribution among males.

Sixteen of the 86 women acted as masters for their sons, indicating that they had probably entered the Company as widows. In eight of these instances, the son did not join the Company after the apprenticeship, a proportion similar to that of other apprentices. Only 16 women appeared as masters in the recording, begun in 1706, of binding transfer, called turnover. One of the reasons for a turnover is the death of the master, and indeed, 13 out of 16 turnovers were made to widows. (It is possible that the remaining three were also widows, since these sixteen are the only turnover records with women as the second master.

In one of the three instances, the apprentice was bound to his mother, and then turned over to another woman.)

Some women appeared in the records even when they were the widows of dyers who were not Company members. Mary Richardson, a dyer, is recorded as the widow of John Richardson, a dyer in the Mercers' Company. She accepted to bind an apprentice by turnover three times, each on the same day as they were bound to a member of the Dyers' Company. This same-day turnover was an option that helped the apprentice as well as a dyer registered in another Company. It allowed the apprentice to join the Dyers' Company without financial penalty, after completion of a seven-year term, at the same time as allowing a dyer, registered in another Company, to be responsible for training an apprentice. The alternative was for dyers like Mary Richardson to find an apprentice willing to be bound in another Company, without the social interaction and contact that might be expected if they were bound to a member of the Dyer's Company. Finally, if women could continue the profession of their husbands, one would expect to find widow dyers who had married dyers in other Companies; unfortunately, evidence about these women is rarely available.

2.6 Changing masters (turnovers)

We have seen that a bound apprentice could find a new master through a "turnover", and that these turnovers are recorded in the apprentice register of 1706-46.¹⁸ Among other things, this evidence can be used to determine how apprentices who were turned-over differed from other apprentices and whether the masters who gave or received turnovers differed from other masters. The data can also be used to establish the existence of relationships between turnovers and recruitment. That is, it might be possible to establish whether some masters were frequently involved in turnovers, accepting bindings for a short time, before allowing the apprentice to find another master or allowing a master to find another apprentice. A master frequently involved in turnovers might be a senior dyer in the

¹⁸ London Dyers 1706b.

Company who was designated for this purpose – acting, in other words, as a kind of labour broker in the specialised labour market.

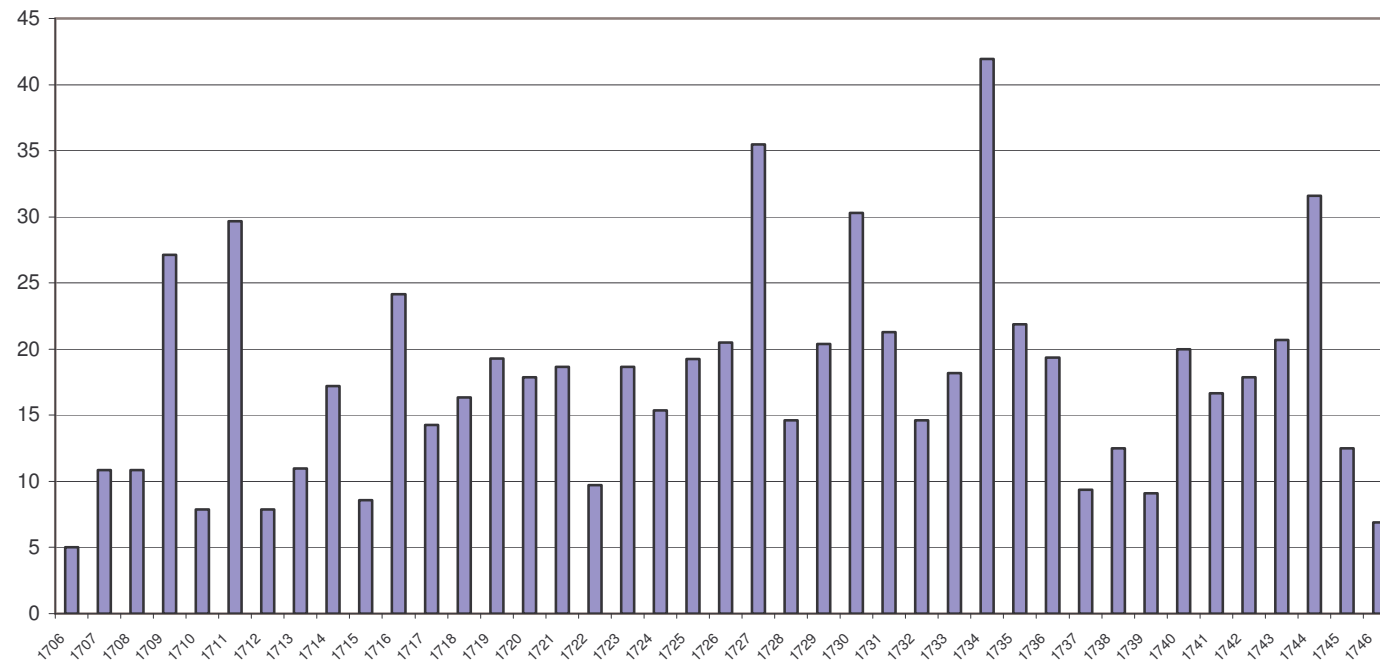
Although a total of 17 percent (331/1951) of apprentices bound between 1706 and 1746 were turned over to another master (Figure 2.2), turnovers in any single year could range from 3 to 19 (5 percent to 40 percent).

Of the 331 recorded turnovers, almost 9 percent occurred in the same year that the apprenticeship began, some occurring on the same day as the original binding. The highest proportion (17 percent) occurred in the third year of apprenticeship, with slightly lesser proportions (12-16 percent) in the second, fourth and sixth years; only 6 percent occurred in the seventh year. There were 30 occasions in which there was a second turnover, and one occasion in which an apprentice was turned over 5 times.

There are several explanations for turnovers. One possibility is that the apprentice was turned over to a dyer in another Company. This would allow the apprentice to be registered initially with the Dyers' Company, but be trained by a member of another Company. Then, after completing the seven years of apprenticeship, the apprentice could appropriately join the Dyers' Company. Fifteen percent (51/331) of turnovers were to members of other Companies, including the Clothworkers (10), Weavers (5), Blacksmiths (3), Merchant Taylors (3), Coopers (2), Cutlers (2), Joiners (2), Mercers (2), Bakers, Carmen, Clothiers, Feltmakers, Fishmongers, Fruiterers, Goldsmiths, Haberdashers, Paviours, Sawyers, and Skinners. Although these turnovers occurred throughout the period, three times as many (24) occurred in 1730-39, for unknown reasons. The percentage of turnovers, from dyers in the Dyers' Company to dyers in other Companies was not unusual. Crawforth found that 24 percent of turnovers of instrument makers were what he called "convenience bindings", made to instrument makers in other Companies.¹⁹

¹⁹ Crawforth 1987, pp. 324-326. The Companies included: Blacksmiths, Broderers, Clockmakers, Founders, Framework Knitters, Goldsmiths, Grocers, Horners, Joiners, Pewterers, Plumbers, Spectaclemakers, Stationers, Tylers and Bricklayers.

Figure 2.3 Apprentices turned over relative to total bindings (percent)



Source: London Dyers, MS 8169.

A second possibility was for a turnover to occur when the original master died. However, transfers resulting from the master's death occurred in only 5 percent (15/331) of the cases, and were often made to the master's widow. This is substantially fewer than among the instrument makers, among which 28 percent of turnovers followed the master's death.²⁰

A third explanation is that turnovers represented an adjustment process within the Company, which allowed a more appropriate matching between apprentice and another master, for economic or other reasons. One might expect this to be more frequent when prior information on both sides was lacking, as might occur when the apprentice came from far away from London. Since the apprentice lived within the master's household, a turnover would allow an apprentice to leave an unhappy household, or could permit a master to pass on an apprentice he no longer wanted. Yet there is little to suggest that turnovers were more frequent for more distant immigrants compared to those coming from within or near London, for the rate of turnover did not differ significantly by place of origin (Table 2.8).

Table 2.8 Turnover rates by region of origin of apprentice's family, 1710-1744

REGION	Turned over	Not turned	Total	Percent
London	149	708	857	17.4
Home counties	49	310	359	13.6
South and West	16	101	117	13.7
Midlands	3	17	20	17.6
Eastern counties	24	130	154	15.6
Northern counties	3	21	24	12.5
Wales	0	13	13	0
Other	54	256	310	9
Not given	15	112	127	11.8
Together	313	1,668	1,981	15.8

Source: London Dyers, MS 8169.

A fourth possibility is that turnovers allowed apprentices to learn additional skills. In this case, one might expect that specialty dyers would receive turnovers more frequently, perhaps more than initial bindings, and possibly involving apprentices who had already

²⁰ Crawforth 1987, pp. 324-326.

been trained a number of years. Moreover, this process might be less frequent if the apprentice were from London or the Home Counties, where the apprentice's information before the binding could be expected to have been better. This hypothesis was tested, first against evidence for premia, on the assumption that specialty or higher skilled dyers could demand higher premia; second, against evidence for joining, on the assumption that better trained and more skilled apprentices were more likely to become members of the Company; and third, against evidence that place of origin modified the rate of turnovers. In fact, neither the premium asked, nor the frequency of joining, nor place of origin of the apprentice differed significantly between stable and turned-over apprentices.

A fifth possibility is that turnovers occurred because the initial binding was to a well-known and established dyer, who would accept more apprentices than he needed and act as a broker with less well-known colleagues. In this case, it would seem reasonable to find more turnovers with masters who were officers of the Company, but a review of turnovers from 1706-1746 did not confirm this. However, pre-1706 data do suggest that instances of large numbers of bindings in a single year made to officers of the Company may have preceded turnovers, although the records of turnovers are incomplete for that time.

A sixth possibility is that some dyers were willing to accept apprentices with little information, and then turnover that apprentice after a short introductory period. This would allow a dyer without a significant reputation to find a first apprentice. There is some evidence for this hypothesis. For example, several masters, Richard Angell (4 direct completed bindings/3 turnovers), Matthew Blewen (1/5), Thomas Callingwood (4/5), William Graves (2/2), Isaac Lefever (4/4), William Low (4/3), Thomas Manning (3/3), Edmund Nurden (2/2), and William Probart (1/2) received almost as many or more turnovers as they took direct bindings. Conversely, Augustine Meadows (8/4) employed turnovers as his first two apprentices and two as his last. Thomas Callingwood had one direct binding of an apprentice from Wales and accepted a turnover from Wales, although the residence of the apprentices did not suggest that he had unusually strong ties with a particular Welsh locality or county.

Finally, since turnovers to masters in other companies might have been done as a means of changing specialization, or to learn different skills, it seemed worthwhile to see if apprentices who were turned over to masters in other companies behaved differently from those bound to masters in the Dyers' Company.

Of 46 apprentices who were turned over to masters in other Companies, 16 (35 percent) joined the Dyers Company on completing their apprenticeship, a rate similar to those not turned-over. Eight of the 16 joined 7 years after initial binding, 4 after 8 years, and the others at 9, 11, 12, and 13 years after initial binding. Six of the 16 (38 percent) bound apprentices in the Dyers Company, again at a similar rate to those who were not turned over.

In sum, turnovers allowed adjustments of many kinds, including the settlement of difficulties between master and apprentice, the reallocation of surplus labour, and the redistribution of apprentices through masters acting as quasi-brokers. Turnover occurred with almost equal frequency throughout the seven years, but the purpose of those made after the middle of the term might have been to allow training of a different kind than that available with the first master. Turnovers also allowed apprentices bound to masters from other companies to become active in the Dyers' Company. The latter's frequency may relate to changing efforts at enforcement of City regulations, which required craftsmen to become members of the Company in which they practiced their craft. This may explain the peak in turnovers in the short period in the early 1730s. Turnovers also allowed newly established masters to obtain apprentices from better-known masters in the Company; this may explain some of the turnovers made on the same day as the first binding. In any case, the frequency of turnovers, occurring in about one of every six bindings, shows how important they were in allowing the market in skilled labour to adjust.

2.7 Apprentices bound by individual masters, 1649-1746

Some Company members never bound an apprentice, and many bound only a few. However, a small number of masters bound large numbers of apprentices, and thus played a

major role in training and technology transfer. This section considers these circumstances in some detail (Figure 2.4).

Forty seven percent (858/ 1836) of identified masters who bound apprentices from 1649 through 1746 bound only a single apprentice, and an additional 32 percent (591/1836) bound 2-4 apprentices. Thus, over almost a century, nearly four fifths of the masters who bound apprentices, (who themselves constituted only about half the number who began an apprenticeship) were little involved in the transmission of skills and technical knowledge. In the appendix, Table A 2 is a tabular listing showing, in 5-year groupings, of the distribution of bindings by these masters.

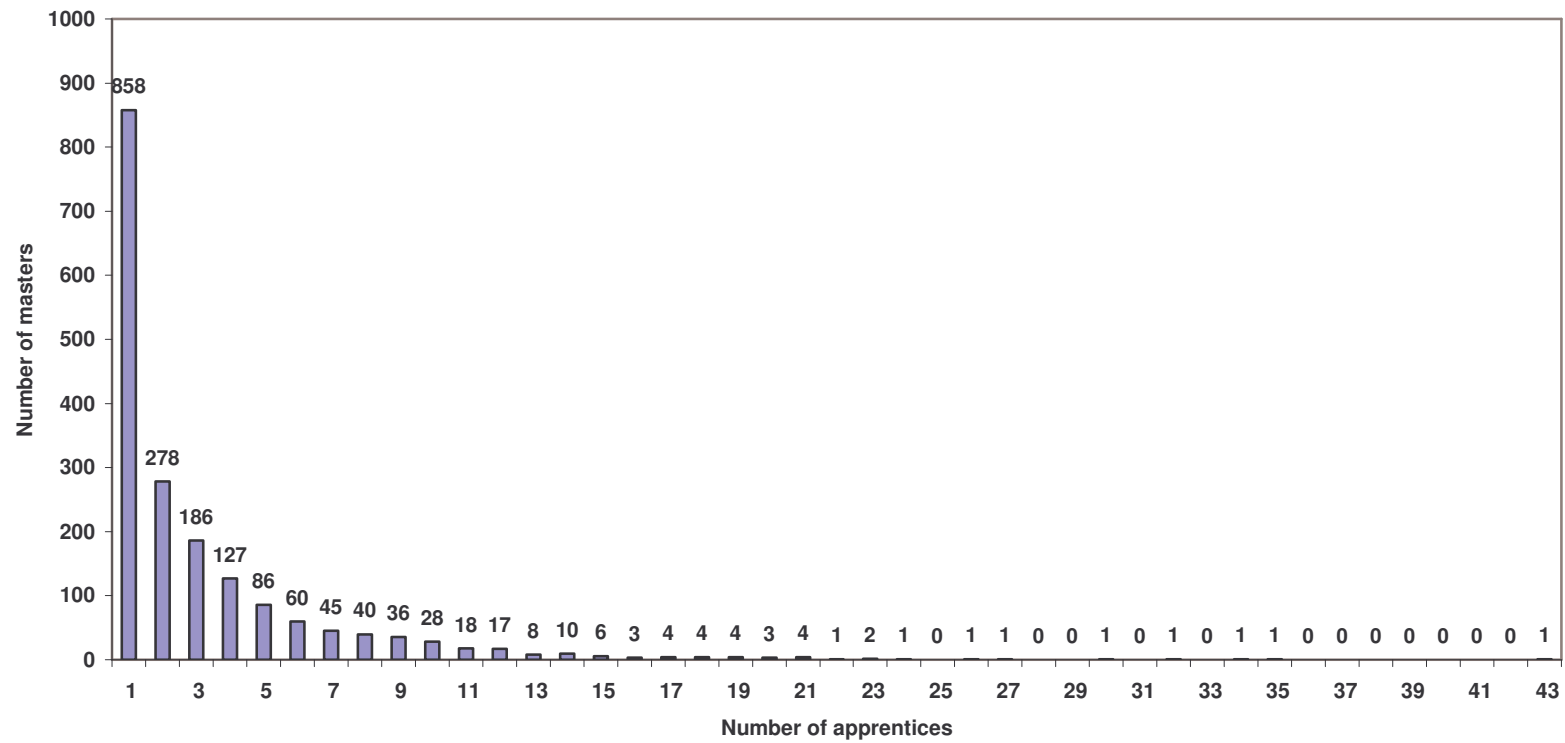
Looked at from the point of view of the apprentices rather than the masters, less than half (2480/5755), equivalent to 43 percent of the apprentices in the Dyers' Company, were bound to masters who bound fewer than 5 apprentices.

There remain uncertainties about whether all apprentices bound to a single master were not, in reality, bound to different people with the same name. Even if the name is unusual, for example, it is possible that a master and his son, using the same name, were active for partly overlapping periods. Clearly, however, there is no uncertainty concerning duplicate names for masters who bound a single apprentice, and little uncertainty with those who bound only 2-4.

Underlying these broad distinctions, there were secular changes in the proportions of masters who bound apprentices.²¹ Using 5-year periods (which meant eliminating data from before 1650 and after 1744), four different distinct periods can be identified (Figures 2.5a [numbers] and 2.5b [percent]).

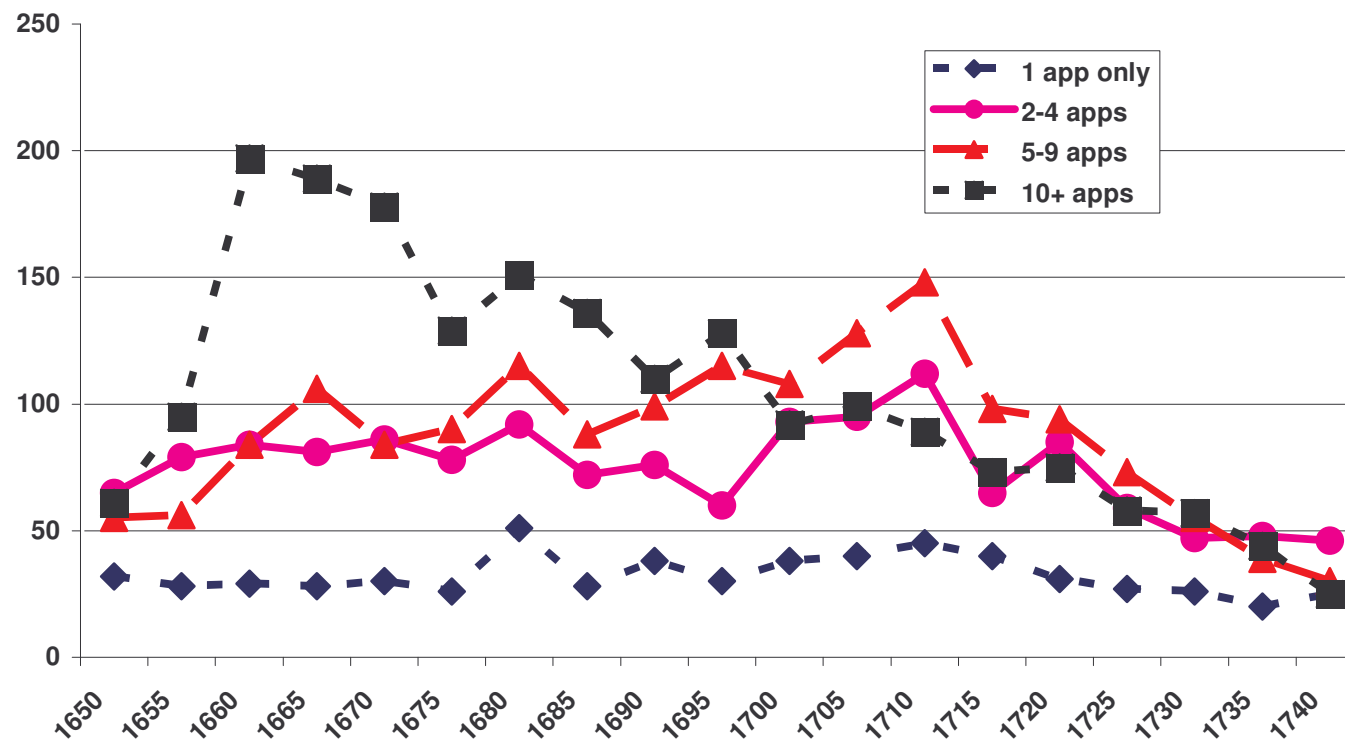
²¹ The changes do not define changes in the average size of firms, since journeymen dyers could form a significant portion of the workforce.

Figure 2.4 Number of apprentices bound to individual masters, 1649-1746



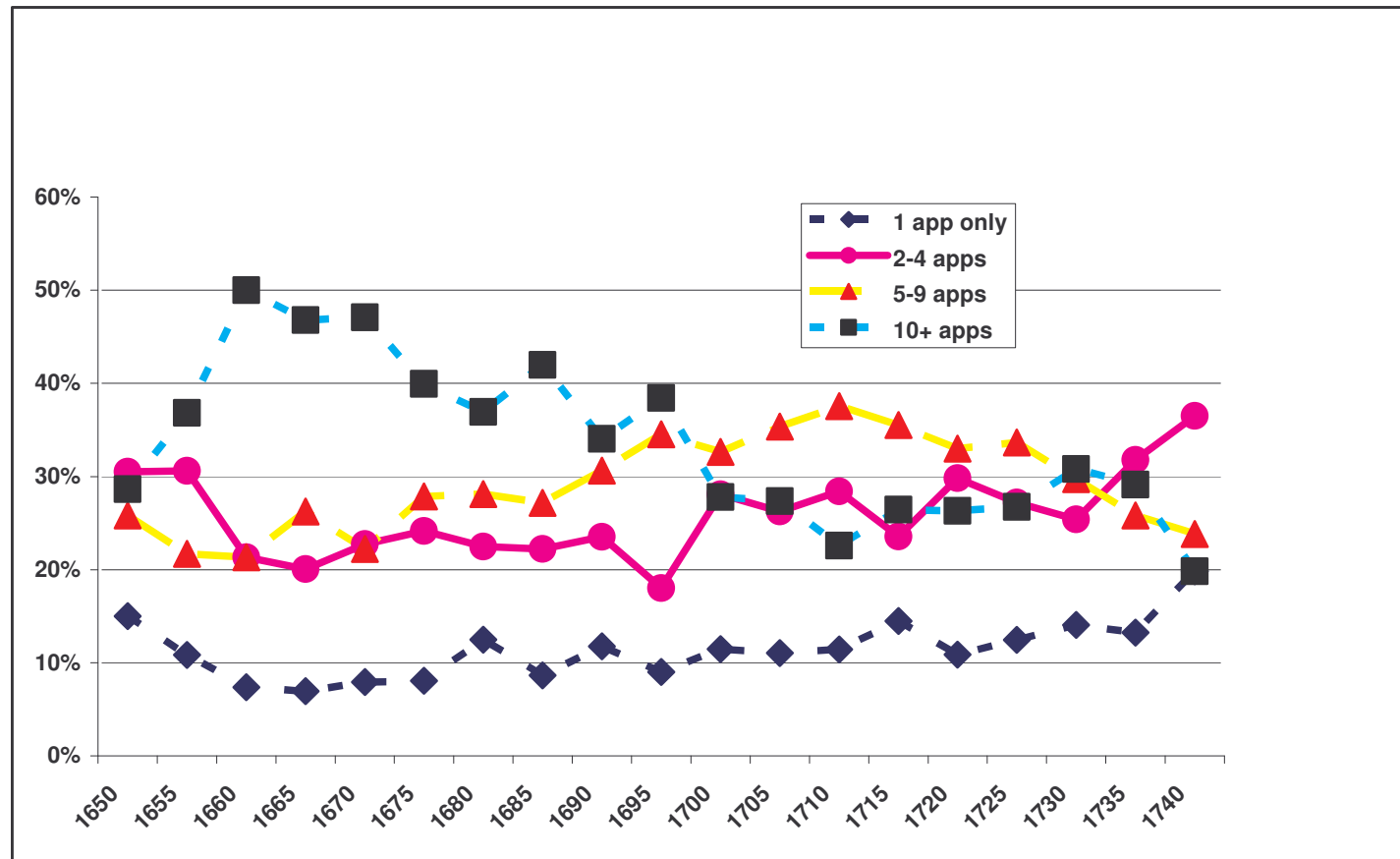
Sources: London Dyers, MS 8169; MS 8171 Vol.1, 2, and 3.

Figure 2.5a Distribution of bindings by master, 1650-1744



Sources: London Dyers, MS 8169; MS 8171 Vol.1, 2, and 3.

Figure 2.5b Percent distribution of bindings by master, 1650-1744



Sources: London Dyers, MS 8169; MS 8171 Vol.1, 2, and 3.

First, using Figure 2.5b, the proportion of masters binding 10 or more apprentices rose rapidly from 30 percent in 1650-54 to a peak of 50 percent in the years 1660-1674, and then declined slowly over the following seventy years. Second, the proportion of masters binding 5-9 apprentices rose slowly, from about 20 percent in 1650-54 to a peak of slightly over 35 percent in 1710-14, after which it fell back to its earlier level by 1744. Third, using first Figure 2.5a and then 2.5b, the numbers bound to masters who bound 2-4 apprentices rose slowly to a peak in 1710-14, and then fell; however, the proportion bound to such masters stayed largely unchanged at about one third. Finally, the number and proportion of single apprentice bindings stayed largely unchanged at 25 apprentices per 5-year period, which is about 10 percent of bindings in each 5-year period.

Eleven masters bound ten or more apprentices in a five-year period (Table 2.9). They were Humphrey Aldersley (16 apprentices in a 5-year period), Robert Beale (10), Edmund Butler (20), John Clay (10), Philip Dawkins (18), James Denew (11), Henry Green (14), John Harbourne (16), William Light (17), George Mayo (18)) and Richard Mottershed (10). All these master-apprentice-binding clusters occurred in the fifteen years between 1660 and 1674. One might be tempted to believe this relates to the relaxation of Guild rules of entry after the Great Fire of London in 1666, but four of the eleven bound 10 or more apprentices in 1660-1664 (Table 2.9 light shading). By contrast, five of the eleven did so in 1665-69 (Table 2.9 dark shading), when relaxation of the rules of entry might have made a difference.

Why did some masters bind so many apprentices? One possibility is that this is the result of errors based on homonymy. However, eight of these eleven masters did not bind anyone with the same family name. Among the other three masters, Robert Beale bound a Robert Beale as an apprentice in 1664, and the second Robert Beale became a member of the Company in 1672, but the first Robert Beale had already bound 10 apprentices in 1665-69. William Light bound a William Light as an apprentice in 1668 and the second William Light became a member of the Company in 1675, but the first William Light had already bound 17 apprentices in 1665-69. James Denew bound a second James Denew and also John Denew in 1671, but the second James Denew did not join the company, and the first James Denew had already bound 11 apprentices in 1670-74.

Table 2.9 Masters binding 10 or more apprentices in a five-year period

MASTER	1650	1651	1652	1653	1654	1655	1656	1657	1658	1659	1660	1661	1662	1663	1664	1665	1666	1667	1668	1669	1670	1671	1672	1673	1674
John Clay			1			1		2	4		1	1	1	1	3	3	1	2	1	3	2	1	4		
Phillip Dawkins					1		1	1	1	4	2	8	5	2	1	5		1			1	1	1		
Edmund Butler	1			1	1	1	1		1				1	7	12	1	1	2					1		1
William Light				1			2		1		1					1			7	9	1			1	
Humphrey Aldersey	2								1	1						1		7	8		1		1		
James Denew		1				1			2	1				1	1						1	2		5	3
Robert Beale			2		1					1					7	8			2						
George Mayo					1		1				2	7	8	1											
Henry Green			1	1							2					2	10		2					1	
John Harbourne					1		1				8	7	1												
Richard Mottershed							1						1			1		1	1	1	5	4			1

The lighter shading highlights 1660-64, and the darker shading 1665-69

Source: London Dyers, MS 8167 Vol.1.

Thus, although it is possible that the other clusters are the result of two or more people with the same name, there is no evidence to confirm this possibility.

High rates of turnover from these eleven masters might also explain a proportion of this clustering. Ten out of the 11 masters were acting wardens during the years when they bound large numbers of apprentices. This suggests that they were carrying out Company responsibilities, which might include acting as temporary masters for some apprentices. However, the register for this period did not record turnovers, so this cannot be verified.

Perhaps these masters had unusual skills. If so, it seems possible the subsequent activities of those who were apprenticed to masters who bound large numbers of apprentices might differ from the subsequent activities of other apprentices, if the first group had been taught by more effective masters. Measures of technical success are difficult to define, but might include a higher percent than average joining the Company, and a shorter time than average between finishing training and binding an apprentice. To test this possibility, I followed a sample of 1318 apprentices, with names beginning from A to C, bound from 1649 and joining the company up to 1738, to observe how many of them went on to join the Company and then to bind at least one apprentice. Forty seven percent (617/1318) joined the Dyers' Company, and 31 percent of these (194/617) bound at least one apprentice. Almost one third of the 194 bound their first apprentice within one or two years after completing their apprenticeship, and another third did so 3 to 8 years after completing the apprenticeship – that is, 10-15 years after being first bound. In some instances, 30 or more years elapsed between starting the apprenticeship and joining the company.

Only fifteen of these 194 masters bound 10 or more apprentices. It is possible that they (those who bound large numbers of apprentices) were specialty dyers and were perhaps in demand as high quality teachers.²² Seven of the 15 in the period 1650-1694 had been identified as specialty dyers: Edward Aston as a wool dyer, Lazarus

²² The 15 masters, with the numbers of apprentices they bound in parentheses, are: William Andrews (10), William Ashwyn (11), Edward Aston (14), Thomas Aynsworth (10), Daniel Bird (10), Robert Bird (20), Hercules Brideson (12), Richard Brittain (12), Thomas Brown (11), William Butler (11), James Cecil (16), Francis Chapman (23), Stephen Cleeve (12), Lazarus Coleman (14), and John Corner (10).

Coleman as a silk dyer, Stephen Cleeve as a linen dyer, William Andrews, Hercules Brideson and Francis Chapman as both silk and wool dyers, and Thomas Aynesworth as a hat and wool dyer. Seven of the 8 masters who were not mentioned as specialty dyers bound their first apprentice after 1689 and so might not have been known as specialty dyers by the methods used for the others. These data are compatible with the binding of large numbers of apprentices relating to being well known as specialty dyers.

In the comparison with the general group, of the 198 apprentices bound to these 15 masters, 43 percent joined the Company, 40 percent bound an apprentice, and 54 percent of them bound an apprentice within 2 years after joining. These parameters of success do not tell a clear story, since they are not clearly different from the 47 percent of the general group that joined and 31 percent that bound an apprentice. However, 54 percent bound an apprentice within 2 years, compared to the 33 percent in the general group. Perhaps the differences relate more to occupational specialties of the masters, not the numbers of apprentices bound.

2.8 Selecting a master

Parents or guardians could obtain some information concerning placement in London from friends, relatives, and travellers. More information might come from the beadle or clerk of the Dyers' Company. The information might refer to the dyer's reputation as a good householder, and include information about the kind of clothing, housing, and supervision provided. Other information might relate to the prospective master's skills. If the parent or guardian were able to identify a "good" dyer, the apprentice would have a higher chance of success after completing the apprenticeship than if he had been placed with a less good dyer. But is it possible to identify a "good" dyer after the fact?

One readily identifiable marker is whether the dyer was a member of the livery, or, even better, a member of the Court in the Dyers' Company, both of which were marks of professional distinction and good reputation. Thanks to the record of the livery and members of court for 1696, and names of the livery on the quarterage registers from

1632 to 1667, it is possible to estimate the average number of apprentices bound and their rate of joining the Company, and then compare these two subgroups with the record of the Company as a whole. In order to allow sufficient time to measure apprentice binding and joining, the analysis utilizes data from 1649 to 1705.

Between 1649 and 1705, the average number of apprentices bound by masters in the livery was 8.8, with a range from 1-43, while for masters not identified as in the livery, the average was 2.7 with a range of 1-32. Since the rules, written in 1563 in the Act of Artificers, allowed masters in the livery to bind more apprentices than masters not so highly placed, the existence of a difference is not entirely surprising, although the scale of the difference certainly is.

On the other hand, the difference in the percentage of apprentices of these two groups who later joined is less striking, with 48.5 percent of apprentices of masters in the livery joining compared to 43 percent of non-livery master's apprentices doing the same. In sum, the choice of a master in the livery meant that one's child or ward would not be more likely to join the Company, but would be much more likely to train in a bigger shop.²³

An alternative measure of the quality of a master might be their pupils' rate of success in training apprentices of their own. Although such information might not help contemporaries in placing an apprentice, it might well be an indication of other qualities that we can no longer observe. Out of a sample of 30 apprentices from the almost 1,000 in the livery group, 9 (30 percent) bound apprentices after joining the Company, and 48.6 percent (17/35) of these went on to join the Company. Conversely, out of a sample of 35 apprentices from the over 2500 in the non-livery group, 12 (34 percent) bound apprentices after joining the Company, but only 33 percent (13/39) of their apprentices went on to join the Company. In other words, the probability of pursuing a career as a successful London dyer was substantially higher if one were taught by a master whose own master had been a member of the livery.

²³ Using data only from masters who were members of the Court, the proportion of apprentices joining was minimally less than than among apprentices bound to members of the livery, 47.6 percent to 48.5 percent.

Alternatively, a parent or guardian might find knowledge about a particular dyeing speciality useful. For example, silk dyeing was taking an increasing share of the dyeing business in the late seventeenth century, and knowing this might influence a decision to arrange an apprenticeship. This hypothesis can be tested against the statements of apprentices who joined the Company in the period from 1665-95 and stated the speciality in which they wished to work. Data to be presented in Chapter 3 show that masters who bound fewer than 5 apprentices saw 38 percent join the Company while masters who bound from 5 to 43 apprentices saw 45 percent join the Company. The 35 silk dyers, who bound fewer than 5 apprentices each, saw 75 percent of their apprentices join the Company. The 27 silk dyers who bound 10-35 apprentices each (and many of whom were in the livery) saw 49 percent of their apprentices join the Company. A further comparison was made with those who selected 'dyer' as their speciality when joining. The 75 masters, whose specialty was given as dyer, and who bound less than 5, 5-9 or 10-23 apprentices over the same time period, saw 48, 47 and 44 percent of their apprentices respectively join the Company. These findings are not easy to interpret. Rather than the size of the firm, it was perhaps the specialty and the character of the firm that influenced the decision about joining the Company. More will be said about this question in chapter 5, which deals with chain length and generations.

Finally, a limitation in this analysis is that premia were only recorded after 1710. Taking these constraints into account, the results of these tests are inconclusive (table 2.10).

Table 2.10 Premia and percent joining the Dyers' Company, 1710-1746

	Premia in pounds					
Premium	0.25-4.9	5-9.9	10-14.9	15-19.9	20-49.9	50-860
Apprentices	30	134	182	24	54	29
Number joining	7	59	69	8	25	8
Percent joining	23	44	38	33	46	28

Source: Dyers' Company, MS 8169.

On the one hand, the probability of joining did not increase in a linear fashion with the size of the premium. Although the numbers are small, those who paid the highest premia (above £50) were *less* likely than average to join the Company. On the other hand, for reasons that are as yet unclear, those who paid £5-9.9 and £20-49.9 had a

substantially higher than chance of joining than others. Data for a longer time period may lead to a clearer picture.

2.9 Chapter 2 Summary

Annual recruitment of apprentices in the Dyers' Company for 1649-1826 displays four distinct periods. Entries ranged from about 40 to about 75 per year in the period 1649-70, perhaps showing a reduction in recruitment earlier as a result of unrest associated with the Civil War. For half a century after 1670, annual recruitment fluctuated between 60 and 80 per year. Within this steady state, there appears to have been a cyclical element of about 5 years. If peak and trough years measured significant variations in demand for apprentices, one might expect a variation in the size of premium requested at the time of binding. Moreover, if the variation in numbers led to differences in available labour when the seven-year training period was completed, this might also affect the percentage joining the Company. In fact, the percentage joining and time to joining was no different for the two groups; however, premia were higher in the peak-years' group. Between the 1720 and 1750s, annual recruitment fell steadily to about 25 per year and remained at this level until 1785, when the annual recruitment of apprentices fell again sharply to about 15 per year. There is no clear explanation for the change in the 1720s, and then in the 1780s, although changes in enforcement of regulations may have played an increasing role during the later years.

Data concerning the geographic area of recruitment has been analysed for 1706-1746. Over this period, an increasing number of apprentices were drawn from London and its adjacent areas. There was some clustering of apprentices from a few small urban areas; this was possibly a result of better local information about opportunities for apprenticeship in dyeing. The recruitment process involved, ideally, knowledge by the apprentices' families of the best place to bind their child, and knowledge by the masters of which apprentices already had some experience at the requisite work. Thus, apprentices from families involved in a textile-related activity were well represented: children of dyers comprised 13 percent of all dyers' apprentices. At the same time, this relatively low proportion contradicts the traditional view of strong craft endogamy.

In addition to family relations and geographical origin, other factors played a role in allowing apprentice families from outside London to find a master for their son. However, precise details concerning the system are hard to identify. As the example of Humphrey Rock shows, when a new apprentice appeared after only five years, it could mean that the earlier apprentice had left early, but it could also mean that the master was willing to contract for additional help. From the analysis of the Dyers' Company data, the family's decision did appear to be based on knowing that a master was a member of the livery, or was a Company officer. The possibility that some Company members acted as brokers for their craft can be interpreted as evidence of a lack of information about apprenticeship opportunities.

Premia paid in association with dyeing apprentice contracts were generally low. Only 20 percent of the apprentices whose fathers were dyers paid a premium, compared to 50 percent if the father was otherwise employed. This may have been a measure of the possibility of having a knowledgeable apprentice, able to provide the master with an earlier return on his training costs. Alternatively, it may have been a result of greater inter-personal contact among dyers, which made dyers' sons more valuable. If the apprentice's father was dead, premia were unchanged. Premia were no higher for apprentices coming from outside London, even though information about the apprentice might have been less than that available for London-based families. Finally, paying a higher premium did not increase one's chance of joining the Company in a straightforward fashion.

Only 16 out of almost 5,800 apprentices bound before 1746 were women. However, over nearly a century, about two percent of apprentice bindings were to women, mostly widows of Company members.

After recruitment, an adjustment process, whereby the apprentice was transferred to another master by a mechanism known as a turnover, occurred for about one in seven apprentices. Although these data relate to the period after 1706, there is no reason to believe that the rate was substantially different in the earlier period. It is not clear what the commonest reasons for a turnover were. One major reason was in order to accommodate a dyer who was not a member of the Dyers' Company, and to enable

his apprentice to join the Dyers' Company at low cost at completion. Other reasons for turnovers relate to the completion of an apprenticeship after the death of a master, and to accommodate changing needs of the master, the apprentice or both. It is possible that some turnovers were made to allow an apprentice to obtain different skills, but data to verify this are not available.

Since most of those who joined the Company either did not bind an apprentice, or bound only a few, training of further generations of dyers was the task of a small proportion of Company members, some of whom bound a disproportionate number. Part of the reason may have been that some Company members acted as brokers, binding apprentices with the intention of handing them on to other dyers by turnover. But there may have been other reasons, including involvement in a dyeing specialty.

Success following an apprenticeship might depend on family factors, but could also relate to the choice of a 'good' dyer as a teacher. However, although having a teacher who was a member of the livery or a Company officer increased the likelihood of training in a large shop, it did not increase the likelihood of becoming a member of the Company. By contrast, having a master who had been trained by a livery member did increase the chances of joining the Company. Finally, being bound to a silk dyer increased the likelihood of joining, although the data are difficult to interpret.

Chapter 3 Joining the Dyers' Company

3.1 Introduction

The continuity of the Dyers' Company depended on the long-term balance between entry into the Company of new members and the loss of old members by retirement or death. As seen in Chapter 2, potential new members might enter the Company after completion of an apprenticeship, but alternative routes to entry included entering on the basis of family relationship (patrimony) or payment of a fee (redemption). Entry into the Company following completion of an apprenticeship was an entitlement to joining, but often entry was postponed. In such a case, completion was often followed by work as a paid journeyman before joining the Company. It was only a minority who joined the Company. A large number of those who began an apprenticeship never joined the Company at all.

The apprentice binding and freedom registers of the Company include the dates of binding and joining, but no information about the master other than the name, unless they note the name of the warden who signed the freedom register. There is no further information about the small number of masters who bound large numbers of apprentices. Yet, it may have been these particular masters on whom Company size and transmission of technology depended. This chapter deals with variables that relate to the numbers and percentages of apprentices that joined the Company, numbers and percentages on which the future of the Company depended.

The historical records of the Company do not indicate what efforts, if any, were being made to maintain, decrease or increase the size of the Company. It is not clear, however, that increasing the number of apprentices bound by 10 percent would result in a proportionate increase in the number joining to Company. Perhaps efforts to change Company size could be better spent encouraging selection of apprentices from a particular region, or with a particular background.

This chapter opens with a description of the numbers of apprentices joining the Company, and discussion of the possible reasons for the high percentage that do not join the Company. It then analyses variations over time in the proportions joining the

Company by patrimony and redemption, the two other major modes of obtaining Company membership. This is followed by discussion of journeymen and their organisations, and then of data about journeymen dyers, with estimates of the time between ending an apprenticeship contract and joining the Company, and the time between joining the Company and binding an apprentice. The chapter concludes with a speculative analysis of the number of journeymen in a firm, a question that is difficult to answer directly.

3.2 Joining the Company: after an apprenticeship

Chapter 2 described the annual numbers of apprentices bound in the Company, and showed that only a small proportion of Company members bound apprentices. Of those masters that did bind apprentices, almost half who bound apprentices from 1649 through 1746 bound only a single apprentice, and an additional 32 percent bound just 2-4 apprentices. In essence, 80 percent over nearly a century bound only a handful of apprentices each. Looked at from the point of view of the apprentices, 43 percent of the apprentices in the Dyers' Company were bound to masters who bound fewer than 5 apprentices over their working lifetime. This experience in firms that bound a small number of apprentices may itself have influenced future apprentice-binding behaviour. Perhaps apprentices from these small firms themselves bound few apprentices, and subsequently remained in small firms with one apprentice or a few apprentices and employed journeymen if the firms grew in size.¹ This question will be considered further in Chapter 5, which discusses chains of transmission. It is not possible to distinguish a dyer who worked alone from a journeyman dyer who worked for someone else, since the records of a Company member paying a fee as a housekeeper relates to those who intended to bind an apprentice. The term master may justifiably be reserved for someone who bound an apprentice.

¹ Ben-Amos 1994, p.102, discusses firms of small size and mentions that in London in 1566, 13 out of 42 cloth finishers had only a single apprentice or journeyman in their shop. In Bristol, from 1532 to 1658, among cooper, joiners, carpenters, turners, shipwrights and other woodworkers, nearly two-thirds employed no more than a single apprentice in their entire career. The question left unanswered by these observations is whether those who did not bind even a single apprentice were themselves journeymen.

After completing an apprenticeship, paying a fee (3 shillings 4 pence up to 1690, when it increased to 13 shillings 4 pence) allowed an apprentice to join the Company. This was followed by a regular payment of 6 pence quarterly dues. But only a modest proportion, approximately 40 percent, of apprentices did join the Company. The first issue to be addressed here concerns what variables relate to the proportion of apprentices that joined the Company.

Chapter 2 presented data concerning masters who bound large numbers of apprentices. For some of these masters, the binding related to their status in the Company, since 10 of 11 had been responsible for maintaining the freedom registers in the period when they bound large numbers of apprentices. But it is also possible that simply being in the livery might explain binding of large numbers. And perhaps the large numbers related to their reputation as a teacher. Although it is not easy to separate these three possibilities, it is possible that the numbers greater than 20 apprentices bound by one master relate predominantly to the master's administrative role, rather than reputation as a teacher. Of apprentices bound to masters who bound from 1 to 43 apprentices, 2062 apprentices were bound to masters who bound fewer than 5 apprentices, and 38 percent joined the Company. Of 3710 apprentices bound to masters who bound from 5 to 43 apprentices, 45 percent joined the Company. Although the difference is not large, being apprenticed to a master who bound a large number of apprentices is associated with a higher percent of those apprentices joining the Company.

The issue of what other variables relate to the proportion of apprentices that joined the Company can be further analysed in several ways, using the limited information available. The most frequently used description relates the number of apprentices bound in a single year to the number who joined the Company in that year, which can be done using the Dyers' Company registers of apprentice bindings and freeman admissions.² But this proportion can be viewed in more than one way. It is also possible to look at the process of joining the Company dynamically, observing when, after completing an apprenticeship, joining took place. This may be achieved by looking separately at each annual entry cohort, rather than at all those who joined in a calendar year. The cohort study of the proportions joining over time in each cohort

² London Dyers 1650a; London Dyers 1650b; London Dyers 1706a; London Dyers 1735.

gives a more nuanced indication of changing economic opportunities. The two different methods provide alternative assessments of conditions in the labour market. The first method approximates what an apprentice could know. The second method shows the actual long-term outcome of training begun in a particular year, although the latter information was not available to a trainee at the time of entry. A third measure compares the proportion of each annual intake of apprentices that joined immediately after completion of the apprenticeship with the proportion that joined 2 or more years later. This third comparison may be a better measure of changes in local economic conditions at the time of joining.

It need not be assumed that apprentices who did not join the Company failed to complete their indentures. After their training, they could have worked outside the City limits, or worked in the City but avoided the expense of paying quarterage for life.³ Because this study is limited to Dyers' Company records, there are no data concerning activities of those who never joined the Company.

3.2.1 Time between apprentice binding and joining the Company, 1657-1754

In principle, all those bound into apprenticeship in dyeing in London could look forward to joining the Dyers' Company in seven years time. In practice, however, the proportion joining was significantly lower, around 40 percent. Moreover, the length of time between finishing training and joining the Company varied substantially.

Various factors might influence the length of time from completion of apprenticeship training to joining the Company. Did the apprentice, and/or his family, have the capital to start a business independently? If capital was available, what possibilities and opportunities existed for starting a new business in dyeing in London? Did the distance of the family residence from London affect decisions to join the Company after completion of the apprenticeship? Did the father's professional background affect the decision to stay in London? Sons of dyers might be more likely to return to their home county rather than stay in London. And how important was the strength of enforcement

³ Crawforth 1987, p. 328.

of Company restrictions on practicing the trade in the City without being a Company member?

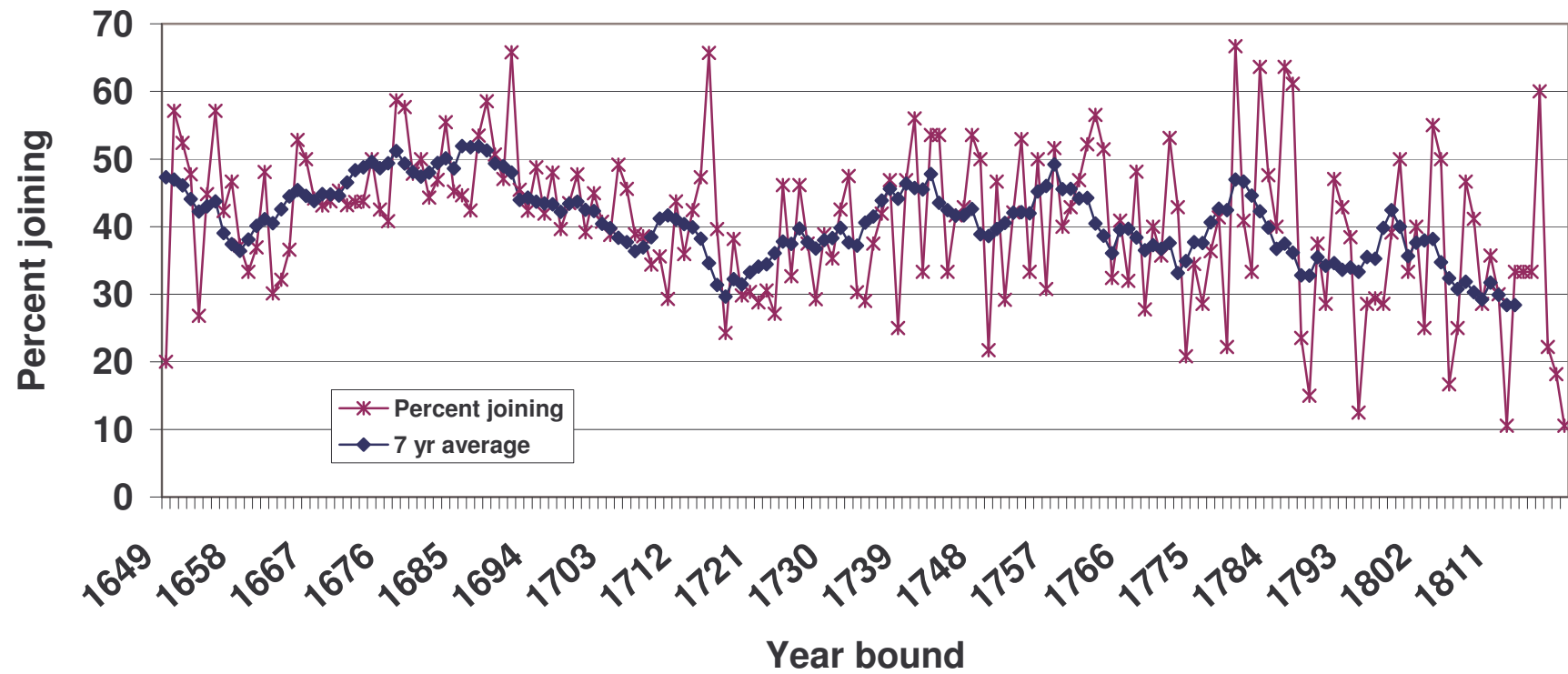
Since apprentice-binding information in the Dyers' Company is only available after 1649, the analysis of time between completion of apprenticeship training and then joining the Company can only begin in 1657, seven years after the time when apprentices who were bound after 1650 became qualified to join the Company.

The denominator in figure 3.1a relates to the year of joining. The percent (using the 7 year moving average) of those who joined immediately after completion (7 years after starting an apprenticeship) (Figure 3.1b), fell from over 50 percent in the 1650s to 30 percent by 1672, rose to a modestly steady 40 percent to 1700, after which it fell to around 20 percent from the 1720s and rose slow to 30 percent by the 1750s.⁴ A similar picture is seen using 5 years averages, and a period of 2 years or less after completion of training (Tables 3.1a and 3.1b). The fall from 1700 to 1720 in the percent joining preceded the fall (Table 2.1 and Figure 2.2) in the number of apprentices bound. The two changes may be related, but the picture is not clear. There are signs, shown later in this chapter, that economic opportunities were increasing after 1700, which could lead to increasing numbers of apprentices bound, and a higher percentage joining the Company. Yet the changes in the percent joining are equally compatible with decreasing economic opportunity. An alternative is that economic opportunities were increasing outside of London-, and attracting new apprentices as well as those who had completed training. I do not have data concerning this possibility.

In 1650-54, over 95 percent of apprentices who joined the Company did so within two years after completing their apprenticeship (Table 3.1b). After 1675, the proportion joining early fell steadily over 30 years so that by 1700 it averaged 60 percent joining early, where it remained for over 40 years. In other words, after 1675, trained apprentices who had not joined the Company waited a longer time before doing so. It does not appear that family residence was a factor in the timing of joining the Company (Table 3.2a and 3.2b).

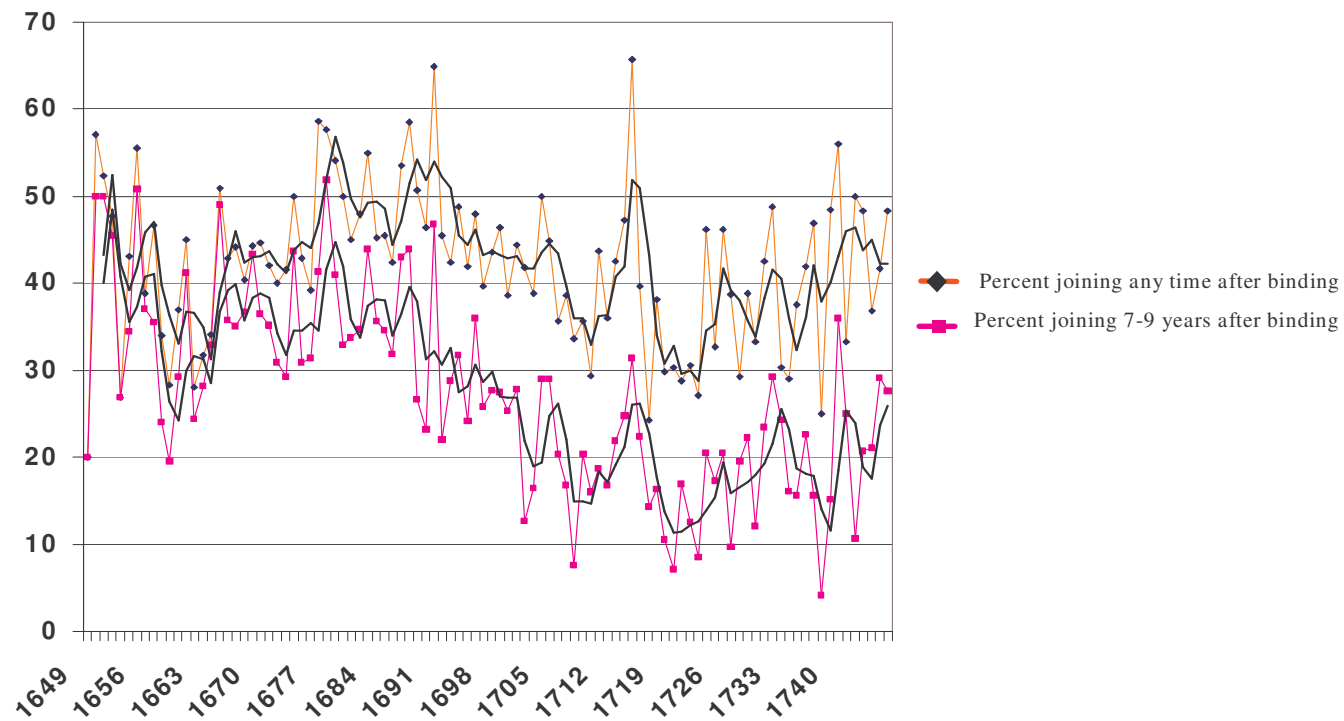
⁴ There were a four single years when less than 10 percent joined immediately after training, but it is unclear whether this relates to the recording artefact or to other causes.

Figure 3.1a Percent of apprentices joining the Company at any time, with a 7-year average, 1649-1819



Source: London Dyers, MS 8167 Vol.1, and 2,3, MS 8168. Vol.2, MS 8169.

Figure 3.1b Apprentices joining the Dyers Company within two years after completion of training or at any time after completion, 1649-1746 (as percent joining, with 3-year moving average)



Sources: Dyers' Company, MS 8167 vol 1,2,3, MS 8168. Vol 2, MS 8169.

Table 3.1a Years between completing training and joining the Dyers' Company, 1650-1744 (NUMBER)

Years bound	0	1-2	2 or less	3 plus	3-4	5-8	9-12	12-22	23- 32	33- 42	43- 47	Total
1650-54	58	33	91	4	2	1				1		95
1655-59	74	26	100	7	5	1				1		107
1660-64	89	39	128	10	7	1		1	1			138
1665-69	110	57	167	9	1	2	2	1	3			176
1670-74	97	53	150	17	9	6	1			1		167
1675-79	77	68	145	19	9	4	3	3				164
1680-84	98	78	176	27	10	8	4	5				203
1685-89	77	56	133	29	13	8	4	3	1			162
1690-94	70	48	118	45	20	11	7	6	1			163
1695-99	58	53	111	35	13	17	5					146
1700-04	48	39	87	54	16	20	9	5	3	1		141
1705-09	47	31	78	59	20	18	16	4			1	137
1710-14	54	48	102	54	20	15	12	5	2			156
1715-19	29	25	54	47	16	16	12	3				101
1720-24	18	32	50	40	12	17	5	5	1			90
1725-29	30	18	48	32	12	9	3	7	1			80
1730-34	29	15	44	26	5	12	4	3	2			70
1735-39	15	15	30	32	13	10	5	4				62
1740-44	15	20	35	22	7	10	3	2				57
Total	1093	754	1847	568	210	186	95	57	15	4	1	2415

Source: London Dyers, MS 8167, Vol.1, 2, 3 and MS 8168, Vol.1 and MS 8169.

Table 3.1b Years between completing training and joining the Dyers' Company, 1650-1744 (PERCENT)

Year bound	0	1-2	2 or less	3plus	3-4	5-8	9-12	13-22	23- 32	33- 42	43- 47	Total
1650-54	61.1	34.7	96	4	2.1	1.1				1.1		100
1655-59	69.2	24.3	93	7	4.7	0.9				0.9		100
1660-64	64.5	28.3	93	7	5.1	0.7		0.7	0.7			100
1665-69	62.5	32.4	95	5	0.6	1.1	1.1	0.6	1.7			100
1670-74	58.1	31.7	90	10	5.4	3.6	0.6			0.6		100
1675-79	47.0	41.5	88	12	5.5	2.4	1.8	1.8				100
1680-84	48.3	38.4	87	13	4.9	3.9	2.0	2.5				100
1685-89	47.5	34.6	82	18	8.0	4.9	2.5	1.9	0.6			100
1690-94	42.9	29.4	72	28	12.3	6.7	4.3	3.7	0.6			100
1695-99	39.7	36.3	76	24	8.9	11.6	3.4					100
1700-04	34.0	27.7	62	38	11.3	14.2	6.4	3.5	2.1	0.7		100
1705-09	34.3	22.6	57	43	14.6	13.1	11.7	2.9			0.7	100
1710-14	34.6	30.8	65	35	12.8	9.6	7.7	3.2	1.3			100
1715-19	28.7	24.8	53	47	15.8	15.8	11.9	3.0				100
1720-24	20.0	35.6	56	44	13.3	18.9	5.6	5.6	1.1			100
1725-29	37.5	22.5	60	40	15.0	11.3	3.8	8.8	1.3			100
1730-34	41.4	21.4	63	37	7.1	17.1	5.7	4.3	2.9			100
1735-39	24.2	24.2	48	52	21.0	16.1	8.1	6.5				100
1740-44	26.3	35.1	61	39	12.3	17.5	5.3	3.5				100

Source: London Dyers, MS 8167, Vol.1,2 and 3, MS 8168, Vol.1 and MS 8169.

Table 3.2a Years between completing training and joining the Dyers' Company, by family residence, 1706-1746 (NUMBER)

Family residence	Years between completing training and joining											Total
	0	1-2	2 or Less	3 plus	3-4	5-8	9-12	13-22	23-32	33-42	43-47	
London	46	33	79	37	10	13	6	6	2			116
Home	85	85	170	127	43	43	24	12	4		1	297
London+Home	131	118	249	164	53	56	30	18	6	0	1	413
Midlands	36	46	82	81	34	24	12	8	3			163
Northern	19	13	32	17	6	6	5					49
Eastern	2	3	5	4	1	1	1	1				9
South & West	23	13	36	26	7	11	5	3				62
Wales		2	2	6		5		1				8
Other	1	1	2	1	1							3
Unknown	888	570	1,458	275	111	85	43	26	6	4		1,733

Source: London Dyers, MS 8167, Vol.1, 2 and 3, MS 8168, Vol.1 and MS 8169.

Table 3.2b Years between completing training and joining the Dyers' Company, by family residence, 1706-1746 (PERCENT)

Family residence	Years between completing training and joining (percent by family residence)											Total
	0	1-2	2 or less	3 plus	3-4	5-8	9-12	13-22	23-32	33-42	43-47	
London	40	28	68	32	9	11	5	5	2			100
Home	29	29	57	43	15	15	8	4	1		0.3	100
London+Home	32	29	60	40	13	14	7	4	2		0.2	100
Midlands	22	28	50	50	21	15	7	5	2			100
Northern	39	27	65	35	12	12	10					100
Eastern	22	22	44	56	33	11	11					100
South & West	37	21	58	42	11	18	8	5				100
Wales		25	25	75		63		13				100
Other	33	33	67	33	33							100
Unknown	51	33	84	16	6	5	3	2	0.3	0.2		100

Source: London Dyers, MS 8167, Vol.1, 2 and 3, MS 8168, Vol.1 and MS 8169.

A possible explanation for delay in joining concerns changes in enforcement of regulations concerning working as a journeyman, without joining the Company. However, if this were a major factor, you would have expected a continuing decrease in the percent joining early rather than the steady 60 percent that was observed. The more likely alternative is that the difference related to a reduced but then sustained level of opportunity for independent employment as dyers after the 1680s.

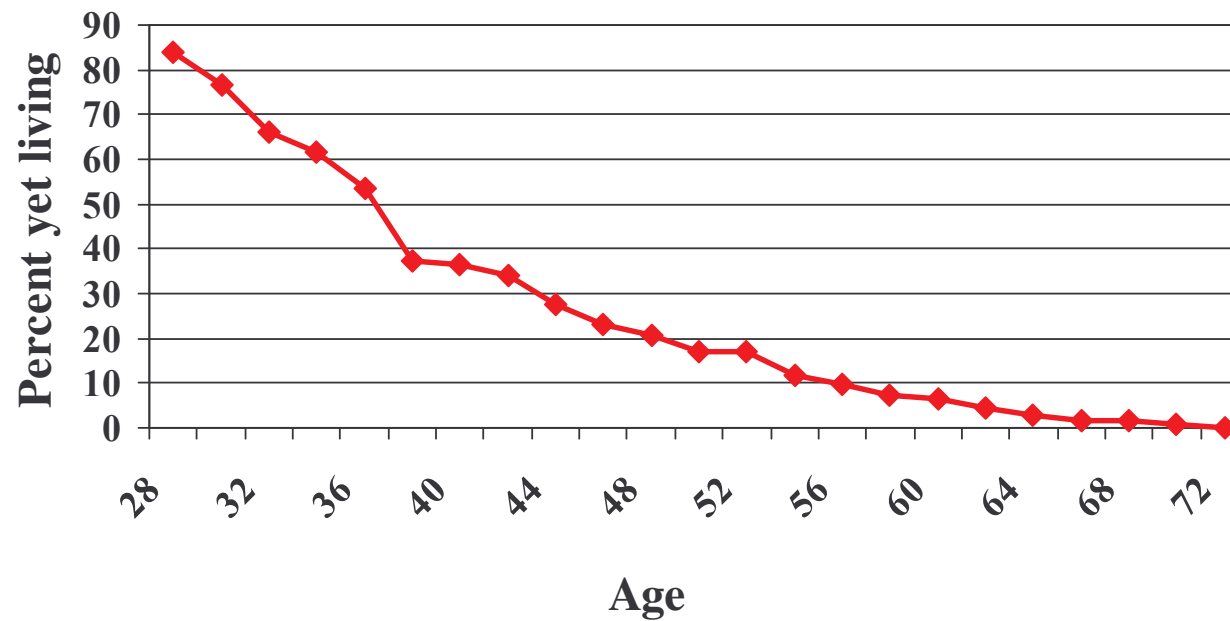
There are several possible explanations for low proportion of apprentices who subsequently joined the Company, often looked at as an 'educational failure' rate. The low proportion of apprentices joining a Company was not specific to the Dyers' Company. In early Stuart London, only 27 percent of apprentices in the Cordwainers, 38 percent in the Drapers, 40 percent in the Carpenters, 41 percent in the Stationers, 42 percent in the Merchant Taylors, 44 percent in the Masons, 45 percent in the Goldsmiths, and 50 percent in the Poulterers joined their Company and took the freedom of the City.⁵ Although the percentage joining was generally low, the wide variation in the percent of apprentices joining their Company suggests that some reasons for not joining were common and some were specific to each Company.

One reason for 'educational failure' was mortality. Mortality affected freemen from three London livery Companies in the 1550s significantly⁶ (Figure 3.2). The figure shows deaths after age 28, when there was a 20 percent loss from age 28 to 36. If such mortality rates were present for the age group of apprentices, mortality might explain a not insignificant portion of the 'educational failure'.

⁵ Grassby 1995, p. 139, collated information from a variety of sources to show 41 percent taking freedom in mid Tudor London.

⁶ Rappaport 1989, p. 331 and figure 8.2. This information relates to over a century earlier than the period of this study, the data from Rappaport, particularly those that follow individuals over time, are difficult to compile. I have used Rappaport's data often in comparison to those presented here, even though Rappaport did not include dyers in his analyses.

Figure 3.2 Mortality experience of London freemen of the Brewers, Butchers and Coopers Companies, admitted to the freedom of London, 1551-1553 (percent)



N = 112 freeman

Source: Rappaport, 1998, p. 331.

Another possible common reason for 'education failure' was finding work outside of London. The apprentice could have left London at or before the 7-year term was completed and taken up the dyer's trade elsewhere outside the City, and so did not need to join a London-based Company.⁷ Without a more thorough investigation of the names of active dyers in other cities or the London suburbs, it is not possible to know what percentage of apprentices worked as dyers, without joining the Dyers' Company.

Financial limitations might make working as a journeyman outside the company a sensible option. The apprentice would not then have had to pay quarterly fees. If a journeyman worked at his trade, his absence from the company register should not be considered an educational failure. Crawforth cites several examples.⁸ It is possible the 7-year apprenticeship period appeared too long, so leading some apprentices to abscond once they had learned enough to start a business on their own. But the 7-year period may have been in the interest of the master, who had to be able to recoup the costs involved in training. There is no way to estimate the frequency of absconding among Dyers' Company apprentices. George⁹ suggests that perhaps some masters wanted to retain the premium, which had risen significantly after 1660, and were glad to have the apprentice abscond. Ben Amos noted that 5 percent of apprentice bindings in Bristol from 1600-45 terminated amicably when the apprentice and the master agreed that the contract could be cancelled. Most were within the first month or the first two years.¹⁰ Absconding did not necessarily mean giving up the trade.

Another possible common reason for not joining a company was that the apprentice found his housing or working conditions unacceptable. It is possible he requested a transfer, via the mechanism known as a turnover. If granted, he would then complete his training under the supervision of another dyer. In Chapter 5, where an effort is made to follow transmission of skill through several generations, the question about from whom an apprentice learns his skill in dyeing will be discussed further.

⁷ I tested this assumption in a limited way. I searched in the Stroud-Gloucester area, with the help of Ian Mackintosh, the archivist of the London Dyers Company, for the names of Dyers' Company apprentices, originally from the Stroud-Gloucester area, who did not join the London Company. I did not find any as active dyers in the Stroud-Gloucester area.

⁸ Crawforth 1987, p. 327.

⁹ George 1996, pp. 276-277, citing a 1687 pamphlet titled "Relief of apprentices wronged by their masters, how by our law it may effectually be given and obtained without any special new act of parliament for that purpose".

¹⁰ Ben-Amos 1994, p. 105.

In the period, 1706 to 1829, 349 children from dyers' families were apprenticed, and 54 percent (189/349) joined the Company. For all other apprentices bound in this same period, only 37 percent joined the Company. The major difference between children of dyer's families and other family occupations might have been that children from dyer's families had a greater chance of a successful future as dyers. It is also possible that, in relation to social ties to the master, they were less likely to abscond. Of the 189 apprentices from dyers' families, 63 percent joined within 2 years after completing training, a proportion identical to the overall group of apprentices for the same time period.

An unrecorded educational success occurs when an apprentice, bound in another Company, receives training as a dyer, and subsequently trains other dyers who themselves remain members of the other Company. Although the frequency of such a situation with dyers is not known, information is available concerning instrument makers who were bound in several different Companies, only a few of which (Blacksmiths, Clockmakers, Grocers, Spectacle-makers) claimed responsibility for the trade.¹¹ Crawforth described instrument makers who were members of the Joiners Company and the Broderers Company,¹² and Brown lists some as members of the Grocers Company.¹³ One aspect of this mixture of two trades in a single Company is to confuse measurement of trends in the binding of apprentices; the numbers of apprentices in instrument making in the Grocers Company stayed unchanged or increased through the eighteenth century, while the total number of apprentices bound in the Grocers Company steadily decreased.¹⁴

The frequency of joining the Company was influenced by political as well as economic changes.¹⁵ The upheaval associated with James II's requests in the early 1680s for

¹¹ Crawforth 1987, p. 329.

¹² Crawforth 1987, pp. 337-377.

¹³ Brown 1979, pp. 15-56.

¹⁴ Brown 1979, pp. 16-17, Figures 1 and 2.

¹⁵ Guildhall Library MS 8164/1, fol 143, 23 April 1684. James II, in the 1680s, demanded submission of all guild charters to the King, so they could be reissued with changes. The Dyers Company responded by "heartily lamenting whatsoever their body or any members of it may in any ways have done to his displeasure and most humbly begged his clemency." The new charter included oaths to the King as supreme in things spiritual and ecclesiastical as well as temporal, and barred anyone that did not hold communion with the Church of England. It stated that members or officers of the Company were to be removable at the pleasure of the King. The livery of the Dyers Company was purged in September and early October of 1687 of members who would not be "loyal", and numbers were reduced by about half. But almost immediately after their removal, they were restored. The restoration of 18 senior dyers meant the return of men such as Congregationalist Roger Locke and Walter Clemens, who had opposed the

changes in London livery Company charters were associated with a reduction in annual admissions to freedom of the City of London. In the period 1675-79, 11,051 freemen were admitted to livery companies in London. The admissions had fallen to 8,989 in 1680-84, and to 8,611 in the period 1685-99, before climbing back to 10,708 in 1690-94.¹⁶

3.3 Joining the Company: by patrimony, redemption, or special action

The sources of data concerning entry by patrimony and redemption are incomplete in the earlier available Dyers' Company register, but complete after 1706. Even though it is not possible to know the earlier pattern, the data allow analysis of changes into the early nineteenth century.¹⁷ And this is the period when, as shown in Chapter 2, there was a significant decline in the numbers of apprentices bound in the Company. It was also a period of increasing use of redemption as a means of entering the Company. As shown later in this Chapter, the Company was undergoing significant changes in composition and mode of entry after the mid 1750s. Entry to the Company, by all modes of entry (Figure 3.3b¹⁸), mirrors the rise in apprentice bindings after 1650, and reaches a plateau at about 35 joinings per year from 1670 to 1700, after which it falls steadily to about 25 joinings per year in the 1730s, when it falls sharply to another plateau of about 15 bindings per year from the 1740s to 1815.

3.3.1 Joining the Company by patrimony

Patrimony is the process by which a child, born to an active company member, could join the company without an apprenticeship. Other possibilities were entry to the

surrender of the charter, James Houlton, future Whig MP for London in 1698-1700, as well as Christopher Lethieullier and James Denew, both associates of the Whig elite.

¹⁶ Knights 1997, p. 1175, citing Corporation of London Record Office freedom accounts, Vol. 1/15, 2/15 and 3/15.

¹⁷ Kahl 1956, describes changes in the frequency of modes of entry from 1690 to 1750 for the Grocers, Goldsmiths and Fishmongers. Although the patterns were different for the three Companies, only the Fishmongers showed an almost trebling in the percent that entered by patrimony, from 10 to 30 percent, while in the Grocers and Goldsmiths, the percent entering by patrimony stayed relatively stable at about 15 percent.

¹⁸ It is important to be careful in interpreting information shown in Figure 3.3b. Because the figure uses a 7-year average, it is sensitive to the data of the single year 1685, when a large number of entrants were by redemption and by service and redemption, as shown in Table 3.4. The single year is a partial explanation for the blip in the curve, seen around the 1680s. Without the influence of that year, the 7-year average is relatively flat from 1670 to 1710.

company by paying a special fee, called entry by redemption, or allowance to enter the company given by the London municipal authorities.

Entries to a company by patrimony or redemption were methods used in many towns, with variable frequency.¹⁹ Glass tabulated the proportion of company admissions using patrimony and redemption, with the major difference concerning use of redemption (Table 3.3).

Detailed data concerning mode of entry to the Dyers' Company are available after 1684 (Table 3.4). Although data are absent before 1684, patrimony was probably being used in the same proportion as shown after 1680. The proportion joining by patrimony to 1826, annually (Figures 3.3a and 3.3c) and in 5-year grouping (Figure 3.3d), show that patrimony was a significant and increasing mode of entry to the Dyers' Company.²⁰

Table 3.3 Percent joining the Dyers' Company by patrimony or redemption, compared with that of other London livery Companies²¹

Admission year	Number of admissions		Percent patrimony		Percent redemption	
	Total	Dyers	Total	Dyers	Total	Dyers
1690	1850	60	7.4	3.0	8.3	1.6
1695	1545	33	8.9	3.0	4.0	0
1700	1959	40	11.0	5.0	6.1	0
1725	1782	33	15.7	9.1	11.1	0
1750	1135	16	16.7	37.5	16.7	0

Sources: Glass, 1969 and London Dyers, MS 8167 Vol.1 and 2.

¹⁹ Grassby 1995, p. 140. In Bristol, from 1600-1699, thirty percent of merchants, and twenty five percent of Merchant Venturers obtained their freedom by patrimony. In Tudor London, overall, nine percent of freedoms were obtained by patrimony and four percent by redemption, but there were variations among livery Companies. In early 1600, in the London Drapers Company, nineteen percent obtained freedom by patrimony and five percent by redemption. Half a century later, from 1660-1688, sixteen percent obtained freedom by patrimony and ten percent by redemption.

²⁰ Riello 2002, in a study of Cordwainers covering 1690-1830, presented a graphic representation (10.4), p. 150, which shows patrimony as a mode of entry varying from about 5 to 20 percent per decade, but not an increasing proportion of the total.

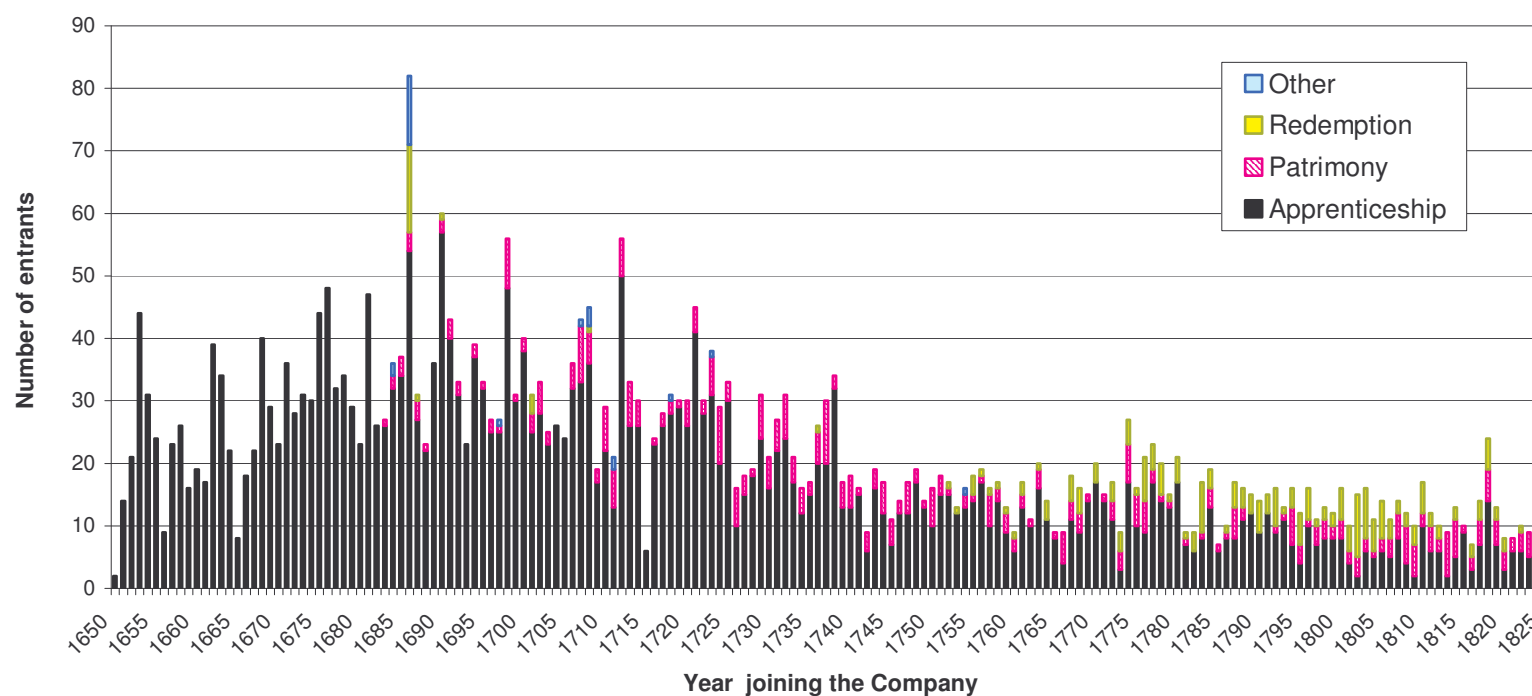
²¹ Glass 1969, p. 585. The data for the London livery Companies were taken from the completed indentures, deposited with the chamberlain's court when applicants were admitted to the freedom of the city. The use of single years in producing this table may distort the comparisons. For example, for the Dyers' Company, the average for 1725-29 and 1750-54 is 17.1 and 15.0 percent by patrimony, quite similar to the other Companies. The more significant difference is with redemption.

Table 3.4 Mode of entry into the Dyers' Company, 1660-1724, showing other modes in addition to apprenticeship, patrimony and redemption

	1655-9	1660-4	1665-9	1670-4	1675-9	1680-4	1685-9	1690-4	1695-9	1700-4	1705-9	1710-4	1715-9	1720-4
Apprenticeship	50	115	105	139	175	149	172	190	161	141	141	140	113	146
Patrimony						3	10	9	13	11	20	30	5	26
Redemption						1	16	1		3	1			
Service and redemption						2	8							
Patrimony and redemption							1							
Foreign brother											1	1		1
Common Council													1	
New Charter											1			
Lord Mayor/Court of Alderman											1	2		
Unknown											1			
Total	50	115	105	139	175	155	207	200	174	155	166	173	119	173

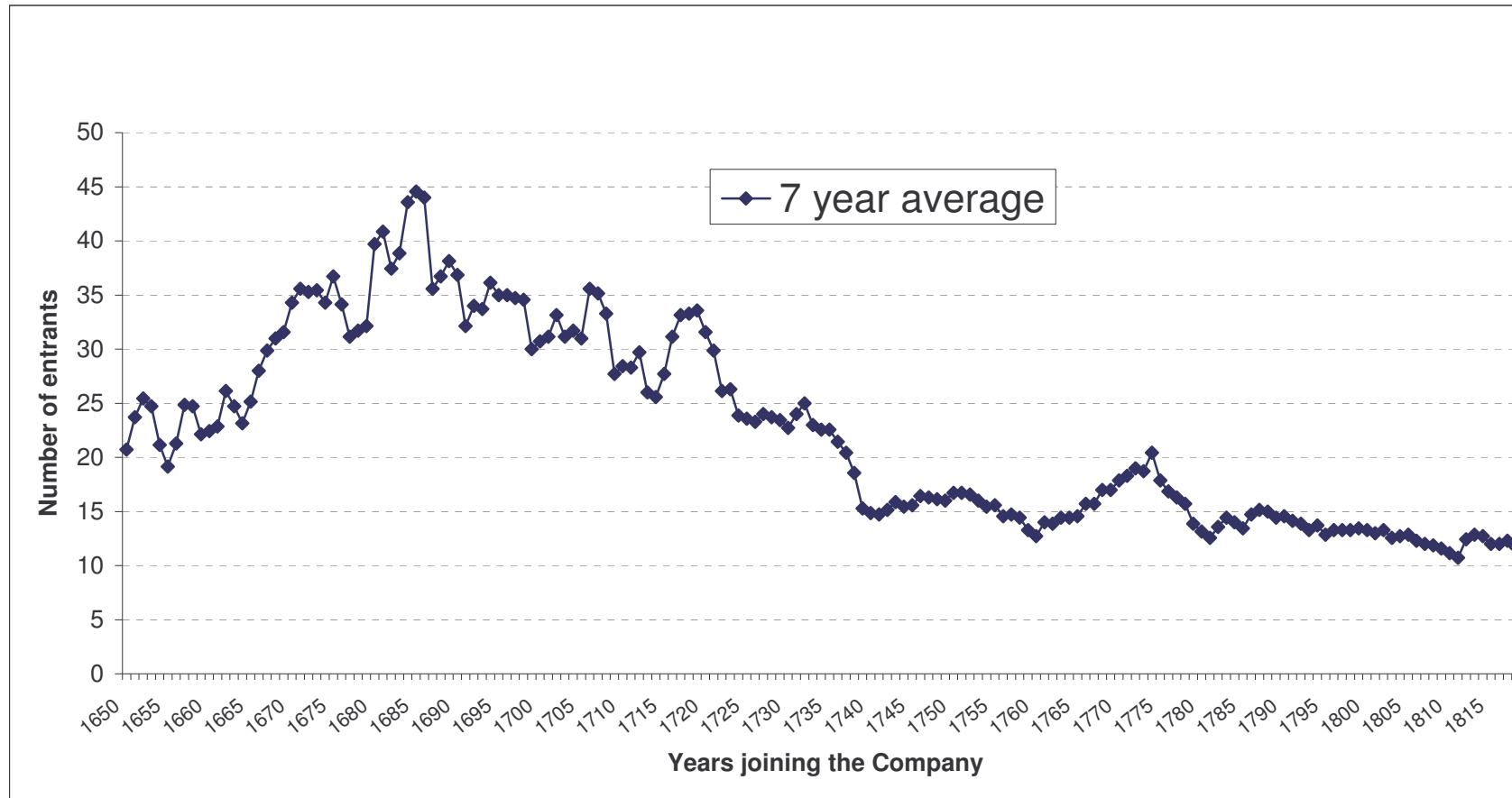
London dyers, MS 8167 Vol.1.

Figure 3.3a Entry to the Dyers' Company by apprenticeship, patrimony, redemption and other modes, 1650-1825



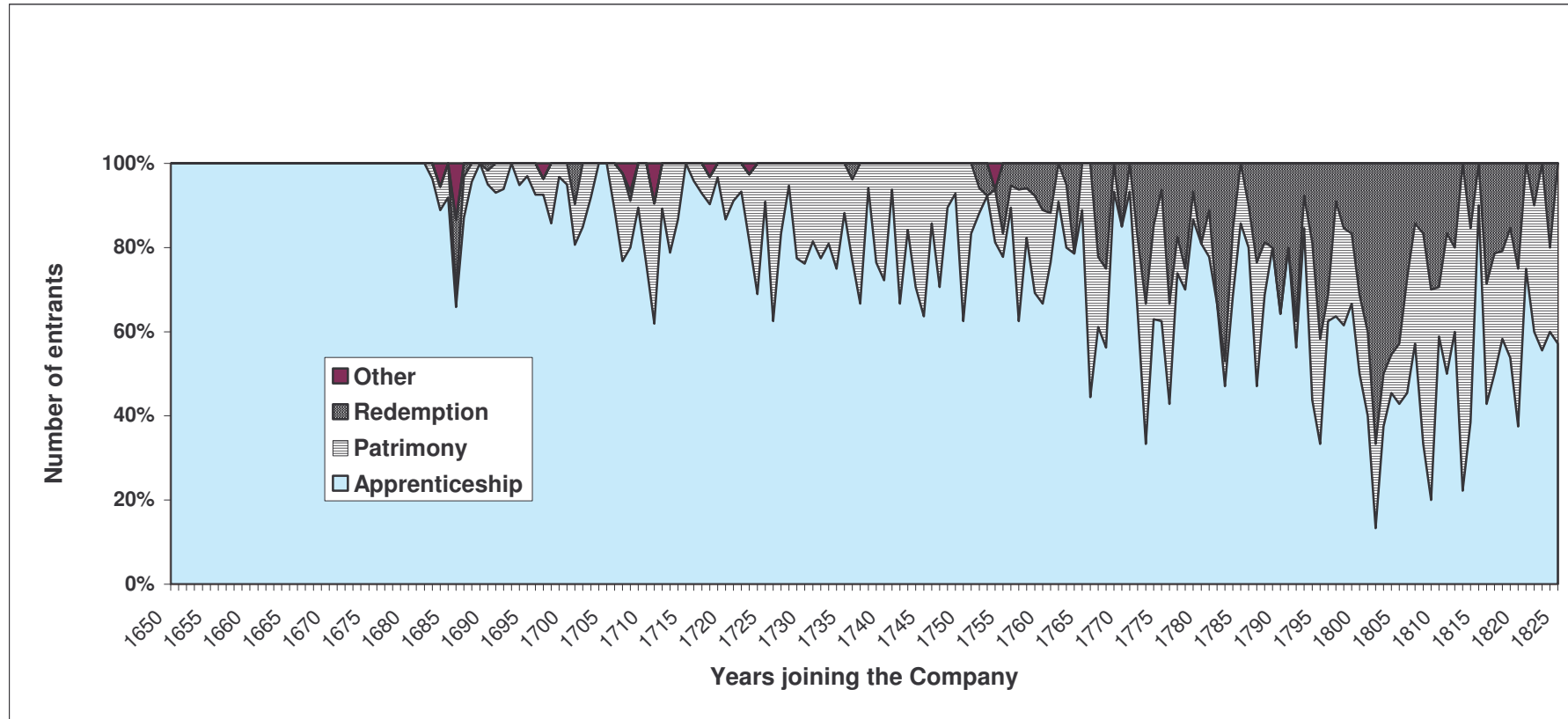
Sources: London Dyers, MS 8167 Vol.1, 2 and 3.

Figure 3.3b Entry to the Dyers' Company by all modes of entry, 1650-1825, as a 7 year average



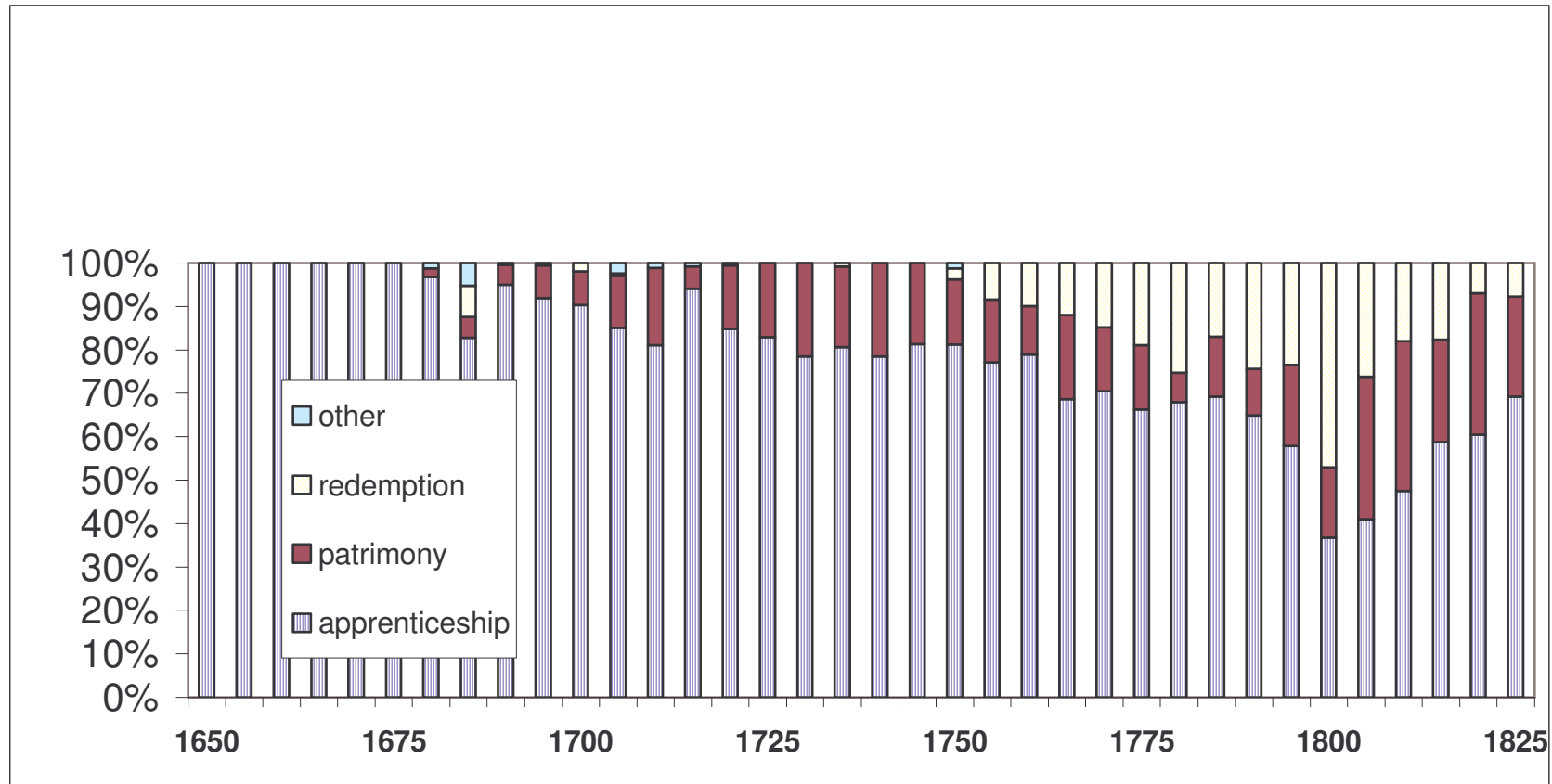
Sources: London Dyers, MS 8167 Vol.1, 2 and 3.

Figure 3.3c Entry to the Dyers' Company by all modes of entry, 1650-1825, by each mode's percent of total



Sources: London Dyers, MS 8167 Vol.1, 2 and 3.

Figure 3.3d Entry to the Dyers' Company by all modes of entry, 1650-1825, by each mode's percent of 5 yr total



Sources: London Dyers, MS 8167 Vol.1, 2 and 3.

From 1685 through 1744, an average of 9 percent joined the Dyers' Company through patrimony, but the percentage joining through patrimony steadily increased from 5 percent from 1685-1699 to 11 percent in 1700-1719. Then, as apprentice numbers began to fall, the percentage joining by patrimony rose further to 17 percent from 1720-39 and 22 percent in the 5-year period 1740-44. From that peak it fell back to about 15 percent for the next 50 years. However, from 1800-1809 it was 24 percent (Figure 3.3c, showing annual joining and Figure 3.3d showing joinings over 5-year periods).

It is not clear why all Company members did not use patrimony as a way to regularise their children's membership in the Company. Perhaps they wanted their children to learn from another teacher. And for those from outside of London, subsequent job opportunities for their son might be greater in London. Company records from 1706 to 1829 show that of 669 persons whose fathers were dyers, 303 (45 percent) joined by patrimony. The proportion of dyers' children who joined by patrimony, rather than being bound as an apprentice, was lowest (around 40 percent) from 1780 to 1800, but was otherwise rather steady at around 60 percent. I was unable to find a change in entry barriers that might explain the change observed.

3.3.2 Joining the Company by redemption or special action

Entry by redemption was initially infrequent in the Dyers' Company (Table 3.4), though in the period 1685-89 it was briefly more common than entry by patrimony, when efforts by municipal authorities resulted in many practicing dyers from outside the Company paying to join it. In the decade of the 1750s, 5 percent of entry to the Company was by redemption, by the 1760s it was 11 percent, by the 1770s it was 17 percent, by the 1780s it was 21 percent, by the 1790s it was 24 percent and from 1800-1809 it was 37 percent. In the period 1800-1809, entry by patrimony and redemption together was more common than entry by apprenticeship (Figures 3.3a, 3.3b, 3.3c, and 3.3d).

In 1685-89, some apprentices joined the Dyers' Company by service and redemption (Table 3.4). This use of service and redemption followed revision of the Dyers' Company charter (LG, MS 1684, vol. 1, p. 105) expanding their search area to six miles, which meant that dyers who were in other Companies should become members of the Dyers' Company.

There were a small number who entered the Company as a result of a request from the Mayor and/or Council. This method was used to admit well-established dyers who were aliens. However, this special category may not fully represent the entry of well-trained dyers from other countries, since some of them may have entered through redemption.

The limited number of masters who undertook to bind apprentices had important implications for the growth of the Company. Since only a minority of masters bound apprentices, there would come a time when the Company would shrink. When the numbers of apprentices bound averaged 70 per year, as it did for the years from 1670 to 1720, only about 30 apprentices of the 70 (40 percent) joined the Company, and about 10 (one third of these) bound an apprentice. To maintain stability in numbers in the Company, each master who bound apprentices would have to bind about 7 for the Company to retain its size; in practice, the average was less than 3. Entry by patrimony, plus entry by redemption was essential to make up the difference. However, those who entered by redemption (37 percent in the early 1800s) were most often not dyers by profession. Although they increased the numbers in the Company, the function of the Company was decreasingly related to the teaching of dyers.

It is unclear that the Company as a way to increase Company size solicited increased entry by redemption. Similar changes were seen in the Cordwainers²² and other Companies.²³

3.4..Time after completing training but before joining the Company

Although each apprentice dyer might aspire to join the Company and become a master, the time between completing an apprenticeship and becoming a master could vary from a few years to a lifetime. And even though some of this time would precede joining the Company, much of it could be spent as a journeyman.

²² Riello 2002, the previously cited table showed that redemption was an increasing mode of entry to the Cordwainers' rising from less than 10 percent in 1750-59 to 40 percent in 1810-19, at a time when apprentice bindings were stable.

²³ Kahl 1956, p. 18, showed redemption increasing as a mode of entry from the 1730s.

"Each livery company contained an ordered hierarchy of members ordered in five status groups: officers and assistants, liverymen, householders, journeymen and apprentices."²⁴ The distinction between journeymen and householders was that journeymen were not independent businessmen, and worked for others. Householders were independent businessmen, and could exercise this privilege, after paying a fee to their Company, by binding an apprentice. It is important to note, however, that these official categories do not completely describe reality. Some dyers who performed as journeymen were not members of the Company. In this group were those who had just completed their training but not yet joined the Company. Some of this time lag might simply represent administrative delay, either in settling details about payments or about recording the decision in the records. But the time also involved working temporarily as journeyman, and remaining outside the Company. We will deal later with measurement of the time some Company members spent as journeymen after joining the Company but before becoming a housekeeper (householder).

Aside from the need to obtain funding to become independent, there were guild regulations and actions that were barriers that could prevent or delay newly trained craftsmen from becoming independent, leaving them as journeymen. One such cause of delay to entry was the requirement to produce a masterpiece.²⁵ The use of the masterpiece, as a cause for delay, or perhaps as a measure of competence, was becoming common in the seventeenth century, being used by the Weavers, Saddlers, Feltmakers, Broderers, Clockmakers, Joiners, and Tin-plate Companies.²⁶ I found no information about the need for presentation of a masterpiece in the London Dyers' Company.

²⁴ Rappaport 1989, pp. 217-19, 244-50, 385-87. The term householder refers to the occupant of a property who is held responsible by parish and ward authorities for the payment of rates of various sort (so-called scot and lot). Householders were held to be legally responsible for the behaviour of anyone inhabiting a household (children, servants, apprentices). Householders were the bottom rung or first line of civic government, and could be eligible for service in the parish or ward, as wardmote inquestmen and other jobs. In reference to membership in a livery company, householders often formed a distinct estate of members of companies below the estate of liverymen and above that of journeyman. Householders were freemen of the companies who had completed apprenticeship, and, after paying a fee to their Company, set up household, bound apprentices, but did not have the status to progress to liveryman within a company. In many of the larger companies, this group formed a substantial proportion of the membership.

²⁵ Unwin 1966, Ch. XV, pp. 243-66.

²⁶ Unwin 1966, p. 265.

There are few data to determine how many apprentice dyers became journeymen dyers, and worked, either temporarily or permanently, for other dyers, rather than running their own business. Even the characteristics of their employment are uncertain. Some journeymen may have worked steadily in one place for one master, while some were temporary employees, working while gaining capital to become independent. Some perhaps worked part-time as dyers, subcontracting with other masters, while earning a living at another occupation altogether. In the records of the occupation of some of the journeymen dyers, three were called porters (two were woad porters, probably at Dyers Hall, and one was a porter at Billingsgate). It is possible these were temporary jobs, and that the journeymen were porters only until there was contract work in dyeing.

Another reason for delay was the ability, as a journeyman, to work without incurring quarterly dues or an entrance fee for joining. Earlier in this chapter it was shown that after 1690, more than 30 percent of apprentices had allowed a delay of more than 2 years between completion of training and joining the Company. And from 1705 to 1739, approximately 10 percent waited more than 9-12 years before joining (Table 3.1a and 3.1b). Although the differences are not large, those from London families who did join the Company were less likely to take a long time before doing so (Table 3.2a and 3.2b). Other than families from London, the geographic origin of the apprentice did not seem to be a variable that influenced the amount of time spent as a journeyman before joining the Company.

3.5 Journeymen and timing

3.5.1 Journeymen in the Company

Discussions of journeymen often focus on the national organisations that developed to deal with markets in skilled labour, and involved movement of skilled workers over wide geographic areas.²⁷ English independent journeymen's organisations were later in developing than those in France and Germany, though illegal fraternities of journeymen in late medieval London were the groups from which were developed the yeomanry of some London guilds.²⁸ ²⁹ During the fifteenth century, these illegal fraternities of

²⁷ Epstein 2004a, pp. 252-54.

²⁸ Rappaport 1989, p. 219.

²⁹ Epstein 2004a, pp. 254-64.

journeymen underwent expansion and change, and by the sixteenth century they included both journeymen and householders, that is, both employers and employees, often with their own structure, officers, income, accounts, powers, and practices.³⁰ The journeymen's groups were often responsible for the Company's search activities, which maintained discipline within the Company, and limited the entry of 'foreigners' and the number of apprentices per master.³¹ In London, journeymen's brotherhoods organized 'turn houses' or 'houses of call'. These were places where travelling journeymen³² could stay, the major actors being feltmakers, weavers, brushmakers, curriers, millwrights, and masons.³³

Journeymen's organizations were not always peaceably dealt with.³⁴ In England in 1549, a law declared illegal "all confederacies and conspiracies of working people to determine wages or amount of work to be done." Laws were passed in 1718 against journeymen's clubs, in 1721 against journeymen tailors, and in 1726 against unlawful workingmen's clubs and societies.³⁵ Sir John Fielding wrote, in 1756, that "the master tailors...have repeatedly endeavoured to break and suppress the combinations of their journeymen to raise their wages and lessen their hours of work, but (the journeymen) have never been defeated.... And this has been in some measure due to the infidelity of the masters themselves to each other; some of whom, taking advantage of the confusion, have collected together some of the journeymen, whose exorbitant demands they have complied with, while many other masters have had a total stop put to their business."³⁶

³⁰ Rappaport 1989, p. 220.

³¹ Leeson 1979; Swanson 1989; Farr 2000.

³² Journeymen associations appeared first in cities in the late Middle Ages, where urban production required a flexible supply of trained workers. Weavers and fullers were among the first craft groups to organize. But by 1400, there were journeymen's organizations of shoemakers, tailors, furriers, bakers, coopers and smiths in Germany along the Rhine, and in France. Large journeymen organizations in France, Germany and the Netherlands were involved in assisting with the mobility of trained labour. Dambruyne 1998; Deceulaer 1998; Farr 2000; Truant 1979.

³³ Leeson 1979, pp. 76-77.

³⁴ Lis and Soly 1994, p 42 cite examples relating to journeymen in the Netherlands. One concerned journeymen dyers of Bruges, who, having established a fraternity, proceeded in 1453 to form an international society of journeymen dyers, with members from 42 towns. Either in response or as a cause, their employers joined forces to try to control journeymen's wages. Another example concerned the collective action of journeymen clothiers (in Leiden, Amsterdam, Haarlem, Hoorn, Gouda and Rotterdam) between 1636 and 1639 which was the direct cause for collective action by all Clothiers Guild masters in nine cities in Holland. The collective action involved identifying subversive workers and equalizing wages throughout the province.

³⁵ Leeson 1979, p. 86.

³⁶ Lis and Soly 1994, p. 45.

There were few legal cases brought concerning journeymen who never served an apprenticeship. From 1563-1642, and for whatever craft, the offender in virtually all apprenticeship cases is the master. In the two Westminster Courts, from 1563-1640, not one journeymen case was observed from any county outside London. When there were workers without apprenticeship, the case was against the employer. When there were cases about apprenticeship, in Wiltshire and in Essex, none related to journeymen.³⁷

Sometimes, journeymen sought legal redress against their own Company. After the 1666 fire of London, many dye masters moved their premises from the City into the suburbs. In 1699, journeymen of the Dyers Company petitioned the Lord Mayor of London and the Alderman, complaining that some masters of the Dyers Company was ignoring ordinances against hiring foreign workers without written permission. The Dyers' Company Warden supported the masters, and justified their behaviour because it fell outside the city jurisdiction. The Aldermen, however, ordered the Company to renew efforts at enforcement.³⁸ A much later example concerned a journeymen's strike of London calico printing firms was called when 1 of 16 London calico printing firms in 1744 employed a higher than agreed ratio of apprentices to journeymen. The regulation allowed only 1 apprentice for every 7 journeymen.³⁹

Most of the rank and file of a Company were in the yeomanry, and were not members of the livery or Assistants. In the 1550s, only 14 to 20 percent of several Companies studied by Rappaport were in the livery (Table 3.5).⁴⁰

³⁷ Davies 1956,

³⁸ Ward 1997, pp. 38-39, citing CLRO, Rep 74, fol 21 4v-16v.

³⁹ Simon 1994, p. 127.

⁴⁰ Rappaport 1989, Table 7.7, p. 275. In the 1550s, from 14 to 20 percent of men in the Company were in the livery. Promotion to the livery might come quickly, if money and other elements of status were present, but promotion from householder to livery might average 10 years, with another 8-10 to go from livery to assistant.

Table 3.5 Status of the membership of four London Companies in the mid 1500s (as percent)

	Livery	Householders	Journeymen
Brewers	14	17	70
Butchers	20	38	43
Coopers	14	46	41
Pewterers	17	48	35

Source: Rappaport, 1989, Table 8.16, p. 346.

3.5.2 Time as a journeyman

When a Company member paid a fee to become a master-and-housekeeper, he then had authority to bind an apprentice. The time between joining the Company and becoming a master-and-housekeeper was most probably a time when the member had been working as a journeyman.

For those who did not join the Company, it is unclear how many became practicing dyers outside Company jurisdiction, and how many simply gave up the practice of dyeing. There is also the possibility that those outside the Company spent time both as independent dyers and as journeymen, depending on season or circumstance. There are limited Dyers' Company data that can be used meaningfully to estimate how long any dyer spent as a journeyman.

Data are available concerning journeymen in London livery companies in the sixteenth century, but they do not mention dyers.⁴¹ However, I have used the relevant tables as background to help understand the analysis of data concerning journeymen in the Dyers Company in the period 1640-1750. Rappaport analysed data concerning 53 freemen in the mid sixteenth century who never became householders (Table 3.6). He showed that the time as a journeyman differed significantly in different Companies. For Brewers the average was 13.4 years, while for Coopers it was only 2.6 years.⁴² Dyers' Company data will be presented later, which allow an estimate of this character.

⁴¹ Rappaport 1989, Chapters 6 and 7, pp. 162-184, deal in depth with time spent as a journeyman in the sixteenth century, but do not deal with dyers. The only mention of dyers concerns a dispute between the Clothworkers and shearmen concerning those that in addition were practicing as dyers.

⁴² Rappaport 1989, Table 8.12, p. 334.

Using the Dyers' Company records, it is possible to follow individuals from when they joined the Company to when they bound an apprentice. In one instance, the data concern a unique listing of employment of yeoman in the Dyers Company in 1640. A separate instance concerns data relating to Dyers' Company housekeepers from 1682 to 1728.

3.5.2.1 1640 yeomanry data and time as a journeyman

In a Dyers' Company biennial quarterage list in 1640,⁴³ there were 202 yeoman dyers. It is not certain that 202 is the total number of yeomen in the Company at that time, but other data suggest that the number might be a good estimate. From 1632 to 1667, the total number of yeomen in any year in the register rises above 300 in only one year, 1667. And, 50 years later, in a 1696 poll of all members of the Dyers Company⁴⁴, there were only 199 yeoman dyers.

Twenty two of the 202 yeoman in this 1640 cohort had residence outside London, as: being at sea, in the Americas, or in other locations in England, (Bristol, Burton-on-Trent, Guildford, Southampton, Worcester, or Yarmouth). Of the remaining 180 yeoman in the 1640 cohort, 89 (49 percent) were recorded as working for other dyers, as journeymen..

Although there are no remaining registers of annual apprentice binding or annual freeman joining for the 1630s (such registers are only available from 1649), which could indicate when these 89 journeymen started their apprenticeship or joined the Company, 72 of them were found on the biennial quarterage lists from 1632 through 1638, and notations indicate some of them were also present earlier. Of the 72 journeymen, 20 (28 percent) had been in the Company for 8 years or longer, 11 (15 percent) for 6 years, 15 (21 percent) for 4 years and 26 (36 percent) for 2 years. It is possible that those working for longer periods were "permanent" journeymen, while those for the shortest period might still be considering going into business for themselves. The data for 1640 suggest that up to about 50 percent of those who had joined the Company worked initially as journeymen, some for long periods of time.

⁴³ London Dyers 1632.

⁴⁴ PRO 1696, class C213/171/13.

Since the data are available only for 1640, it is not clear what percentage of those who joined the Company remained journeymen for long periods, and whether this percentage changed over time, or varied greatly in relation to economic changes.

3.5.2.2 1682-84 housekeeper data and of time as a journeyman

It is possible to measure time spent as a journeyman using information concerning housekeepers in the Dyers' Company. The use of the term *housekeeper*, in the Dyers registers, describes a category, which appears identical with that of *householder* in other Companies. A fee was paid to become a housekeeper, and then apprentices were bound. A householder was a freeman with the right to start an independent shop and bind apprentices. Although there may have been additional rights and responsibilities that might distinguish a housekeeper in the Dyers Company from a householder in other Companies, I assume they are essentially identical.⁴⁵

There is an annual, sometimes biennial record, in the Renter Warden's register, from 1682-1728, which records the "masters-and-housekeepers" in a given year or biennium, and notes a payment of 10 shillings for that status. From these lists I have tabulated: the year bound; the year the year joining the company; and the year becoming a housekeeper. For this group, the number of apprentices they bound in their lifetime; the percentage of the cohort of apprentices who became housekeepers; and the time between joining and becoming a housekeeper were recorded.

None of the dyers in the housekeeper listing had bound an apprentice prior to becoming a housekeeper. This suggests, but does not prove, that the dyer who paid to become a housekeeper was not independent before that date. After all, almost two-thirds of those who joined the Company did not bind an apprentice. It is probable that the fee to become a housekeeper related specifically to the intention to start an independent business and to be permitted to bind apprentices. For the period 1682-84, 45 housekeepers were listed, with 7 (16 percent) having professions other than a dyer (Table 3.6).

⁴⁵ Rappaport 1989, pp. 217-32. I am indebted to Michael Berlin who helped me clarify the relation between householder and housekeeper.

Table 3.6 Housekeepers' occupations, 1682-1684

Master's name	Occupation	Residence	Year
Ferdinando Holland	cloth dyer	in the Close	1683
William Crutchfield	cook	by Queenhithe	1683
Thomas Crossland	cook	without Bishopsgate	1682
Richard Ford	dyer	in George Alley	1682
George Smith	dyer	in the Maze	1684
Benjamin Willmott	hat dyer	in Barnaby Street	1683
John Werrett	heelmaker	in Red cross Street	1683
Richard Rootlidge	hot presser	in Crouched Fryers	1682
Henry Elderton	linen dyer	in Hog Lane by Norton Folgate	1682
Benjamin Ollive	linen dyer	in Old street	1682
Henry Simmons	linen dyer	in Brick Lane	1683
William Branch	linen dyer	near Cold Harbour Thames Street	1683
Roger Guy	linen dyer	in Hog Lane	1683
Peter Sands	linen dyer	in Moor Lane	1683
John Grimshaw	linen dyer	in Hog Lane	1683
John Short	linen dyer	Barbican	1684
Joseph Robinson	linen dyer	in Whitecross Street	1684
James Wheldon	oyleman	just without Temple Bar	1683
Benjamin Knott	rug dyer	Five Foot Lane	1684
George Powell	silk dyer	in Little Old Bailey	1682
Thomas Brandes	silk dyer	in St Albans Street near St James	1682
John Thompson	silk dyer	in Pearl Street in Spittlefields	1682
Thomas Bloseman	silk dyer	Bankside	1682
William Lee	silk dyer	in Spittlefields	1682
Edward Morton	silk dyer	by Three Cranes	1682
Robert Coley	silk dyer	Old Change	1682
William Bird	silk dyer	in Five Foot Lane	1682
John Bartholemew alias Pizzy	silk dyer	in Cousin Lane Thames Street	1683
William Devonshire	silk dyer	by 3 Cranes	1683
John Wait	silk dyer	Whitecross Street	1683
Elias Heath	silk dyer	in Horseshoe Alley in Moorfields	1683
Timothy Crouch	silk dyer	Morgan's Lane	1683
Henry Ganderton	silk dyer	in Castle Street near Spittlefields	1683
John Morris	silk dyer	in Drury Lane	1683
Jervis Coley	silk dyer	Morgan's Lane	1684
William Lamb	silk dyer	Rose Lane, Wheeler Street, Spittlefields	1684
Matthew Taunton	silk dyer	in Campion Lane Thames Street	1684
Joseph Rich	silk dyer	in Sheppard's Alley	1684
John Fowler	stuff dyer	in the Close	1683
Samuel Woolf	stuff dyer	at Lambeth	1683
James Smith	stuff dyer	at the Bridgehouse	1683
Henry May	stuff dyer	in Wall Street in Spittlefields	1683
John Ufford	stuff dyer	at Three Cranes	1684
Joseph Elliot	tobacconist	in Wood Street	1683
Nathaniel Pedley	wood rasper	St Paul's wharf	1683

Source: London Dyers, Renter Warden's Register, MS 8154.

These other occupations included a hot presser, a tobacconist, 2 cooks, a wood rasper, an oyleman and a heel maker. The remainder were silk, linen, stuff, rug, cloth, and hat dyers.

Of the 349 dyers, from 1682-1728, with complete records from being bound as an apprentice through to becoming a housekeeper, 27 became housekeepers before 1690, 70 between 1690-99, 118 between 1700-1709, 94 from 1710-1719, and 50 from 1720-1728. In a tabulation of the proportion of those joining the company who became housekeepers, using only those 349 dyers for whom an apprenticeship was known, there were 12 years in which 30 percent or more became housekeepers, but the overall average, from 1680 through 1724, was 21 percent.

For the analysis of time as a journeyman, I used the recorded year of apprentice binding, the year of joining the Company, and the year of becoming a housekeeper, and constructed a record of the time spent by that individual between these three events.

There are the usual difficulties because names are not unique identifiers.⁴⁶

Thirteen of the 349 dyers who became housekeepers bound no apprentices. This means they paid the fee, and either contracted only with journeymen, or perhaps tried but failed to find an apprentice.

⁴⁶ Examples of uncertainties include: Thomas Gilbert, who became a housekeeper in 1703. But there are 2 Thomas Gilberts who joined the company, one in 1689, one in 1703. I have made the assumption to select the individual with the shorter time between joining the Company and becoming a housekeeper, because, in the majority of instances, when there is no difficulty with duplicate names, the interval is short. This means that the estimate of average time between joining the Company and becoming a housekeeper is a minimum, although, in fact, the number of times such duplicate name problems arise is infrequent. A more common problem is that there is no record, in either the apprentice or freeman registers, of that dyer subsequently recorded as becoming a housekeeper. There is, however, a record of apprentices bound to that housekeeper, starting in the year of that dyer becoming a housekeeper. There were 349 individuals identified as housekeepers who could be identified as apprentices who had joined the Company. On rare occasions, one name appears twice in the housekeeper lists. For example, Joseph Hackney appears in 1704 and 1713. And there is only one Joseph Hackney who joined the Company in 1704, and not another in 1713. So, I assume, with much uncertainty, that this is the same man, paying twice to become a housekeeper. He bound 3 apprentices before 1713 and 7 additional apprentices after 1713. Another duplicate is Robert Hayward, Junior, who paid to be a housekeeper in both 1723 and 1726. He bound his first apprentice in 1731.

In describing journeyman status, there are some who joined the company, bound no apprentices for several years, then became a housekeeper, and bound an apprentice. If the binding of an apprentice is an indication of starting a business, the years between joining and becoming a housekeeper is a measure of how long they worked as a journeyman. The following table excludes 13 dyers who are not recorded as binding an apprentice.

One hundred and forty three (41 percent) of the 349 who became housekeepers from 1682-1728 had worked as journeymen for less than two years before becoming independent. (Table 3.7)

Table 3.7 Years between joining the Company and becoming a housekeeper

Years between joining and becoming a housekeeper	Number	Percent
0	85	24
1	58	17
2	36	10
3	25	07
4	19	05
5-9	73	21
10-14	25	07
15-19	16	05
20 plus	12	04
Total	349	100

Source: London Dyers, Renter Warden Register, MS 8154.

Ninety-eight (28 percent) had worked 5-14 years before becoming independent and another 28 (9 percent) had worked 15 years or more as a journeyman before becoming independent. It is possible that economic conditions or specialty knowledge influenced how long a dyer would need or want to spend as an apprentice and journeyman, before attempting an independent business. Data concerning housekeepers, by number (Table 3.8a) and percent (Table 3.8b) shows that after 1700, a higher proportion of housekeepers worked less than 2 years as a journeyman before becoming independent.

Table 3.8a Years between joining and binding an apprentice, for housekeepers, by year of joining, 1665-1729 (NUMBER)

5 yr	0	1	2	3	4	5	6-10	11-15	16-20	21-32	Total
1665-69								1			1
1670-74							1		1	2	4
1675-79				1	2	1	3	1	1	3	12
1680-84	4	3	6	2			2	3	3		23
1685-89			1	3	1	3	13	5	2	2	30
1690-94	4	4	5	4	1	3	11	5			37
1695-99	1	9	4	2	2	2	14	2	5	1	42
1700-04	14	8	4	2	3	2	7	2			42
1705-09	15	10	6	2	3		4	1	3		44
1710-14	13	9	4	4	5	3	6	2			46
1715-19	15	9	2	3		1	2	1			33
1720-24	13	4	3	2	2	1	1				26
1725-29	6	2	1								9
Total	85	58	36	25	19	16	64	23	15	8	359
Percent	24	17	10	7	5	5	18	7	4	2	100

Source: London Dyers, MS 8154 vol 1.

Table 3.8b Years between joining and binding an apprentice, for housekeepers, by year of joining (PERCENT)

Y e a r s	0 - 2	3 - 5	6 - 10	11 - 15	16 - 20	21 - 32	T o t a l
1665-69	0	0	0	100	0	0	100
1670-74	0	0	25	0	25	50	100
1675-79	0	33	25	9	8	25	100
1680-84	56	9	9	13	13	0	100
1685-89	3	23	43	17	7	7	100
1690-94	35	21	29	15	0	0	100
1695-99	33	14	33	5	12	3	100
1700-04	61	17	17	5	0	0	100
1705-09	71	11	9	2	7	0	100
1710-14	57	26	13	4	0	0	100
1715-19	79	12	6	3	0	0	100
1720-24	77	19	4	0	0	0	100
1725-29	100	0	0	0	0	0	100
T o t a l	51	17	18	7	4	3	100

Source: London Dyers, MS 8154 vol 1.

This suggests there was an improvement in economic opportunity after 1700. It is not possible to relate the increased economic opportunity to a particular speciality, since specialty data were only available from before 1690.

There is another factor that may have influenced the decision as to when to become a housekeeper. Of the 140 who joined the Company within 2 years of completion of training, **38 percent became housekeepers within 2 years of joining**, while 43 percent became housekeepers 5 or more years after joining. For the 22 who waited 3 to 7 years after completion to join the Company, **68 percent became housekeepers within 2 years** of joining, while 23 percent waited 5 or more years. For the 21 who waited 8 or more years after completion of training to join the Company, **81 percent became housekeepers within 2 years**, while 10 percent waited 5 or more years before becoming housekeepers. These data show that the longer they worked as journeymen, the sooner they became housekeepers after joining the Company.

The time between completion of training and joining the Company measures the time, after finishing training, when the decision about becoming independent was being made. This interval measures the economic conditions of the time, and the economic conditions of the dyer and his family. There were 28 dyers who joined by patrimony; a group you might expect would then immediately become housekeepers. However, only 17 of the 28 (61 percent) became housekeepers within 2 years of joining, while 10 (36 percent) waited 5 years or more before becoming a housekeeper.

3.5.2.3 London 1692 quarterly poll tax data and time as a journeyman⁴⁷

Nine journeymen dyers were identified in the 1692 and 1694 quarterly tax poll of London. Eight of the 9 journeymen dyers were found as Dyers' Company members. If they had been journeymen from the time they joined the Company, they had worked as journeymen for 3, 5, 6, 10, 17, 17, 21, and 43 years, that is, 50 percent had been journeymen for 17 years or more. In describing times as journeymen in three Companies in the 1550s, Rappaport showed that the patterns differed by Company (Table 3.9), so the pattern in the Dyers' Company, 50 percent over 17 years, may be distinctive to them.

⁴⁷ Alexander 1992; Arkell 1992; Spence 2000.

Table 3.9 Years as journeymen by never householders, in three London Companies, 1550s

		Years as a journeymen									
Company	No.	1	2	3	4	5	6-10	11-15	16-20	21-46	Mean
Brewers	25	-	-	2	2	2	5	7	3	4	13.4
Butchers	20	2	1	1	3	2	6	3	1	1	8.0
Coopers	8	4	1	-	1	1	1	-	-	-	2.6

Source: Rappaport, 1998, Table 8.12, p. 334.

An alternative interpretation of the data is that some of the journeymen may have worked at one time as independent dyers, but because they never paid to become housekeepers, they never bound an apprentice. If the first interpretation is correct, it is possible that the large proportion of Company members who never bound apprentices were journeymen. If the second interpretation is correct, then it is difficult to know what percentage of the large group of dyers who never bound an apprentice were intermittently independent dyers, rather than journeymen. For the group who recently completed their training, and who were journeymen for less than 10 years, there may be many who were waiting to accumulate enough capital to start a business. This happened with one of the three, Thomas Gill, who joined in 1686, had been a journeyman for 6 years in 1692, and bound an apprentice in 1696. For the other 5 journeymen, it is possible they were never able to start an independent business.

3.6 How many journeymen did a firm employ?

It is difficult to find information about the employment of dyers amidst Company information concerning late or incomplete payment of fines, promotions to the livery, and other administrative details. One coherent source appeared by chance in 1640. It appeared that previous records had been lost or misplaced, so a new record was constructed, listing members of the Company, their location and employment. Unfortunately, such an effort was never again repeated

3.6.1 Firm size in 1640

The information about journeymen numbers in 1640 also allows a measure of numbers of journeymen employed by any single master. The 89 journeymen in 1640 were employed by 40 different masters, 24 (60 percent) of whom employed, during an 8-year period, only a single journeyman. There were 10 masters (25 percent) who employed 2 to 4 journeymen, 5 masters (12 percent) who employed 5 to 9, and one master (3 percent) who employed 10. (Table 3.10) The master who employed the largest number held a public office in the city.

Table 3.10 Frequency distribution of journeymen dyers employed by a single master, London, 1640

Number of employed journeymen	Percent of 40 master dyers
1	60%
2-4	25%
5-9	12%
10	3%

Source: London Dyers, MS 8154 Vol.1.

This distribution of journeymen suggests that the commonest London dyeing firm in 1640 was small, employing fewer than 5 journeymen. It also suggests that a few large firms employed a majority of the journeymen.⁴⁸ There are no data about the effect on joining the Company by apprentices in the large firms since the data set only begins after 1649. The closest one can come to answering this question relates to the proportion joining the Company of apprentices who were bound to masters who bound large number of apprentices. With these data, the percentage of apprentices joining the Company is no greater with those bound to masters who had bound large numbers of apprentices than to masters who bound smaller numbers.

3.6.2 Firm size in the 1680s

⁴⁸ Anonymous 1674. The skewed distribution of journeymen is not distinctive to a craft trade. There are data about a non-craft activity, lightermen between Gravesend and above London Bridge in 1674. These data show a skewed distribution of lighters per owner, with 20 percent of the lightermen owning 54 percent of the lighters. (Thirty eight percent (93/245) of lightermen owned one lighter, 42 percent (103/245) owned 2-4 lighters, while 12 percent (32/245) owned 5-9 lighters and 8 percent (17/245) owned 10 or more). Among lightermen, the number of servants and journeymen were equally skewed in distribution. Ten percent of the lightermen employed 43 percent of the servants and journeymen. (Thirty six percent (25/70) had neither a servant nor journeymen, 33 percent had 1 servant or journeyman, 9 percent (6/70) had 5-9 servants of journeyman, while 1 percent (1/70) had 10 servants or journeymen).

In the Minute Book for 1682-1700, financial data relate to those being bound, those made free, as well as to quarterage payments. The quarterage payments were those required of all Company members 4 times a year. The quarterage data were analysed as a way to determining the size of the Company in 1683 and 1684, and also to see if it were possible to measure firm size.

There are difficulties with trying to determine firm size by using the size of the quarterage fee paid. When an apprentice completed his 7-year term, and his entry fee of 3 shillings 4 pence was paid, the notes in the Minute Book also often record that the involved master also paid his quarterage fees at the same time. And irregular payment of quarterage seemed common.

The quarterage fees were 1s.6d. every quarter (6s. a year) for a master and 6d. every quarter for a journeymen or other freeman. It is surprising that there were no really large clusters of payments of 6s., 12s., 18s. or other multiples of 6s. in the records. If they refused to pay, they would be fined 10s. A foreign brother who is a master is to pay 1s. 6d., (like other masters), and those foreigners who are only freeman will pay 6d. The fee for entrance to the company, before 1690 was 3s. 4d. and after 1690 was 13s. 4d. The cost of apprentice binding remained 2s. 6d.

Interpreting the quarterage data as a measure of firm size, I arranged the amounts paid to represent payments for individuals (Table 3.11).

Table 3.11 Data for estimating firm size in 1683-84

Payment	Number	Percent of total
2s.	13	10
2s. 8d.	14	
4s.	26	
5s. 4d.	17	56% from 2s. to 5s.4d.
6s.	7	
7s.	1	
8s.	14	
9s.	1	
10s.	3	
10s. 8d.	1	
11s.	1	
12s.	8	
13s. 4d.	3	
14s.	1	
15s.	2	
16s.	5	
17s.	1	
18s.	1	
18s. 8d.	1	
21s 4d.	1	
24s.	1	
26s.	2	
Total	124	100

Source: London Dyers, MS 8154.

The tabulation shows 13 individuals (10 percent) of 124 individuals represented by single payments. Presumably these were journeymen. They may have been paying themselves. Slightly more than half were paying for themselves and another, while 15 percent were paying for 6 or more persons. I used the 2-shilling payment to represent one person and with this assumption brought the number of individuals represented to 323. Assuming that the master was paying the fees for clusters of persons, 16 percent of 323 persons for whom fees were being paid were in firms with 10 or more persons, 22 percent were in firms with 5-9 persons. If these data can be used as a measure of firm size, then about 38 percent of this sample were in firms with 5 or more persons, fifty four percent in firms of size 2-4 persons, while 8 percent were single person firms.

Although it is difficult to extrapolate from these incomplete data, they resemble those from 1640 in suggesting that about half of the journeymen were employed in firms with 5 or more journeymen.

3.7 Chapter 3 Summary

Only about 40 percent of apprentices joined the Dyers' Company. Similar 'failure' rates were found for many, perhaps all London livery Companies. The reasons for this similarity among all Companies have yet to be explained satisfactorily.

Over the almost two centuries from 1650-1820, the number of apprentices bound (Chapter 2) decreased, in steps, from about 70/year to about 30/year, and later to about 15/year. In spite of these changes, the proportion of apprentices that joined the Company stayed between 35 to 45 percent.

A variable that might influence the proportion of apprentices joining the Company is the size of the firm in which they were trained; apprentices from large firms were more likely to join the Company. Another variable is family background; an increased proportion of apprentices coming from a dyer's family joined the Company. From 1706 to 1829, 45 percent (303/669) of children from dyer's families joined by patrimony.

Entering the Company on the basis of family relationship (patrimony) or payment of a fee (redemption) became more important after the middle of the eighteenth century when apprentice numbers had fallen significantly. From 1685 to 1826, the percentage joining through patrimony steadily increased from 5 percent from 1685-1699, to 11 percent in 1700-1719, to 17 percent from 1720-39 and 24 percent by 1800-1809. Redemption was an insignificant way to join the Dyers' Company until after the 1750s, but by 1800-09 it was used by 37 percent. So, by 1800-09, patrimony and redemption together were more common as a mode of entry than apprenticeship.

Those who entered by redemption most often were not dyers by profession. Although they increased the numbers in the Company, the function of the Company was decreasingly related to the teaching of dyers.

From 1650-1744, there was a decline in the proportion of apprentices joining the Company soon after finishing training. The proportion was not affected by family residence. Changing economic opportunity to start an independent firm seems the most likely explanation for the changing proportions joining soon after training.

Information about numbers and the amount of time spent as a journeyman are difficult to determine directly, but are possible using dates of binding, joining, and first binding an apprentice. After completing apprenticeship, it was possible to start work, as a journeyman, before entering the Company. After 1690, more than 30 percent of apprentices who ultimately joined the Company had allowed a delay of more than 2 years between completion of their training and joining the Company. The time between completion of training and joining the Company was probably spent as a journeyman. And from 1705 to 1739, approximately 10 percent waited more than 9-12 years, probably as a journeyman, before joining. Apprentices from London families, who did ultimately join the Company, were less likely to take a long time before doing so than families from other places. Other than families from London, geographic origin of the apprentice did not seem to be a variable that influenced the amount of time spent as a journeyman before joining the Company.

In the 1640s, 43 percent of 89 journeymen had been working as journeymen for more than 4 years.

Of housekeepers from 1682-1728, while 41 percent had worked as journeymen for less than two years, 37 percent had worked 5 years or more as journeymen before becoming independent. The longer they worked as journeymen, the sooner they became housekeepers after joining the Company. After 1700, an increasing percent spent less than 2 years before joining, suggesting an improvement in economic opportunity.

Of eight journeymen dyers identified in the 1690s, half had worked as journeymen 17 years or longer.

In 1640, 60 percent of journeymen worked in firms with one journeyman, 25 percent

in firms with 2 to 4 journeymen, 12 percent in firms with 5 to 9 journeymen and 3 percent in a firm that employed 10 journeymen. The commonest dyeing firms (34/40) were small, employing few journeymen

Extrapolations from quarterage data for 1683-84 showed 38 percent of journeymen were in firms with 5 or more persons. If the extrapolation comes close to reality, large firms were becoming more common, from 1640 to 1680.

Chapter 4 Occupational specialisation of dyers

4.1 Introduction

The process of being recognized as a dyer predominantly involved becoming a member of the Dyers' Company. However, additional information other than Company membership is needed to be certain about a person's occupation, because some members of the Dyers' Company followed an occupation other than dyeing. Such information is not routinely available since freeman registers rarely mention the occupation of the freeman.¹ Some information has been presented in Chapter 1, section 5.1. When a dyer did describe his occupation, it often related to specific fibres, such as cotton, linen or silk and occasionally specific colours, such as scarlet, or blue or black. Information in Dyers' Company records and elsewhere occasionally mention the specialty of individual dyers. However, even when present, the available information was often for a limited period.

Although at the time of the Statute of Artificers in 1563, legislators attempted to restrict each craftsman to a single craft,² the use of patrimony and redemption as methods of joining a Company conflicted with this intent.³ If one's father was already a Company member, one could learn any trade without an apprenticeship, and then obtain membership in the father's Company through patrimony. As a result, entry by patrimony to a livery Company such as the Dyers' Company did not necessarily identify a practicing dyer. Uncertainty concerning occupation might be greatest in crafts that first enlarged in the seventeenth century, since if the craftsmen did not fit readily into an existing livery Company they could enter into any one of several Companies. For example, in the new craft of scientific instrument making, instrument makers were to be found in at least 33 different Companies, prominently among them the Grocers,

¹ Blagden 1958; Brown 1979; Cash 1966; Collin 1896; Crawford 1987; Fearn 1955; Graham 1987; Hollis 1947; Jenkinson 1925; Jenkinson 1929; Jurica 1991; Lane 1977; Lane 1996; McKenzie 1974; McKenzie 1978; Melville 1954; Rice 1929; Rising and Millican 1959; Williams, et al. 1961.

² Bindoff 1961, pp. 56-94.

³ Beier 1986, pp. 142-143, notes that a declining proportion of craftsmen joined a Company as the seventeenth century progressed. Additionally, as shown in Chapter 3, towards the end of the eighteenth century, redemption became increasingly common as a method of entering the Dyers' Company. As a result, over the 150 years, there was potentially increasing uncertainty about using Company membership to measure occupation.

Broderers, Spectaclemakers and Joiners.⁴ Closer to our own concerns, calico (cotton) printing, which developed in the late seventeenth century, combined several operations (management, design, block cutting and/or engraving, colour selection, and sometimes painting on top of or in parts of the printing, when bleaching was needed) in addition to the printing of dyes on the cloth. Although the craft involved dyeing of textiles, it also involved several other skills, and it is therefore unclear how many calico (cotton) printers joined the Dyers' Company.

An apprentice in dyeing must learn to work with a variety of dyes to make distinctive colours reproducibly. It is probable he will learn to work with different fibres, in the form of yarn as well as woven into cloth. The dyeing should have good permanence, and be achieved without spotting, or destruction of the fibre. Some dyers specialized in producing specific colours, for technical, economic or fashion-related reasons, and it is probable it was their speciality that they taught to their apprentices.^{5 6 7} There were dyers who specialized in dyeing wool, or silk, or linen, or in printing on cotton, and it is probable that it was these processes that were those that the apprentice learned. And there were economic reasons for clothiers outside of London, or merchants within London to use specialist dyers in London, rather than dyers where the textiles were produced.⁸ Colour was itself a significant element in the quest for cloth of good quality.⁹ Finally, the quality of the colours could determine where textiles should be

⁴ Crawforth 1987, p. 329.

⁵ Moir 1957, p. 231. In Gloucestershire, "the large manufacturers themselves dye all the common colours, such as browns and olives, but the true or woaded colours, such as blue, wool-black, or green, can only be well-done by those who make it their special business". James Winchcombe, for example, called himself "clothier and dyer" and his papers contain frequent bills and orders for dyeing, many of them merely informal notes from his neighbours.

⁶ Mann 1971, p. 9. The dyed cloths, mostly dyed in the piece, were being sent to the Mediterranean and the Levant in the 1620s, and these were not only Stroudwater reds, but also other colours.

⁷ Munro 1988, pp. 693-711. The red dyes (madder, cochineal, kermes, and grain) needed a preliminary bath in a mordant, like alum, before they would be colour-fast. Mordant dyeing was often conducted in distinct establishments, by different dyers, requiring boiling to dissolve the alum, then boiling with madder or other similar dyes. There was little change in technology with woad, which was un-mordanted, and once indigo came into common use, little change in the technology used with indigo.

⁸ A clothier (Richard Wood) of Woodchester, just south of Stroud, wrote that most of his cloth was dyed and dressed in England, but not in Gloucester, and much Worcester and Gloucestershire cloth, and some from Wiltshire, was dyed and finished in London and Coventry for foreign markets. (PRO, E 134/2 Car i, Easter 1626).

⁹ Moir 1957, pp. 233-5. William Phelps' Blackwell factors, Hanson and Mills, said "Will you, in a post or two, send us a pattern letter containing about 6 to 8 greens, as many blues, a few blacks, whites and scarlets in good press, and we will endeavour to get you some good orders upon your terms?", and "Please forward immediately 6 pieces for scarlet. Pay every attention to get the dyer to do them as early as possible, and ascertain the price from the dyer." And "if the colours are not right, the cloth cannot sell, and will be returned.

dyed.¹⁰ Since hard water made piece-dyeing of woollens irregular, it was only in the softer water area of Stroudwater that they dyed in the piece, while in Wiltshire, East Somerset and areas of Gloucestershire, they dyed in the wool.

Immigration of Flemish and Walloon dyers in the mid sixteenth century and of French Huguenots almost a century later resulted in improvements in the technology in the dyeing of silk. Many of the immigrant silk weavers and dyers settled in London, Canterbury and Norwich, where they began to produce trimmings, for which they employed second-choice or waste silk, and also an immense variety of mixed fabrics with silk. Some of them also worked with wool and linen. Some Flemish workers who had immigrated to England began to produce more expensive cloths of pure silk, such as velvets and taffetas. They introduced a type of workmanship already traditional in vast areas of the northern European continent.¹¹ This workmanship expanded at the end of that century, with the immigration of French Huguenots and the creation of Spitalfields, a workers' district in London. The English silk industry also benefited from Italian Milanese *setaioli* and artisans who produced cloths woven with gold and silver threads in London in the early seventeenth century.¹²

Textile printing on plain cotton in London developed in the late seventeenth century. This followed a fashion boom relating to Indian dyed and painted cottons of the 1660s.¹³ By 1669, the market for Indian dyed and painted cotton textiles became so successful that the East India Company was asking for particular designs on cotton and requesting that they be produced in India. In response to the growth in imports of Indian dyed and painted cottons, English wool and silk textile producers lobbied for legislation banning cotton imports, regardless of whether they were plain, or dyed and

¹⁰ "Bright colours could not be obtained except by dyeing in the piece, and this was always a chancy business, best left to London dyers. Reds, however, were a Stroudwater specialty and the East India Company, whose usual practice was to buy whites for dyeing in London, made at least an exception in their favour." (Commonwealth Office Library Home Misc 16, Dyers account for 1704.) However, R. Heath, in Davis 1967, p. 112, notes that both the Levant Company merchants and those of the East India Company were having their reds dyed in London by 1704.

¹¹ Mola 2000, p. 341 cites the Calendar of the Patent Rolls, 4: doc 347, and 5: docs 1602, 1604, 1606, 1624, 1637, 1643. 4: doc 347 which record a permit granted in 1567 to the town of Maideston, Kent, to receive 30 families of immigrants skilled, among other things, in weaving "mockados, chamlettes, grograine chamlettes, russelles, daiper, damaske and lynning clothe, sack-clothe, stamelles, fryrados, Flanders woollen clothe, arras and tapissarie."

¹² Mola 2000, pp. 25-6.

¹³ Cary 1699; Chapman 1987; Floud 1961; Rothstein 1964. The term calico was used to describe the plain Indian cotton, but then was also used to describe the dyed and painted cotton. Sherwin's patent application in 1676 used the term calico for plain cotton.

painted cotton. Subsequently, regulations forbidding cotton printing occurred also in France, Germany and Switzerland, as printing on cotton was becoming a significant industry in these countries. On the other hand, the increased use of dyed and painted Indian cottons led to efforts by English dyers to find printing methods that could imitate the Indian dyed and painted cotton. A 1676 patent request by William Sherwin, who migrated to England from Dublin, concerned printing broad calico and scots cloth with a double-necked rolling press; Sherwin later established a successful calico printing business in West Ham. And the further developments of calico printing, involving many aspects of producing cotton for printing, as well as more effective methods in printing with many different dyes, "served as a principal channel for creating links between technology and science."¹⁴

The initial success of English calico printing was followed by government actions prohibiting the import of calico in 1701, and then further government action banning import of all cotton cloth in 1719. There were numerous counter petitions against government regulatory activity. In one of the most prominent, in 1696, William Sherwin was the lead signatory, as one of 50 calico printers, when the number of cotton textile printing firms in London was "around a dozen".¹⁵ In 1701, it was estimated there were about 800 men, women and children at work in the calico printing trade.¹⁶ The petitions, pamphlets and broadsides in 1719 and 1720 presented reasons for and against the proposed government action, and clearly were being read by the protagonists, who wrote responses to other broadsides. Most were anonymous (although some were signed), but some, by well-known writers such as Defoe, may have been read by the parliamentary committee members involved in reviewing the proposals.¹⁷ The calico printing business was steadily expanding, and by 1760, there were 20 calico printing firms in London.¹⁸ In spite of this steady growth in development of a new technology involving dyeing, only a small proportion of calico printers were members of the Dyers' Company.¹⁹

¹⁴ Thomson 1991, p. 57.

¹⁵ House of Lords MSS 1051 (2) and (3), April 1691, and 1719 (CO 388/2, p. 223) cited by Clayton 1954.

¹⁶ CO 388/2 p. 213, Memorial from the Baily weaver's assistants, in the weavers' petitions, October 1719.

¹⁷ Rothstein 1964, p. 7

¹⁸ Chapman 1983.

¹⁹ Clayton 1954. Theodore Haultain, a French Huguenot, naturalized in England in 1585, worked as a calico printer in Mitcham and West Ham. He had 49 employees in 1714, and is probably the Hawtaine who is a dyer mentioned in a 1735 London Directory. He was not a member of the Dyers' Company. Peter Mauvillon, a naturalized French Huguenot, had premises for cotton printing on the Wandle at

4.2 Occupations of dyers

The occupation of an individual dyer is occasionally described in the Dyers' Company registers, and occasionally in government tax assessments, voting registers, wills with probate, and parish baptism, marriage and burial records. The sources used include:

- 1665-1736 probate inventories in the Orphan's Court
- Archdeaconry Court
- Commissary Court
- Baptism, marriage and death registers in several parishes
- 1650-95 Dyers Company Freedom registers
- 1682-84 Dyers' Company Renter Warden's housekeeper lists
- 1692 London quarterly tax poll
- 1696 and 1719 petitions to Parliament
- 1721 Jury Poll in several London Wards

4.2.1 Orphan's Court Probate inventories (1665-1736)

From 1665 through 1736, probate inventories identify the specialty of twenty-four dyers (Table 4.1).²⁰ Nineteen of the 24 dyers bound apprentices in the Dyers' Company, and are listed below (Table 4.2). There was no difference in the frequency with which apprentices of these silk or wool dyers joined the Company. The 6 silk dyers worked a total of 98 years, bound 34 apprentices, and 20 of them (59 percent) joined the Company. The 9 woollen dyers worked a total of 91 years, bound 42 apprentices, and 23 of them (54 percent) joined the Company.

The silk dyers dealt with silk thread, an expensive raw material, but in small volumes, while the wool dyers dealt with an expensive material, but in large and heavy volumes. These 19 dyers worked, on average, 15 years, and within this small sample, a dyer

Mitcham, signed both the 1696 and 1719 petitions as a dyer from Mitcham and Wandsworth. At that time he employed 203 workers. His family was in the business as George and Stephen Mauvillon, and had a large stock at Morden, Surrey. He was not a member of the Dyers Company. The Haverkam (Havercoome) family, from the Netherlands, were calico printers in West Ham. They were not member of the Dyers Company. Benjamin Ollive had been apprenticed in the Dyers' Company, signed the calico dyers petition in 1719, was a member of the Dyers Company, and his sons Thomas and Joseph were both calico printers and Dyers' Company members.

²⁰ Mitchell 1995c.

bound an average of 6 apprentices in his working life, about half of whom went on to join the Company. The number of apprentices bound was greater than the average for all dyers in this same period, and the percent that joined the Company was greater than the average for all dyers. Both observations are compatible with the observation that those who produce wills with probate inventories are likely to be better off than the average. It is not clear what significance to attach to the absence of any calico printers from this sample, nor whether the paucity of hat dyers relates to their income or to their numbers.

4.2.2 Testamentary Records in the Archdeaconry Court of London, 1363-1649 and 1661-1700.²¹

None of the 75 dyers with wills in Archdeaconry Court concerned hat or linen dyers or calico printers. The bulk of them must have been woollen dyers. Two silk dyers died before 1640, outside my period of analysis.

4.2.3 Testamentary Records in the Commissary Court of London (London Division), 1571-1625, 1626-1649 and 1661-1700.²²

Of 68 dyer's wills in the Commissary Court, there were no dyers identified as hat or linen dyers or as calico printers. Four silk dyers were identified, who died in 1574, 1673, 1677, and 1698. Pierson Russell, silk dyer, who died in 1673, had bound 2 apprentices, and the one who joined the Company said he would be a silk dyer. Leonard Ensall, silk dyer, who died in 1677, had bound 2 apprentices, both of whom said they would be silk dyers when they joined the Company. Richard Preston, silk dyer, who died in 1698, had bound only one apprentice, who did not mention a specialty²³.

²¹ Fitch 1979; Fitch 1985a.

²² Fitch 1985b; Fitch 1992; Fitch 1996; Fitch 1998.

²³ The findings for Russell and Ensall add support to the suggestion that the specialty occupation of a master is also likely to be that of his apprentices.

Table 4.1 Specialty in dyeing and colours, probate inventories, 1665-1736

Masters name	Specialty	Colour / dyes	Place	Year
Edmonds William	Cotton ribbons	Many colours (madder and indigo)	Cripplegate	1676
Ellery John	Hats	Cheap black (Logwood and verdigris)	Thames Str	1736
Toone William	Linen	Blue (indigo)	Cripplegate	1717
Hudson Philip	Mixed fabrics	Cochineal (grain colours)	Bow	1665
West Samuel	Mixed fabrics	Not given	Southwark	1680
Grimshaw John	Mixed fabrics	Black, red and orange (madder & indigo)	Shoreditch	1700
Ramsey John	Silk thread	Cheap colours (weld, fustic, annatto)	Thames Str	1673
Bridgewater Benjamin	Silk thread	Many colours (madder and indigo)	Thames Str	1675
Parker Henry	Silk thread	Many colours (madder and indigo)	Unknown	1678
Clarke Thomas	Silk thread	Grain colours & yellow (cochineal & safflower)	Southwark	1687
Webb Robert	Silk thread	Many colours (madder and woad)	Southwark	1691
Wintle William	Silk thread	Cheap reds (sweetwood)	Thames Str	1707
Jennels John	Unknown	Blue (indigo)	Cripplegate	1729
Champney Thomas	Woollens	Red/Black	Thames Str	1666
Trimmer William	Woollens bays	Black (madder and woad)	Southwark	1675
George Thomas	Woollens	Black (not given)	Cripplegate	1678
Scothorne Nathan	Woollens	Cheap blue (logwood)	Southwark	1679
Proctor Richard	Woollens	Blue (indigo)	Southwark	1681
Cleeve William	Woollens	Blue (indigo, woad)	Cripplegate	1689
Cater William	Woollens	Grain colours (cochineal and archil)	Thames Str	1691
Shooter James	Woollens	Black, red and orange (madder & indigo)	Cripplegate	1700
Sands Peter	Woollens	Not given	Cripplegate	1700
Keay James	Woollens	Grain colours and blue (cochineal & indigo)	Thames Str	1705
Walker Robert	Woollens	Many colours (madder, indigo, logwood)	Leadenhall St	1712
Monk John	Woollens	Black and others (madder and woad)	Thames Str	1723

Source: Mitchell, 1995; London Dyers, MS 8167 Vol.1-3, MS 8171 Vol.1-4.

Table 4.2 Specialty, years worked, and apprentices bound, for dyers with probate inventories, 1665-1736

Name	Apprentice	Worked	Years	Death	Specialty	# Apps	Join
Ramsey, John	164x-1650	1651-1672	20	1673	Silk thread	7	2
Bridgewater, Benjamin	1651-1658	1659-1674	15	1675	Silk thread	7	3
Parker, Henry	164x-1651	1667-1678	11	1678	Silk thread	3	2
Clarke, Thomas	1671-1681	1682-1687	5	1687	Silk thread	1	1
Webb, Robert	1670-1677	1678-1689	11	1691	Silk thread	4	2
Wintle, William	164x-1654	1671-1707	36	1707	Silk thread	12	10
Trimmer, William	164x-1650	1650-1674	24	1675	woollens	7	4
George, Thomas	-1665	1671-1678	7	1678	woollens	5	4
Proctor, Richard	-1663	1664-1681	17	1681	woollens	6	3
Cleeve, William	164x-1660	1660-1689	29	1689	woollens	14	6
Cater, William	1654-1662	1674-1690	16	1691	woollens	6	4
Shooter, James	1670-1677	1680-1699	19	1700	woollens	8	3
Sands, Peter	1669-1676	1684-1700	16	1700	woollens	11	6
Keay, James	1667-1674	1682-1704	22	1705	woollens	10	6
Walker, Robert	1690-1700	1700-1711	11	1712	woollens	5	2
Ellery, John	1700-1706	1706-1732	26	1736	hats	5	1
Hudson, Philip	164x-1654	1655-1670	15	1665	mixed	2	0
West, Samuel	1669-1676	1676-1680	4	1680	mixed	0	0
Grimshaw, John	1674-1682	1684-1699	15	1700	mixed	9	4
Group averages			15			5.7	3.0

Sources: Mitchell, 1995; London Dyers, MS 8167 Vol.1-3, MS 8171 Vol.1-4.

4.2.4 Baptism, marriage and burial registers in several parishes (1600-1660)

Four silk dyers were identified, two in the period for which I have Dyers' Company records.²⁴ Matthew Goodred, identified as a silk dyer, was bound to Thomas George from 1682-1690, and subsequently bound 3 apprentices between 1699 and 1707. His master, Thomas George, had been apprenticed to Thomas Colebrook. Thomas Colebrook was the beginning of an 8-generation silk dyer's chain. One of Thomas Colebrook's apprentices, Joseph Nunn, was a silk dyer. Francis Brown was identified as a silk dyer from Red Lyon Street. He was married in 1716. He is not present in my records either as an apprentice or as a master. This small sample also supports the hypothesis that a master was likely to transmit his specialty occupation to his apprentices. Although there are probably other dyers identified in parish records, I have not explored these records further.

4.2.5 Dyers Company freedom registers (1650-95)

Out of 3047 apprentices bound in the Dyers' Company from 1650 through 1694, 745 reported what specialty they intended to follow at the time they joined the Company (Table 4.3a and 4.3b). In that group, almost 60 percent planned to work in dyeing (probably wool), 18 percent silk dyeing, 6 percent linen dyeing, 4 percent hat dyeing, about 2 percent each in stocking and stuff dyeing, while 10 percent went into other textile and non-textile related professions and activities. The changes over this time period were large, with silk dyeing having been mentioned for the first time in the early 1660s and steadily increasing in frequency as a choice so that it was the commonest choice (38 percent) in 1675-1679 and 1680-1684 (37 percent), larger even than dyeing (probably wool) (28 percent and 25 percent) respectively. Among those who chose hat dyeing, 1675-1679 were the years with the highest percentage (9 percent). Linen dyeing was most frequently chosen (12 percent) in the same years 1675-1679). The majority of the intended "occupations" were dyer, including hat

²⁴ David Marsh scrolled through every surviving parish register for the City and suburbs, and all vestry minutes and churchwarden's accounts, in the process of which he identified dyers from 14 sources from roughly 1660-1730. The occupation was mentioned for four silk dyers: Simon Comsbye, a silk dyer mentioned in 1605 (Bannerman and Bannerman 1919, 1920, John Branthwaite, a silk dyer mentioned in 1638 (Brooke and Hallen 1886, Matthew Goodred, a silk dyer mentioned in 1698 (Airey 1904, and Francis Brown, a silk dyer from Red Lyon Street, married in 1716 (Herber 2001).

dyer, linen dyer, litho dyer, silk dyer, black silk dyer, stocking dyer, stuff dyer. The textile-related occupations included hot presser, linenman, oylman, and silkman. There were also non-textile occupations such as butcher, carpenter, cook, distiller, gold and silver lamp maker, mariner, packer, salter, tobacco cutter, warden and woodmonger. Among the 50 named specialties, there were none who recorded calico printing as their choice.

Table 4.3a Chosen specialty when joining the Company, 1650-1694 (NUMBER)

Years	Dyer	Silk	Linen	Hats	Stocking	Stuff	Not textile related	Textile related	
1650-4	56		1	1			5	8	71
1655-9	71				1		1	14	87
1660-4	88	1	3				2	3	97
1665-9	82	11	4	5	1	1	6	8	118
1670-4	46	14	2	1		2	2	5	72
1675-9	38	53	17	12	4	5	6	3	138
1680-4	20	30	6	3	6	6	5	5	81
1685-9	29	21	8	6	4	1	1	1	71
1690-4	5	3	1		1				10
1650-94	435	133	42	28	17	15	28	47	745

Source: London Dyers, MS 8167 Vol.1.

Table 4.3b Chosen specialty when joining the Company, 1650-1694 (PERCENT)

Years	Dyer	Silk	Linen	Hats	Stocking	Stuff	Not textile related	Textile related	
1650-4	79		1	1			7	11	100
1655-9	82				1		1	16	100
1660-4	91	1	3				2	3	100
1665-9	70	9	3	4	0.8	0.8	5	7	100
1670-4	64	19	3	1		3	3	7	100
1675-9	28	38	12	9	3	4	4	2	100
1680-4	25	37	7	4	7	7	6	6	100
1685-9	41	30	11	9	6	1	1	1	100
1690-4	50	30	10		10				100
1650-94	58	18	6	4	2	2	4	6	100

Source: London Dyers, MS 8167 Vol.1.

4.2.6 Dyers' Company Renter Warden's housekeeper lists (1682-84)

Thirty-eight Company members recorded their dyeing specialty when they paid the Company to become masters and housekeepers in 1682-84 (Table 3.6). Twenty-eight of them bound at least one apprentice: 18 as silk dyers, 7 as linen dyers and 3 as stuff dyers. The time from joining the Company to becoming a housekeeper was longer for 7 linen dyers (average 7 years), and 3 stuff dyers (average 5 years), and than for the 18 silk dyers (average 3 years). The number of apprentices bound during the interval when these masters bound apprentices was, for those same 28 masters, on average, 31/85 (.4/yr) for 3 stuff dyers, 31/67 (.5/yr) for 7 linen dyers and 62/147 (.4/yr) for 18 silk dyers. However, averages hide the fact that 10 of the 18 silk dyers bound only one apprentice, while three of them bound 8 or more apprentices, suggesting either that the masters had different attitudes towards use of apprentices, or they had different sized firms. The three stuff dyers bound 14, 11 and 6 apprentices, and one of the 7 linen dyers bound 13 and another 9, so that 2 masters of the 7 bound 22 of the total of 31 apprentices. There are no equivalent data on the number of employed journeymen, so it is difficult to tell anything about the size of the firm from the number of apprentices bound.

Using the entire 1650-1694 population, fourteen percent (8/57) of masters who could be classified as silk dyers, and 13 percent (2/15) of masters classified as linen dyers bound 10 or more apprentices. A larger percentage, 24 percent (24/87) of masters classified as wool dyers bound 10 or more apprentices. None of those masters classified as stuff dyers (5), stocking dyers (4), or hat dyers (10) had more than 10 apprentices in the period considered.

The possible interpretations of the differences between woollen and silk dyers' uses of apprentices are many. David Mitchell (personal communication) has suggested that because of the heavy work involved in wool dyeing, masters specialising in wool dyeing more frequently used large numbers of apprentices than masters in silk dyeing.

It is possible that the specializations of the masters were known when apprentices were bound, and that this was the major influence on the numbers of apprentices bound. Other interpretations include that numbers of apprentices bound are an

indication of the size of the firm, regardless of specialization, or that masters binding large numbers were those who had less money for wages, and so were using apprentices rather than journeymen as cheap labour. During the period 1650-1694, there is no information concerning the father's occupation or residence, so nothing can be said about the recruitment areas from which these masters drew their apprentices.

Tables shown earlier (Table 3.6 for 1682-84 and Table 4.1 for 1665-1736) have some overlap of master's names, and tell a story about change in the business of linen dyeing. John Grimshaw, beginning his business in 1683, is identified as a linen dyer, but when he died in 1700 is identified from the probate inventory as a dyer of mixed fabrics. Peter Sands, beginning his business in 1683, is identified as a linen dyer, but when he died in 1700, is identified from the probate inventory as a dyer of woollens, and insolvent. It is possible that linen dyeing was losing its appeal and profitability over this period.

4.2.7 London quarterly tax poll (1692)²⁵

Of the 98 dyers identified in this poll, 67 percent (12/18) of the silk dyers were members of the Dyers' Company. One of the silk dyers, William Biggs, had been bound to a Dyers' Company member, but there is no record that he had joined the Company. Sixty seven percent (2/3) of the hat dyers were members of the Dyers' Company. Sixty five percent (44/68) of dyers with no other specialty were members of the Dyers' Company. Twenty percent (14/68) had been bound to a Dyers' Company member, but there is no record that they joined the Company. However, each of these 14 dyers had subsequently bound apprentices in the Dyers' Company. The fact that 15 (Biggs plus 14 others bound in the Dyers Company) of the 98 were not identified as Dyer' Company members appears to relate to incomplete recording of their joining the Company, rather than that they were working as dyers without being a Dyers' Company member.

²⁵ Alexander 1992.

4.2.8 Petitions to Parliament (1696 and 1719)

Although the development of calico printing as a specialty appears in Dyers' Company records, the Company does not seem to have been the major location of calico printers. While some Dyers' Company members were active in this new trade, for some reason the trade was unable to achieve independence, even though it was growing rapidly and included both small and large businesses. However, even in the absence of a single large group in one livery Company, or of an independent Company, calico printers were able to coordinate petitions, and represent the new industry. This is seen in two petitions to Parliament in 1696 and 1719. Of the 50 calico printers who signed the 1696 petition, only 5 were identified in my listing of Dyers' Company members.²⁶ Of the remaining 45, 21 were members of other livery Companies.²⁷ Identifying to which Company the signatories might have belonged was possible only after 1681, using retained and indexed freedom records available in the City of London Record Office. Twenty-four names were not identified as members of any livery Company. If the signatories had obtained their freedom before 1681, they would not appear in my data.²⁸

The 1719 petition²⁹ had 26 names. In response to the 1719 petition, the Board of Trade and Plantations undertook a review of calico printing establishments. The report, published in 1721, showed that these 26 printers employed anywhere from 4 to 152 employees, including drawers and cutters (53), printers (134), job printers (80), grounders (45), tearers (179), and fieldmen (237).³⁰ Although the London calico

²⁶ House of Lords 1696. This petition is found in the manuscripts of the House of Lords, Vol. 2, new series, 1695-1697, p. 243, No. 1051, March 31, Silks (Persia and East Indies) Bill- petitions to be heard on Bill (No. 1050). The petition involves "an Act for restraining the wearing of wrought silks, Bengals, and dyed printed or stained calicoes, imported into the kingdom of England. 1051 (b), on 3 April, is the petition of the Calico Printers. The petition itself is in the Manuscript Minutes, Vol.31, from November 22, 1695 to 1 September, 1697. The volume of the manuscript minutes also includes, on 4 April, with 141 signatures, a petition of calico and linen dyers, on behalf of themselves and all the calico dyers in England.

²⁷ The livery companies identified for the 21 signatories included: Bakers, Clothworkers (3), Coopers, Curriers, Drapers (2), Fishmongers, Framework Knitters, Haberdashers (2), Leathersellers, Mercers, Stationers, Painter Stainers, and Shipwrights. Four of the 21 names, John Edwards, William Lewis, Robert Smith, and John Taylor were found as freemen in several different Companies.

²⁸ CLRO, COL/CHD/FR/02.

²⁹ CO-388/21, p. 243 is the humble representation of the printers of calicoes and linens, against the weavers petition, to the right honourable lords commissioners for the board of trade and plantations, in 24 November 1719, received 25 November.

³⁰ CO388/21, p. 223 includes a carefully described inventory of calico printing firms, with definitions and numbers employed in specific occupations within the businesses. The description is copied as

printing industry was described in several other reports,³¹ none provided as much detail as that of 1721.

One cluster within this group of 26 printers, comprising only members of the Dyers' Company, reveals a clear switch from linen printing to calico printing. Benjamin Ollive, apprenticed to John Meakins in 1671, joined the Dyers Company in 1678, two years after William Sherwin received his patent for printing on cotton and linen. Benjamin Ollive said he would be a linen printer when he joined the Company, but stated he was a calico printer when he signed the 1719 petition. Of Benjamin Ollive's 12 apprentices, from 1682 to 1712, 9 joined the Dyers' Company. Two of them, Thomas Brown (apprenticed 1782-1791) and Joseph Hackney (apprenticed 1695-1704) signed the 1719 petition concerning calico printing. One of Joseph Hackney's apprentices, Stephen Marshall, also signed a 1719 calico printers' petition. Two of Thomas Brown's apprentices, William Crabb and Edward Gillman, signed the 1719 calico printers' petition. Two of Benjamin Ollive's sons joined the Dyers' Company by patrimony in 1713, and are mentioned as calico printers. A third member of the Ollive family, Thomas Ollive, joined the Dyers' Company in 1741, and is mentioned as a calico printer. This is additional support for the hypothesis that a master is likely to transmit his specialty occupation to his apprentices.

Printing on calico had similarities to printing on linen, but there were also significant differences. Linen printing was done chiefly with black, which was not a fast colour. Blue-dyed flax thread, called Coventry blue, was used in weaving and was a 'true' blue that did not fade and was not destroyed by washing. Printing on cotton,

written: "Drawers are those that invent the patterns. Cutters are those that engrave them in the wood to be used by the printer. They are 53 in number. Printers are those that make the first impression of any colour upon the calicos and are 134 in number. These, with the drawers and cutters are the only persons that lay a claim to the trade, as having served apprenticeship to it (though one half of them never did) and most of them apply themselves to other business, when they have no work of their own, which is most part of the winter. Job printers are those that print calicos and linens, which gives a great encouragement to servants to rob their masters or mistresses, for by getting it printed, it is altered so much as it cannot be known again. The number of these are 80. Grounders are mostly women who put in the finishing colours and are 45 in number. Tearers are boys and girls that attend on the printers and grounders when at work, and are 179. Fieldmen are those that whister the calicos and are as day labourers and as capable as any other employ, and are 237. These are all the people that are employed, when in full business, which is about 8-9 months of the year."

³¹ There are three reports in documents of the Board of Trade and Plantations. One lists 23 printers and the number of their employees (C.O. 388/21, p. 223; One is a petition with 16 signatures; (C.O. 388/21, p. 243; One lists 23 printers in London, with a total of 635 employees (C.O. 389/27, fol. 266; A fourth is a House of Lords petition, with the names of 29 printers. (H.of L. MSS, Apr 6, 1720.

stimulated by the fashion interest in the Indian dyed and painted cottons, began almost simultaneously in France, Switzerland, the Netherlands and England in the 1670s. Linen printing may have been shrinking at about the time calico printing was developing.

Initiatives for the introduction of calico printing in England do not seem to have been strongly related to French or Dutch craftsmen whose immigration either preceded calico printing by several decades or followed it by several years. The names of craftsmen involved in the calico printing industry were predominantly English. The petition of 1696 includes only 2 Dutch and 4 French surnames out of 50.³²

4.2.9 Jury poll in several London wards (1721)

In a London jury duty poll in 1721³³, those polled included one hat dyer (John Ellery), one calico printer (John Perkins), three silk dyers (John Pearce, John Tatnall and John Thorne), and twenty dyers without an identified specialty, a total of 25 dyers. Sixteen of the 25 dyers were members of the Dyers' Company, and had bound apprentices. Five others were members of the Dyers Company, but had not bound an apprentice. It is unusual to find that about 80 percent of a group of dyers had bound apprentices, when overall, the average is about 40 percent. Maybe dyers who live in the wards involved in the poll were better off than the average, on the view that higher income leads to more frequent binding of apprentices.

Further information is available about some of these resident dyers. John Ellery is here confirmed as still a hat dyer, which he was in earlier Company records. John Perkins, not previously shown to have a specialty in Company records, was a calico printer in 1721. He did not sign either the 1696 or 1719 petitions. John Pearce, not previously shown to have a specialty in Company records, was the seventh of 12 apprentices of Anthony Light. The ninth apprentice, Christopher Waggitt, said he would be a silk dyer when he joined the company, which adds strength to the suggestion that Anthony Light was a teacher involved in silk dyeing. John Tatnall, not previously shown to have a specialty in Company records, was the first of four

³² Wadsworth and Mann 1931, p. 137.

³³ CLRO, 1721.

apprentices bound to William Allington, but neither John Tatnall nor the other apprentice of William Allington mentioned a specialty in silk dyeing when they joined. John Thorne, not previously shown to have a specialty in Company records, was the fifth of 6 apprentices bound to John Knight, but neither Knight nor the other apprentice of John Knight who joined the Company indicated a silk dyeing specialty when they joined.

Eight of the 25 dyers lived in the St James Garlickhythe precinct of Vintry ward, none with a stated specialty. All three silk dyers lived in Farringdon Within ward, two in the Christ Church 2nd precinct. There were no other dyers identified in that ward. There are no data to separate residence from place of work.

It is difficult to know if a specialty is underrepresented among the identified specialties in dyeing. This would be the case if a specialty were more often in a Company other than the Dyers' Company. Silk dyers were the most frequently mentioned specialty among dyers in other Companies. Scarlet dyeing appeared as a specialisation not uncommon outside the Dyers' Company.

Calico printing was represented by only a single printer in other livery Companies in the 1750 and 1792 livery polls. The simplest explanation for the absence of calico printing is that the printers, located outside the City jurisdiction, were not commonly members of any livery Company. Even though it was probably the biggest of innovations in dyeing, it appears the Dyers' Company was unable to capture a major group of practitioners of this specialty.

4.3 Chapter 4 Summary

There is a significant amount of information about occupational specialty in dyeing, but it is scattered and often available only for a limited period. Some comes from published information from probate inventories, from wills, Dyers' Company records, the quarterly tax poll in London in 1692, and from a variety of petitions.

Probate inventory data from 1665 to 1736 identified 24 dyers, 19 of whom could be followed in the Dyers' Company records. The 19 included 6 silk dyers, 9 woollen

dyers and 4 others. The dyers worked an average of 15 years, bound on average 6 apprentices, 3 of whom joined the Company. There was no difference in the frequency with which apprentices of the silk and woollen dyers joined the Company. There was no calico printer identified.

The records of the Commissary court identified 68 dyers, among whom were 4 silk dyers. There were none concerning hat or linen dyers, or calico printers. Dyers' Company records were available for 3 silk dyers. The apprentices of two them had mentioned they would be silk dyers. This supports the hypothesis that a specialty occupation of a master is likely to be that of his apprentices.

In the period 1650-94, silk dyeing was chosen by about one fifth of Dyers' Company apprentices who mentioned a specialty when they joined the Company, and the frequency of silk dyeing as a named occupation rose to almost 40 percent by the 1690s. Although calico printing made its appearance in the late 1670s, it did not appear in the Dyers' Company records as an occupational interest.

In the period 1682-84, 28 dyers (18 silk dyers, 7 linen dyers and 3 stuff dyers) identified an occupational specialty in dyeing and bound apprentices. It took silk dyers an average of 3 years from the time of finishing apprenticeship training to binding an apprentice, while for stuff dyers the average was 5 years and linen dyers the average was 7 years. It is possible that linen dyeing, as contrasted to silk dyeing, was losing its appeal towards the end of the seventeenth century, and this explained the increased time spent as a journeyman before binding an apprentice. Alternatively, there may have been another influence at work. Some linen dyers became cotton printers towards the end of the seventeenth century. And it appears that cotton printers were not always, or perhaps not often members of the Dyers' Company. Perhaps those interested in linen dyeing (and calico printing) were not in evidence because they were not joining the Company, in which case the numbers found in the 1682-84 data did not represent the interest in the specialty.

It is possible that the large number of apprentices bound by some masters relates to their specialised occupation. Woollen dyers bound large numbers of apprentices more often than either silk or linen dyers. This difference could relate to a combination of

circumstances: woollen dyers may have needed larger numbers of hands to operate their firm, with large cloth bundles and need to handle heavy materials; woollen dyers, as contrasted to silk and linen dyers, may have needed less technically trained, inexpensive labour, that is, apprentices rather than journeymen.

Of 50 calico printers who signed a petition in 1696, only 5 were found as Dyers' Company members, and 21 were members of 13 other Companies. Calico printers were growing in numbers, and their firms were growing in size. In 1721, there were 26 firms, ranging in size from 4 to 152 employees. One calico printer, Benjamin Ollive, had been a linen dyer when he joined the Dyers' Company in 1678, had become a calico printer by 1719, and his sons became calico printers. The Dyers' Company does not seem to have been a major location for calico printers, nor did calico printing become a livery Company in its own right. But they did have political clout and a future. Though they lacked a formal organisation, calico printers, with help from many other groups, had organised public petitions in 1696 and 1719. When the government investigated the craft, it recorded a significant number of firms, some with large numbers of employees –The industry, potentially the most innovative of any in the dyeing trade, had found a way to develop outside the control of the Dyers' Company.

Chapter 5 Transmitting technical knowledge: a study of chains and generations

5.1 Introduction

This thesis considers apprenticeship as the major route of transmission of knowledge and skill in dyeing. What an apprentice dyer learns from his master is one step - a first generation - in the transmission of knowledge and skill. To continue this transmission, apprentices-turned-masters have to pass on their learning to their apprentices. Although much has been written about the value of apprenticeship as a way to transmit knowledge and skill, it remains unclear what factors influence the continuing success or failure of this transmission.

One way to understand what happens to an apprentice's knowledge and skills in dyeing is to follow that apprentice through his career, and observe the transmission, to his (or her) apprentices, of what he (or she) has learned.

An apprentice learns tacit knowledge about how dyeing is successfully carried out, in addition to explicit knowledge about the character of the dyes and fibres, and both explicit and tacit information about the business more generally. Knowledge transmitted by the written word may have been a minor or negligible element of the transmission process.

Although books concerning methods of dyeing were written with the specific purpose of transmitting information, and included recipes, formulae and descriptions of how dyeing was to be done, there is little to suggest that these books were the way skill and knowledge was transmitted to apprentices.¹ Books describing the processes of dyeing were available, occasionally compiled with the intention of disseminating accumulated knowledge more widely. But even detailed recipes were not for beginners.² By

¹ Musson 1975, pp. 74-5.

² Brunello 1973, ch 5, pp. 175-220. In one of many examples from Chapter 5, one recipe, on page 189, from the Venetian dyer, Giovanventura Rosetti's *Plictho* of 1548, concerns dyeing silk by means of lac. The recipe reads: "First you will boil the silk in this manner. Measure one pound of black soap for each

contrast, there is much to suggest that on-the-job learning was far more important. Thus, the Dyers' Company minute book contains a note concerning a written report about a method of dyeing.³ After reviewing it, the Dyers' Company officers declared that they were not satisfied with anything other than a practical demonstration to verify the results.

It follows from this that an analysis of the transmission of technical knowledge over time involves developing information about *chains of transmission*, a process similar to that involved in developing a family tree in a genealogical study. Many different words can be used to describe this process of transmission. I have used the phrase *chains of transmission* to describe the continuing passage of knowledge and skills in dyeing from masters through their apprentices to other apprentices. I use the phrase *number of generations* to describe how many generations are present within a chain.

The number of generations is infrequently described in reference to transmission of knowledge and skill in a craft, though the history of a business firm is often described in

pound of silk and put it into a small sack, that is, the silk boil in clear water with said soap for a space of one hour. Then wash it in boiling water and then in cold water. Having done this, if it is not white to your manner, you will take again half a pound of soap and cook it as you did above but do not let it boil but for half an hour and dry it over the sticks. Then take one pound of roche alum, and dissolve it in water and throw away the residue. Then have on the fire some water that is boiling, and before it boils throw inside the silk two or three times and then set it so that it stays until it boils. Then remove it and set it in the bath of lukewarm roche alum. See that it stays inside for two days. And then you take pounds of gum of lac and pestle it. Take away the rods and then put the silk in a small sack and put it well into the water that is well warm until the said water be well loaded with colour. Then put that water into the clean cauldron, and you will take the said water clean and hot. Do as above so that it changes colour, and when you have enough bath, put it to boil, and as it commences to boil, you will throw in four ounces of white clear tartar and pulverized finely, and stirring well with a pole. Then put inside your silk and have the rods in four parts and leave it boil for one hour ever passing it by hand. Then take it out and return it to the alumed water and then take still half a pound of grain and you will do as you did above, but not letting it boil more than a half hour. Then when you will have seethed it, take it out from the dye bath, wringing the bundles in the alum liquor, and leave it stay for a *miserere*. Note that it would best be a little new alum solution because it makes the silk lustrous. Also if it were too loaded and uneven, the alum would open the colour. When each thing is done as above said, wash it in the river or the canal, and wring it and drip it and make it dry and spread it so that it remains lustrous. This silk stands in comparison to the grain. And note, make good provision of water always, if you wish to have honour for your workmanship."

³ London Dyers 1747, p. 318, which begins a 4 month exchange of letters. A letter from the treasury informed the Dyers' Company that a Mr Berkenhout, in the presence of the Lords of the Treasury, had demonstrated a method of dyeing scarlets and crimsons on linen and cotton. The Company Warden requested details, but subsequently the Company officers required further explanations. Even among the knowledgeable, dyeing secrets could only be evaluated by seeing them done.

that manner. In discussing merchants and the life of a firm,⁴ Grassby mentions chains involving several or many generations, but he has no way to calculate how frequent they were, that is, what percent of family firms involved chains of 3 or more generations. Clifford Webb's computer file, in association with other information about the members of the Company, facilitated studying chains of transmission.⁵

As shown in Chapter 2 on recruitment, a large proportion of the apprentices in the Dyers' Company did not subsequently join the company, and this pattern has been observed in other Companies as well.⁶ What is more, a large percentage of apprentices who became masters did not bind any apprentices. Thus, even though the Dyers' Company was directly involved in transmitting knowledge and skills in dyeing, much of the training did not take place beyond one generation.

In relation to the *number of generations* of transmission, Chapter 2 dealt with the first generation. However, for knowledge and skills in dyeing practice to persist, there must be transmission to further generations.⁷ This chapter explores information about the distribution of the number of generations in a chain, and factors, such as occupational specialization, which may have influenced the number of generations in a chain.

⁴ "If business was to acquire a separate identity, it was necessary for family firms to sustain a continuous existence over time...There were many families which lasted for three, and a few four for or five generations: the Childs and Hoares spanned three centuries. Half of London notables between 1660 and 1725 followed their father's occupation." But the three-generation cycle, noticed earlier by William Caxton, was still evident, (though) it coincided with the period usually prescribed to acquire gentility by style of life.", Grassby 1995, p. 371.

⁵ Clifford Webb's efforts to computerise the apprenticeship records of over 40 guilds are an incredible achievement. Volume 25 of his series of London Livery Company Apprenticeship Registers concerns the Dyers Company, 1706-1746, published in 1999 by the Society of Genealogists. It is an essential source for this thesis.

⁶ Grassby 1995, p. 139 notes that in early Stuart London the percent of apprentices joining their Company varied from 27 percent in the Cordwainers, 38 percent in the Drapers, 40 percent in the Carpenters, 41 percent in the Stationers, 42 percent in the Merchant Taylors, 44 percent in the Masons, 45 percent in the Goldsmiths, and 50 percent in the Poulterers. The Printers had an even higher rate of completion, apparently because of more careful selection of apprentices.

⁷ It is not unusual to be able to follow chains of transmission of skills in fields where the crafted object survives and includes the name of the maker. In that case, the individual craftsman is often known as a trainer, as with instrument makers, spectacle makers, and clock makers. (Loomes 1981, Brown 1979a, Clifton 1993, Turner 2006,) It is less common in craft fields in which the craft objects are less likely to survive, and are, in any case, not labelled with the name of the producer.

The time limits to this analysis are determined by the legislation on apprenticeship: the Statute of Artificers⁸, which codified apprenticeship regulations, was passed in 1562/63 and the portion that related to apprenticeship was repealed in 1814⁹. This defines a period of about 250 years when the apprenticeship records of many London guilds might allow a study of generations.

Joining the Company was an essential element of the transmission process, since the Corporation of London regulations restricted apprenticeship bindings to members of a Company. To measure the frequency distribution of chain lengths, or factors associated with longer chains, it is necessary to systematically follow binding and joining records over long periods of time, following named individuals through the records.¹⁰ Because skill was occasionally passed to a family member without a formal apprenticeship, I also used information about those who joined the Company by patrimony. For completeness, I included those who joined by paying a fee without completing an apprenticeship, a method called “redemption”, even though those who joined by redemption were often not practicing dyers. Finally, data concerning occupation are augmented with information obtained from records other than Company records, as discussed in Chapter 4. The infrequency of published descriptions of chains of transmission and numbers of generations in chains suggests that there are intrinsic difficulties with this type of analysis. Even sustained efforts in identifying the chains of transmission among mathematical instrument makers did not give rise to significant evaluation of this kind.¹¹

An initial problem is that the starting point is generally arbitrary, often, as in the case of the Dyers’ Company, defined by the available data. Because data concerning the Dyers’ Company are only available after 1649, apprenticeship starting at or before that date cannot be included in a chain. The result of this arbitrary beginning is that chains

⁸ 5 Elizabeth c. 4, 12 January, 1562.

⁹ 54 George III c. 96, 18 July, 1814.

¹⁰ Such analyses have been made of guild records relating to some craft guilds, occasionally with graphic representations of the chains of transmission. Steven Quinn’s graphs (Quinn 1997, p. 425) concern the paths of transactions among goldsmith bankers, but also concern apprentice chains, while Joyce Brown’s graphs (Brown 1979b, pp. 22-23) concern apprentice bindings in the Grocers Company, and considers those apprentices who became mathematical instrument makers.

¹¹ Clifton 1995.

that started before 1649 cannot be fully measured. It is difficult to know how to compensate for this factor. One way is to stratify chain lengths by the decade in which they begin, to see if an unusually high percentage of short chains occurred in the earlier decades. Such an analysis will be presented later. A similar problem occurs in defining the number of generations when there is an arbitrary ending point, such as the questionable completeness of apprenticeship binding data after the first decades of the nineteenth century.

In building the analysis of chains in the Dyers' Company, it was necessary to follow each apprentice who joined the Company. The next step was to categorise the chain in relation to occupational information about a dyeing specialty. Because available occupational data essentially ended in the 1690s, I have limited the screening of all chains to those, which started between the 1650s and the 1690s.

5.2 Methodology

5.2.1 Factors determining chain length

It is difficult to know the set of circumstances that will determine the length of a chain. It is possible that a long chain might result from the continuous transmission of a specific skill, such as making a chair with a distinctive design, or a sundial of distinctive pattern,¹² or dyeing fabric in a particular colour or in a distinctive manner, if the design, colour or distinctive manner remains in demand. This would give rise to a long chain being associated with a minimum of innovation, but also, perhaps, an increase in precision and quality. It is also possible that a long chain might result from the transmission of innovative ideas and skills, such that dyers so trained are primed to respond readily to innovation and adapt to new fashions. In fact, evidence concerning mathematical instrument makers suggests that long chains were associated both with more innovative activity, but also with standardisation.¹³ And the frequency of changes in textile fashion suggests that a long chain might be associated with those who were innovators.

¹² Turner 2006.

¹³ Turner 2006, p.15; Brown 1979b, pp. 57-85.

Economic factors might be crucial to the development of long chains. Long chains might result from transmission of skills and knowledge in a rapidly expanding and economically successful area of dyeing. Apprentices who wished to become masters in this sector would find it easier to obtain the relevant knowledge and skill and then to pass on to their apprentices the requisite skills and knowledge, a process, which would generate long chains. But equally, an expanding and economically successful area of dyeing could attract many dyers, initially trained in other sectors, and give rise to many new but potentially short chains.

Family factors might also be important in the development of long chains. It is possible that long chains would result when many apprentices came from families of dyers, so that they - for economic reasons or because they were already knowledgeable when they begin their apprenticeship - were more likely to continue in the same craft.

Other factors, such as the environment of an individual cluster of apprentices, might also influence the way a chain developed. Quinn shows that the master to whom one was bound led to a cohort of apprentices who maintained contacts with each other after their training was over. Consequently, long chains in goldsmith banking were developed.¹⁴ Similar processes of chain development may have occurred among dyers when large numbers of apprentices were bound to a single master.

Alternatively, chain length might be primarily the result of a random process. However, one cannot assume, in a statistical sense, that all apprentices are equal. Apprentices differed in their social background, their father's social status ranging from gentleman to farmer. Apprentices differed in their prior knowledge of the textile business, from having a father in the dyers guild, or in a textile-related guild, to coming from a family without any guild background. Apprentices differed in the ability of their family to pay a binding premium. Exogenous factors, related to individual apprentices, may be most important in determining chain length.

¹⁴ Quinn 1997, pp. 424-5.

Finally, chain length might vary depending on events in a particular time period: Economic recession might result in cutting chains short, and alternatively, economic expansion might help chains survive that would otherwise be curtailed.

5.2.2 Completeness of the evidence

We saw above that the arbitrary starting point in 1649 might cause the analysis to be biased. Long chains beginning before 1649 would not be identified as such because the antecedent data is unavailable. However, short chains, which did occur, would be identified. To test the extent of this bias, I examined dyers with no stated specialty for evidence of an unusually high percentage of short chains in the 1650s (Table 5.1a and 5.1b). In fact, there was no significant difference between the percentage of short chains beginning in the 1650s and those beginning in later decades. On these grounds, I have assumed that there were no substantial differences for specialised occupations, either. What is evident is that there were a greater percentage of long chains starting in 1650-59, something that will be discussed later.

A recurring problem with using apprentice and freedom records is the assumption that names were correctly recorded, both by record keepers and by me. For example, the spelling of a name as written in a petition and as the clerk transcribed it could be inconsistent.¹⁵ A potentially greater problem is that father, son and grandson often had the same name, making it difficult to know which of them was the master of a particular apprentice. As a rule of thumb, I have used the timing of an apprenticeship or of entry to the Company by patrimony to distinguish between generations.

¹⁵ CO-388/21 p. 243 is a “humble representation of the printers of calicoes and linens, against the weaver’s petition, to the right honourable lord’s commissioners for the board of trade and plantations, in 24 November 1719, received 25 November. CO388/21, p. 243 is signed by 16 printers, and therefore the spelling of names is more likely to be correct than on the petition list of CO388/21 p. 223, which was produced by Mr Martin to describe the size of the industry in London in 1719. On the basis of the signatures, I revised the spellings in CO388/21, p. 223, as follows: Brown becomes de Broen; Overcoome becomes Havercam; Kerk becomes Kent; Olive becomes Ollive; Towne becomes Toone; Watkinson becomes Watkinson. In each instance, the given name was the same in both lists. At least in one instance, that of Benjamin Ollive, when he went into business, he used Ollive as his name in the business. Similarly, Gabriel Kent appeared in that spelling throughout the Dyers records, whereas Kerk never appeared.

Changes in the enforcement of Company rules and regulations from the late seventeenth to the early eighteenth century may also have altered the consistency with which the relevant data were recorded. Since enforcement was generally diminishing over this period, it is possible that an increasing proportion of apprentices did not join the Company.¹⁶ However, although there is no conclusive test of this hypothesis, a decline in the number of apprentices is only apparent after 1720.¹⁷

There are lacunae in the data set. On more than one occasion, a master's name appears in the data set without a recorded antecedent apprenticeship. There are many possible reasons for this, including poor bookkeeping, spelling differences, or errors in reading the registers. In these cases, I assumed an earlier nameless master. The result, however, is a chain that may appear to be shorter than it actually was, since the unknown master cannot be linked to an earlier chain.

Other problems with the data relate to the assumed modes of transmission. It is tempting to use the biological analogy of the transmission of an infectious agent in looking for a model relating to transmission of knowledge and skill. One aspect of the infectious agent model emphasises the importance of distinguishing transmission from a case (in this instance an apprentice who has direct contact with the master) as contrasted to transmission from a carrier (in this instance an apprentice who learns from a journeyman). A major assumption in this analysis is that the dyer who binds the apprentice is directly involved in the teaching of the skills. The assumption makes it possible to construct information on chains of transmission from the apprentices bound by that master. But it is possible that the transmission of skills takes place via journeymen dyers employed by a firm. The journeymen may have learned initially from other masters rather than from their current employer. My analysis will miss such instances of transmission from other masters.

¹⁶ Kellett 1958; Grassby 1995, pp. 53-81.

¹⁷ See chapter 3, Figures 3.3a for numbers joining and 3.1a for percent of bindings that join.

Table 5.1a NUMBER of chains starting in the indicated decade for those with no specialty stated

# Gens	1650-59	1660-69	1670-79	1680-89	1690-99	Total
2	39	19	6	9	0	73
3	25	13	5	7	2	52
4	10	4	5	4	0	23
5	9	1	1	1	0	12
6	1	0	0	0	0	1
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
Total	84	37	17	21	2	161

Table 5.1b PERCENT of chains starting in the indicated decade for those with no specialty stated

# Gens	1650-59	1660-69	1670-79	1680-89	1690-99	Total
2	46	51	35	43	0	45
3	30	35	29	33	100	32
4	12	11	29	19	0	14
5	11	3	6	5	0	7
6	1	0	0	0	0	1
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
Total	100	100	100	100	100	100

Sources: London Dyers, MS 8154 Vol.1, MS 8167 Vol.1-3, MS 8168, Vol.3, MS 8169, MS 8171 Vol.1-4.

A second element of the infectious disease model concerns the so-called reservoir of infection, in this instance, a master who consistently transmitted a particular skill, whose trainees, on becoming journeyman, carried the skill to many different firms, without its origin being identified (perhaps many firms would seek out these journeymen, because of their specialised skills). However, although there is no way to estimate the effect of these circumstances on the frequency distribution of chain length,

data concerning specialisation need not be affected differentially. In other words, we can assume that transmission of an ‘exogenous’ (infectious) skill via journeymen would occur with the same frequency among different specialties.

The analysis assumes that one can follow skill transmission effectively by considering only those who joined the Company. This is a significant assumption, since, as shown in Chapter 3, less than half of the apprentices bound in the Dyers’ Company went on to join the Company. Because they did not join the Company, they could not bind apprentices, and any role they may have played in the transmission of skill is not being picked up in my analysis. Furthermore, if a dyer, after completing an apprenticeship, did not join the Company, but worked within the London region outside the control of the Dyers’ Company, he could have taken on trainees who were not recorded in my computer files. However, even if there is transmission of knowledge and skill that I cannot measure, which results in undercounting the transmission of knowledge and skill through apprenticeship, this should not affect the measurement of the number of generations in a chain.

A further source of confusion arises from turnovers. If a master in the Dyers’ Company turned over his apprentice to someone else in the Company, then that second master supervised the training during what could be a major period of the apprenticeship. Whatever turnovers occurred, they were infrequently recorded in the register before 1706, but were recorded for 1706-46. As shown in Chapter 2, from 1706 to 1746, about fifteen percent of apprentice bindings involved turnovers, some to those outside the Company. But those apprentices involved in a turnover would appear in a chain related to the original master. The few turnovers that were recorded before 1706 were to other members of the Company. In spite of this potential confusion, for consistency, I used only the name of the first master, not the master to whom the apprentice was turned over. Turnovers outside the Dyers’ Company, either before or after 1706, seem to have been statistically negligible

An extensive study of mathematical instrument makers indicated an additional difficulty, since several of the Companies in which mathematical instrument makers were trained

were not limited to, or even primarily involved with binding instrument makers.¹⁸ As a result, it was possible that a chain relating to instrument makers, begun in one Company, might continue through members of other Companies. In this case, limiting one's search to a single Company would not only undercount the specialty but might misrepresent the measurement of generations.

A problem similar to that associated with turnovers is the possibility that master dyers were often involved in partnerships. It was common for persons starting a business to initiate a partnership to raise capital. If one of the partners died, there would commonly be arrangements for the handling of apprentices. If under these circumstances the apprentices were turned over to someone in another Company, it is possible that no note would appear in the original Company's record. The chain could then be inappropriately truncated. David Mitchell (personal communication) suggested that partnerships might be more likely in larger firms, and found that the estates of wool dyers were substantially more valuable than those of silk dyers.¹⁹ If the wool dyers were more likely to be in partnerships, and their apprentices were involved in turnovers, it is possible that the measured length of chains among wool dyers would appear to be shorter than those of silk dyers.

5.2.3 Occupational definitions

In analysing the evidence, I have assumed that when an apprentice, at the time of joining the Company, stated the intention to become a specialist dyer, he would carry out that intention, and that a Company member who stated a specialist occupation on

¹⁸ The project, with a stored data set named SIMON index (Scientific instrument making, observations & notes), led to several separate publications by Gerard L'E Turner, M.M. Crawforth, Joyce Brown, and Gloria C. Clifton, dealing with London guilds into which apprentices in instrument making were bound, including the Broderers, Grocers, Joiners, and Spectaclemakers.

¹⁹ The data from Mitchell 1995b are as follows: There were 30 wills with probate available from the London Orphans Court for deaths of dyers from 1665-1736, with the information given in Figure 2, Dyers, Goods and Colours, p. 160, and Figure 3: Dyers: Inventory Breakdown, p. 161. The value in pounds for wool dyers total assets at death were: £5,976, 3,684, 2,705, 1,122, 934, 752, 633, 336, 111, unavailable, insolvent, with the average for those with data of £1,805. The value in pounds for silk dyers total assets at death were: £2,016, 1,655, ,1573, unavailable, insolvent, insolvent, with the average for those with data of £1,274. Data from the 1692 London 4 shillings in the pound special tax show 97 dyers, 18 of whom were silk dyers. The total stock of the silk dyers was less than that of the other dyers, but it is not unlikely that large silk dyers were living outside of London, and would not have been included in the poll, so the large dyers might have been underrepresented.

binding a first apprentice, would train all of his apprentices in the same specialty.²⁰ I have further assumed, even in the absence of much corroboratory data, that all apprentices within one chain were trained in the same specialty. On several occasions, this assumption has been tested and confirmed, as earlier data in chapter 4 has shown. Further confirmatory data will be mentioned below.

The second assumption, however, has been challenged by contrary evidence. Some master's groups of apprentices identified two or sometimes three specialties, including silk, stocking and hats, silk and linen, stocking and linen, and other combinations; during the period for which there were data, silk alone and in combination with others were the commonest groupings observed. Chains with a variety of specialties behaved much like those with silk alone, with longer chains observed more frequently. In such situations, it would be possible to start measuring a chain with each of two (or more) apprentices, and have two (or more) different chains. Alternatively, the data could be considered uninterruptible and discarded. A third alternative, which I have followed, is to place these data in a special category labelled "mixed."

Among those who did identify a specialty, silk dyeing was the most frequent. In chapter 4, all the silk dyers were identified as dyers of silk thread on the basis of the probate inventories. If high quality silk thread dyeing needed a unique set of distinctive skills, it is creditable that these were passed on to apprentices and transmitted through generations. Of the 48 chains identified as involving only silk dyeing, many had only one apprentice indicating silk dyeing as an occupation. Consequently, as the chains lengthened, the probability that the chain concerns only or even predominantly silk dyeing goes down. Of the seven chains of six generations of silk dyers, one chain has only a single apprentice identifying silk, three chains have two dyers, and three chains have three apprentices who stated the intention to become silk dyers.

There is, however, evidence supporting the decision to use incomplete data to identify chains concerning specialties. For example, the longest silk dyers' chain, that of Thomas Colebrook, identifies silk dyers in the second, third, fourth and fifth generations

²⁰ There are many corroborations and also some exceptions. Some dyers have changed their specialty occupation, such a Benjamin Ollive, noted earlier in Chapter 4.

out of eight. Samuel Osborne started a six-generation hat dyers chain. Two of Samuel Osborne's apprentices said they would be hat dyers, and further down the chain, in the fifth and sixth generations, there were additional hat dyers. The seven-generation linen dyers chain, which began with John Meakins, produced several linen dyers. One of John Meakins apprentices, Benjamin Ollive, said he would be a linen dyer, and he subsequently became a calico printer. There were other linen dyers in the second and third generations after John Meakins. Two of Benjamin Ollive's sons became calico printers. One of those sons, Joseph Ollive, trained Joseph Talwyn, who also became a calico printer; members of all three generations were involved in a single calico firm,²¹ involved in calico printing.

5.3 Analysis

5.3.1 Likelihood of being part of a long chain

Over the 150 years of observation, approximately 60 percent of apprentices who joined the Dyers' Company did not themselves bind an apprentice. These apprentices may be considered as chains of one generation, with no demonstrable further transmission of knowledge. They are not included in this analysis of longer chains. Instead, the analysis includes chains involving those who joined the Company and had a stated specialty, and the large number of chains, starting before 1700, which began with dyers who did not mention a specialty. Because data concerning a specialty comes predominantly from before 1700, long chains start predominantly in the middle decades of the 1600s. Analysis concerns 258 such chains and includes 3514 apprentices and 102 persons who joined the Company by patrimony, for a total of 3616 dyers.

Out of 258 chains, 62 percent (159 chains) of chains were two and three generations long, and might be considered as short chains (Table 5.2a and 5.2b). Chains of length two and three had variable numbers of dyers involved in 'successful' transmission.

²¹ Cox 1960, p. 22. The description reads: "The Bromley Hall factory, on the right bank of the River Lea in Poplar, was probably the largest of the early print works. It is first mentioned in the 1740's and was operated successively by members of the Ollive family (dyers and calico-printers since the late 17th century), Joseph Talwin and the Foster family, under the names of Ollive and Talwin (1763-83) Talwin and Foster (1785-1790) and Foster and Co. (1790-1823). The Ollives, Talwins and Fosters were all Quakers, and probably inter-related."

There were, on average, three dyers in chains of two generations, and nine dyers in chains of three generations. About 10 percent of chains had six or greater generations, and might be considered long chains. About 30 percent of chains were four and five generations long, and were of moderate length. In tables 5.2a and 5.2b, I have placed in bold the numbers and percent of chains which had five or more generations to show the difference in chain length between the two largest groups, those involving silk dyers and those with no stated specialty (these chains were labelled general in the appendix). Fifty four percent (1944/3616) of the apprentices and those who joined by patrimony were involved in the 258 chains. The chains of greater length, although they may occasionally involve transmission through a single master, are more often the result of transmission by more than one master in any generation. (See appendix, TableA.1, for graphic representation of the chains)

There were 48 chains that included a dyer who was a silk dyer. This was the most common specialty observed. When compared with those chains without a dyeing specialty indicated, there were a significantly higher proportion of chains with five or more generations among those with silk dyers (39 percent, 19/48) than among those without a stated specialty (8 percent, 13/161) (Tables 5.2a and Table 5.2b).

It was possible that the difference between silk dyer and those without a stated specialty related to a higher frequency of short chains in the decade 1650-59, or 1660-69 in those without a stated specialty. But the distribution of short chains was not greater in those early decades (Table 5.1a and 5.1b).

It is not clear what set of circumstances resulted in the longer chains. A possible explanation is that some specialties trained a larger number of apprentices. The likelihood of survival of a chain might be expected to be greater the greater the number

Table 5.2a NUMBER of 258 masters with a generation of the indicated length, by dyeing specialty, if any, found in the chain*

# Gens	Silk	Linen	Hats	Stocking	Stuff	General	Mixed	Total
2	9	3	2	0	3	73	0	90
3	7	5	2	1	1	52	1	69
4	13	2	3	1	3	23	4	49
5	4	3	1	1	0	12	4	25
6	7	0	1	0	0	1	3	12
7	6	0	0	0	0	0	4	10
8	2	0	0	0	0	0	0	2
9	0	1	0	0	0	0	0	1
Total	48	14	9	3	7	161	16	258

Table 5.2b PERCENT of 258 masters with generations of indicated length, by dyeing specialty, if any, found in the chain

# Gens	Silk	Linen	Hats	Stocking	Stuff	General	Mixed	Total
2	19	21	22	0	43	45	0	35
3	15	36	22	33	14	32	6	27
4	27	14	33	33	43	14	25	19
5	8	21	11	33	0	7	25	10
6	15	0	11	0	0	1	19	5
7	13	0	0	0	0	0	25	4
8	3	0	0	0	0	0	0	1
9	0	7	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	100

* Chains beginning from 1650 to 1690, followed up to 1826

Sources: London Dyers, MS 8154 Vol.1, MS 8167 Vol.1-3, MS 8168, Vol.3, MS 8169, MS 8171 Vol.1-4.

of apprentices trained. In Table 5.3, there is a tabulation of the number of apprentices bound per master, for each generation. This table shows two things. You might expect that if numbers bound per master were important, then the ratio of numbers bound per master would be reduced just before the chain ended. In fact, by looking at the top number in each column headed A/M, the numbers bound per master rises, rather than going down just before the chain ended. An alternative way to view the table is to scan down the numbers bound per master in the columns headed A/M. You might expect that the ratio would steadily increase as one looks at the longer chains. However, for

the third, fourth and fifth generations, there was a higher ratio of apprentices bound per master in the earlier generations. One can conclude from this table that a larger number of apprentices bound per master *does not* appear to have been the explanation of longer chains.

An alternative way of looking at numbers of apprentices bound by a master is to consider whether apprentices trained by masters who bound large numbers went on to bind a larger number of apprentices than those trained by masters who bound small numbers. The following tables (Table 5.4a and 5.4b) concern the effect, on any one apprentice, of the number of apprentices trained in the firm. In other words, making an analogy to a family, did apprentices (children) of large teams (families) go on to produce large teams (families) themselves? The tables use apprentice-binding data from 1649-1674, and 1675-1694.

The number of apprentices bound by a single master is shown in 4 groupings: only 1 apprentice, 2-4 apprentices, 5-9 apprentices and 10 or more apprentices. This grouping ignores journeymen and others in the firm. The analysis starts with the apprentices from firms of the given size in the given time period, and then follows those apprentices to see how many apprentices they bound. The period of observation includes the entire working period of those who joined the Company. In the period 1649-74, the proportion of apprentices binding 5 or more apprentices went from 16 percent (6/38) of those starting in firms of less than 5 apprentices to 34 percent (42/125) in those firms starting from 5 or more apprentices, and in the period 1675-1694, the changes were from 19 percent (14/72) to 26 (30/114) percent. These changes are compatible with the suggestion that apprentices in firms with large number of apprentices were themselves likely to bind large numbers of apprentices.

Table 5.3 Average number of apprentices(A) bound per master(M), in each generation, by number of generations

# Gens	2nd generation			3rd generation			4th generation			5th generation			6th generation			7th generation			8th generation		
	#A	#M	A/M	#A	#M	A/M	#A	#M	A/M	#A	#M	A/M	#A	#M	A/M	#A	#M	A/M	#A	#M	A/M
2																					
3	333	87	3.8																		
4	325	83	3.9	285	57	5.0															
5	197	49	4.0	198	48	4.1	176	29	6.1												
6	173	33	5.2	190	48	4.0	197	29	6.8	118	17	6.9									
7	129	32	4.0	152	35	4.3	174	39	4.5	160	24	6.7	109	16	6.8						
8	36	11	3.3	40	12	3.3	53	9	5.9	26	6	4.3	23	5	4.6	14	3	4.7			
9	10	2	5.0	22	1	22.0	11	1	11.0	4	1	4.0	27	1	27.0	6	1	6.0	3	1	3
	1203			887			611			308			159			20			3		

Sources: London Dyers, MS 8154 Vol.1, MS 8167 Vol.1-3, MS 8168 Vol.3, MS 8169, MS 8171 Vol.1-4.

Table 5.4.a Bindings of apprentices turned masters, 1649-74 bound in firms of different size.

	Number of apprentices in a firm			
	1	2-4	5-9	10+
Subsequent binding by those apprentices	1	2-4	5-9	10+
Bound only one	1	15	13	20
Bound 2-4	3	13	19	31
Bound 5-9	1	3	8	17
Bound 10 or more	0	2	6	11
Total	5	331	46	79

Table 5.4.b Bindings of apprentices turned masters, 1675-94 bound in firms of different size.

	Number of apprentices in a firm			
	1	2-4	5-9	10+
Subsequent binding by those apprentices	1	2-4	5-9	10+
Bound only one	4	17	24	10
Bound 2-4	6	22	21	20
Bound 5-9	1	10	17	7
Bound 10 or more	2	1	1	5
Total	13	59	72	42

Sources: London Dyers, MS 8154 Vol.1, MS 8167 Vol.1-3, MS 8168, Vol.3, MS 8169, MS 8171 Vol.1-4.

Although it did not appear that the numbers of apprentices bound in any generation was a decisive factor affecting the ultimate number of generations in a chain, being part of a cohort of apprentices bound to masters who bound large numbers of apprentices may have been a factor in chain length. This is one bit of evidence that not all apprentices should be considered equal.

Another factor of possible importance in producing long chains was the percentage of apprentices who joined the Company in each successive generation. Since transmission of knowledge depends on an apprentice joining the Company and binding other apprentices, an increased percentage of apprentices joining the Company might have been the decisive factor in developing long chains. If this were the case, you might expect the longer chains would have a higher percent joining, so that if you scan down

each % J column, the percentages would increase. In fact, in Table 5.5, the percentage joining in the 3rd generation column rose from 38 in the third generation to 63 in the seventh, and then fell; and in the 4th generation the percentage joining rose from 28 in the fourth generation to 57 in the seventh, and then fell. However, throughout the second generation, there was no change, and in the fifth, sixth and seventh the small numbers make evaluation difficult. Overall, the percentage joining *did not* appear to have been the explanation, either.

If neither larger numbers bound, nor a growing percentage joining the Company were important, it is possible that those who did join the Company had some distinctive feature as a result of which they were more likely to continue the training process. One such feature is a family connection. This possibility is strengthened by the observation of a clustering of names, such as Andrews, Light, and Ollive among the longer chains.

The analysis includes apprentices as well as those who joined the Company without an apprenticeship, joining by patrimony through their father (or their widowed mother as a surrogate) or, less commonly, by paying a higher fee and joining by redemption. Estimations of chain length do not distinguish between these origins. The number who entered by patrimony was not great, and the slight greater proportion of them to be found among those with longer chains (Table 5.6) probably reflects the increasing use of patrimony as a method of entering the Company, a process that was significantly increased in the later eighteenth and early nineteenth centuries.

When evaluating the possibility that short chains occurred more commonly at the beginning of the study, I looked both at those with no stated specialty, and those with silk as a specialty. An unexpected finding was that many of the chains with five or more generations began in the 1650s. One explanation for this finding may simply be the longer period of follow up, but this may not be the only explanation. Perhaps dyers who became involved in silk dyeing early subsequently developed business relationships or reputations, which were not available to, firms which started later in silk dyeing. This is something that needs further exploration.

Table 5.5 PERCENT of apprentices (A) joining (J) in each generation, by number of generations

# Gens	2nd generation			3rd generation			4th generation			5th generation			6th generation			7th generation			8th generation		
	#A	# J	% J	#A	# J	% J	#A	# J	% J	#A	# J	% J	#A	# J	% J	#A	# J	% J	#A	# J	% J
2	286	142	50																		
3	368	204	55	220	83	38															
4	332	177	53	303	141	47	132	37	28												
5	192	106	55	214	96	45	174	75	43	68	22	32									
6	192	86	45	191	99	52	195	94	48	120	41	34	28	5	18						
7	129	77	60	152	96	63	174	100	57	160	62	39	109	49	45	38	13	34			
8	36	16	44	40	18	45	53	26	49	26	14	54	23	8	35	14	5	36	3	1	33
9	10	6	60	22	8	36	11	3	27	4	1	25	27	9	33	6	4	67	3	1	33

Sources: London Dyers, MS 8154 Vol.1, MS 8167 Vol.1-3, MS 8168 Vol.3, MS 8169, MS 8171 Vol.1-4.

Table 5.6 PERCENT of patrimony and length of a chain of dyers

#gen	pat	2app	%pat	pat	3app	%pat	pat	4app	%pat	pat	5app	%pat	pat	6app	%pat	pat	7app	%pat	pat	8app	%pat	pat	9app	%pat
2	1	277	0.4																					
3	0	366	0.0	12	220	5.5																		
4	2	332	0.6	8	303	2.6	2	132	1.5															
5	2	192	1.0	7	215	3.3	7	173	4.0	2	58	3.4												
6	0	192	0.0	6	190	3.2	8	195	4.1	2	120	1.7	1	28	3.6									
7	0	129	0.0	8	152	5.3	9	174	5.2	8	160	5.0	6	109	5.5	9	38	14.5						
8	0	36	0.0	0	40	0.0	0	53	0.0	2	26	7.7	0	23	0.0	0	14	0.0	3	3	100.0			
9	0	10	0.0	0	22	0.0	0	11	0.0	0	4	0.0	0	27	0.0	0	6	0.0	3	6	50.0	2	3	66.7
Total	5	1534	0.3	41	1142	3.6	26	738	3.5	14	368	3.8	7	187	3.7	9	58	6.5	6	9	66.7	2	3	66.7

Sources: London Dyers, MS 8154 Vol.1, MS 8167 Vol.1-3, MS 8168 Vol.3, MS 8169, MS 8171 Vol.1-4.

5.3.2 Circumstances resulting in longer chains

Although there are published recipes, all or nearly all the relevant technical knowledge concerning dyeing was ‘embodied’ in the head and hands of the master dyer. Practical knowledge could not be sold to an untrained buyer, as it could be with a capitalist firm; instead, technical knowledge was transferred across generations through the master’s apprentices and journeymen. Studying chains of apprenticeship among dyers, essentially defining craft ‘dynasties’, is one way to measure the relative success of transmission of knowledge

Why would a master with specialised knowledge wish to train an apprentice, rather than poach an already trained apprentice or hire a journeyman? (If he did not train an apprentice, there would be no craft ‘dynasty’ to speak of.) The literature suggests two main reasons. First, training one’s own apprentices lowers recruitment costs for skilled labour, and the economic gains are proportionate to the skills; that is, the greater the skills, the greater the benefits to the master from training.²² A corollary of this is that larger firms will be more likely to train large numbers of apprentices. Second, the superior information of the current employer regarding his employees’ abilities relative to other firms creates *ex post* monopsony power, and encourages the employer to provide and pay for training even if the skills are general.²³

Apprentice dyers trained by masters with specialised knowledge would be more likely to ‘survive’ economically (as defined above) because they had better tacit knowledge (knowledge that cannot be learned via language) than their competitors. This advantage would, in principle, be transmitted to their own trainees, and so on over generations. Of course, there are also examples of the opposite, that is, of poorer technical knowledge surviving for a long period of time,²⁴ through weak competition.

There is literature dealing with the number of generations in a firm, focusing, among other things, on family characteristics.²⁵ This chapter, which focuses on chains of

²² Acemoglu and Pischke 1998, pp. 79-119.

²³ Stevens 1994.

²⁴ Turner 2006.

²⁵ Grassby 1995, pp. 90, 370-72, 401-03.

transmission of knowledge and skill, and on the number of generations in a chain in relation to specific technical factors, suggests that much more can be learned from studying number of generations among craft guilds that have retained a clear focus on their specialty.

Much can be learned from work initiated over 30 years ago concerning mathematical instrument makers. If we compare Brown's schematic diagrams of generations of mathematical instrument makers bound in the Grocers' Company²⁶ with those from the Dyers' Company, we find some basic differences in the apprenticeship data. The number of apprentices bound in the Grocers' Company who would become mathematical instrument makers was increasing in the eighteenth century rather than decreasing. There was one apprentice bound per year from 1690-1749, two per year from 1750-1769, 3 per year from 1770-1789, and 4 per year from 1790-99. Acknowledging this difference, I used her published data to generate descriptions of generations following the methodology applied to Dyers' Company records. I encountered data problems similar to those with the Dyers' Company, predominantly in relation to turnovers. However, because the Grocers' Company records were consistent for a very long period, I could use the name of the master to whom an apprentice had been turned over in describing the chain. I could not do this consistently with the Dyers' Company data since turnovers were not indicated in the apprentice register before 1703. With the Grocers' Company records, I found seven chains, four of 2 generations, one of 3, one of 5 generations and one of 13 generations. The distribution resembled that for the Dyers' Company, with more than half of the chains short (two generations).

There were complicated livery company allegiances among the apprentices who became mathematical instrument makers.²⁷ Some were members of two or even three companies, often as a result of turnovers. Some apprentices, having completed an apprenticeship in one company, joined a different company by patrimony. Some apprentices did not join the company to which they were bound, but were found actively working as instrument makers, but outside the City limits of jurisdiction.

²⁶ Brown 1979b, pp 22-23.

²⁷ Crawford 1987, p. 334.

When apprentices in a single craft are bound in many different companies, as was the case with mathematical instrument makers, the possibility of establishing a chain of transmission encounters significant definitional problems. Should the chain be ascribed to the original master? If turnover occurred on the same day as the original binding, should the chain be ascribed to the name of the second master? If the final master is a member of a different company than that of the original master, which group of apprentices does one follow in building the chain? If the specialties of the several masters were different, as was often the case, to which specialty should the apprentice be assigned?

Clifton studied chains of transmission and number of generations among mathematical instrument makers who completed their apprenticeship in the Spectaclemakers Company.²⁸ She suggested, (personal communication) that there were a large number of shorter chains, few of them being greater than 8 generations.

Transmission of knowledge and skill over generations is not the same as preserving a business over generations. Knowledge and skill are transmitted to individuals, and to many different individuals over time, and each individual has the opportunity to start a separate firm; thus, transmission of knowledge and skill does not have the unitary character of maintaining the integrity of a firm. Consequently, the chances of a chain of knowledge persisting would seem far higher than those of a firm surviving the same length of time. It thus comes as a surprise to find that such transmission of knowledge and skill seems commonly to generate chains with 4 or fewer generations. My data do not identify factors associated with longer chains other than those related to some technical aspects of the craft. Clearly the silk industry was growing in London, and many apprentices had selected silk dyeing as their specialty before they started their businesses. Perhaps the major factor involved was economic opportunity. In that case, however, one would expect there to be more silk dyers entering the trade, not necessarily the persistence of longer chains.

²⁸ Clifton 1993, pp. 362-363. The mathematical instrument makers' data, regardless of Company affiliation, were published as a Directory of mathematical instrument makers. Clifton 1995, The data, after decisions about how to define a chain, could be analysed to show the distribution of number of generations in chains related to specific types of instrument makers. This has not yet been done.

It could be that generations of specialised dyers persisted longer than others due to a higher probability of their remaining as members of the Dyers' Company. This would result in specialised dyers being over-represented in the Dyers' Company, relative to the others in the Company

We observed previously that 55 percent (10/18) of the long chains among the silk dyers had their beginning in the earliest decade for which there are data. (Tables 5.7a and 5.7b) Perhaps dyers who were active early in the development of the London silk trade developed kinds of unique skills and knowledge that became an advantage in perpetuating their teaching over many generations. Yet if longer chains are caused by having important technical knowledge to transmit, one might expect this advantage to disappear over time, as information became more freely available. Unfortunately, the available data do not allow a test of this hypothesis.

The presence of long (up to five generations) chains among linen dyers is of interest, since linen dyeing may have begun to dwindle around 1720. Since linen dyeing and cotton printing developed predominantly south of the Thames, in Southwark and Surrey, outside the jurisdiction of the City and the Dyers' Company, perhaps this had some bearing on the absence in recorded transmission (e.g. in apprentices who joined the company intending to be linen dyers) after five generations. The change may relate to reduced enforcement of rules and regulations so that it was less essential for these dyers to become members of the Dyers' Company to be in business. A third possibility is that because a portion of the linen dyers became cotton printers, and cotton printers may have joined Companies other than the Dyers' Company, the absence of linen dyer chains after the fifth and sixth generation may mean the chains continued, but in another company.

Table 5.7a NUMBER of chains starting in the indicated decade for those with SILK as the specialty

# gens	1650-59	1660-69	1670-79	1680-89	1690-99	Total
2	1	1	4	3	0	9
3	0	3	3	1	0	7
4	7	3	3	0	0	13
5	1	1	2	0	0	4
6	5	2	0	0	0	7
7	3	1	1	0	1	6
8	1	1	0	0	0	2
9	0	0	0	0	0	0
Total	18	12	13	4	1	48

Table 5.7b PERCENT of chains starting in the indicated decade for those with SILK as the specialty

# gens	1650-59	1660-69	1670-79	1680-89	1690-99	Total
2	5	8	31	75	0	19
3	0	25	23	25	0	15
4	39	25	23	0	0	27
5	5	8	15	0	0	8
6	28	17	0	0	0	15
7	17	8	8	0	100	12
8	5	8	0	0	0	4
9	0	0	0	0	0	0
Total	100	100	100	100	100	100

Sources: London Dyers, MS 8154 Vol.1, MS 8167 Vol.1-3, MS 8168, Vol.3, MS 8169, MS 8171 Vol.1-4.

How does the technical knowledge embodied in a business survive across generations? That is, what happened to a dyeing business when a master dyer died? In general, even if there was a partnership, the businesses would ‘die’ with the master, but some provision would have been made to deal with the post-mortem issues of outstanding payments, apprentice bindings, and other contingencies. Some business would be carried on by the widow/son(s), but they would be unlikely to persist for more than 2 generations.²⁹

²⁹ I have not, however, checked through the provisions of available wills, or followed the activities of the partnerships, regarding further binding of apprentices.

If a technical (knowledge) advantage explains the length of a craft ‘dynasty’, then the longer the dynasty, the more exclusive its technical advantages. It follows that apprentices to masters who were part of long ‘dynasties’ should pay higher average premia (it is assumed that premia reflect the expected returns of training), in order to benefit from the specialised tacit knowledge that such a master could impart.

Premia paid at the time of binding appeared in the records on a regular basis after 1710, as a result of the introduction of a tax on premia. Since records of apprentice bindings in the Dyers’ Company are available only after 1649, the apprentice binding chains recorded here began in the period 1650-1699. By 1710, when data concerning premia were recorded, if there was a chain, few were shorter than three generations. I had chosen to look at chains beginning in the period 1650-1699 because this was a period for which evidence was available of the choice of future occupation by apprentices or masters at the time of first binding; there were few such data after the 1690s.

The evidence from all chains shows no consistent increase in premia as the length of the chain increased (Tables 5.8a and 5.8b). The percentage of premia over £10 did not increase as the length of chain increased.

As an alternative, the mean premium paid by apprentices in individual chains and by specialty was estimated (Table 5.9). The tabulation omitted chains with less than 3 values recorded. The numbers available for estimates of the mean are often small, except for most chains with silk dyers. An effort to use the median, rather than the mean, did not help, since the commonest value was no premium paid. Once again, the

Table 5.8a Change in premia as length of chain increased, 1710-1746 (NUMBER)

	NUMBER of apprentices bound in chains of indicated length						
	3	4	5	6	7	8	9
Premium							
None	11	18	34	52	38	10	7
Under 5£	0	2	5	3	4	2	0
5- 9£	7	3	13	13	13	8	0
10-14£	3	9	9	21	13	7	0
15-19£	1	2	0	2	6	0	0
20-49£	3	8	5	6	7	2	0
50-99£	0	0	0	1	0	0	0
100£ or more	0	0	1	0	0	0	2
Total	25	42	67	98	81	29	9

Sources: London Dyers, MS 8169, MS 8167 Vol.1-3.

Table 5.8b Change in premia as length of chain increased, 1710-1746 (PERCENT)

	PERCENT of apprentices bound in chains of indicated length						
	3	4	5	6	7	8	9
Premium							
None	44	43	51	53	47	34	78
Under 5£	0	5	8	3	5	7	0
5- 9£	28	7	19	13	16	28	0
10-14£	12	21	13	21	16	24	0
15-19£	4	5	0	2	7	0	0
20-49£	12	19	8	6	9	7	0
50-99£	0	0	0	1	0	0	0
100£ or more	0	0	1	0	0	0	22
Total	100	100	100	100	100	100	100
Percent of premia over £10	28	45	22	30	32	31	22

Sources: London Dyers, MS 8169, MS 8167 Vol.1-3.

results do not show a significantly higher mean premium for apprentices joining chains of greater length. However, these data do not include premia paid after 1746, though some chains extend into the 1820s.³⁰

³⁰ It is possible that data from 1746-1820 may be available. The Society of Genealogists has photographed a typewritten listing of all premia paid, throughout England, from 1710 until the law repealing the tax on premia was repealed. Once the images in this file are searchable, additional information can be added past 1746.

In sum, the results are inconclusive. Chain length might relate inversely to the frequency of technological innovation, such that the more frequent the changes in technology, the shorter the chain length. Similarly, chain length might relate to difficulty in copying technology, so that it was longer with unchanging technology. Alternatively, long chains might reflect a greater ability in adapting to changing technology. Chain length might be a positive function of economic opportunity; however, greater opportunity would raise competitive pressures, which might give rise to shorter chains. All in all, more data that compare different crafts over this period will be needed to be able to interpret the significance of variations in chain length.

Table 5.9 Change in mean premia in individual chains as length of chain increased, by specialty in dyeing, 1710-1746

Mean premium paid (£) by apprentices in individual chains of indicated length*							
	3	4	5	6	7	8	9
Specialty in dyeing							
Not indicated	9.3 (6)	5.8 (6)	1.9 (26)				
Hats	0 (3)			1.2 (4)			
Linen	7.1 (9)						36 (13)
Silk	1.7 (3)	11.5 (16)	4.4 (29)	8.3 (59)	5.4 (79)	6.5 (40)	
Stocken			18 (5)				
Mixed specialties		18 (8)	6.8 (17)	5.7 (59)	1.8 (75)		

*Omits data from chains with less than 2 apprentices, and those with no indication of a premium in the binding record
() = number of apprentice bindings with recorded premium

Sources: London Dyers, MS 8169, MS 8167 Vol.1-3.

Of the generations of dyers I have followed, the largest number is those that do not identify an intention to follow a specialty in dyeing. I have considered apprentices who did not state a specialty to be a mixture of mainstream woollen dyers and of other specialties. It is not possible to know about barriers to entry among these dyers. If they are broadcloth dyers, entry might be expensive, because of their need to have more

assistants, bigger vats, larger space for drying, and the difficulties associated with obtaining a uniform colour for the whole length of the cloth. Entry barriers might be lower for those in one of the specialties. And there is no way to estimate what percent of this later group had lower barriers to entry.

5.4 Chapter 5 Summary

What an apprentice dyer learns from his master is one step - a first generation - in the transmission of knowledge and skill. To continue this transmission, apprentices-turned masters have to pass on their learning to their apprentices, and it is unclear what factors influence the continuing success or failure of this transmission. Using the over 150 years of recorded data concerning apprentice bindings to a known master and subsequent membership in the Dyers' Company, it is possible to describe transmission of skills and knowledge in dyeing through generations. Although information about specialisation in dyeing is not available for every member of the Company, it is probable that skills, such as skills in silk dyeing, linen dyeing and hat dyeing were sufficiently specialized so that those who taught these specialty skills were likely to have bound apprentices who continued in this specialty.

Since the Dyers' Company had a long history, any date to start a study of chains of transmission of skills would be arbitrary. Since data concerning the Dyers' Company apprentice bindings were only available after the 1650s, long chains that had their beginning before 1649 could not be adequately measured. A similar problem exists in defining the time to end a study. Statutory regulations concerning apprenticeship ended in 1814, and if you continued to look for new chains up to that date, the more recently identified chains would be short, because there was not enough time to follow their apprentices. Another constraint related to recording of turnovers. Because the earliest data (from 1649-1703) infrequently recorded turnovers, while that from 1706 to 1746 carefully included them, to be consistent throughout, the analysis assumed that the first master transmitted skill and knowledge.

In using the available occupational data, it has been assumed that if a master teaches one specialty, this will be the specialty of his apprentices. The majority of the data to

support this assumption, but there are also masters with apprentices who have chosen different specialties. In the later situation, the specialty is described as mixed.

Taking all this into account, this study of generations included dyers who first bound apprentices from 1650s to 1690s, and used information concerning apprentice bindings in the construction of diagrams of chains of transmission of skill and knowledge up to the 1820s. The analysis concerned 258 chains, constructed from 3514 apprentices and 102 persons who joined the Company by patrimony, a total of 3616 dyers

The analysis showed that about 60 percent of all the chains were less than four generations long. Thirty nine percent of the forty-eight chains involving silk dyers were greater than 4 generations in length, while only 8 percent of those without a stated specialty were greater than four generations in length.

It was possible that the difference between silk dyer and those without a stated specialty related to a higher frequency of short chains in the earlier decades in those without a stated specialty. But the distribution of short chains was not greater in those early decades

It is not clear what set of circumstances resulted in the longer chains. Neither a larger number of apprentices bound per master, in each generation, nor the percentage of apprentices joining the Company, in each successive generation, explained the longer chains.

A variety of observations suggest that variables other than numbers of apprentices may be important factors in chain length. Apprentices bound by masters who bound large number of apprentices were themselves likely to bind large numbers of apprentices. And family variables may be important. Testing concerning the effect of joining by patrimony showed some relation to longer chains. This may have been the result of an increasing use of patrimony as a mode of joining the Company In the later eighteenth and early nineteenth centuries, rather than a significant factor in chain length. Another variable might be that specialised dyers were more likely to be members of the Dyers' Company, and so were more likely to be over-represented in this study, relative to the other dyers. And perhaps because silk dyeing was growing in London during the time of

the study, the major factor in chain length was economic opportunity. Although plausible, it is equally true that this could lead to more silk dyers, but not necessarily longer chains.

Fifty five percent (10/19) of the long chains among the silk dyers had their beginning in the earliest decade of the study. Perhaps those dyers who were active early in the development of the London silk trade developed the skills and knowledge, which were significant in maintaining the chains. If longer chains are associated with having learned important secret knowledge and skill, you might expect this advantage to disappear as information became more freely available. No data are available to confirm or deny this possibility.

If long dynasties were characterised by exclusive technical advantages, premia requested from apprentices might be higher. However, there was no consistent increase in premium as the length of the chain increased. It is possible that data concerning premia from 1746-1820 would change this observation.

Explanations for the difference in chain length between silk dyers and those without a stated specialty are not obvious because chain length could plausibly be correlated both positively and negatively with the degree of specialisation. On the one hand, craft secrets associated with a specialized and technically difficult craft might be associated with long chains. On the other hand, long chains might be evidence of technological conservatism, related to the difficulty in copying the tacit knowledge involved. Shorter chains could be evidence not of technical simplicity but rather of more rapid innovation. Given the lack of equivalent studies for other 'high' and 'low' technical crafts in the same period, it is not possible to say more. The analysis does suggest that the method is applicable to other sets of guild data, which may help to clarify some of the problems.

Chapter 6 Summary and Conclusions

The study looked initially at the Dyers' Company binding and joining records over 150 years, available only after mid seventeenth century. This produced a study of transmission of knowledge from master to apprentice, a single generation. The study then looked at factors associated with chains of transmission over several generations, using occupational specialization data.

Binding and joining data from the Worshipful Company of Dyers of London (Dyers' Company) has been used infrequently, mostly because the available registers, which begin in the early seventeenth century, have too many lacunae. More specifically, different kinds of records survive for different periods. This makes it hard to present a consistent picture for the entire period. In spite of these problems, Dyers' Company records spanning the period 1649-1826 have been reviewed

There are three major reasons for incompleteness of the data: the dyers may have been members of a livery company but not members of the Dyer's Company, the dyers may have been working outside of any livery company, or the Dyer's Company record books may have been incomplete.

The Dyers' Company records of membership are estimated to be at least 94 percent complete from 1710-1792, and probably similarly complete in the earlier period 1660-1710. Dyers' Company records did not include about 17 percent of the dyers identified in two independent polls, in 1692 and 1721. In a 1750 poll, 93 percent of identified dyers were members of the Dyers' Company, while by 1792 poll, 81 percent of dyers were in the Dyers' Company. In those same years, 34 percent of the livery of the Dyers' Company were not practicing dyers.

One measure of how many dyers were outside livery companies was with a calico printers' petition in 1696. Of 50 calico printers who signed a petition in 1696, only 5 were found as Dyers' Company members, and 21 were members of 13 other Companies. So 48 percent of calico printers could not be identified as members of a livery company.

The apprentice binding data in Chapter 2 tell a story about changes that took place over the century and a half. It is also about families of those who started an apprenticeship, their places of residence, their father's occupation, along with what premia were paid when they were bound. It tells a story about masters who bound apprentices, and how many they bound in a lifetime. By using names as a way to identify gender, information is presented about women apprentices and women who bound apprentices.

There were four distinct periods of change in numbers of apprentice bindings in the Dyers' Company from 1649-1826. In the period 1649-70, annual entries increased from about 40 to about 75 per year, a period of unrest associated with the Civil War. Thereafter, for half a century from 1670, annual recruitment fluctuated around from 60 to 80 bindings per year.

Within this steady state, there appears to have been a five-year cyclical element. Assuming the peak and trough years measured a significant variation in demand for apprentices, the variation in numbers might have resulted in differences in available labour when the 7-year training period was completed, and affected the proportion joining the Company. One might also have expected a variation in the amount of premium requested at the time of binding. In fact, the proportion joining and time to joining was not different for the two groups; however, premia were higher in the peak-years' group.

Between the 1720s to the 1750s, annual apprenticeship recruitment fell steadily to about 25 per year and remained at this level until 1785, when the annual recruitment fell to about 15 per year. There is no clear explanation for the change in the 1720s, and then in the 1780s, although changes in enforcement of regulations may have played an increasing role during the later years.

From 1706-1746, an increasing number of apprentices were drawn from London and its adjacent areas. There was some clustering of apprentices from a few small urban areas, possibly a result of better local information about apprenticeship opportunities. Since the recruitment process involved, ideally, knowledge by the families of the best place in which to apprentice their child, and knowledge by the masters of which apprentices were already knowledgeable about the required work, apprentices from families

involved in a textile-related activity were well represented: children of dyers comprised 13 percent of all dyer's apprentices. At the same time, this relatively low proportion contradicts the traditional view of strong craft endogamy.

Both family relationships and geographic origin were involved in the information system relating to apprentice recruitment. An information system may have existed to allow apprentice families from outside London to have some control of the process of finding an apprenticeship for their sons, but details concerning the system are hard to identify. As the example of Humphrey Rock shows, when a new apprentice appeared after only five years, it could mean that the earlier apprentice had left early, but it could also mean that the master was willing to contract for additional help. From the analysis of the Dyers' Company data, the family's decision did appear to be based on knowing that a master was a member of the livery, or was a Company officer.

A family's lack of information about apprenticeship opportunities for their son might be related to some Company members acting as brokers in apprenticeship. This may explain what happened when many apprentices were bound to a single master in the period near the end and after the Civil War. These apprentice clusters may have resulted in turnovers of apprentices to other masters, although confirmation is lacking as a result of the incomplete recording of turnovers in this period.

Premia paid in association with apprenticeship contracts were generally not high. Only 20 percent of the apprentices whose fathers were dyers paid a premium, compared to 50 percent if the father was otherwise employed. This may have been a measure of the possibility of having a knowledgeable apprentice, able to provide the master with an earlier return on his training costs. Alternatively, it may have been a result of greater inter-personal contact among dyers, which made dyers' sons more valuable. When the apprentice's father was dead, lower premia were negotiated. Premia were not higher for apprentices coming from outside London, even though information about the apprentice might have been less than that available for London-based families.

Few apprentices were women, with only sixteen women among the almost 5800 apprentices bound up to 1746. However, over nearly a century, about two percent of

apprentice bindings were to women, mostly those who were widows of Company members.

Turnovers, an adjustment process whereby the apprentice was transferred to another master, occurred for about one in seven apprentices. Although data were only available after 1706, there is no reason to believe the frequency of turnovers was substantially different earlier. It is not clear what the commonest reasons for a turnover were. One major reason was accommodating a dyer who was a not in the Dyers' Company, so his apprentice would be able to join the Dyers' Company at a low cost at the time of completion of training. Other reasons relate to arrangements for completion of apprenticeship after the death of a master, and accommodating changing needs of either the master or the apprentice or both. It is possible that some turnovers were made to allow an apprentice to obtain different skills, but data to confirm this were not available.

Future generations of dyers were trained by only a small proportion of Company members, since most who joined the Company either did not bind an apprentice, or bound only a few. However, some Company members bound large numbers of apprentices. Part of the reason may have been that some Company members were acting as apprentice brokers, binding apprentices with the intention of handing them on to other dyers by turnover. But there may have been other reasons, including involvement in a dyeing specialty.

Success following an apprenticeship might depend on family factors, but could also relate to the choice of a 'good' dyer as a teacher. Having a teacher who was a member of the livery or a Company officer did not mean you were more likely to become a member of the Company. However, if a livery member trained your master, you would have a greater chance of becoming a member of the Company. Additionally, if you were bound to a silk dyer, you were more likely to join the Company. Paying a high premium to your teacher did not appear to result in a greater chance of joining the Company.

Only about 40 percent of apprentices joined the Dyers' Company, an 'educational failure' proportion similar to that found in many other London livery companies.

Over the almost 2 centuries from 1650-1820, while the number of apprentices bound decreased, in steps, from about 70 per year to about 25 and then to about 15, the proportion of apprentices that joined the Company stayed between 35 to 45 percent. Whatever the cause, the reduction in numbers of apprentices bound did not significantly increase or decrease 'educational failure'. Almost two thirds of the approximately 40 percent who did join the Company did not bind any apprentices.

From 1650-1744, there was a decline in the proportion joining the Company soon after finishing training. Changing economic opportunity to start an independent firm seems the most likely explanation for the changing proportions joining soon after training.

Patrimony was an increasing frequent mode of entry to the Dyers' Company, with the percentage increasing from 5 percent in 1685-99 to 24 percent by 1800-09. An even higher than average proportion (45 percent) of children from dyers families joined by patrimony.

Entry to the Company by redemption was initially infrequently, only five percent in the 1750s. After that it steadily increased to thirty seven percent by 1800-09. By 1800-09, patrimony and redemption together were more common as a mode of entry than apprenticeship. Those who entered by redemption most often were not dyers by profession. Although they increased the numbers in the Company, they decreased the number related to the teaching of dyers.

After completing apprenticeship, some worked as a journeyman *before* entering the Company. After 1690, more than 30 percent of apprentices who ultimately joined the Company had allowed a delay of more than 2 years between completion of their training and joining the Company. From 1705 to 1739, approximately 10 percent waited more than 9-12 years before joining the Company. Apprentices from London families were less likely to take a long time before joining than families from other places.

After 1690, dyers spent an increasing number of years as journeymen after completion of training. This was true even though, within each cohort of apprentice dyers, the percent joining the Company remained relatively steady. This remained true even as the total recorded number of apprentices was falling.

It is unclear what proportion of Company members who did not bind any apprentices were working as independent dyers, and how many spent their whole working life as journeymen. In 1640, 43 percent had been working as journeymen for more than 4 years, and 28 percent had worked as journeymen for 8 years or longer. Using a different data source, in 1692, half had worked as journeymen 17 years or longer.

Overall, 41 percent of *housekeepers* (a category which appears identical with that of *householder* in other Companies), and 61 percent of housekeepers who joined by patrimony, worked as journeymen for less than two years before becoming independent. After 1700, an increasing percentage joined within less than two years.

In 1640, of 89 journeymen employed by 40 different masters, 60 percent employed only a single journeyman, while one master employed 10. Six larger firms employed more than half of the journeymen. Estimations from quarterage data for 1683-84, showed thirty eight percent of journeymen were in firms with 5 or more persons.

There are scattered information sources that concern occupation and specialisation among dyers. Probate inventory data from 1665 to 1736 identified silk, woollen and other dyers who were Dyers' Company members. They worked as dyers an average of 15 years, bound on average six apprentices, three of whom joined the Company. There was no difference in the frequency with which apprentices of the silk and woollen dyers joined the Company. No calico printers were identified. Commissary court records identified 68 dyers, including silk dyers, but no hat or linen dyers, nor calico printers.

In 1650-94, silk dyeing was chosen by about one fifth of Dyers' Company apprentices who mentioned a specialty when they joined the Company. The frequency of silk dyeing as a named occupation among apprentices rose to almost 40 percent by the 1690s. Although calico printing made its earliest appearance in the late 1670s, it did not appear in the Dyers' Company records as an occupational interest.

There were silk, linen, and stuff dyers among those who identified a specialty when becoming a housekeeper in 1682-84. It took the silk dyers an average of 3 years from the time of completing training to binding an apprentice, while for stuff dyers the average was 5 years and for linen dyers the average was 7 years. It is possible that linen

dyeing, as contrasted to silk dyeing, was losing its appeal in the early eighteenth century, and this explained the increased time spent as a journeyman, before binding an apprentice.

Master woollen dyers bound large numbers of apprentices more often than either silk or linen dyers. Woollen dyers may have needed larger numbers of hands to operate their firm, with large cloth bundles and need to handle heavy materials; woollen dyers, compared to silk or linen dyers, may have needed less technically trained, inexpensive labour, that is apprentices, rather than journeymen.

The Dyers' Company does not seem to have been a major location for calico printers. A government investigation of calico printing in 1721 reported there were 26 calico printing 26 firms, ranging in size from 4 to 152 employees, evidence that the industry, potentially the most innovative of any in the dyeing trade, had found a way to develop outside the control of the Dyers' Company.

The final chapter in the thesis concerns chains of transmission of skills and knowledge in dyeing through generations. What an apprentice dyer learns from his master is the first generation in the transmission of knowledge and skill. To continue this transmission, apprentices-turned-masters have to pass on their learning to their apprentices.

The study of generations includes dyers who first bound apprentices from 1650s to 1690s, and uses information concerning apprentice bindings in the construction of diagrams of chains of transmission of skill and knowledge up to the 1820s

About 80 percent of all the chains were no more than four generations long. However, 39 percent of the 48 chains involving silk dyers were greater than 4 generations in length, while only 8 percent of those without a stated specialty were greater than four generations in length.

It is not clear what set of circumstances resulted in the longer chains. Neither a larger number of apprentices bound per master, in each generation, nor the percentage of

apprentices joining the Company, in each successive generation, clearly explained the longer chains.

Variables other than numbers of apprentices may be important factors in chain length. Apprentices bound by masters who bound large number of apprentices were themselves likely to bind large numbers of apprentices. Family variables may be important. Testing concerning the effect of joining by patrimony showed some relation to longer chains. This may have been the result of an increasing use of patrimony as a mode of joining the Company In the later eighteenth and early nineteenth centuries, rather than a significant factor in chain length. Another variable might be that specialised dyers were more likely to be members of the Dyers' Company, and so were more likely to be over-represented in this study. And perhaps because silk dyeing was growing in London during the time of the study, the major factor in chain length was economic opportunity. Although plausible, it is equally true that this would lead to more silk dyers, but not necessarily longer chains.

Fifty five percent (10/19) of the long chains among the silk dyers had their beginning in the earliest decade of the study. Perhaps those dyers who were active early in the development of the London silk trade developed the skills and knowledge that were significant in maintaining the chains. If longer chains are associated with having learned important secret knowledge and skill, you might expect this advantage to disappear as information became more freely available

If long dynasties were characterised by exclusive technical advantages, premia requested from apprentices might be higher. However, there was no consistent increase in premium as the length of the chain increased. It is possible that data concerning premia from 1746-1820 would change this observation.

Differences in chain length could plausibly be correlated both positively and negatively with the degree of specialisation. On the one hand, long chains might be associated with a more specialized and technically difficult craft, with a greater number of craft secrets. On the other hand, long chains might be evidence of technological conservatism, related to the difficulty in copying the tacit knowledge involved. Thus,

shorter chains could be evidence not of technical simplicity but rather of rapid innovation.

The records of the early modern apprenticeship system in London presented a unique opportunity to investigate transmission of technical knowledge over a long period and through many generations. It is difficult to conceive of any other record system that offers such an opportunity. Because those who were trained could only bind apprentices if they joined the guild, and because the apprentices might readily find opportunities for independent business within London itself, and because the guild, within limits, represented dyers in London, the study of chains and generations was possible. And in addition to identifying the length of chains, the data set allowed the study of chains of all lengths, and showed that, even in a highly technical field, it was short chains which were commonest. The study could have been attempted with other guilds, but, as indicated with the instrument makers and goldsmith bankers, there may be unique difficulties with whatever guild is selected for study.

Two major explanations for long chains for dyers - the presence of increased economic opportunity in a specific niche or conservation of a unique skill in dyeing – both seem credible, but cannot readily be confirmed from the available information. A third explanation, which might readily fit within a textile environment, is that long chains were associated with a flexible response to changes in the industry. It will be interesting, as further studies of guilds in the pre-modern are organised, to see what they make of this opportunity to study apprenticeship records to learn about educational questions.

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Appendix

The appendix includes two separate types of data: Table A.1 includes 257 graphics demonstrating chains of transmission; Table 2.9 shows, in five-year periods from 1650-1744, the number of apprentices bound to an individual master.

Table A.1 Graphic presentation of generations of dyers, by occupational specialisation, including silk, linen, hats, stocking, stuff, general, and mixed.

Each line in the graphic indicates a generation from the original master, so that a graphic with 9 lines shows a chain of 9 generations. An additional dark box outline box indicates that dyer bound apprentices. The graphics show, in the boxes on each line, all the apprentices bound to each master in that generation. In the box, in addition to the name, are the years of binding and joining, when the dates are known, and whatever information was available about the stated occupation of that dyer. When there was a turnover, that is indicated by TO and the name to whom the apprentice was turned over.

The graphics are arranged in the appendix by occupational specialty, and within occupational specialty, by the number of generations.

Table 2.9 For each master, the numbers of apprentices bound, by 5 year periods, 1649-1746 and the total number bound in a lifetime.

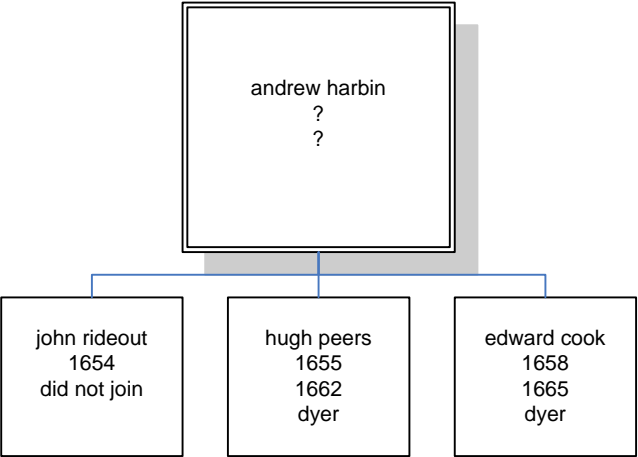
There are some masters whose binding activity occurred over such a long period that it seemed likely that there were two masters of the same name. This has been discussed in the thesis. Because patrimony was not completely indicated in the records before 1683, a father with a son of the same name might have been missed in the record review.

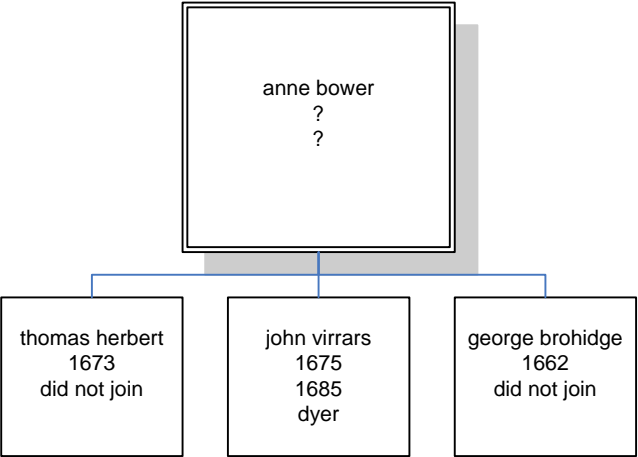
Table A.1 Graphic presentations of generations of dyers, by occupational specialisation, including silk, linen, hats, stocking, stuff, general, and mixed.

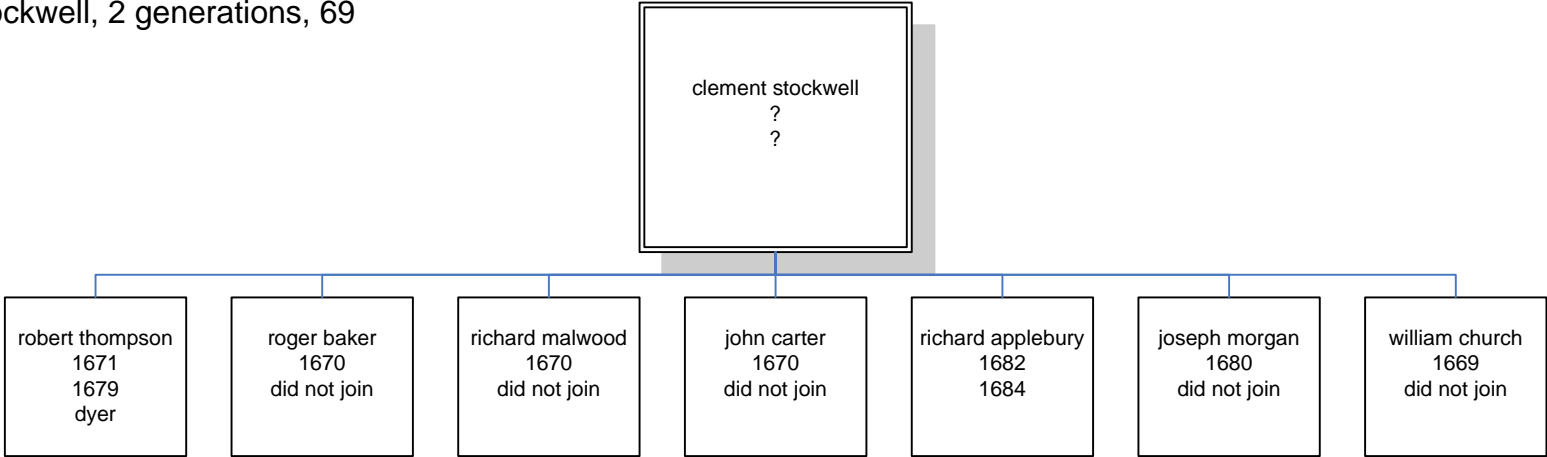
Roger A Feldman

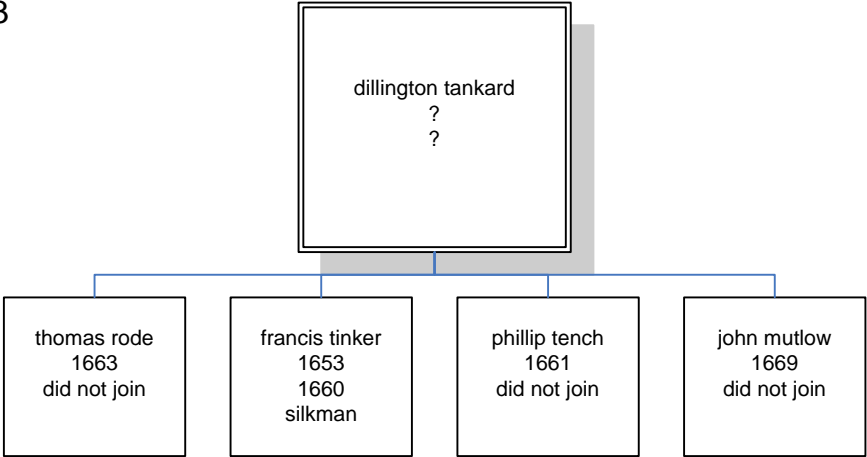
Recruitment, training and knowledge transfer in the London Dyers' Company, 1649-1826

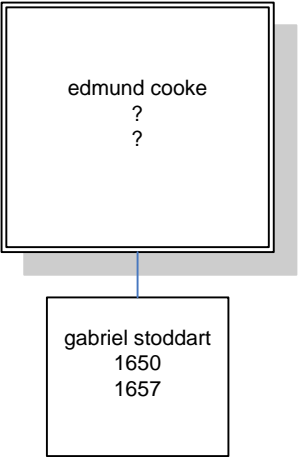
PhD Thesis in Economic History, London School of Economics and Political Science, 2005

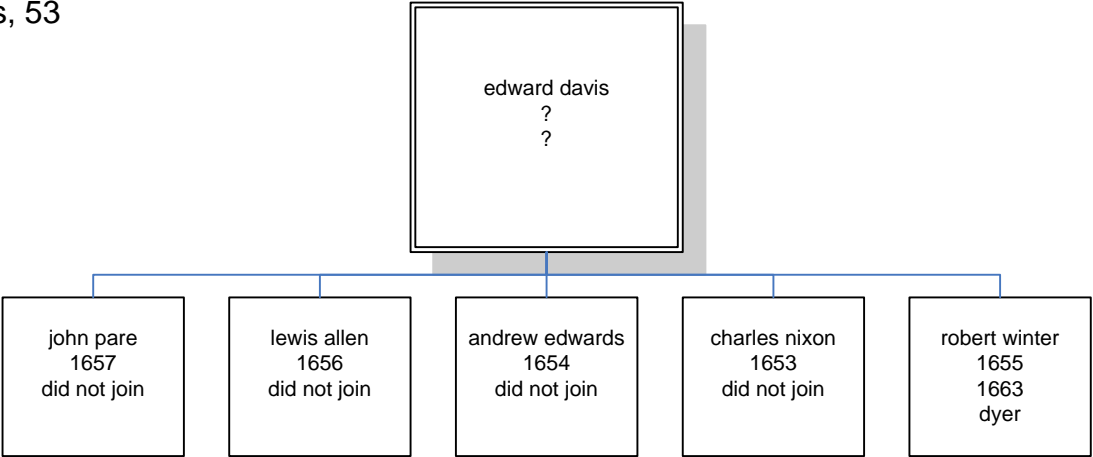


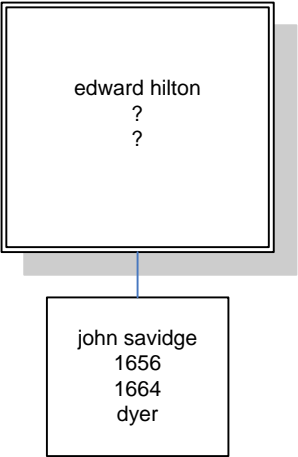


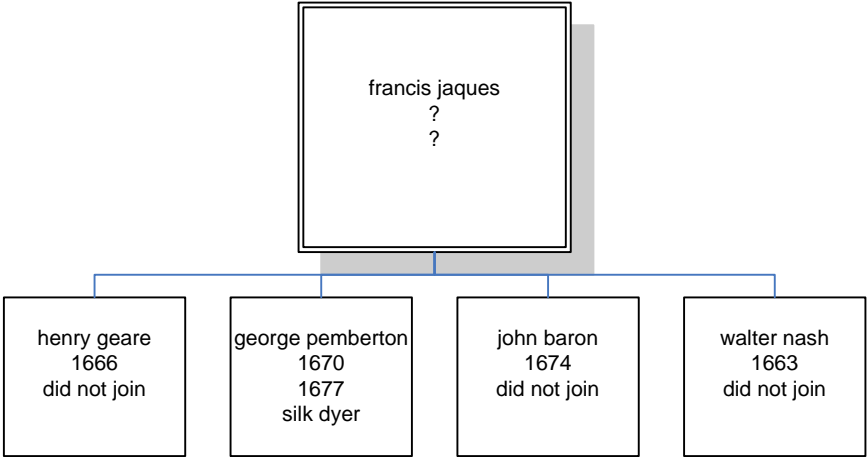


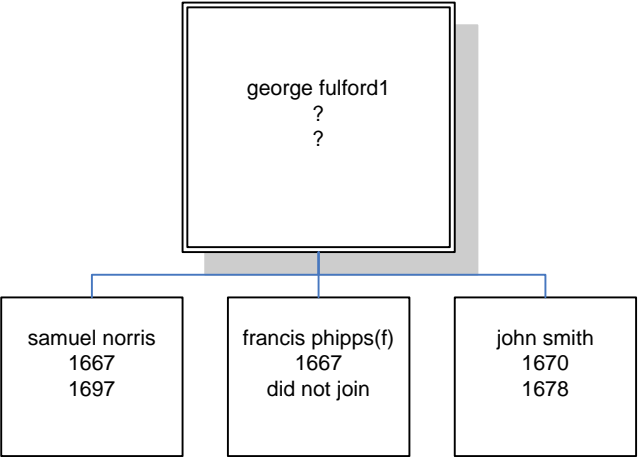




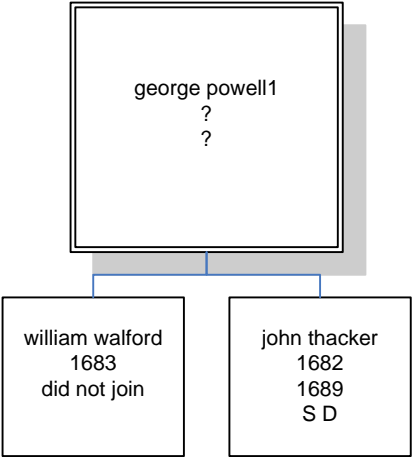




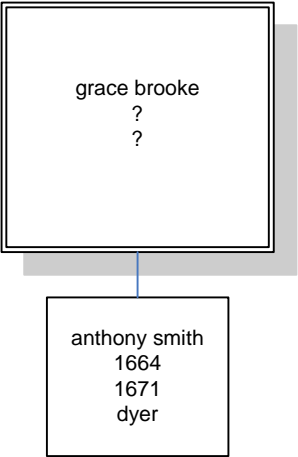


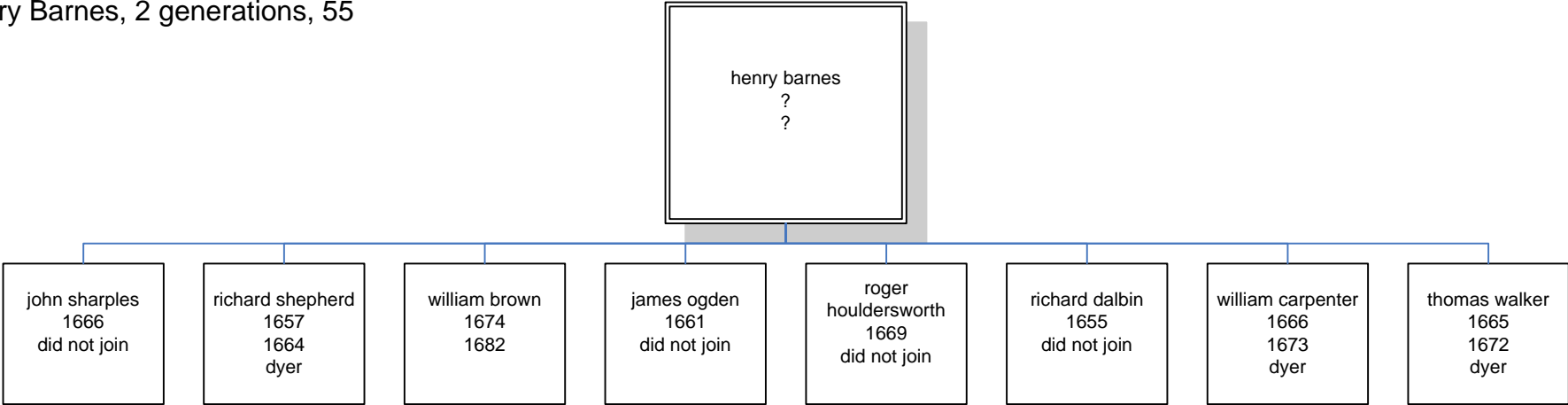


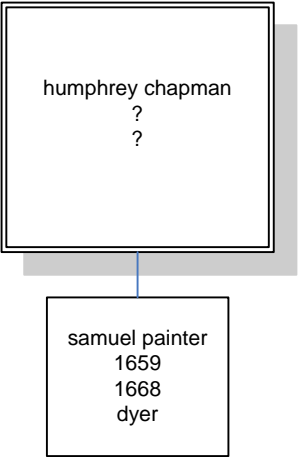
General, George Powell, 2 generations, 82

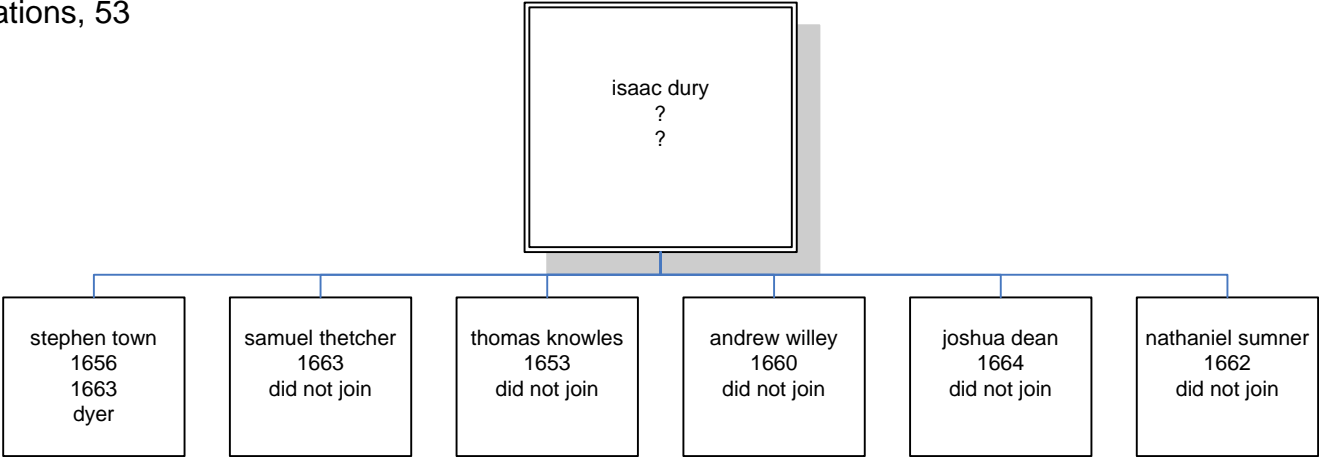


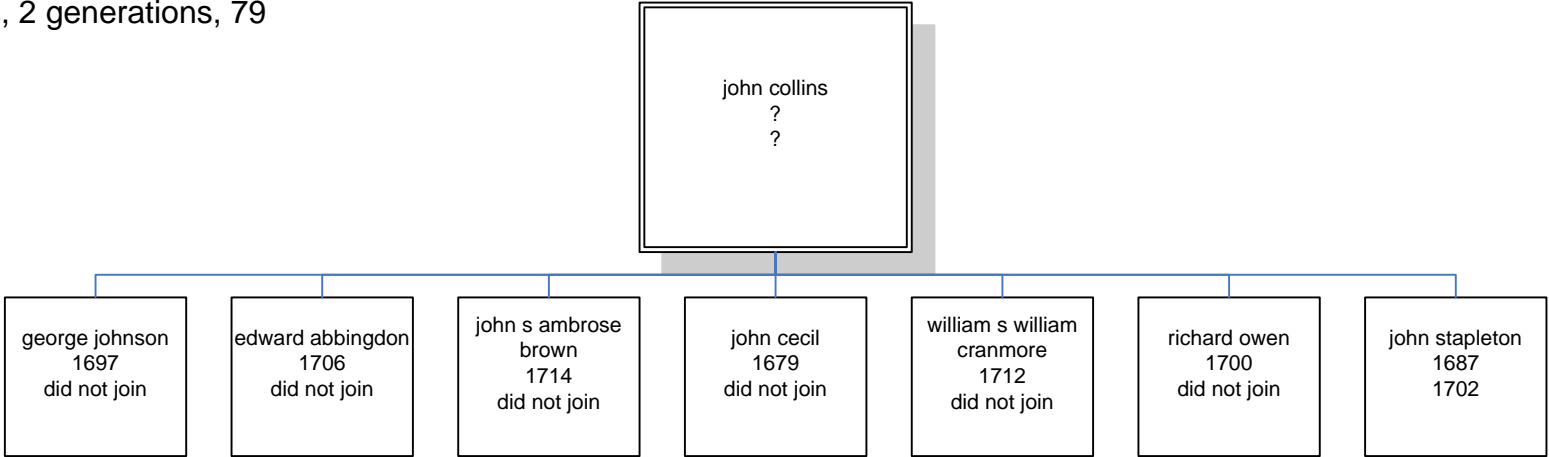
General, Grace Brooke, 2 generations, 64



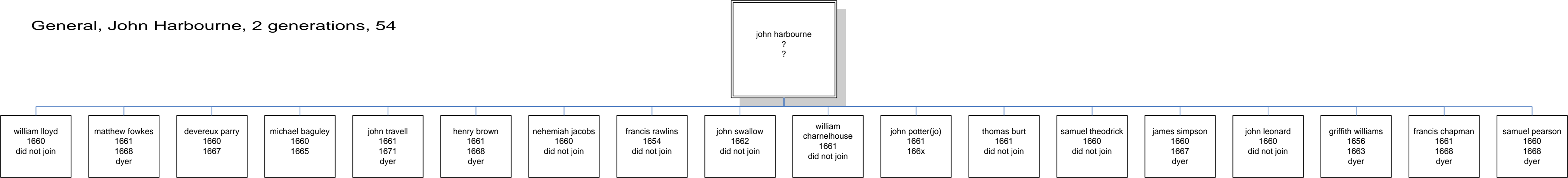


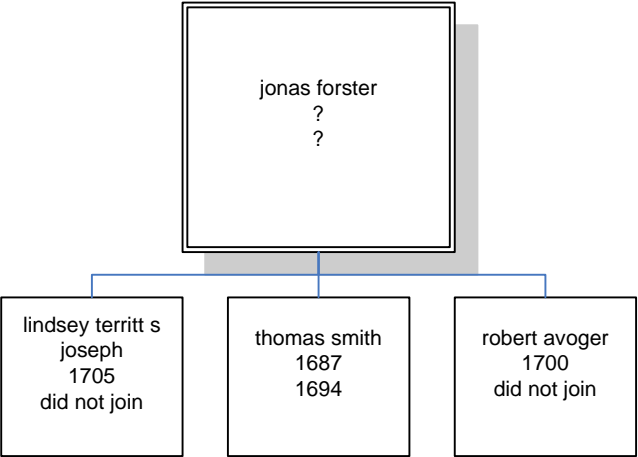


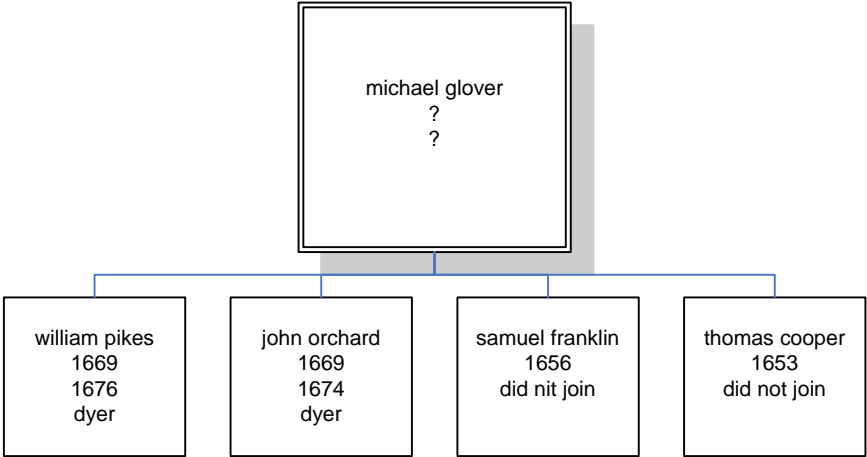




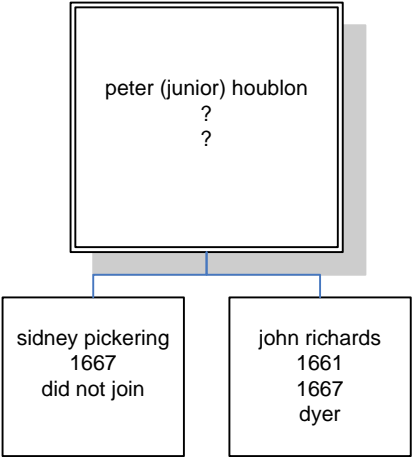
General, John Harbourn, 2 generations, 54

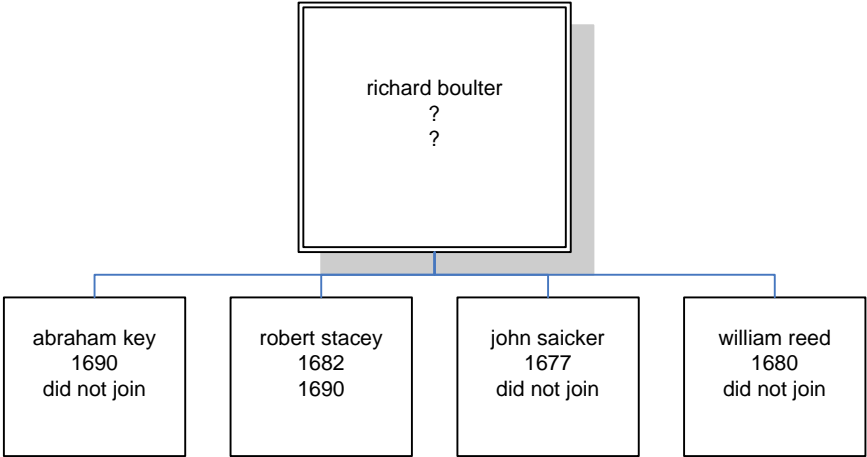




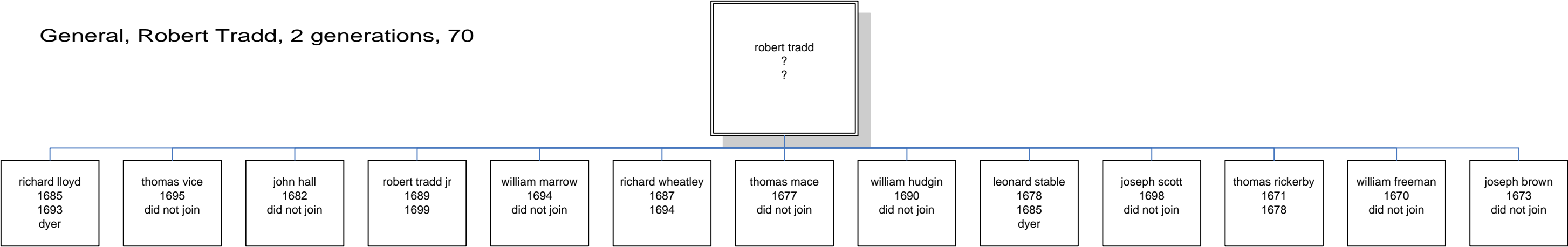


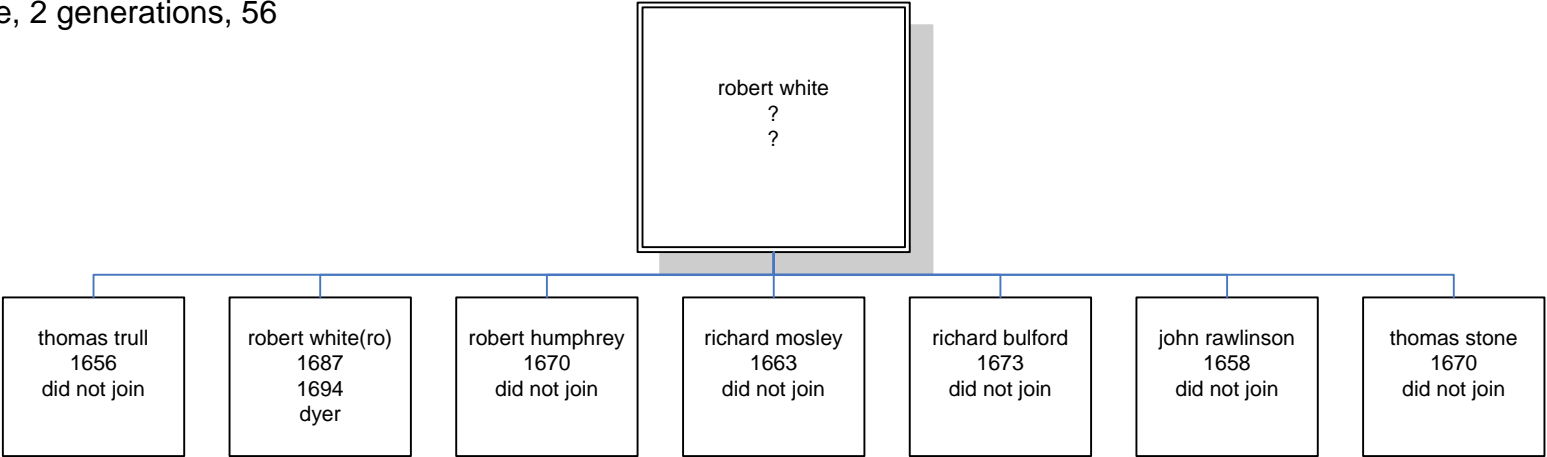
General, Peter Houblon junior, 2 generations, 61



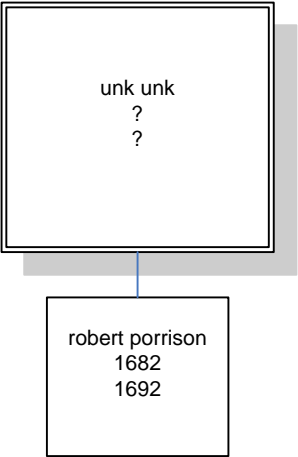


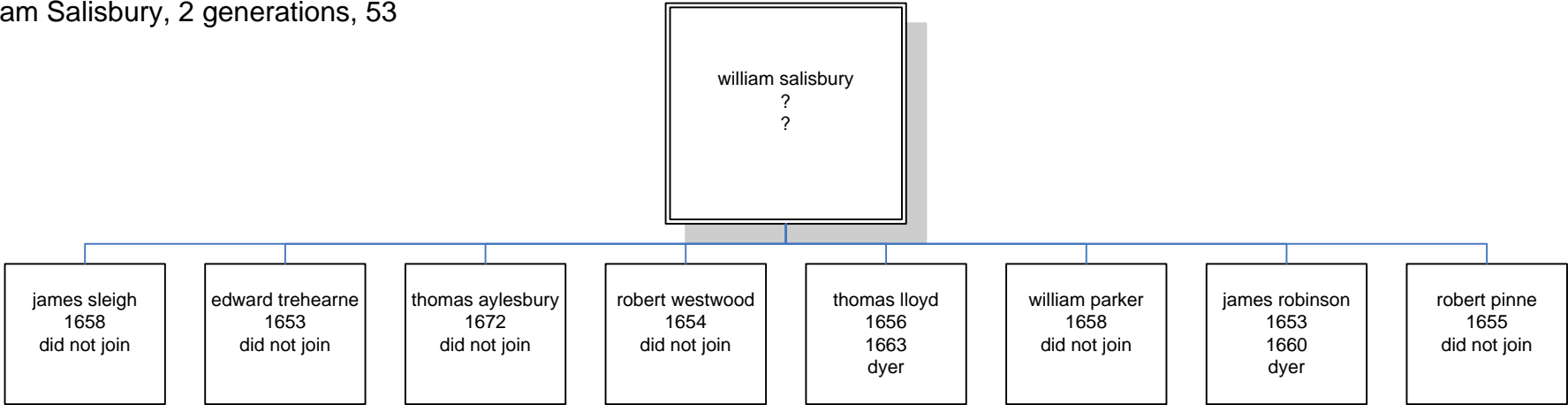
General, Robert Tradd, 2 generations, 70



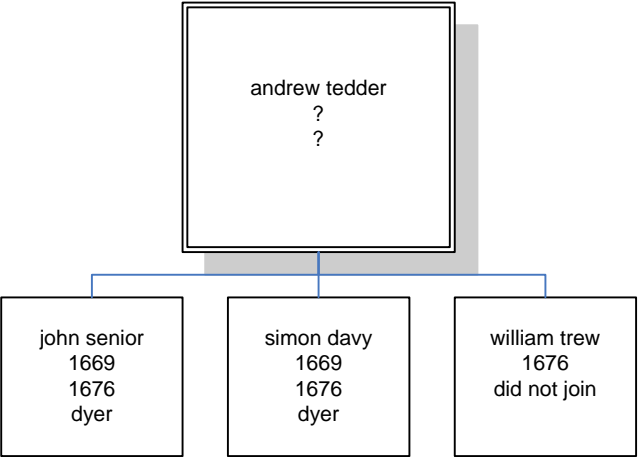


General, Unk Unk, 2 generations, 82

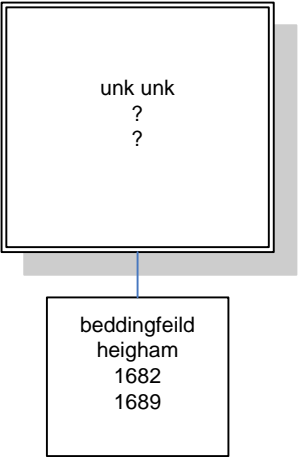




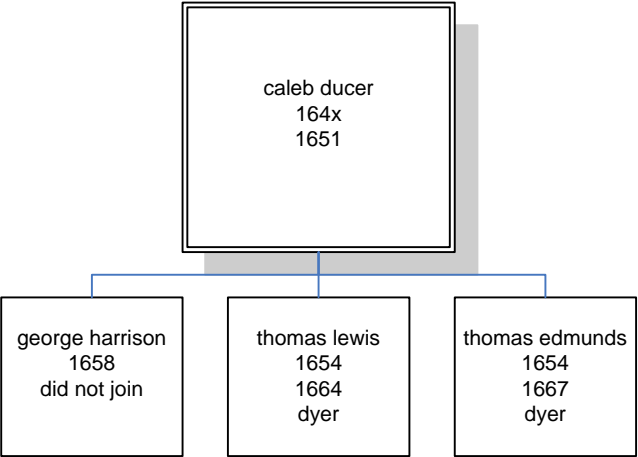
general, Andrew Tedder, 2 generations



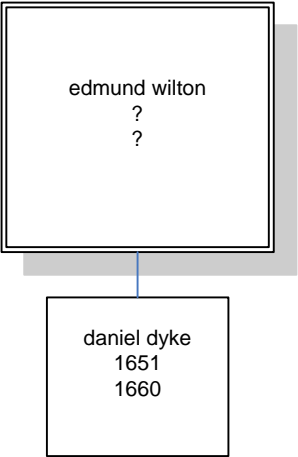
general, Beddingfield Heigham, 2 generations



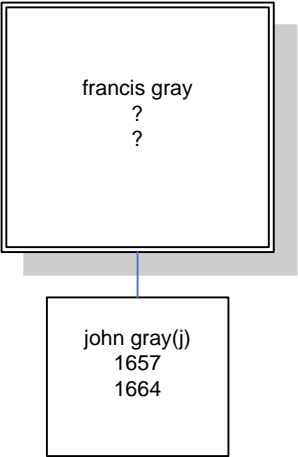
general, Caleb Ducer, 2 generations



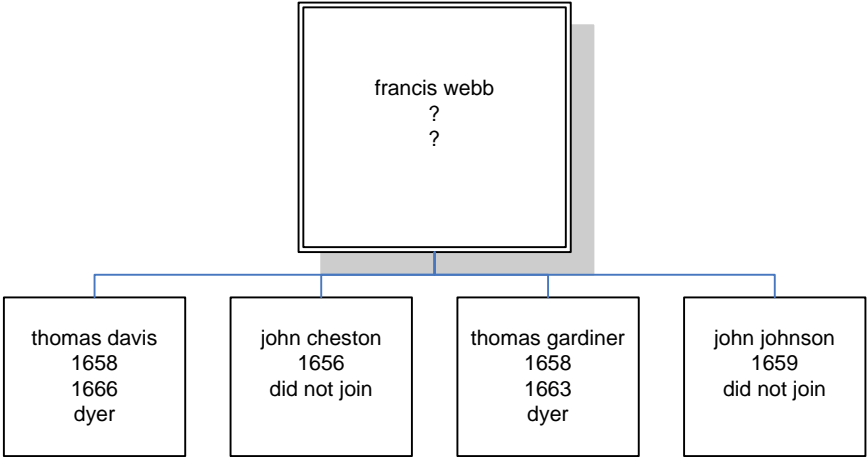
general, Edmund Wilton, 2 generations



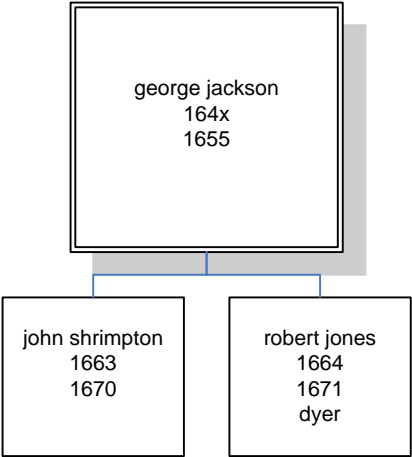
general, Francis Gray, 2 generations



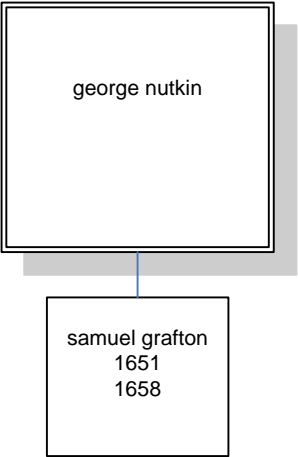
general, Francis Webb, 2 generations



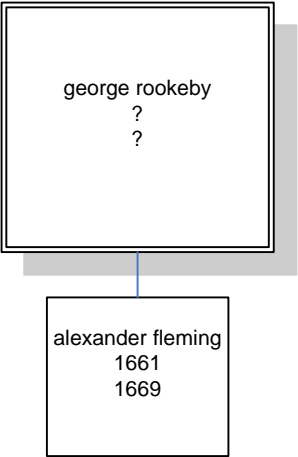
general, George Jackson, 2 generations



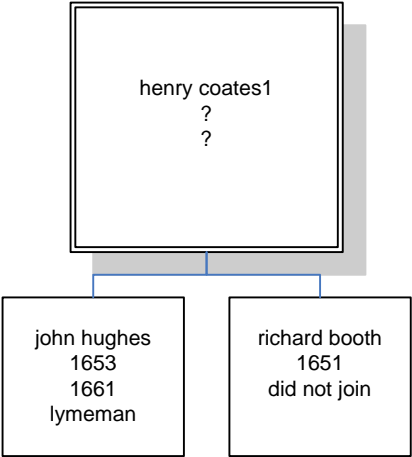
general, George Nutkin, 2 generations



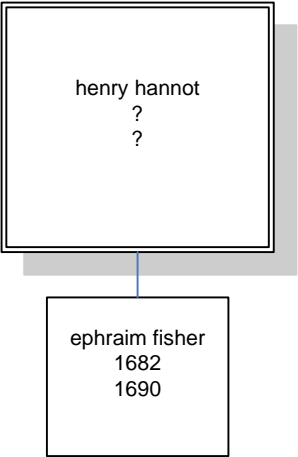
general, George Rookeby, 2 generations



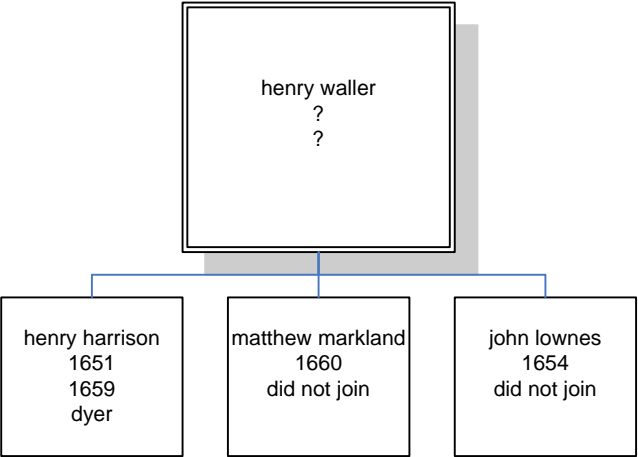
general, Henry Coates, 2 generations



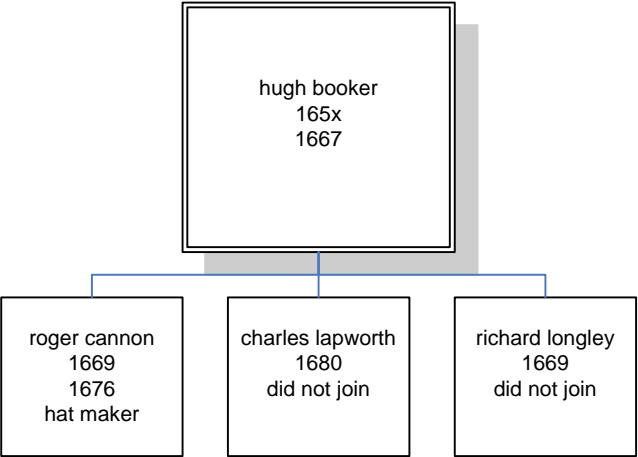
general, Henry Hannott, 2 generations



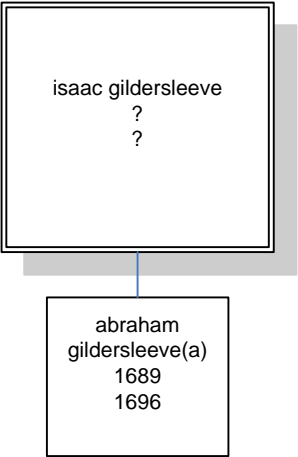
general, Henry Waller, 2 generations



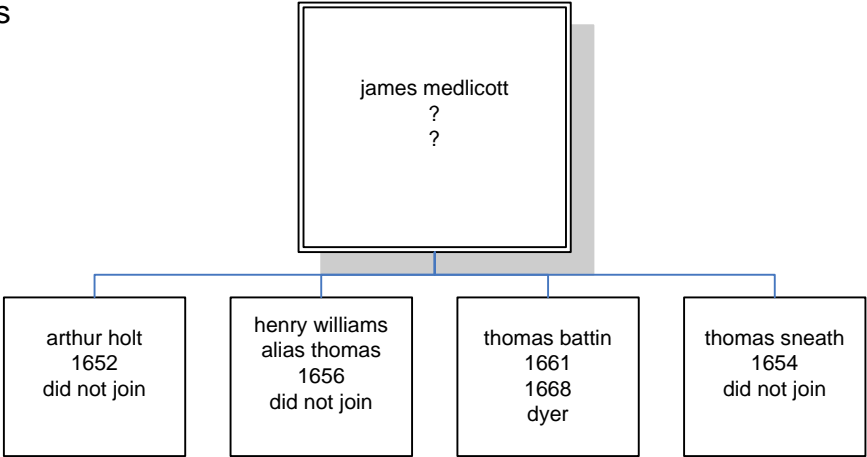
general, Hugh Booker, 165x, 2 generations



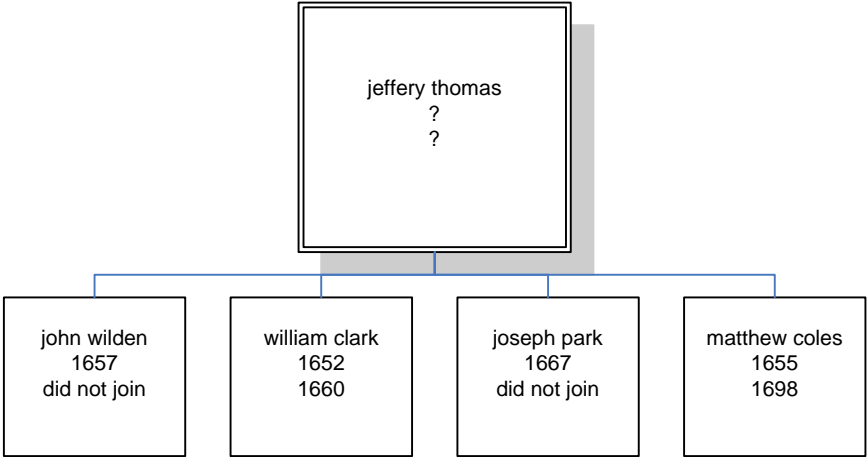
general, Isaac Gildersleeve, 2 generations



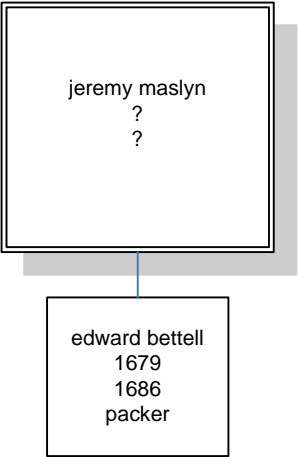
general, James Medicott, 1652, 2 generations



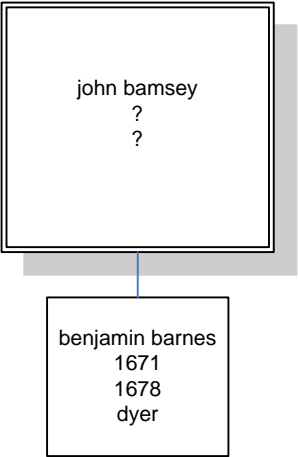
general, Jeffery Thomas, 2 generations



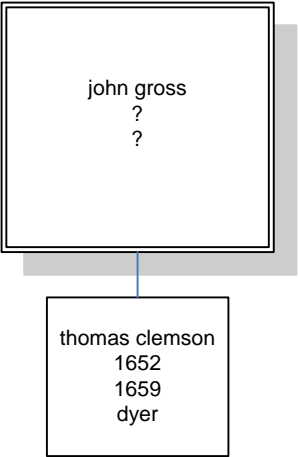
general, Jeremy Maslyn, 1679, 2 generations



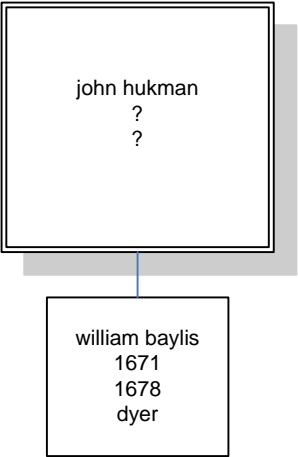
general, John Bamsey, 1671, 2 generations



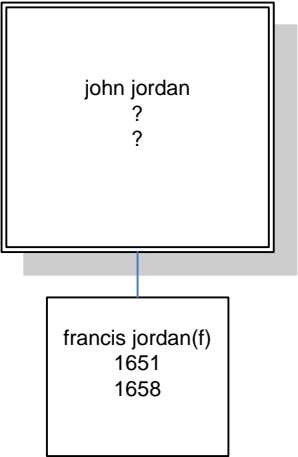
general, John Gross, 1652, 2 generations



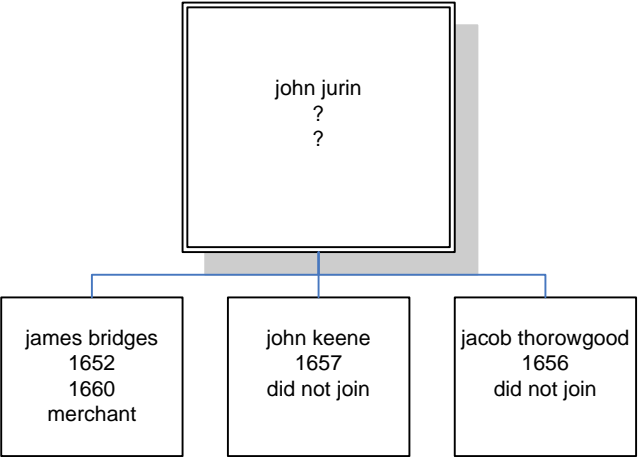
general, John Hukman, 1771, 2 generations



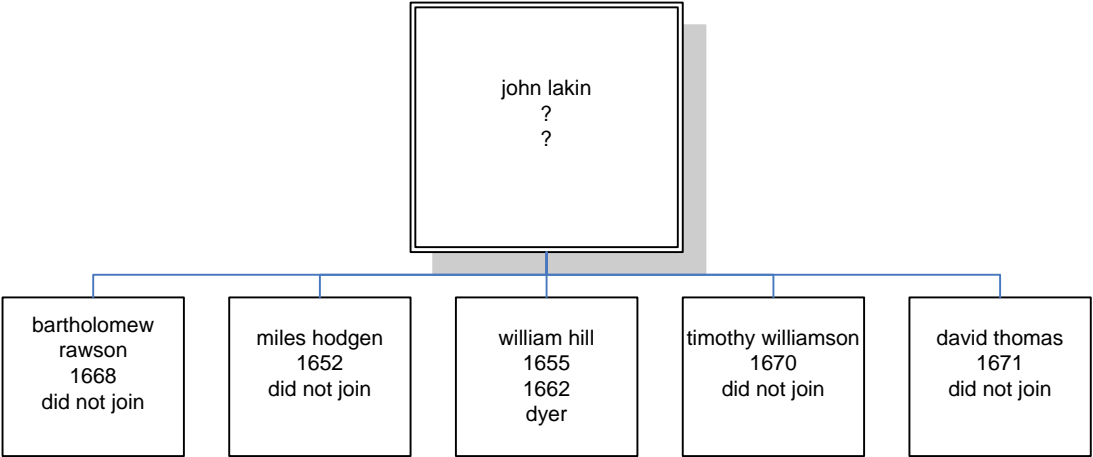
general, John Jordan, 2 generations



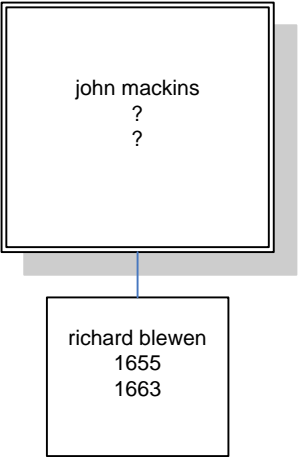
general, John Jurin, 2 generations



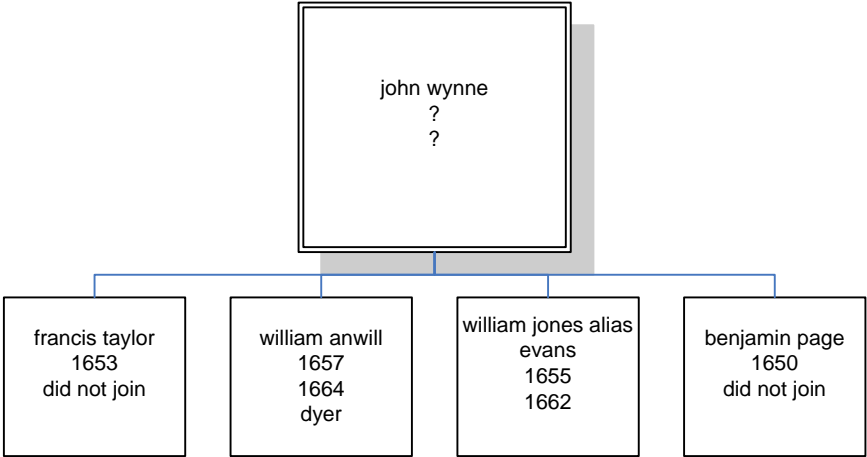
general, John Lakin, 2 generations



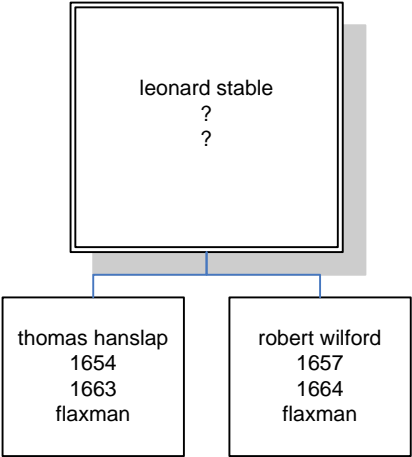
general, John Mackins, 1655, 2 generations



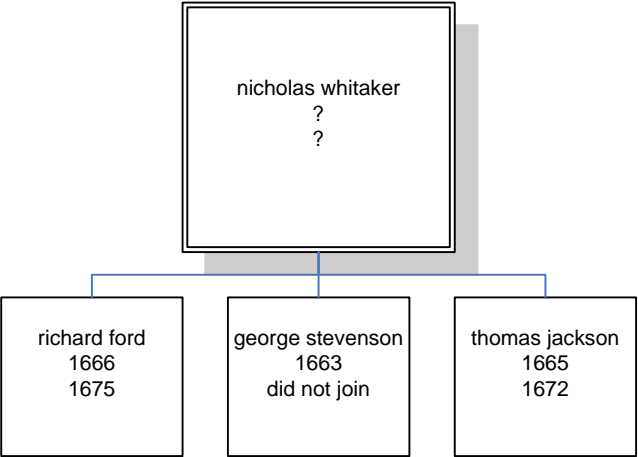
general, John Wynne, 2 generations



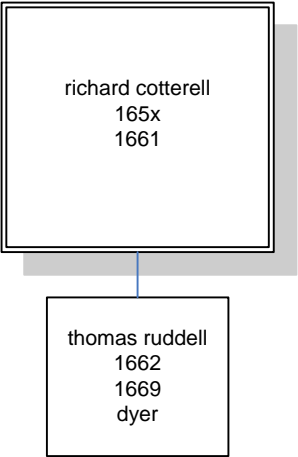
general, Leonard Stable, 2 generations



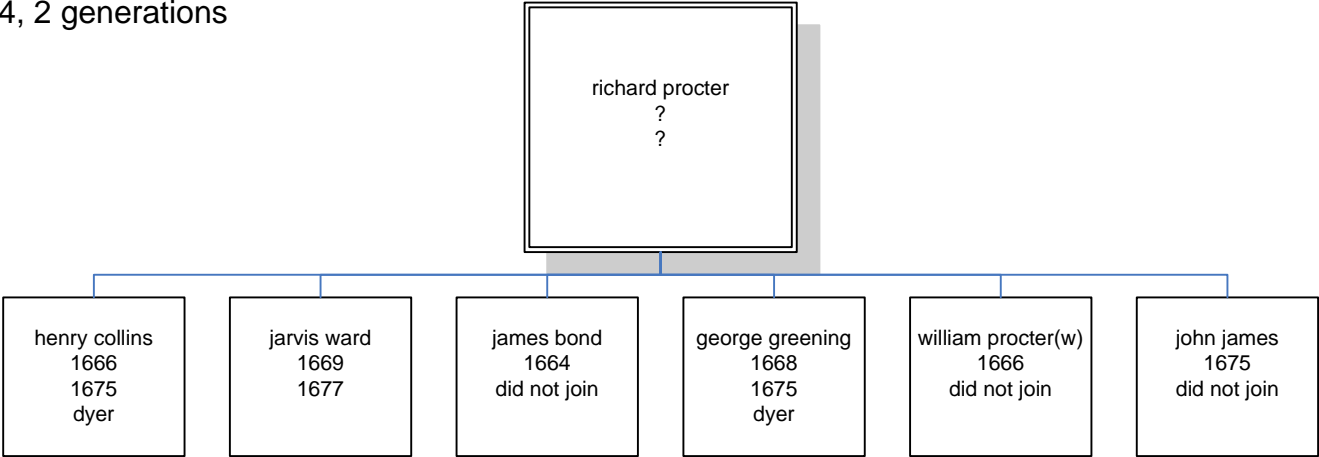
general, Nicholas Whitaker, 2 generations



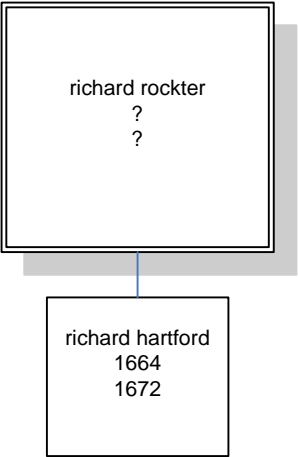
general, Richard Cotterill, 165x, 2 generations



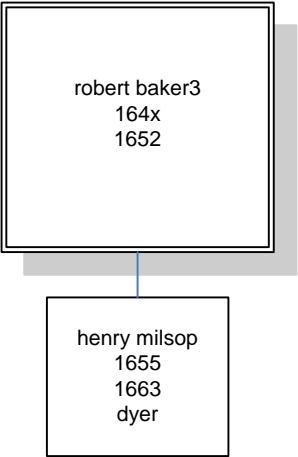
general, Richard Procter, 1664, 2 generations



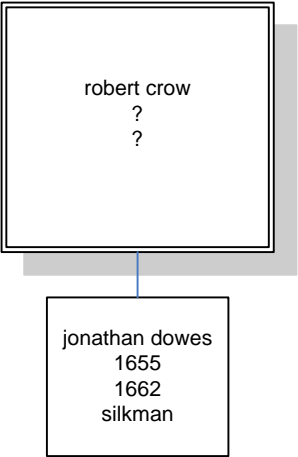
general, Richard Rockter, 2 generations



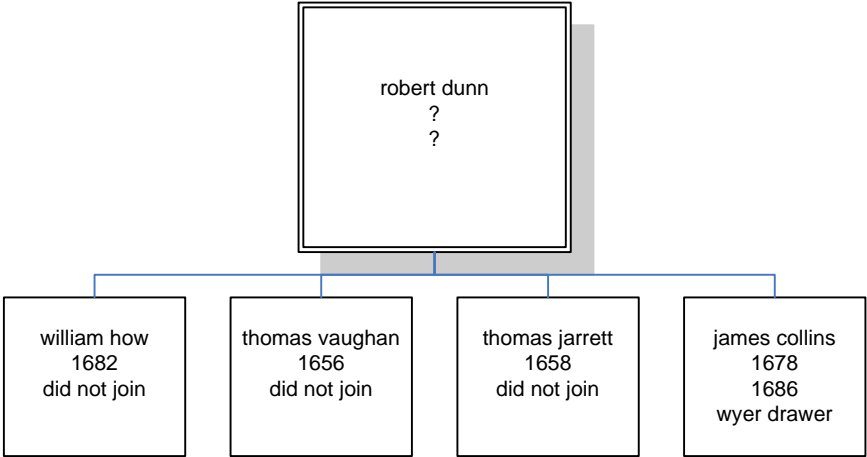
general, Robert Baker, 2 generations



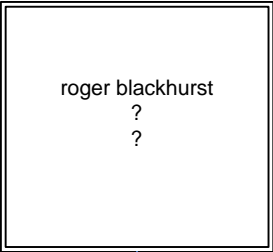
general, Robert Crow, 2 generations



general, Robert Dunn, 1656, 2 generation



general, Roger Blackhurst, 1651, 2 generations



roger mayden
1658
did not join

marmaduke lloyd
1655
did not join

john park
1658
1666
dyer

john naylor
1654
did not join

edward braybrook
1661
1669

james wilkinson
1655
1662
dyer - livery

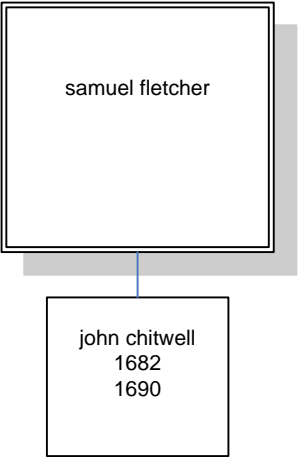
francis belt
1651
1658
dyer

john freckelton
1661
1668
dyer

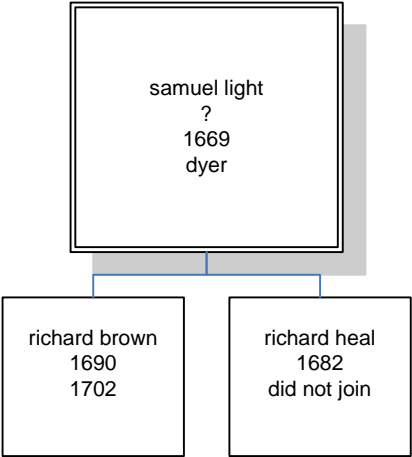
roger blackhurst2
1656
1663
dyer

christopher read
1652
did not join

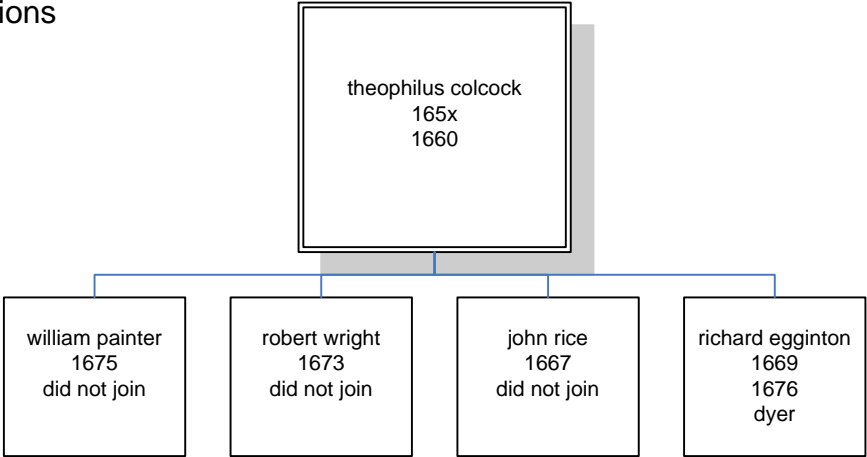
general, Samuel Fletcher, 1682, 2 generations



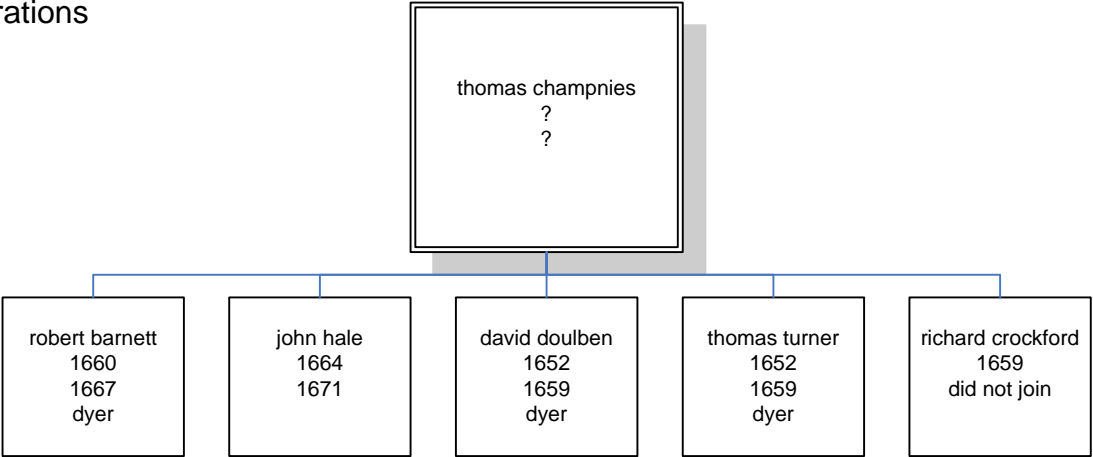
general, Samuel Light, 166x, 2 generations



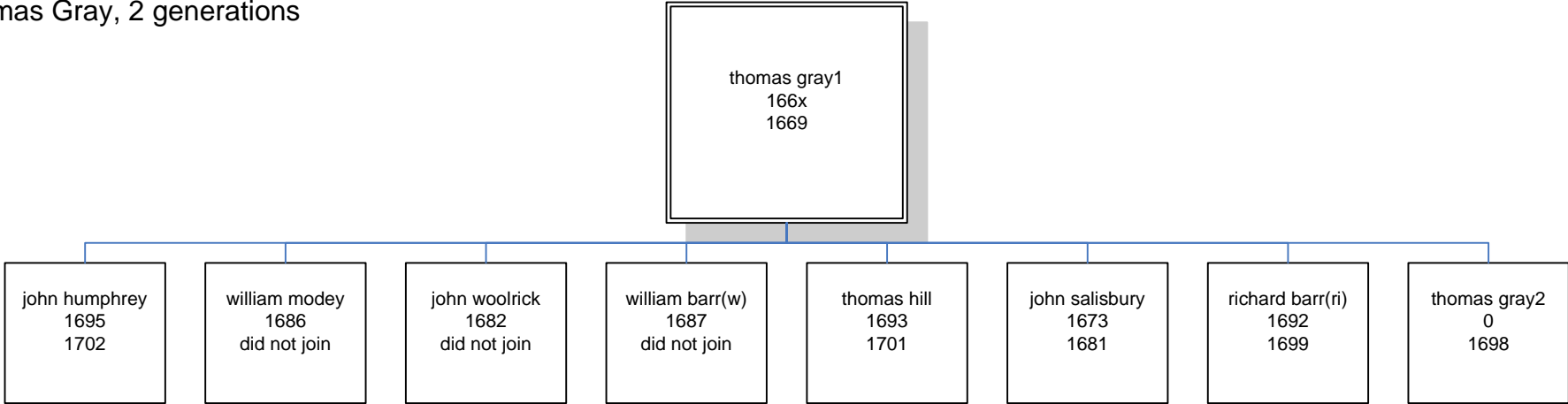
general, Theophilus Colcock, 165x, 2 generations



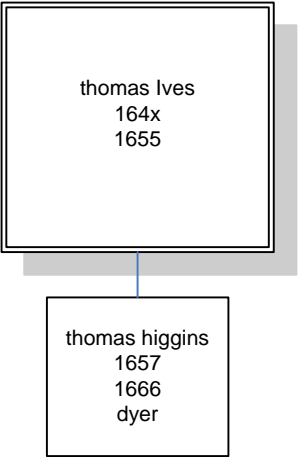
general. Thomas Champnies, 2 generations



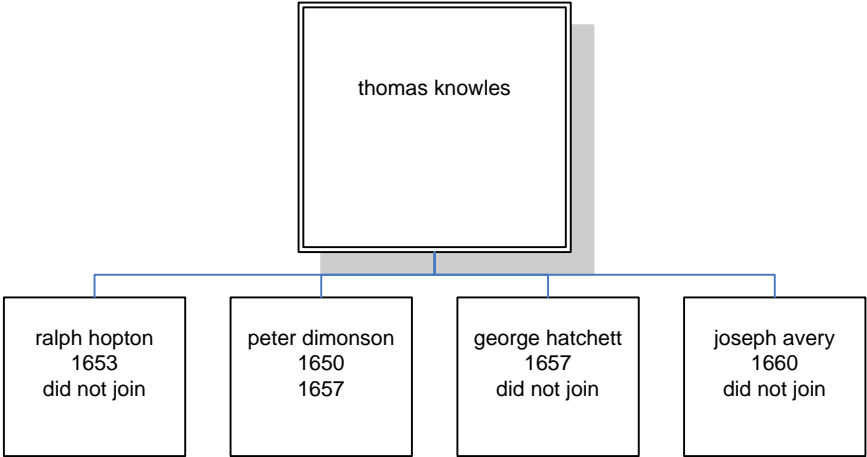
general, Thomas Gray, 2 generations



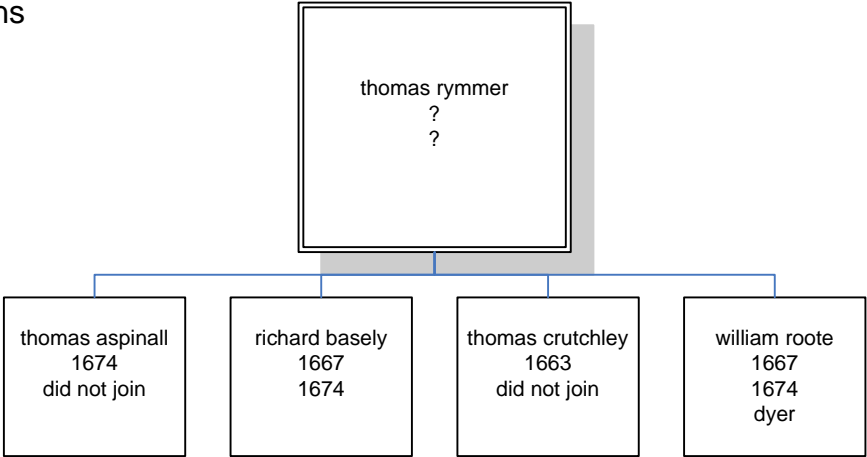
general, Thomas Ives, 2 generations



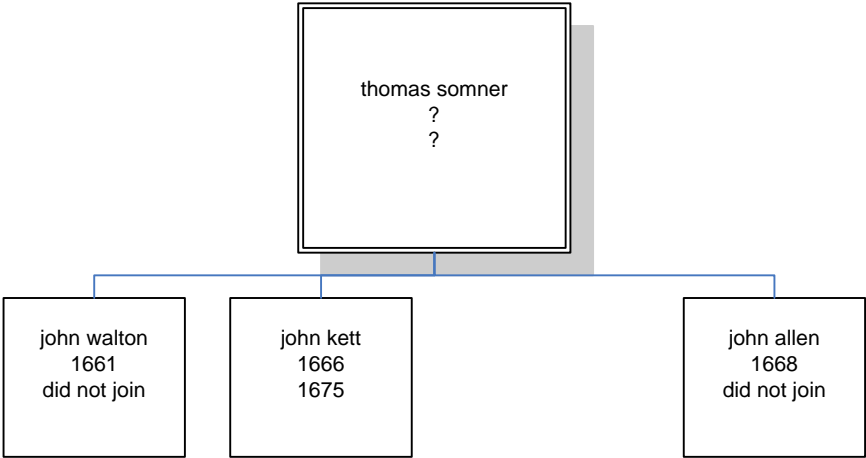
general, Thomas Knowles, 2 generations



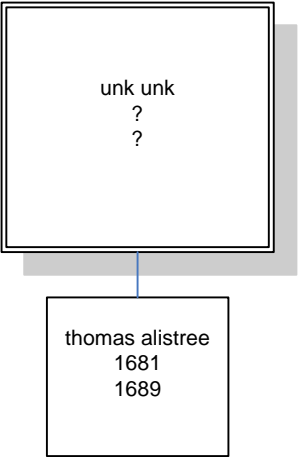
general, Thomas Rymmer, 1663, 2 generations



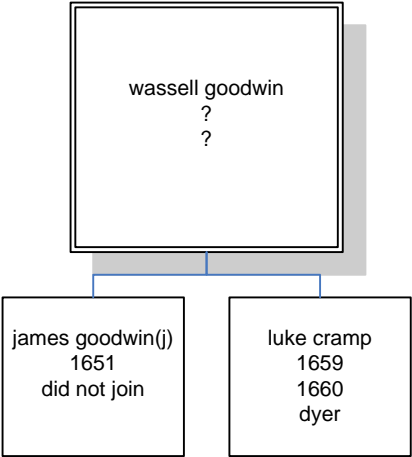
general, Thomas Somner, 2 generations



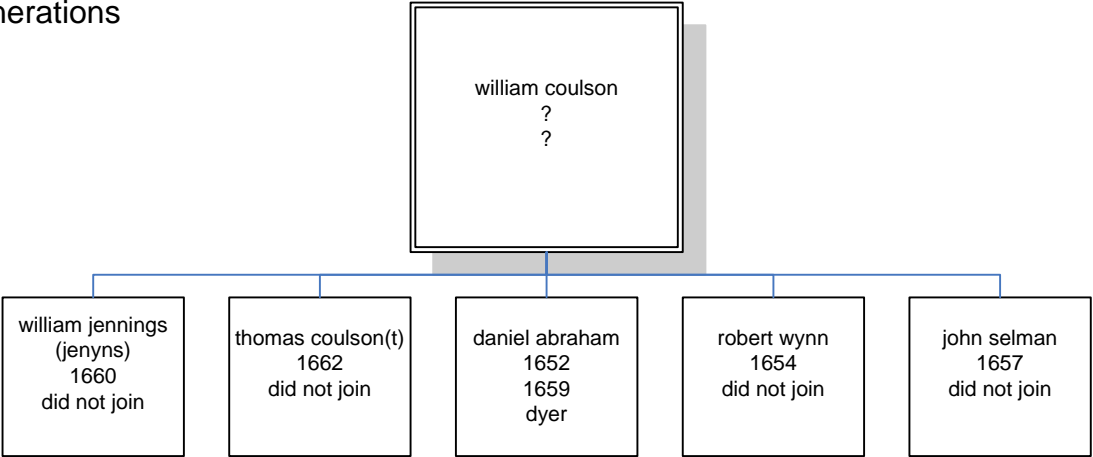
general, Unknown, 168x, 2 generations



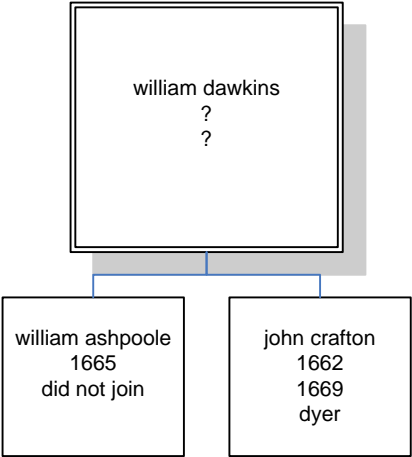
general, Wassell Goodwin, 1651, 2 generations



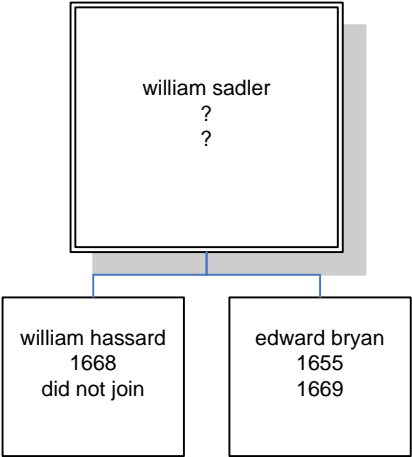
general, William Coulson, 1652, 2 generations



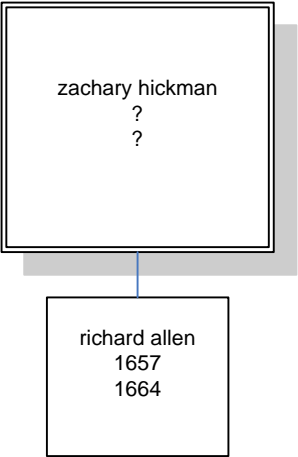
general, William Dawkins, 1662, 2 generations

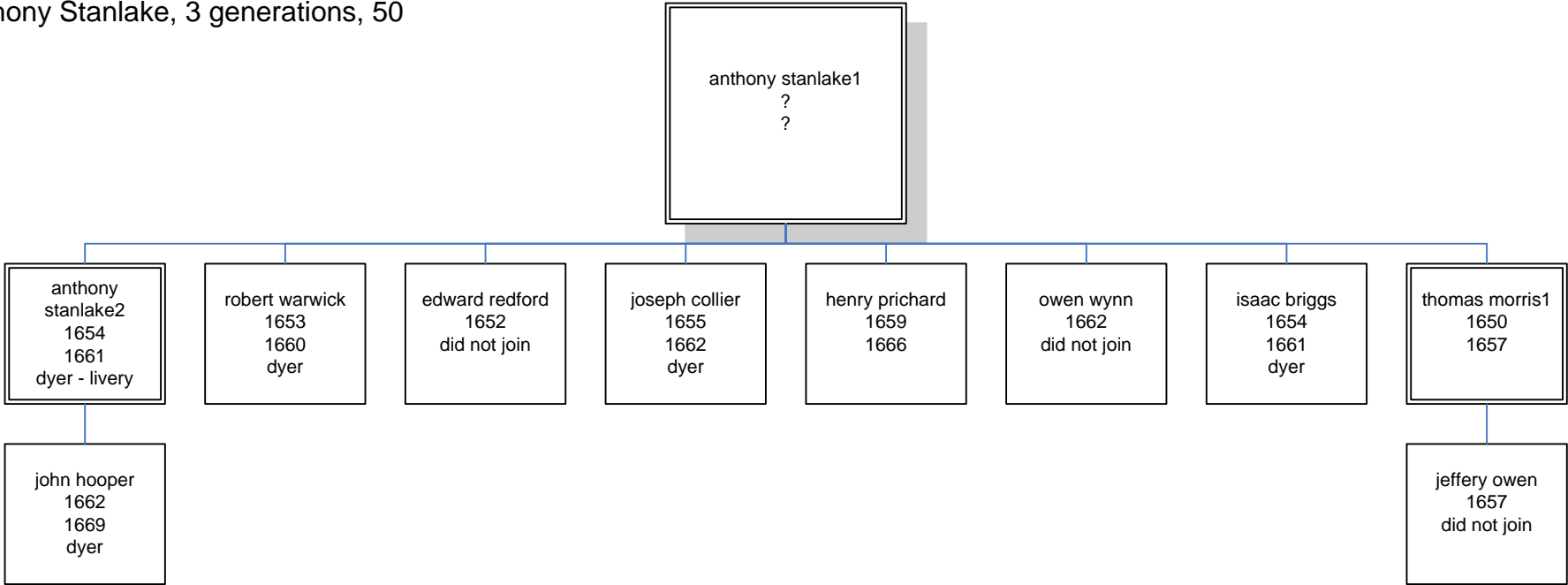


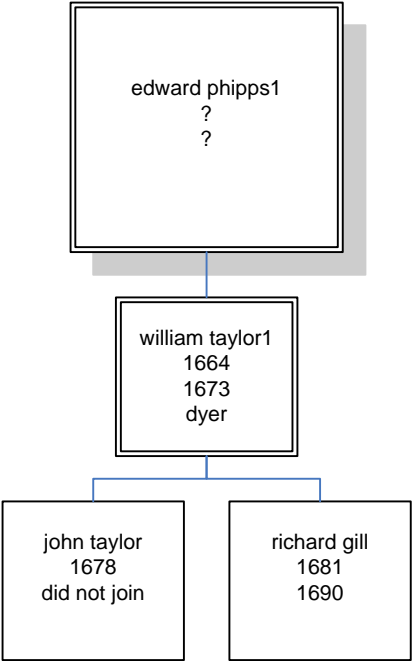
general, William Sadler, 165x, 2 generations

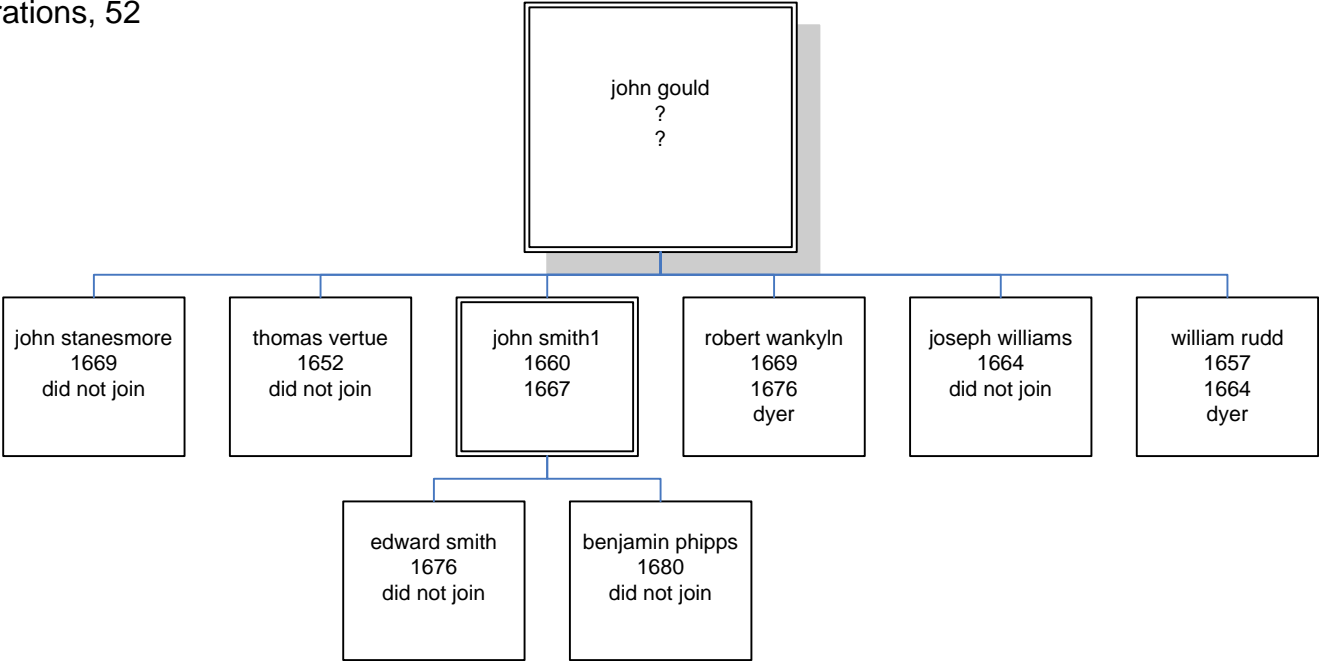


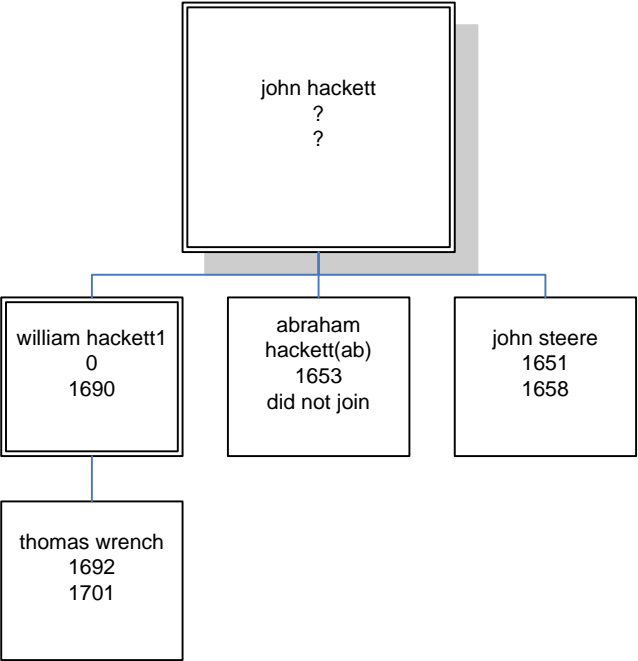
general, Zachary Hickman, 1657, 2 generations

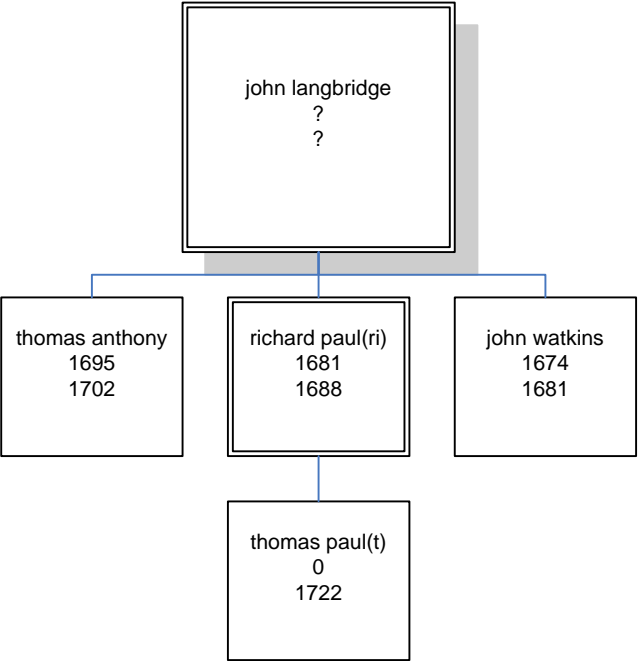


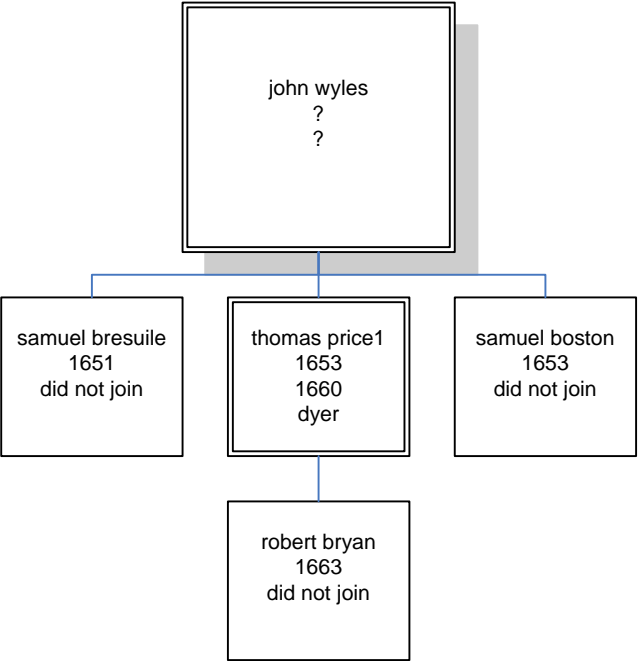


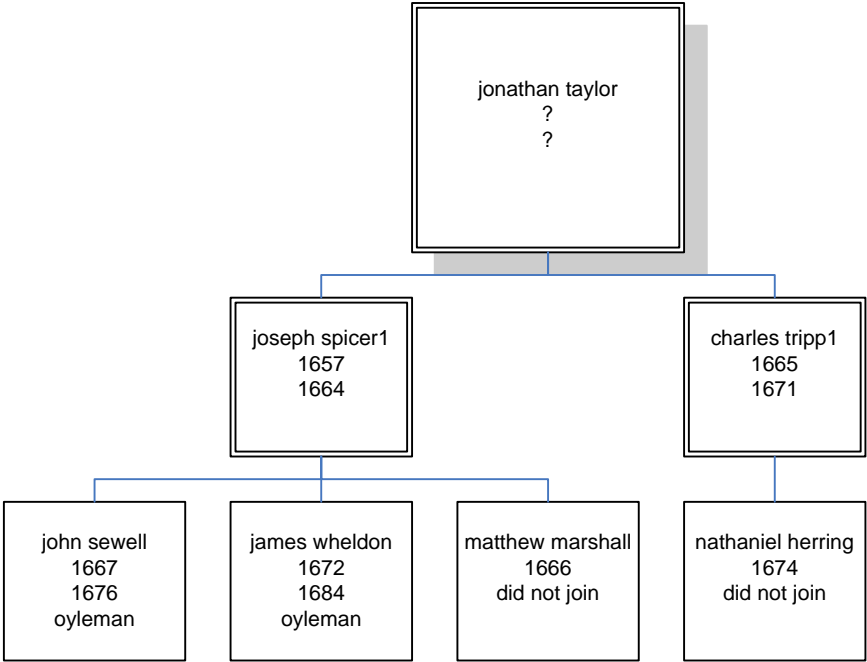


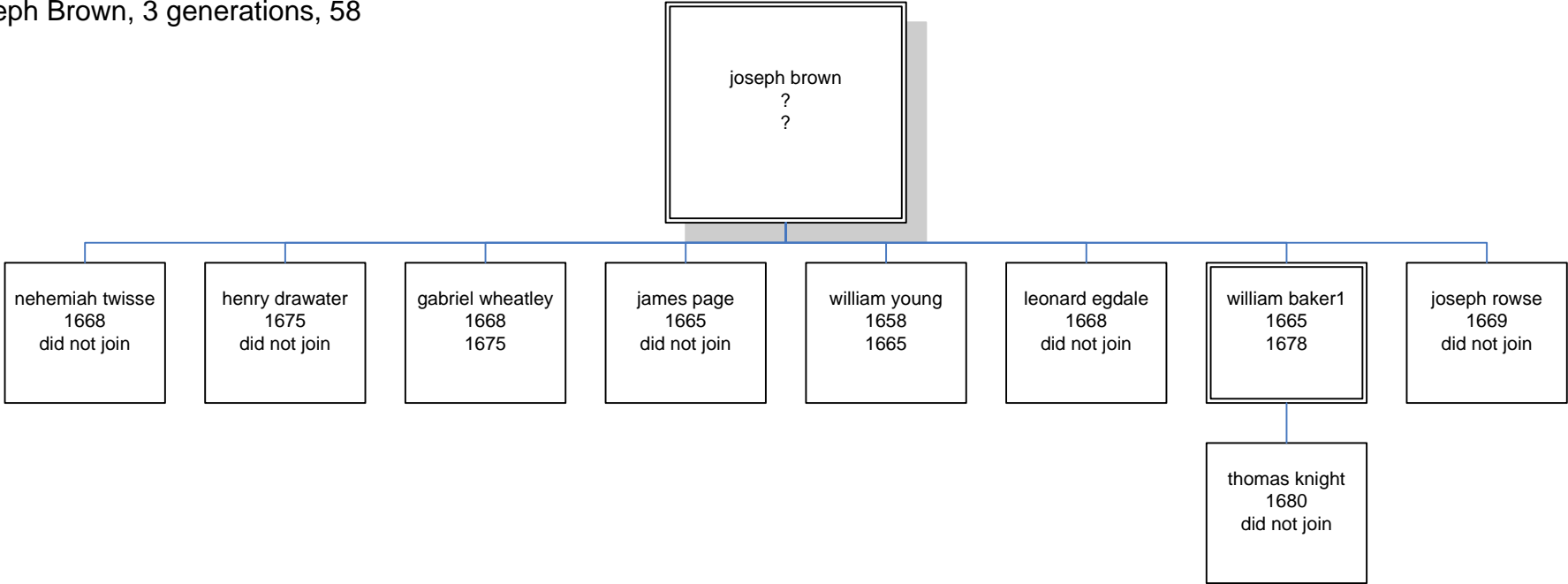


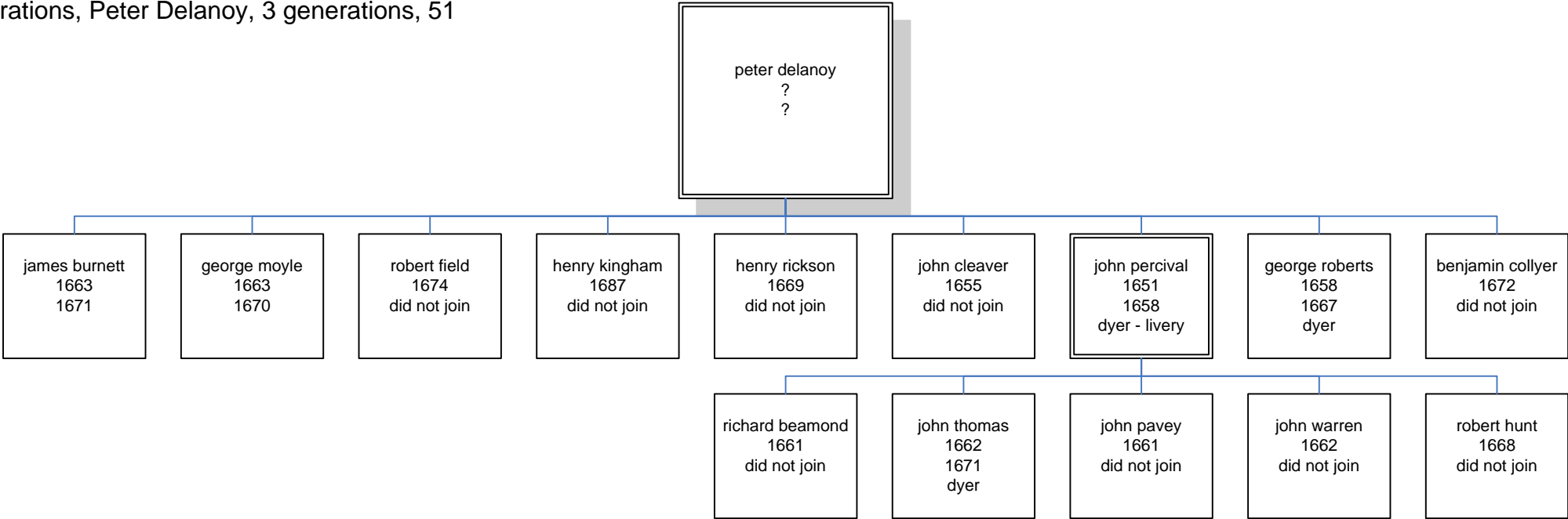


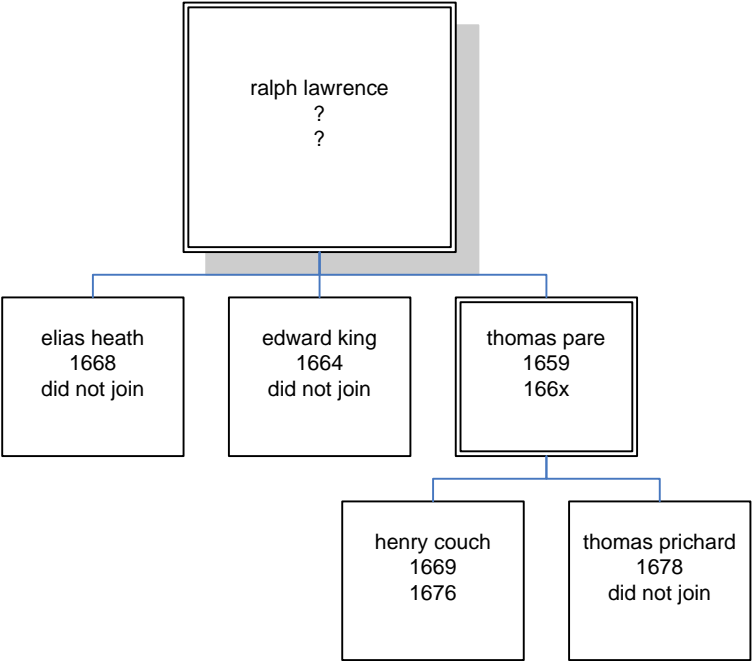


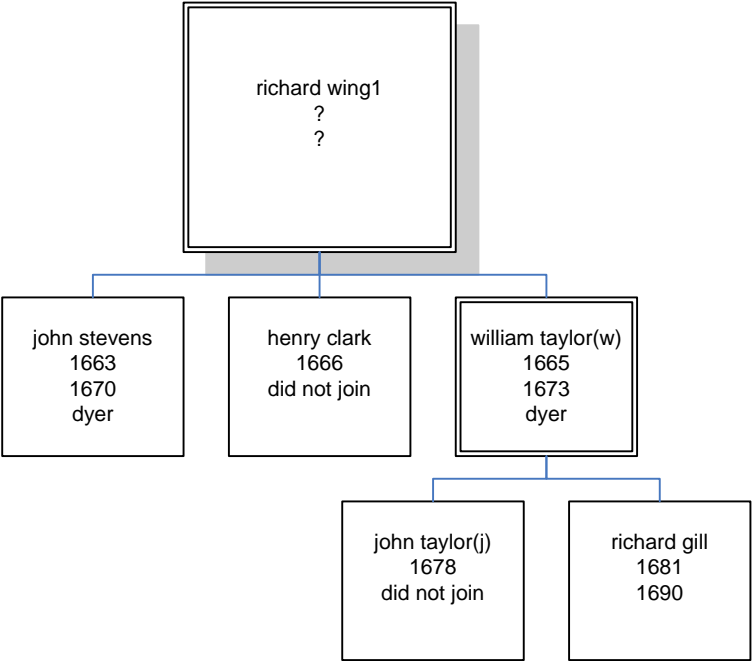


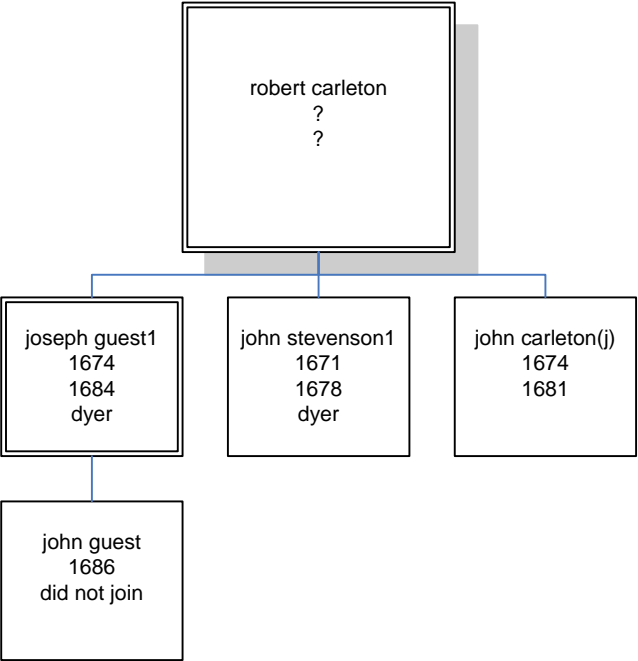


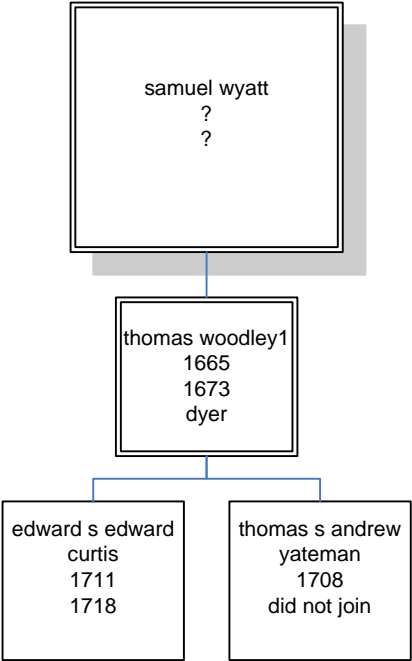




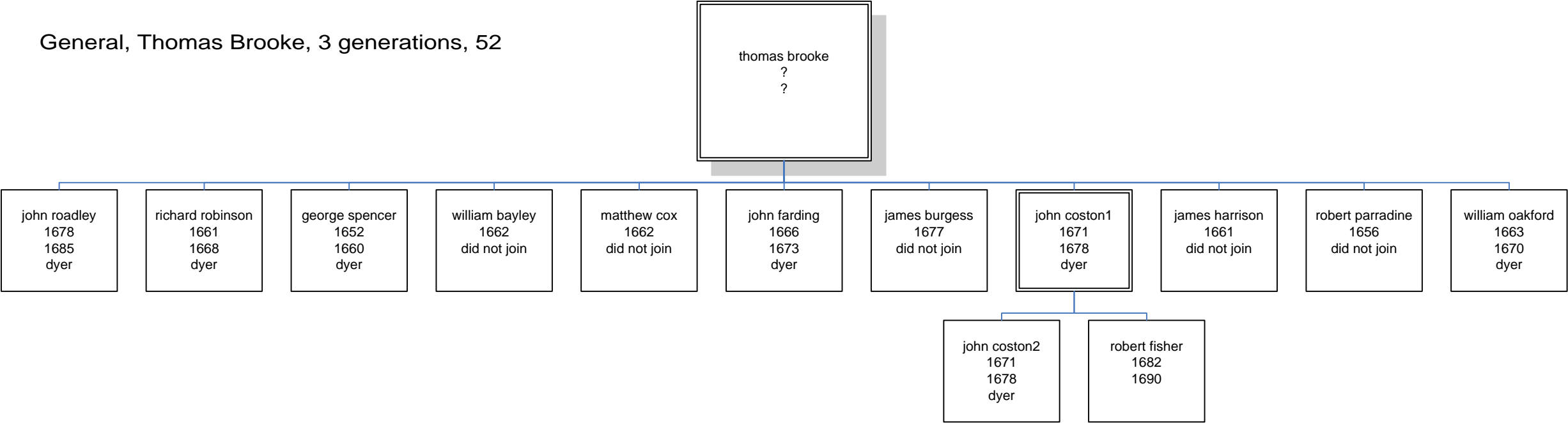




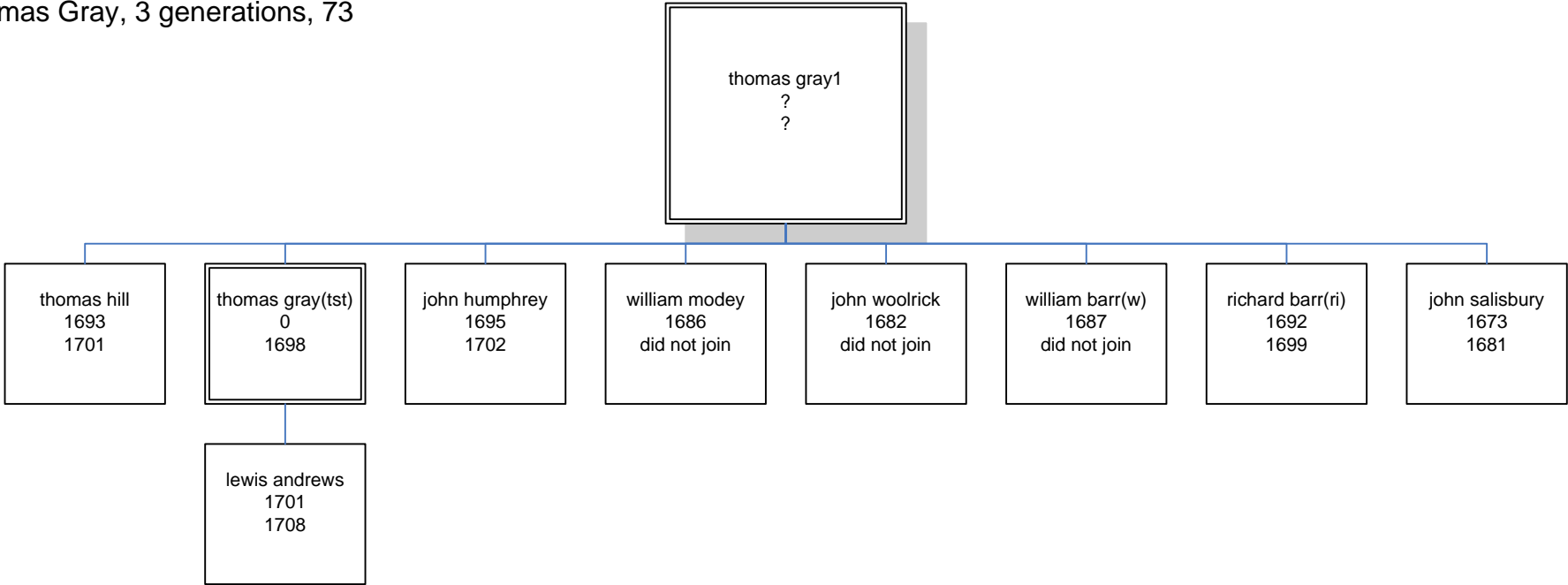


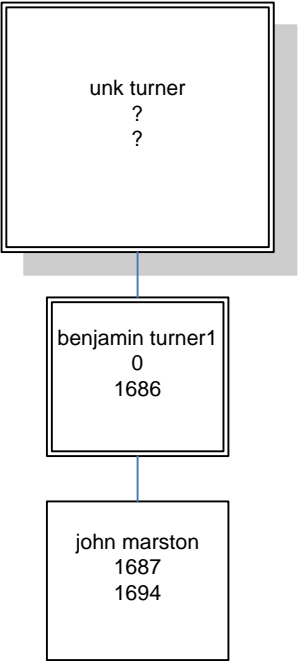


General, Thomas Brooke, 3 generations, 52

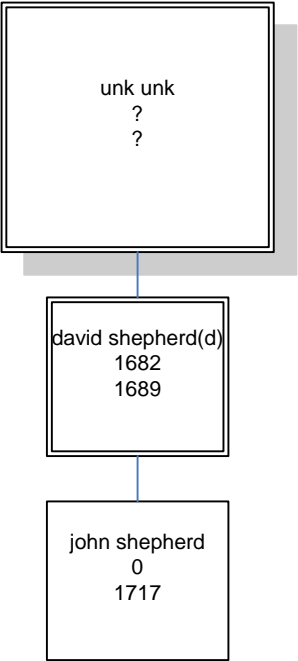


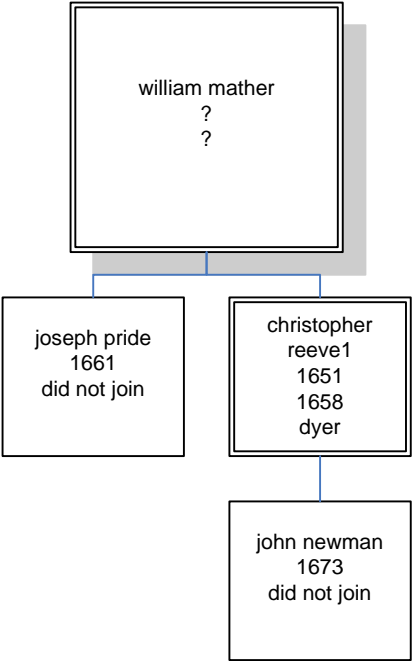
General, Thomas Gray, 3 generations, 73

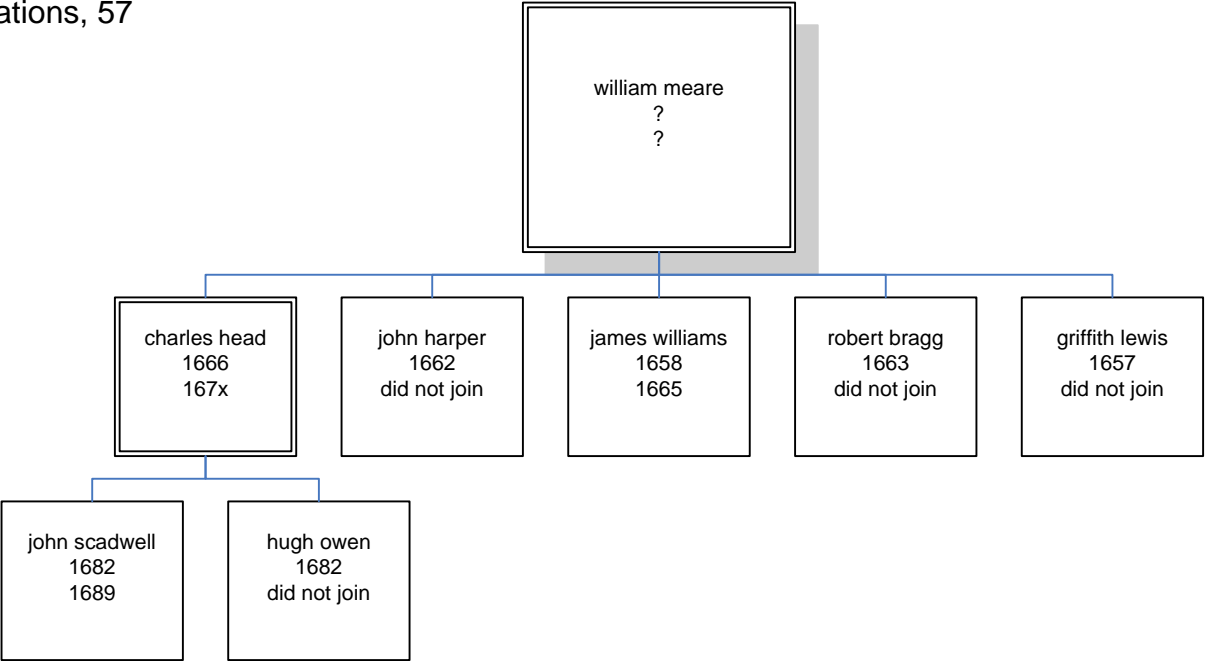




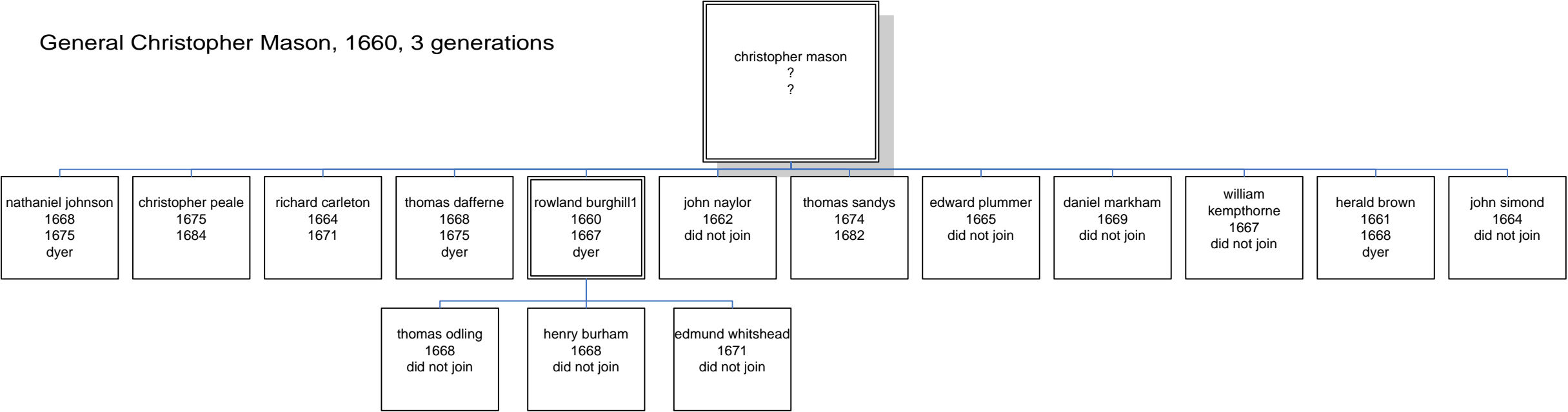
General, Unk Unk, 3 generations, 82



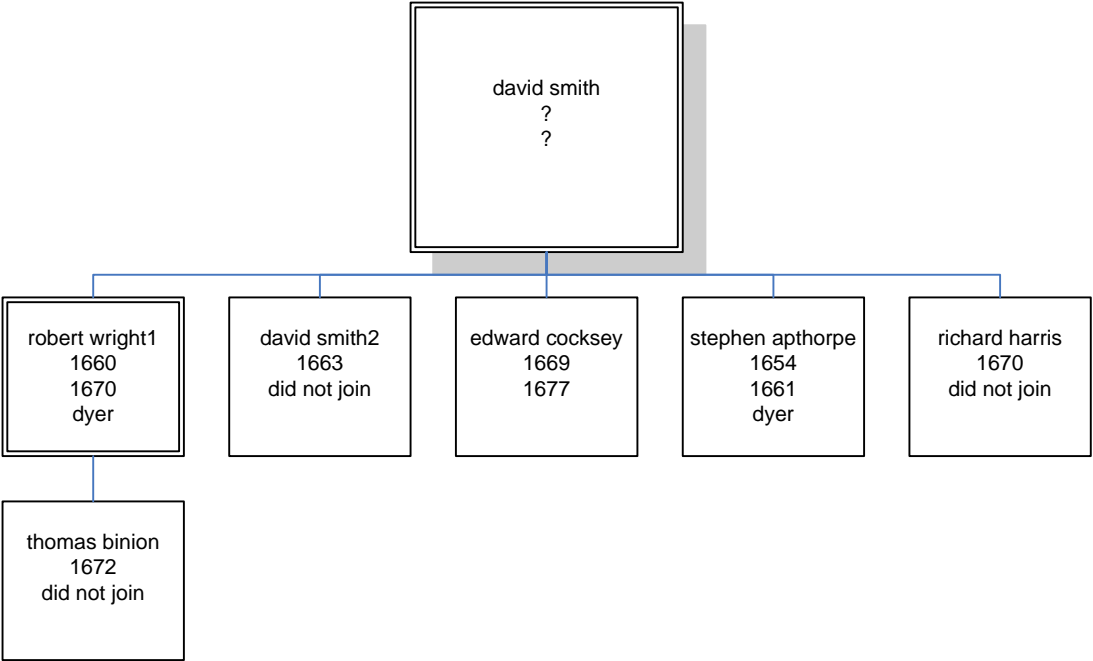




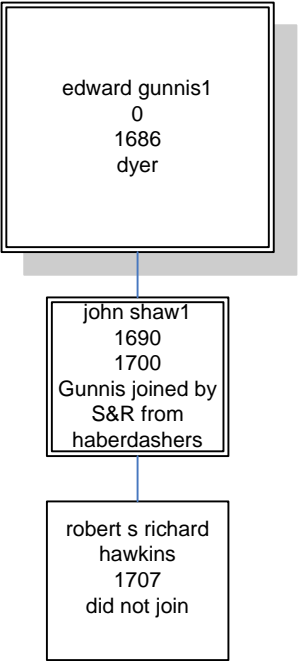
General Christopher Mason, 1660, 3 generations



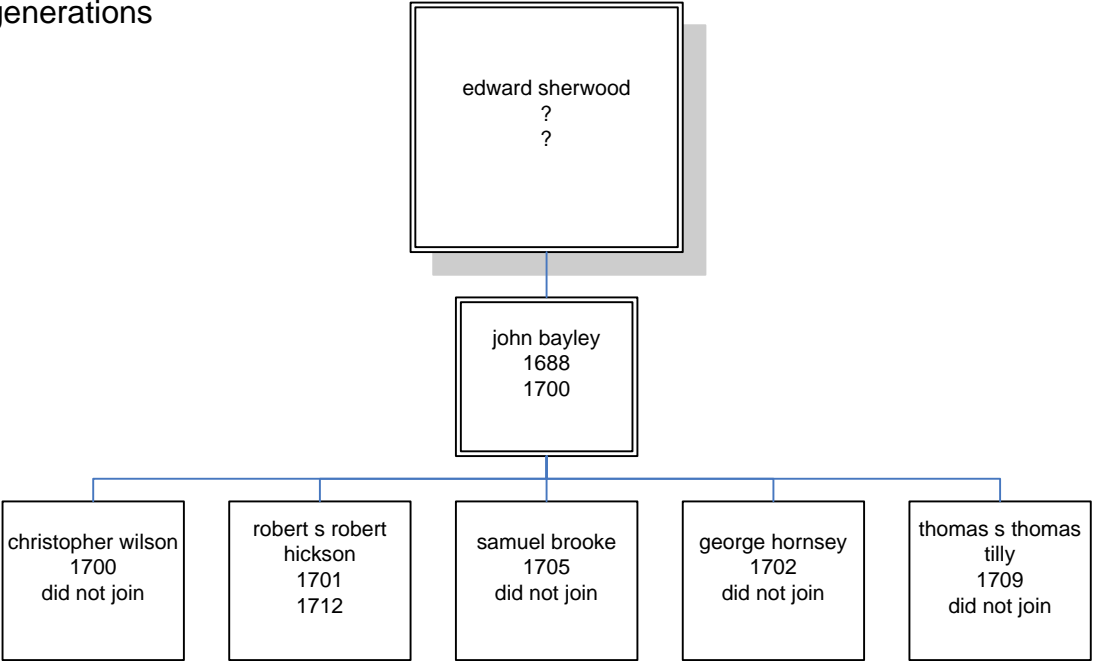
General. David Smith, 3 generations



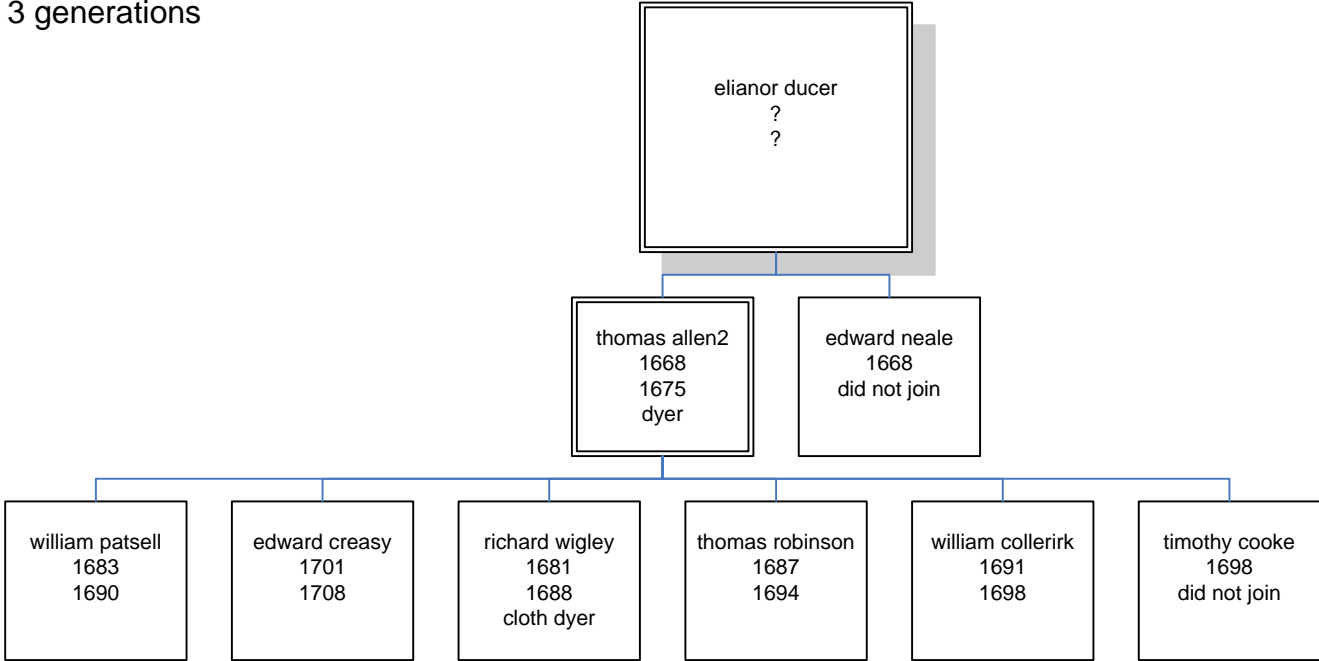
general, Edward Gunnis, 3 generations



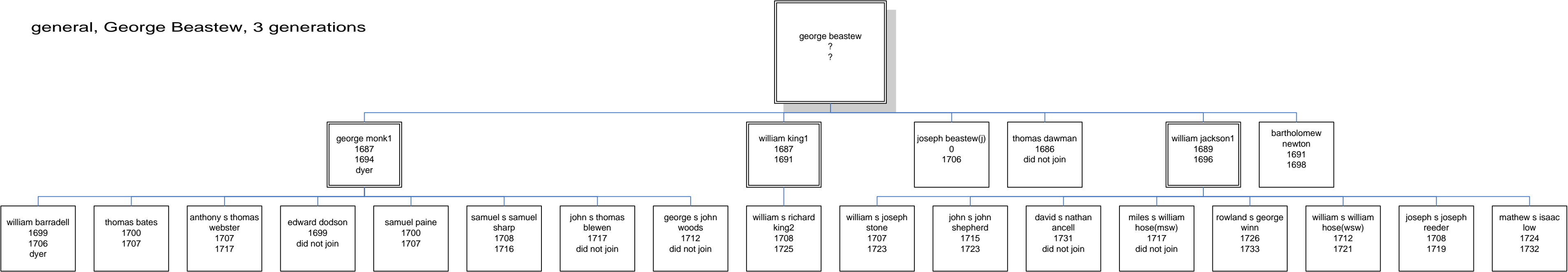
general, Edward Sherwood, 1688, 3 generations



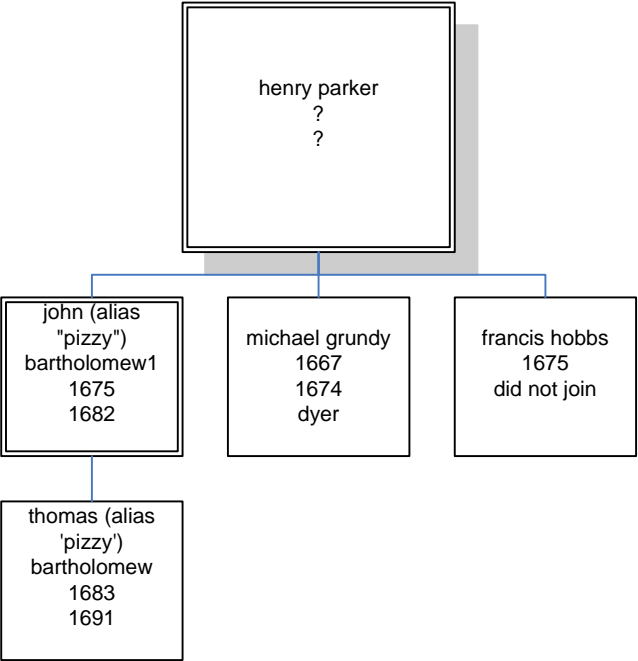
general, Elianor Ducer, 1668, 3 generations



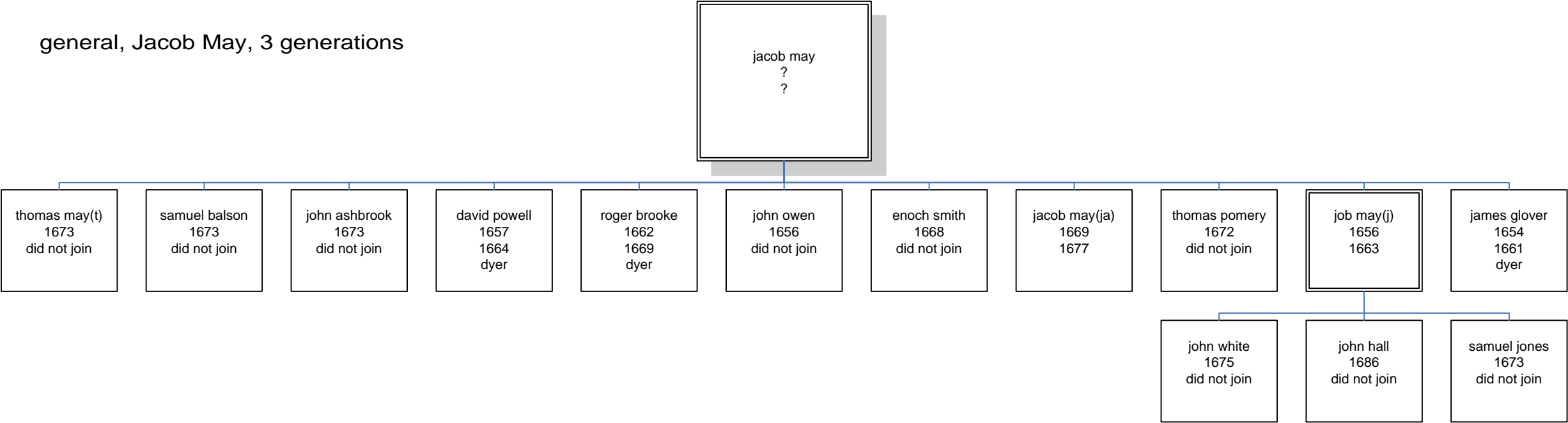
general, George Beastew, 3 generations



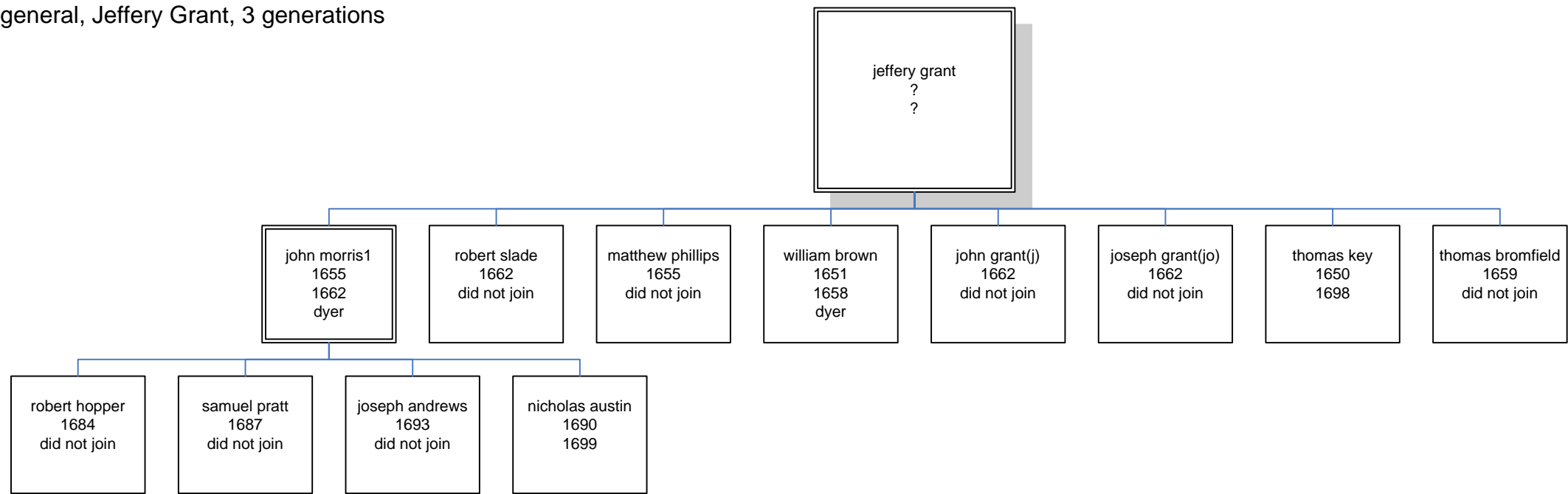
general, Henry Parker, 3 generations



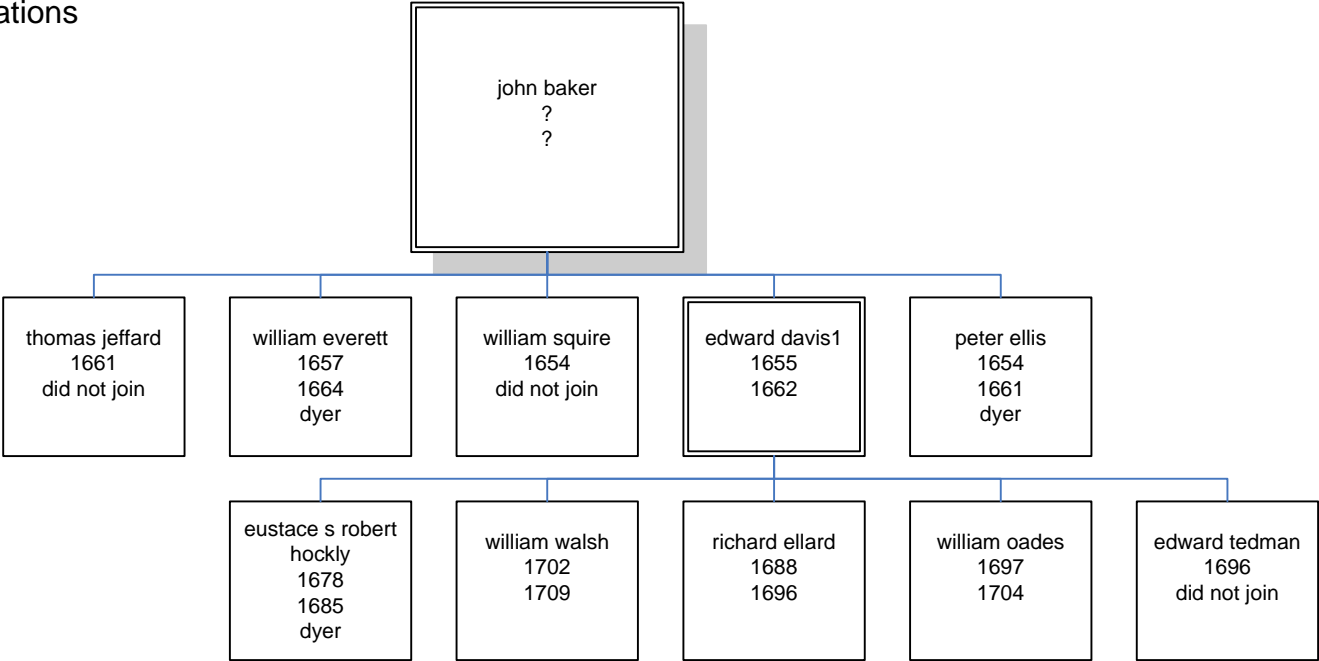
general, Jacob May, 3 generations



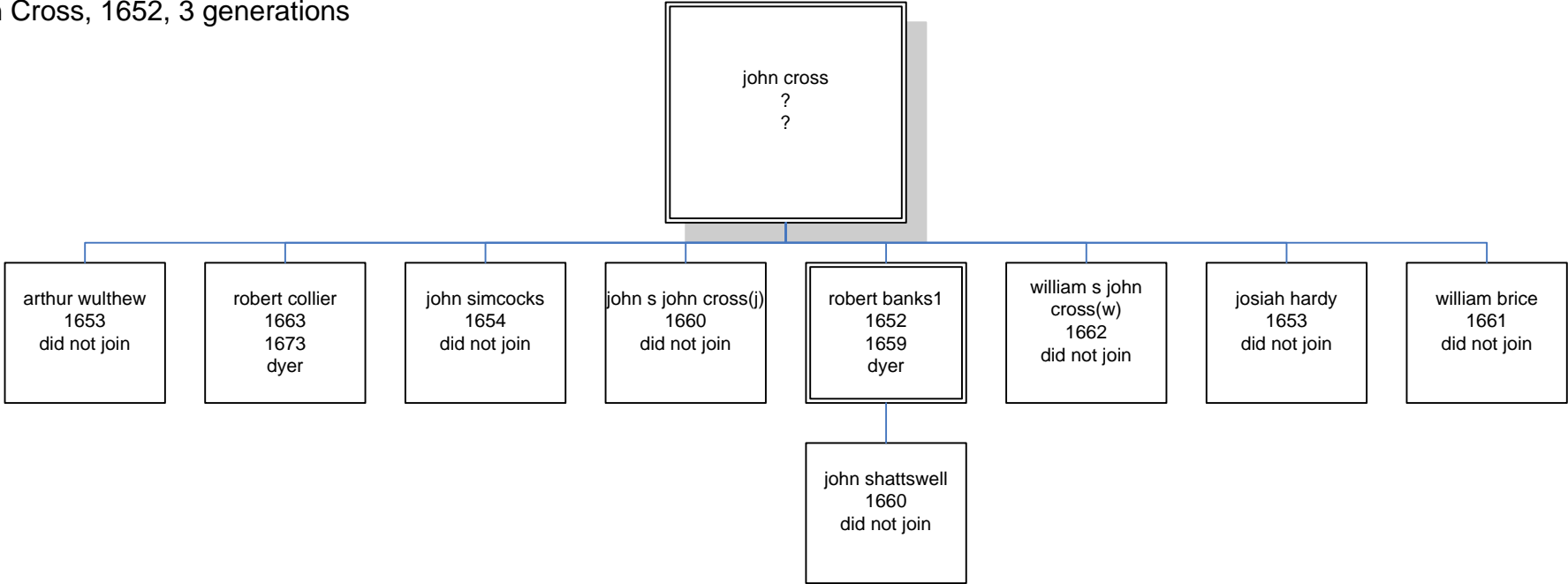
general, Jeffery Grant, 3 generations



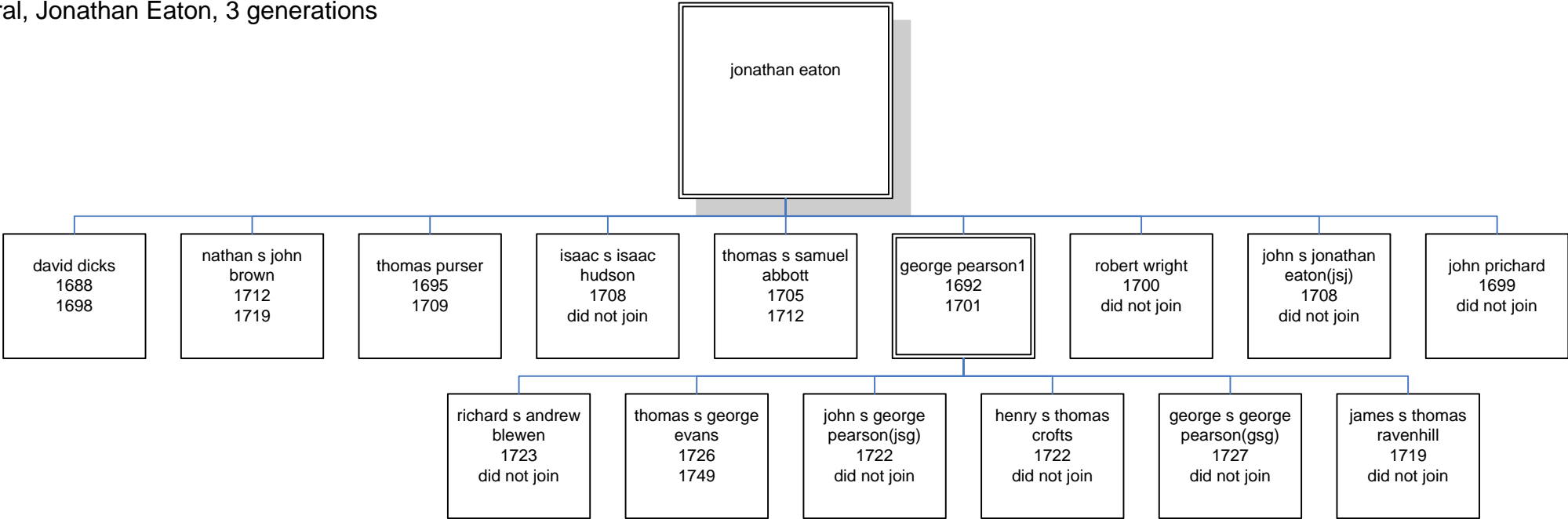
general, John Baker, 3 generations



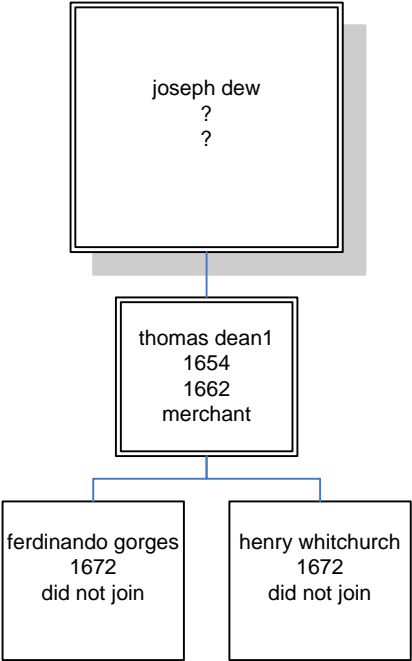
general, John Cross, 1652, 3 generations



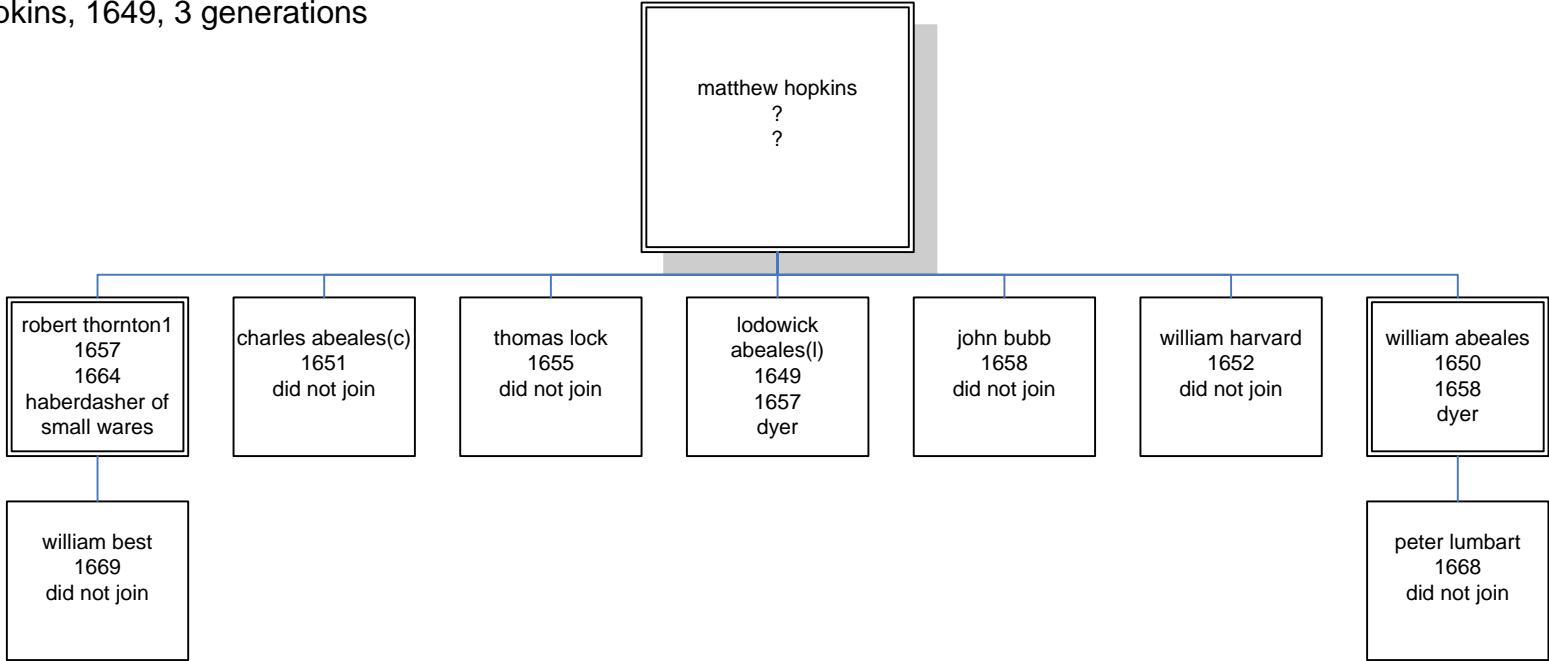
general, Jonathan Eaton, 3 generations



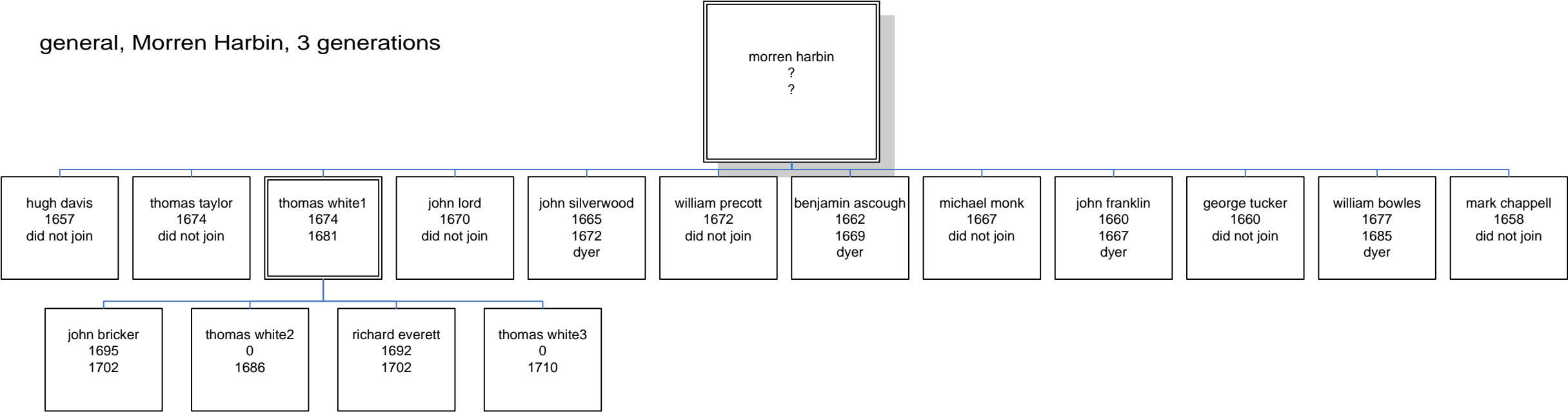
general, Joseph Dew, 3 generations



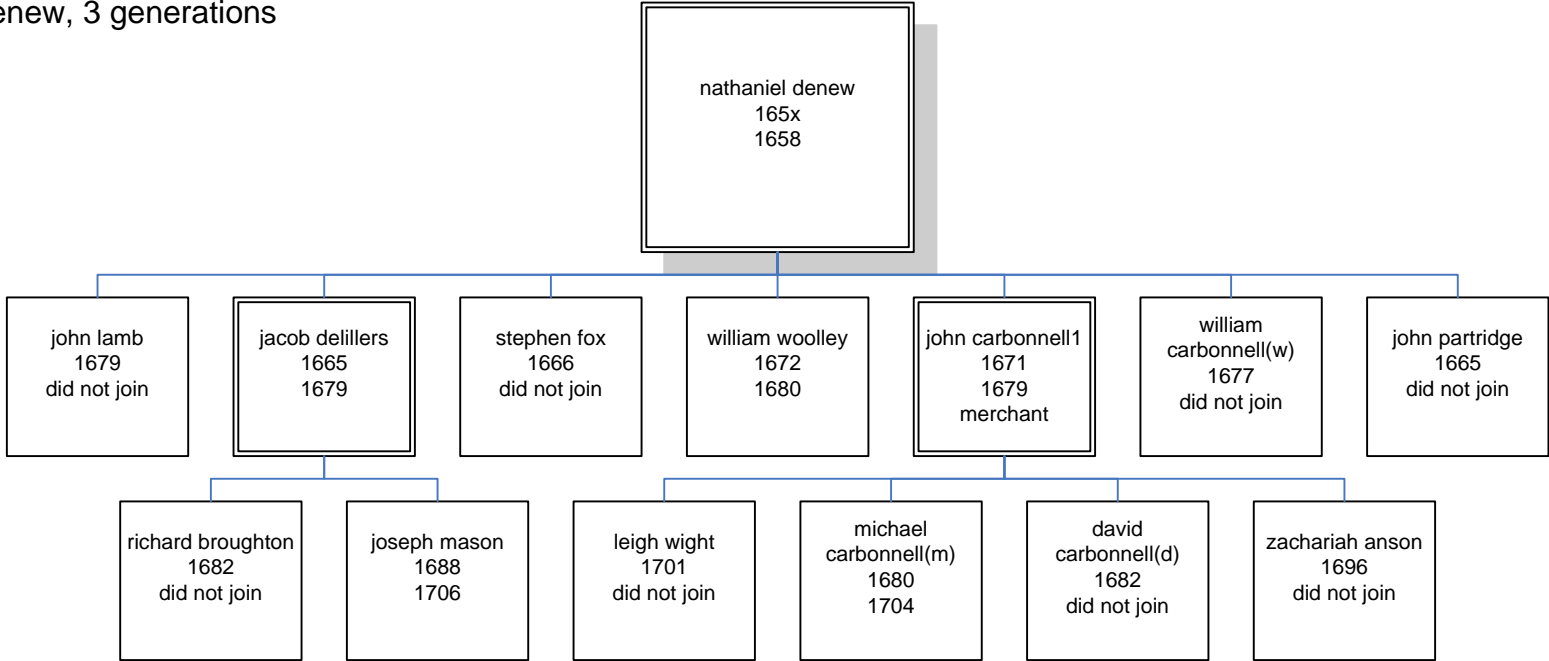
general, Matthew Hopkins, 1649, 3 generations



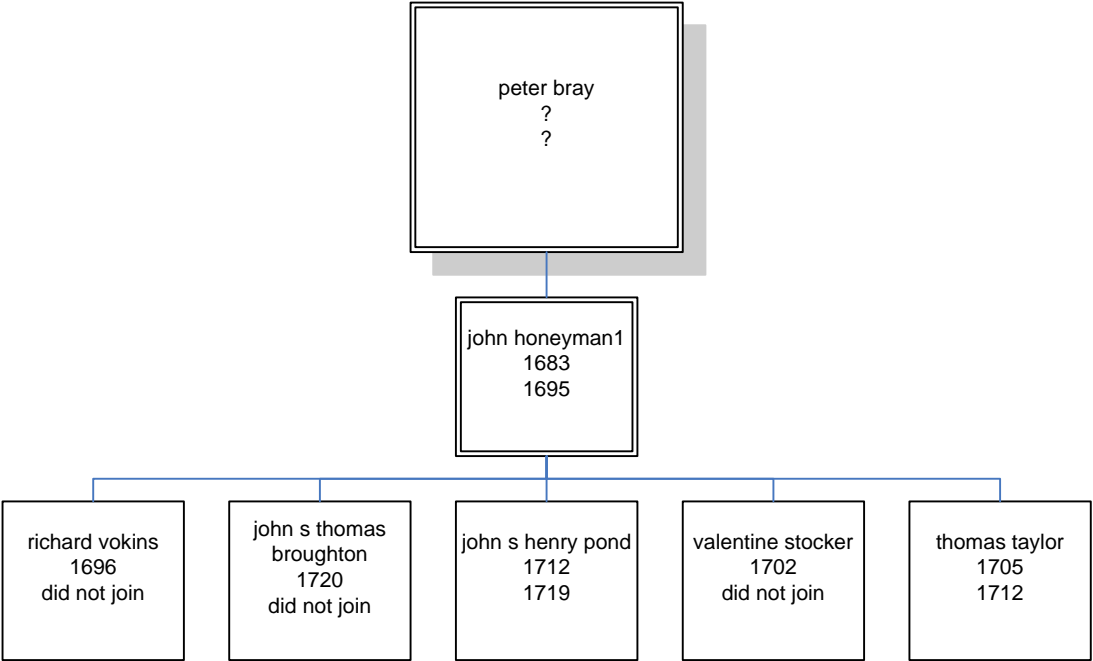
general, Morren Harbin, 3 generations



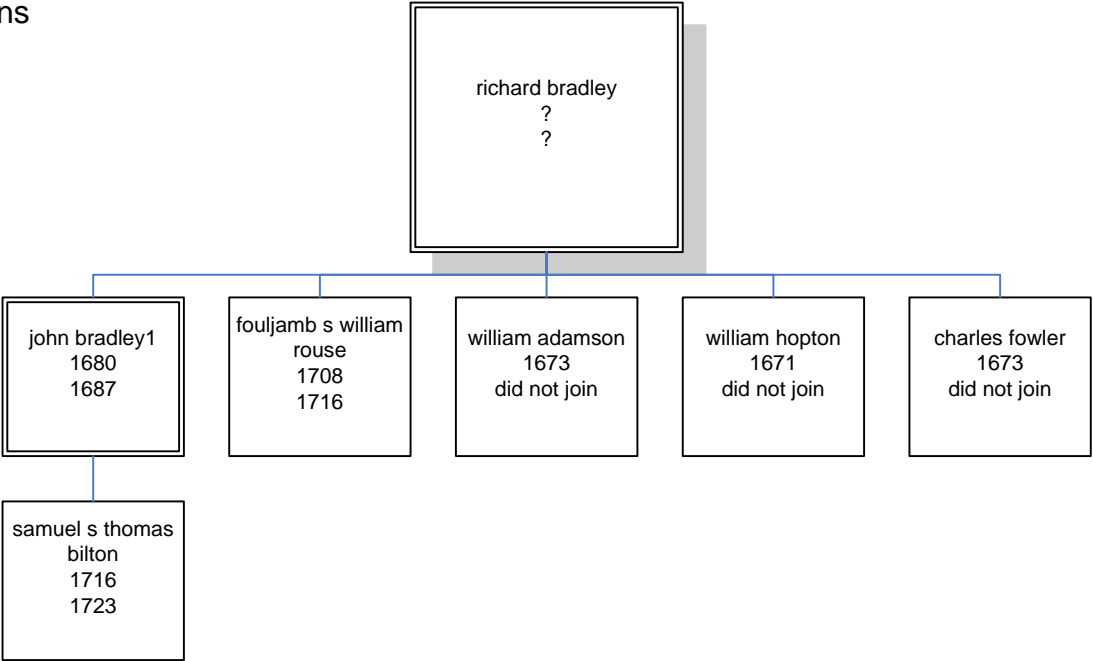
general, Nathaniel Denew, 3 generations



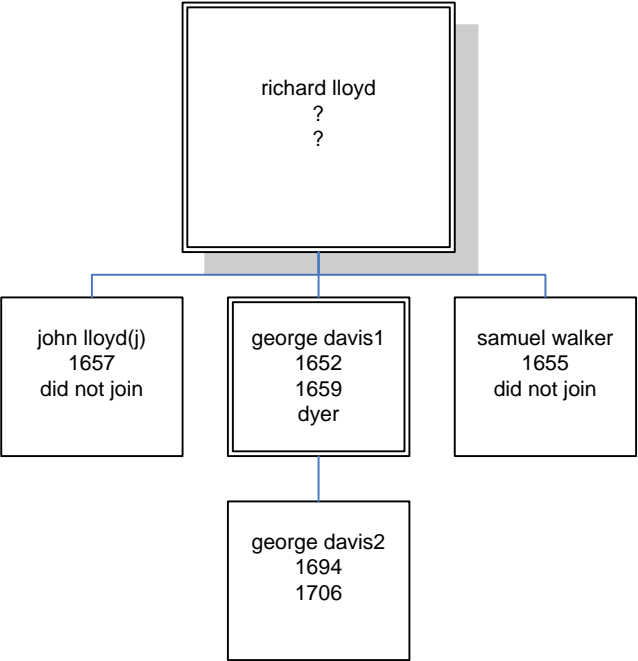
general, Peter Bray, 3 generations



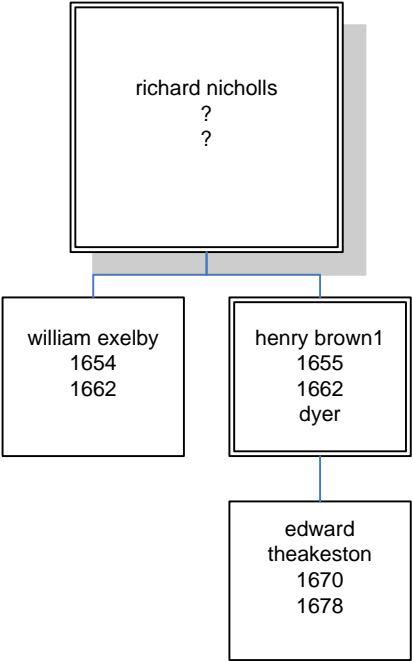
general, Richard Bradley, 3 generations



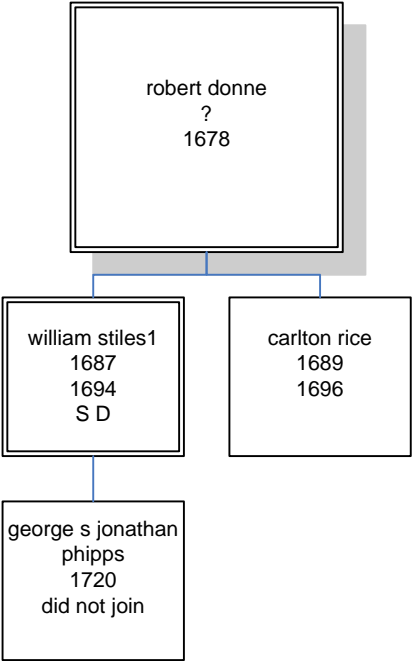
general, Richard Lloyd, 3 generations



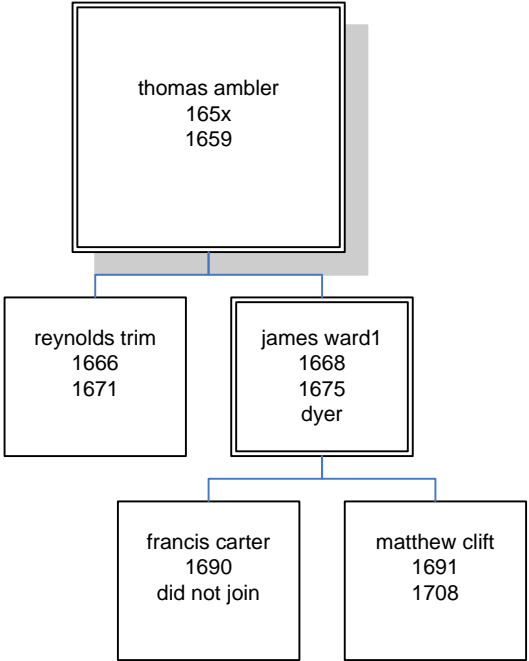
general, Richard Nicholls, 3 generations



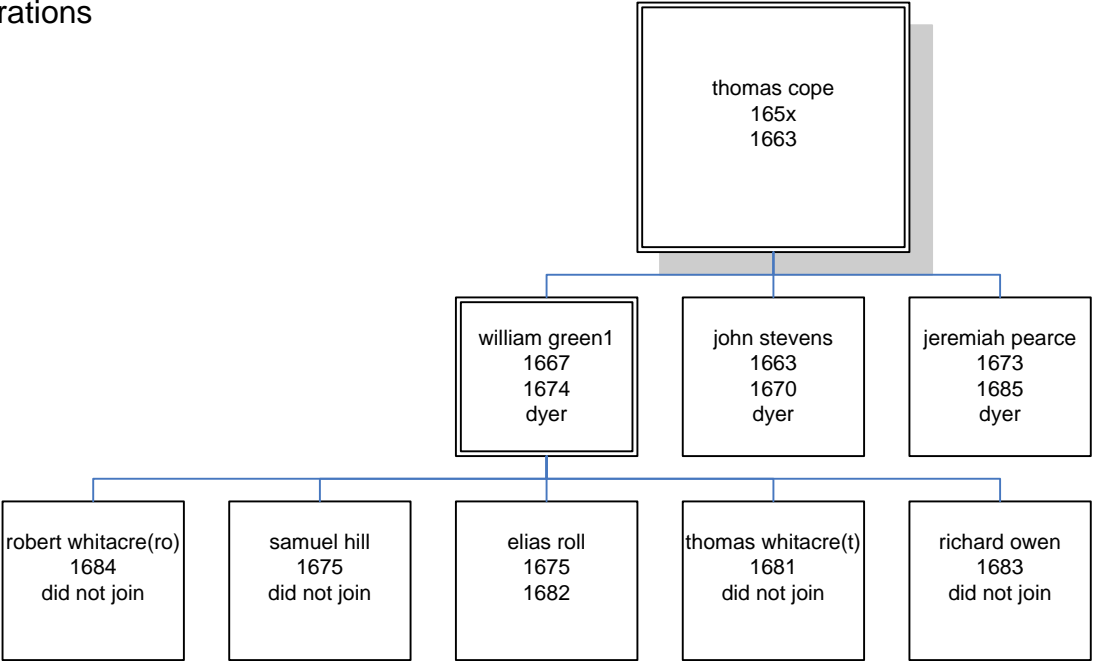
general, Robert Donne, 3 generations



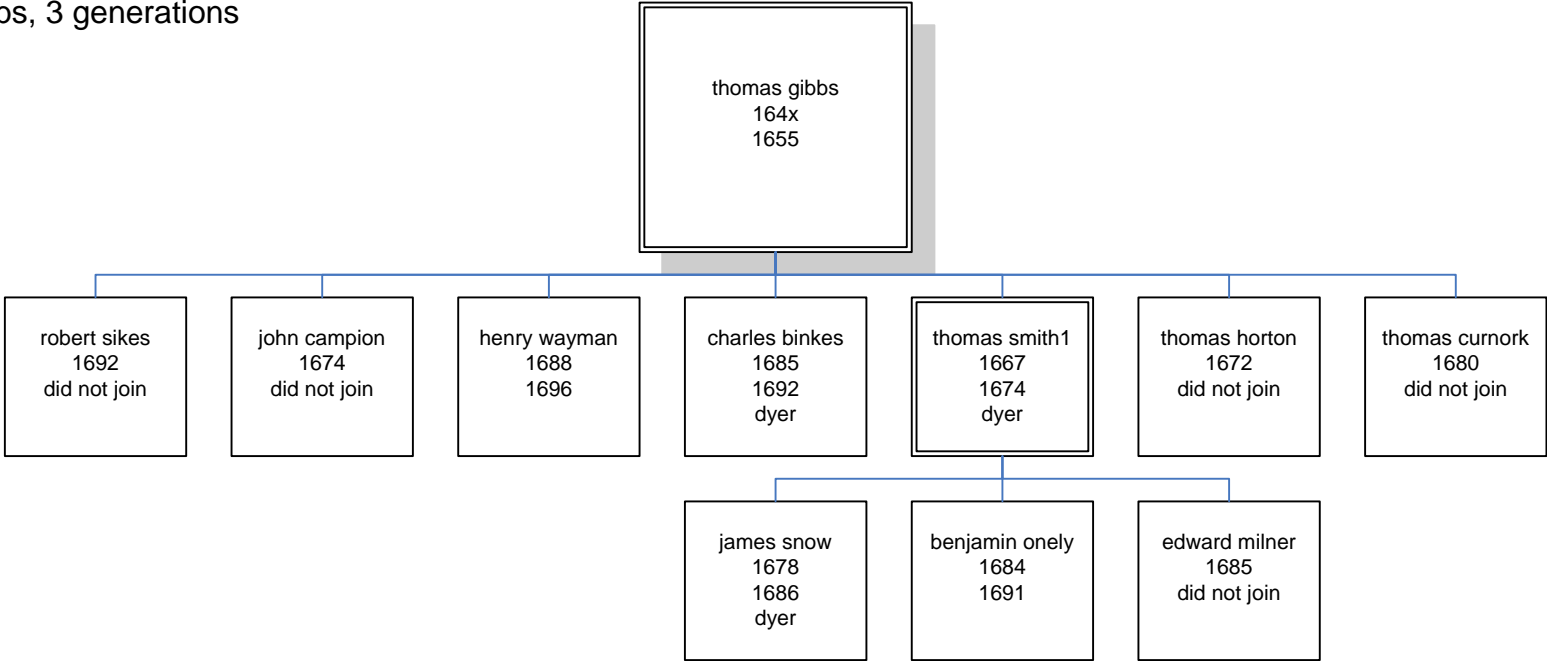
general, Thomas Ambler, 165x, 3 generations



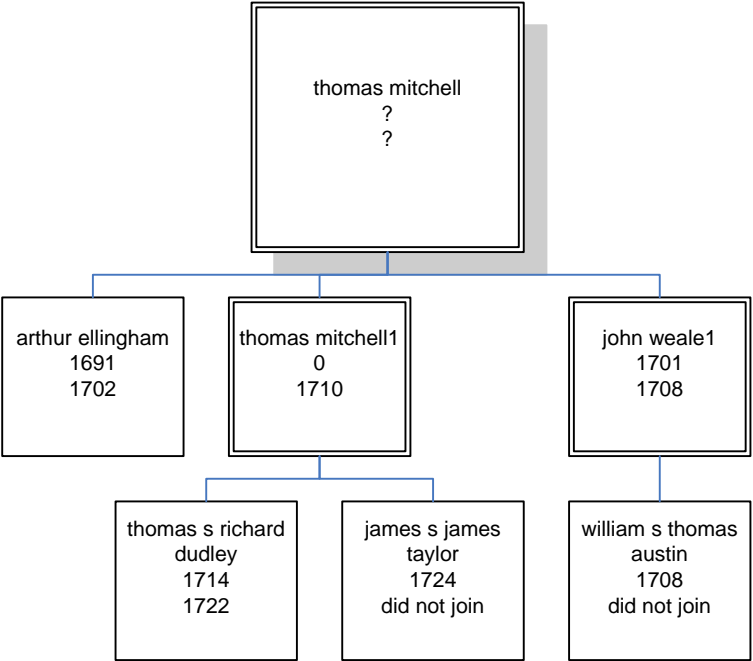
general, Thomas Cope, 1663, 3 generations



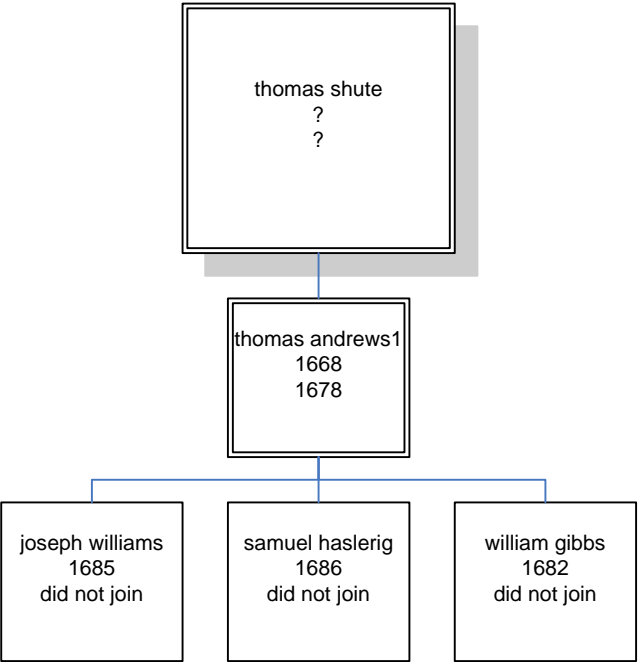
general, Thomas Gibbs, 3 generations



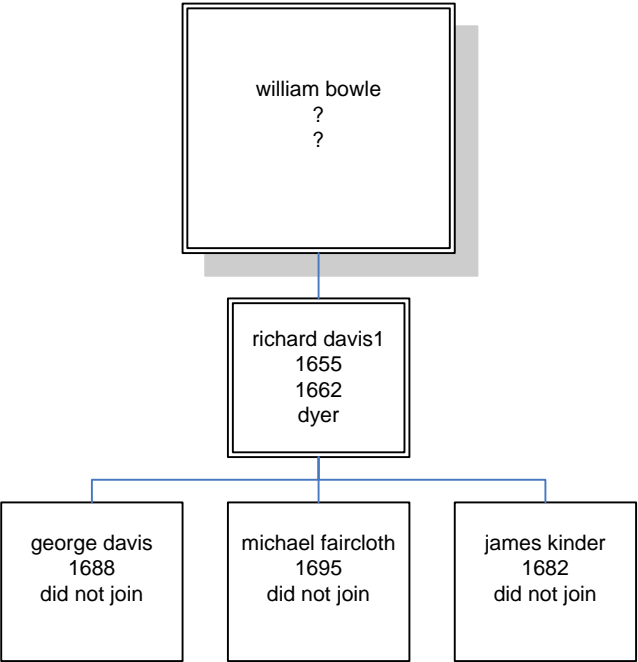
general, Thomas Mitchell, 3 generations



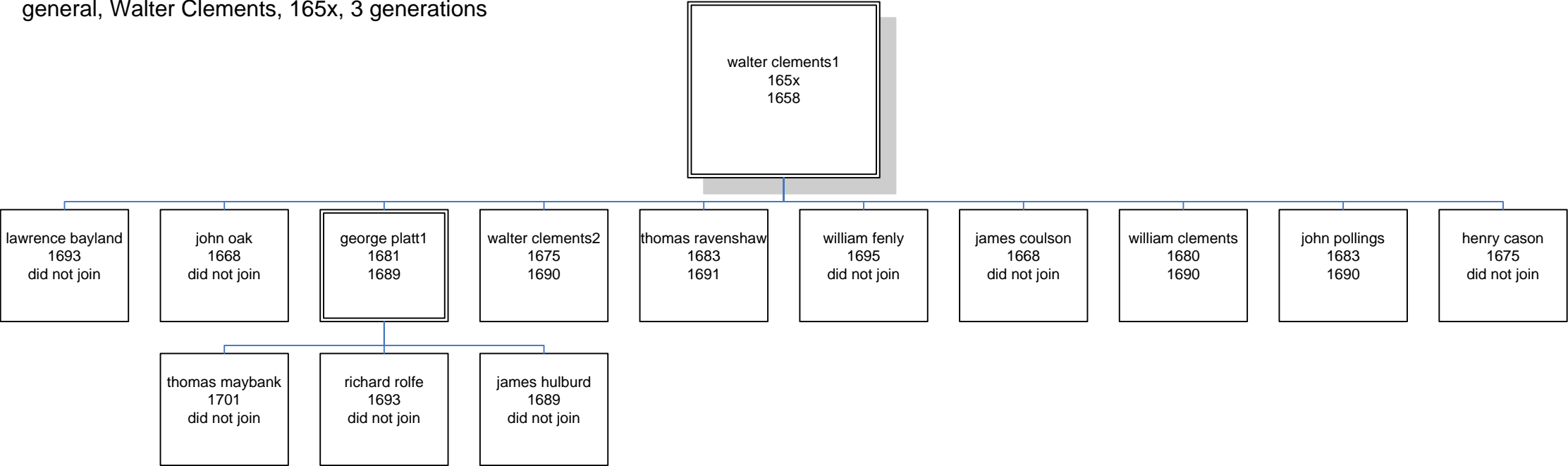
general, Thomas Shute, 1668, 3 generations



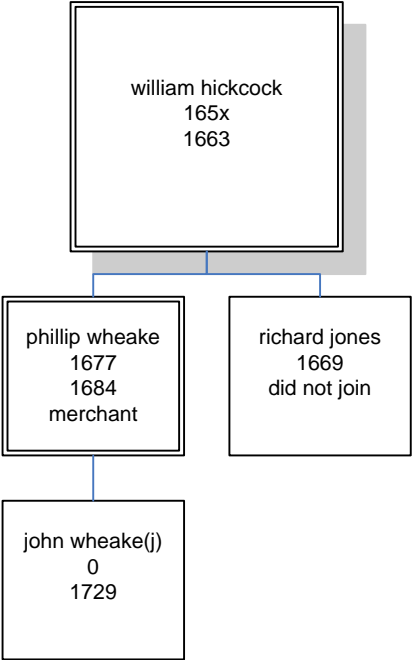
general, Walter Bowle, 3 generations



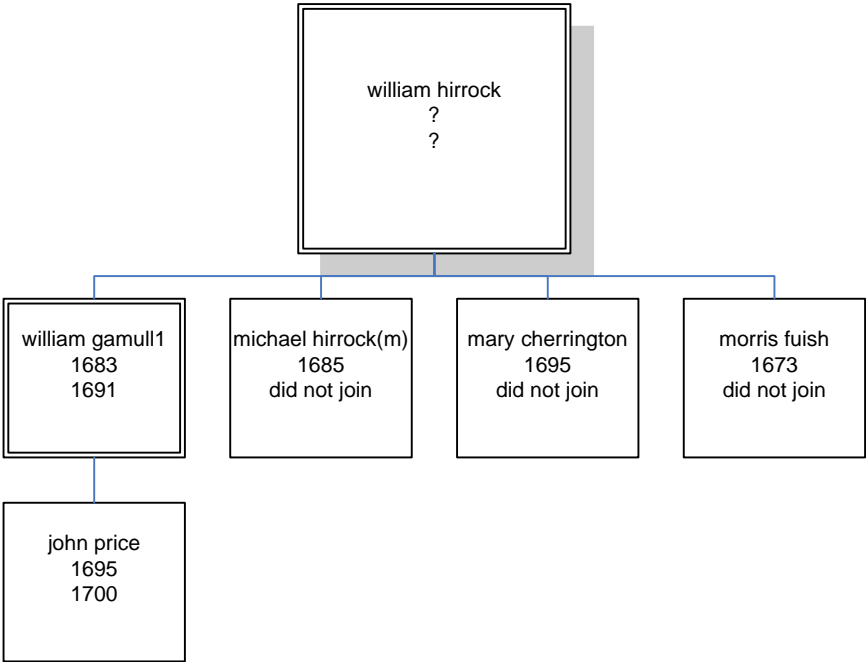
general, Walter Clements, 165x, 3 generations



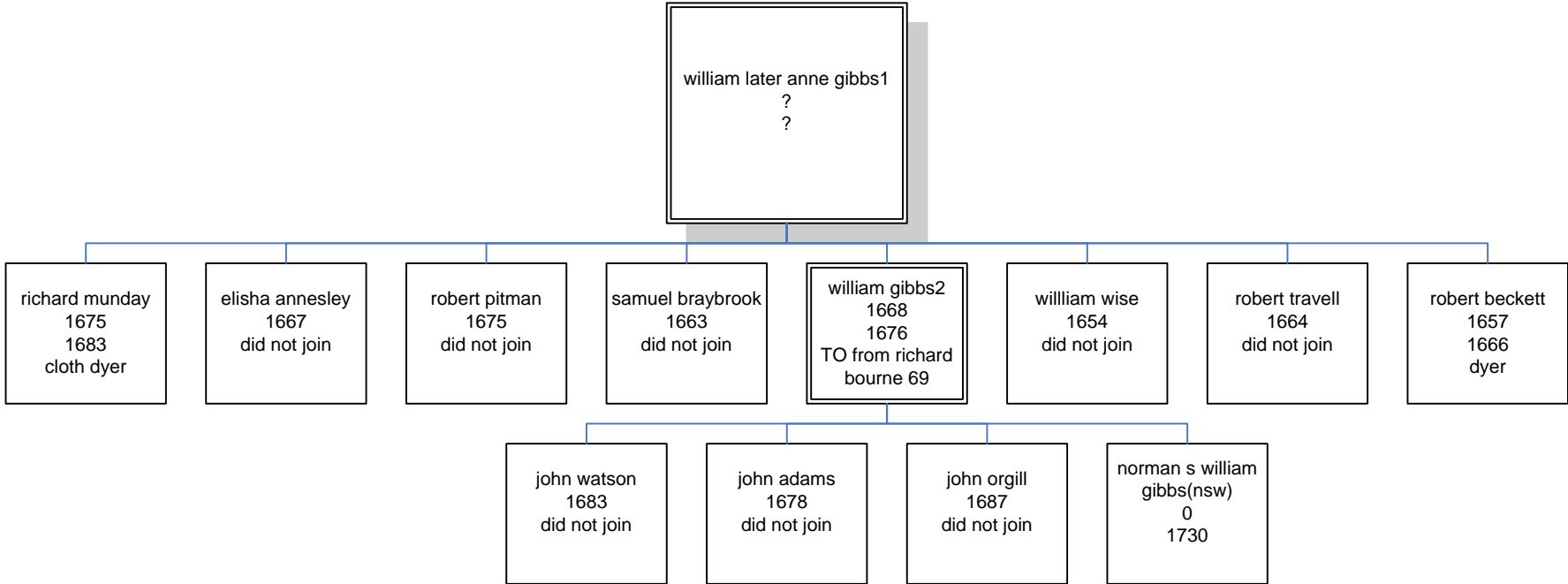
general, William Hickcock, 3 generations



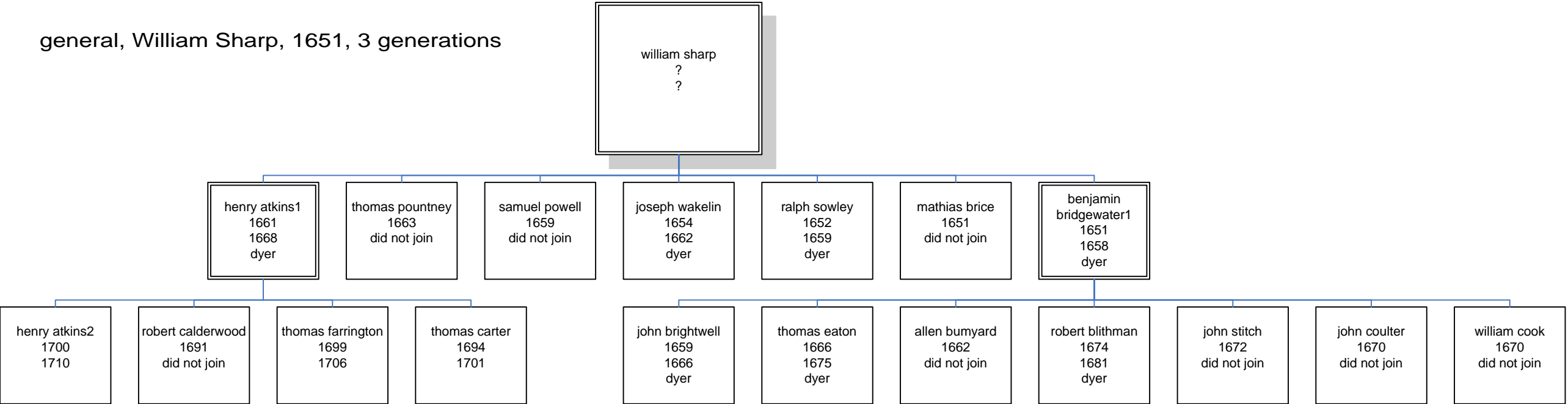
general, William Hirrock, 3 generations



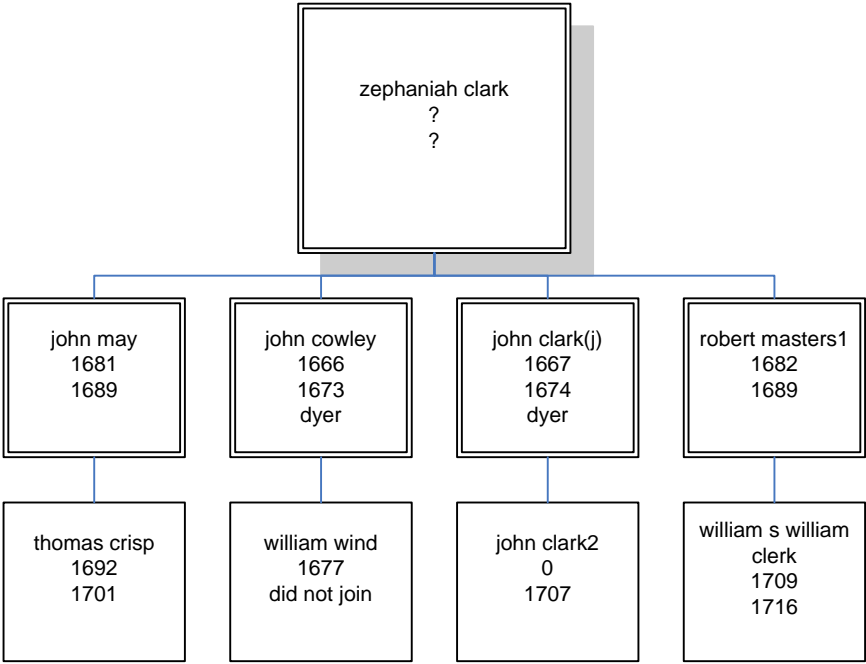
general, William later Anne Gibbs, 1654, 3 generations



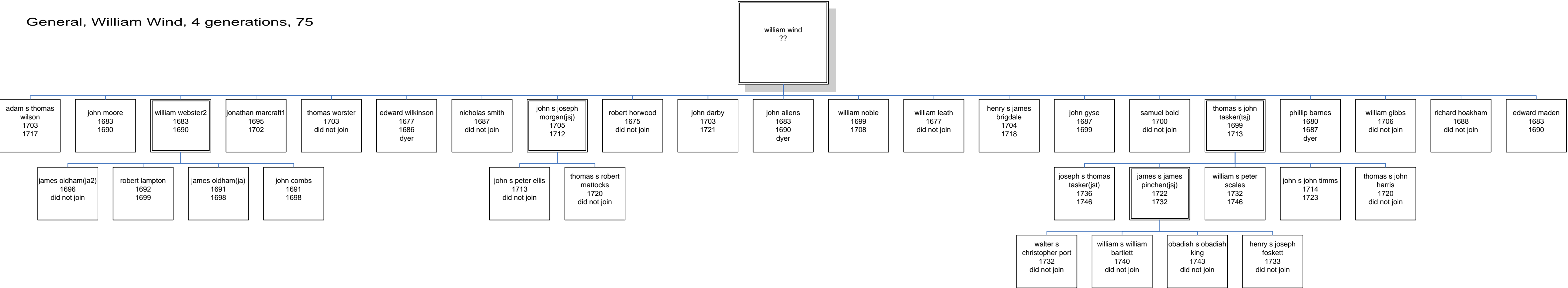
general, William Sharp, 1651, 3 generations

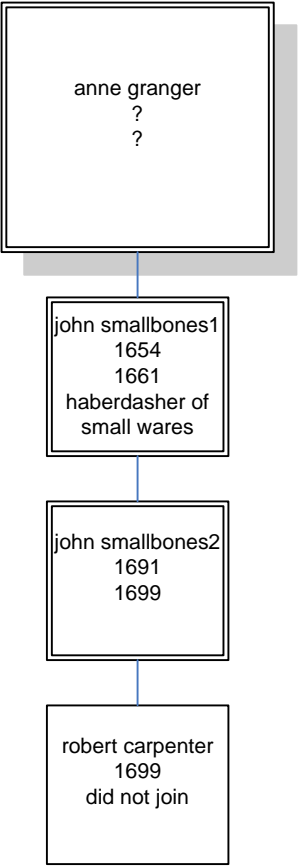


general, Zephaniah Clark, 1666, 3 generations

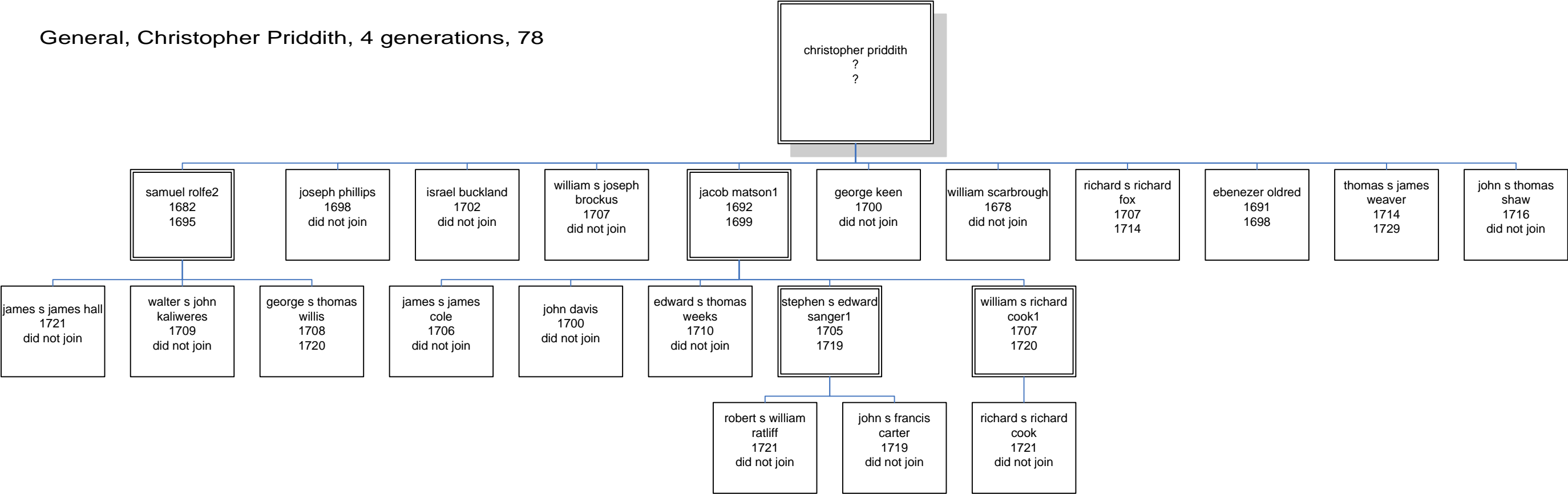


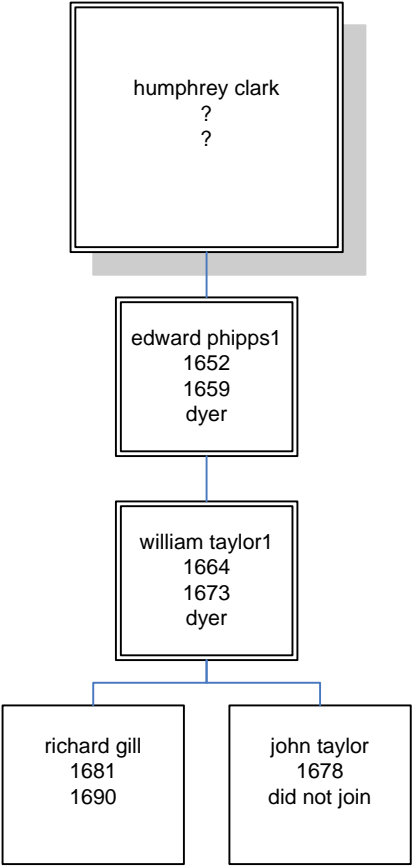
General, William Wind, 4 generations, 75

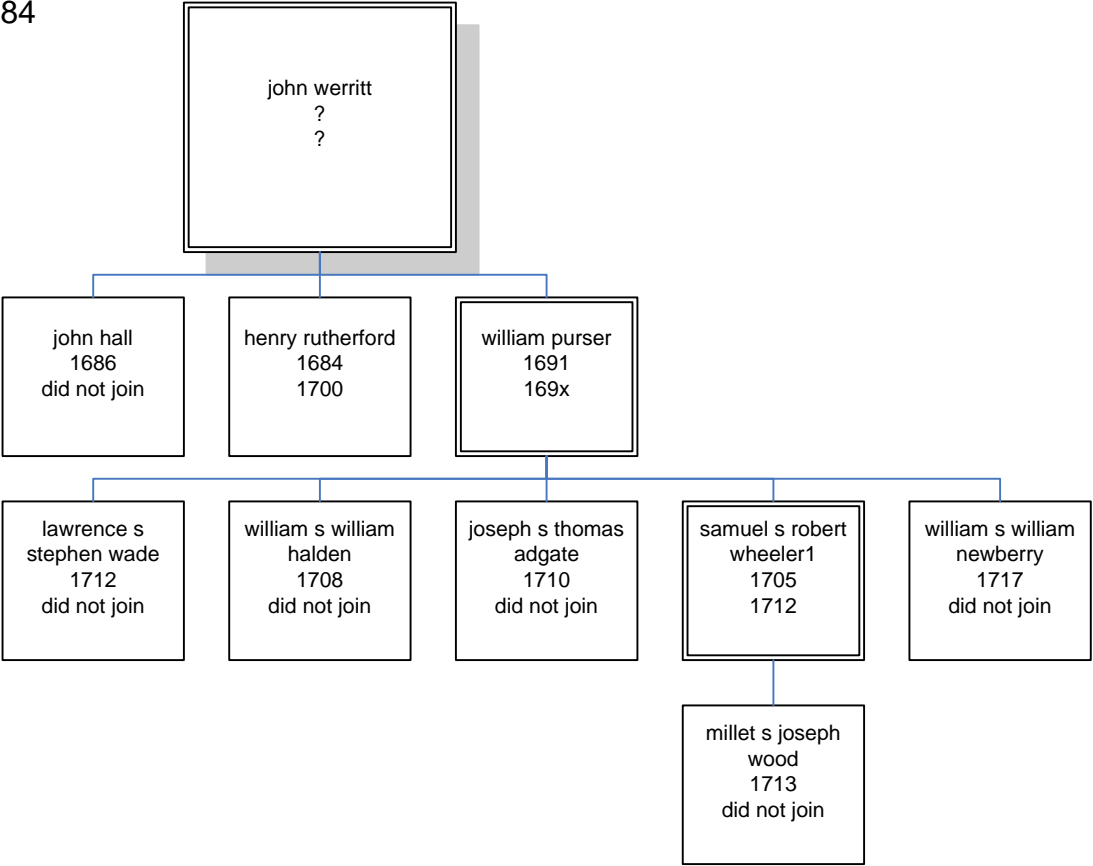


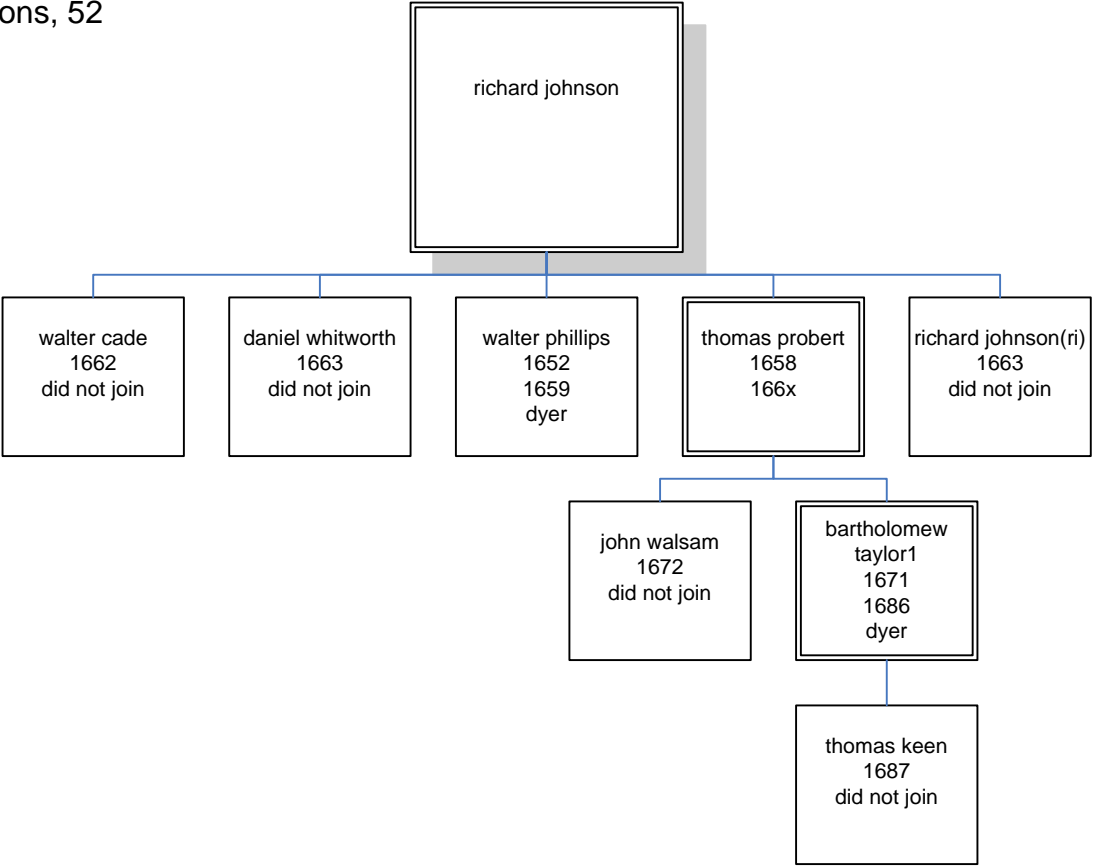


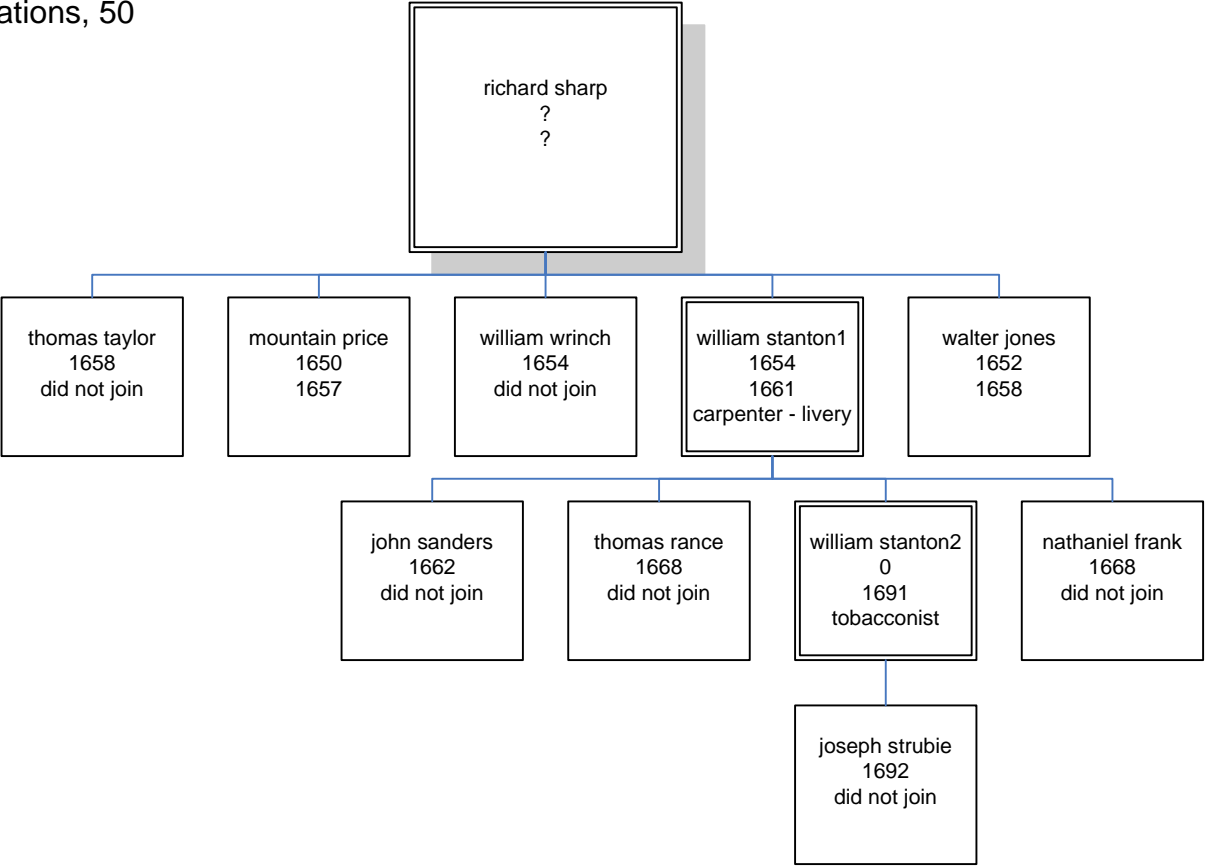
General, Christopher Priddith, 4 generations, 78











thomas roberts
?
?

john woodward1
1671
1678
dyer

daniel s william
alexander
1704
1716

william s henry
woodward
1717
did not join

william s joseph
wright
1709
did not join

samuel s thomas
punn
1722
did not join

jsaac s timothy
smith
1717
did not join

john s henry
earlott
1734
did not join

thomas s thomas
lemon
1724
did not join

john s thomas
cowdry
1722
did not join

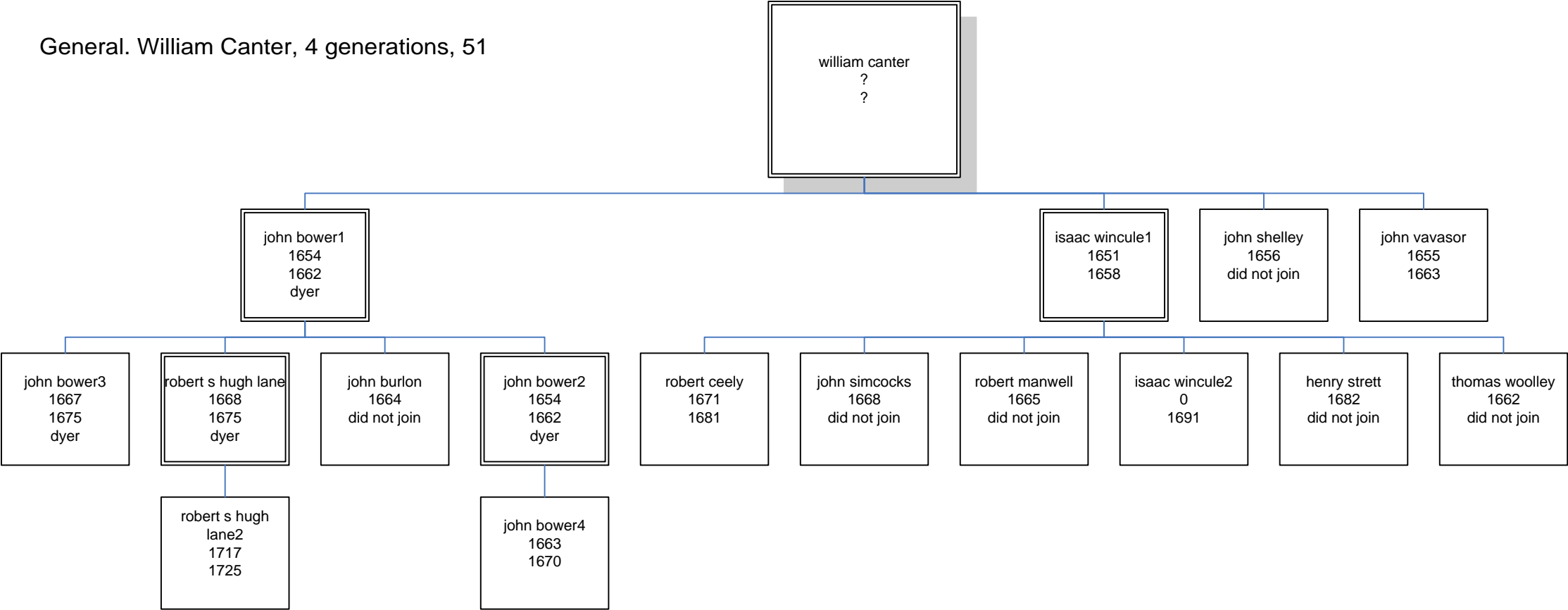
francis s francis
frewin
1717
did not join

peter s john
reynolds
1737
did not join

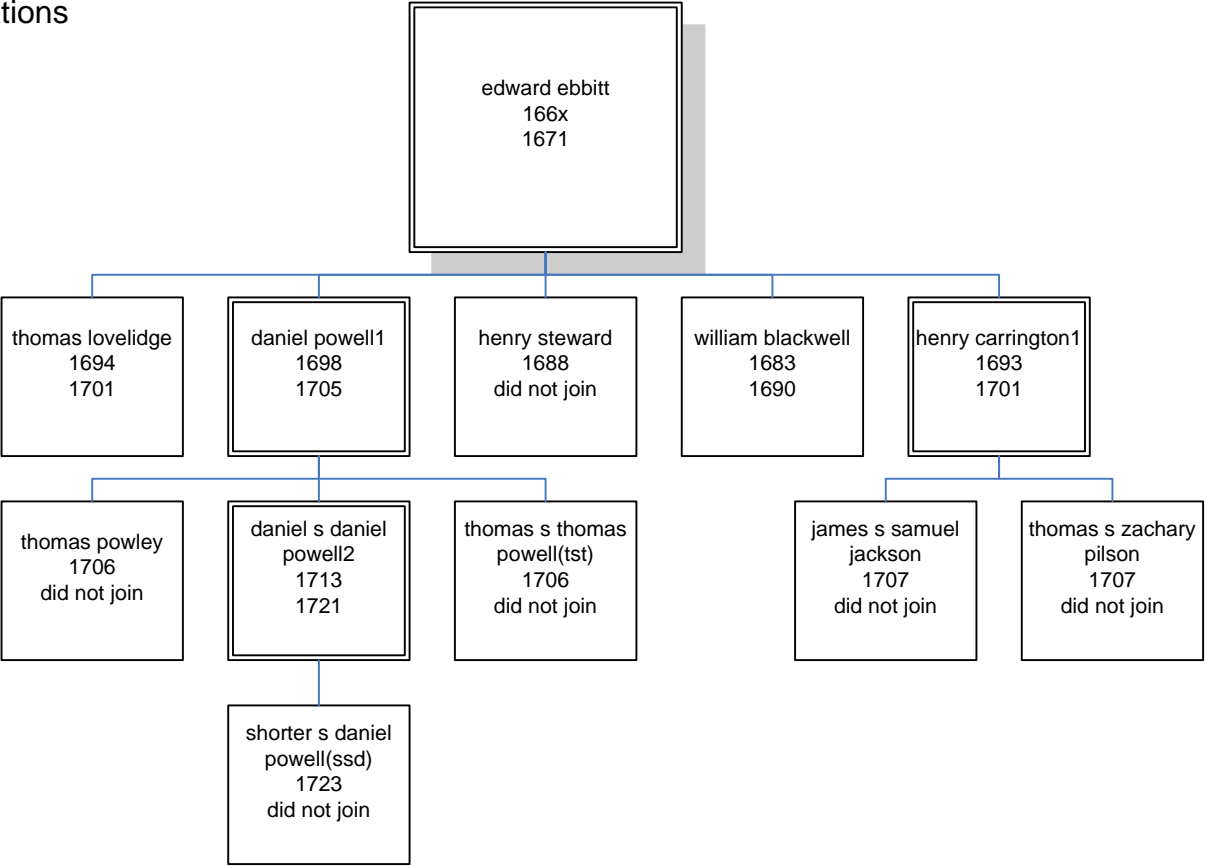
thomas s thomas
alexander(tst)
1728
did not join

daniel s daniel
alexander(dsd)
1730
did not join

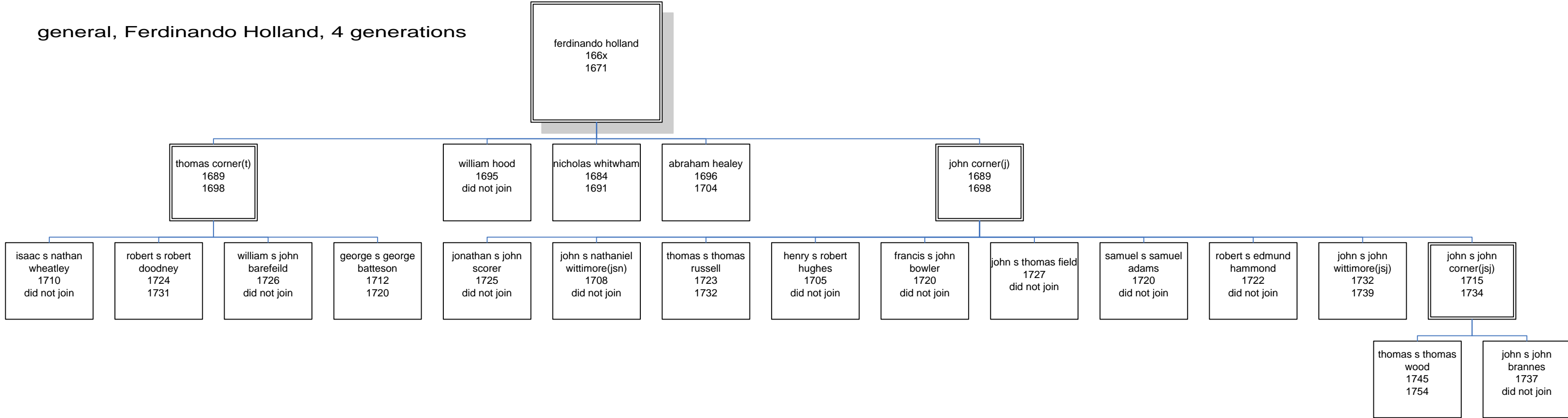
General. William Canter, 4 generations, 51



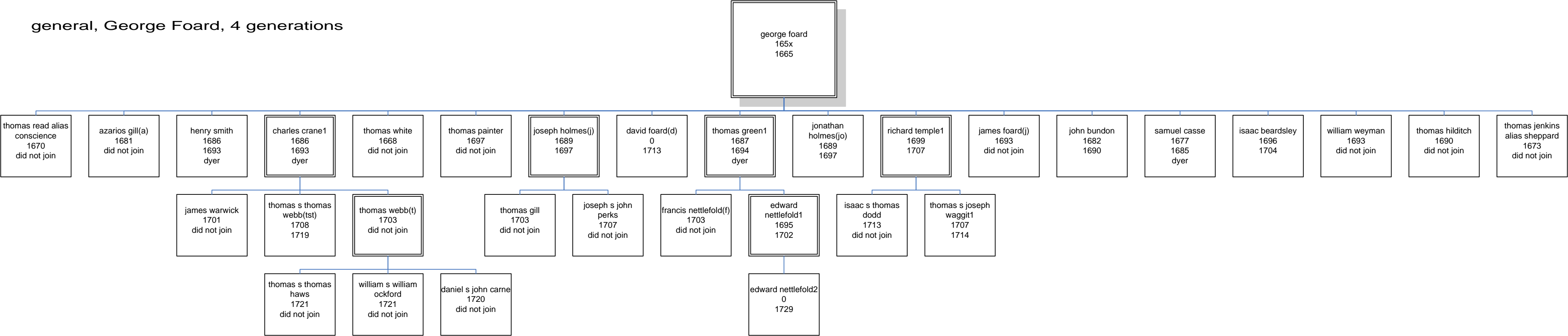
general, Edward Ebbitt, 4 generations



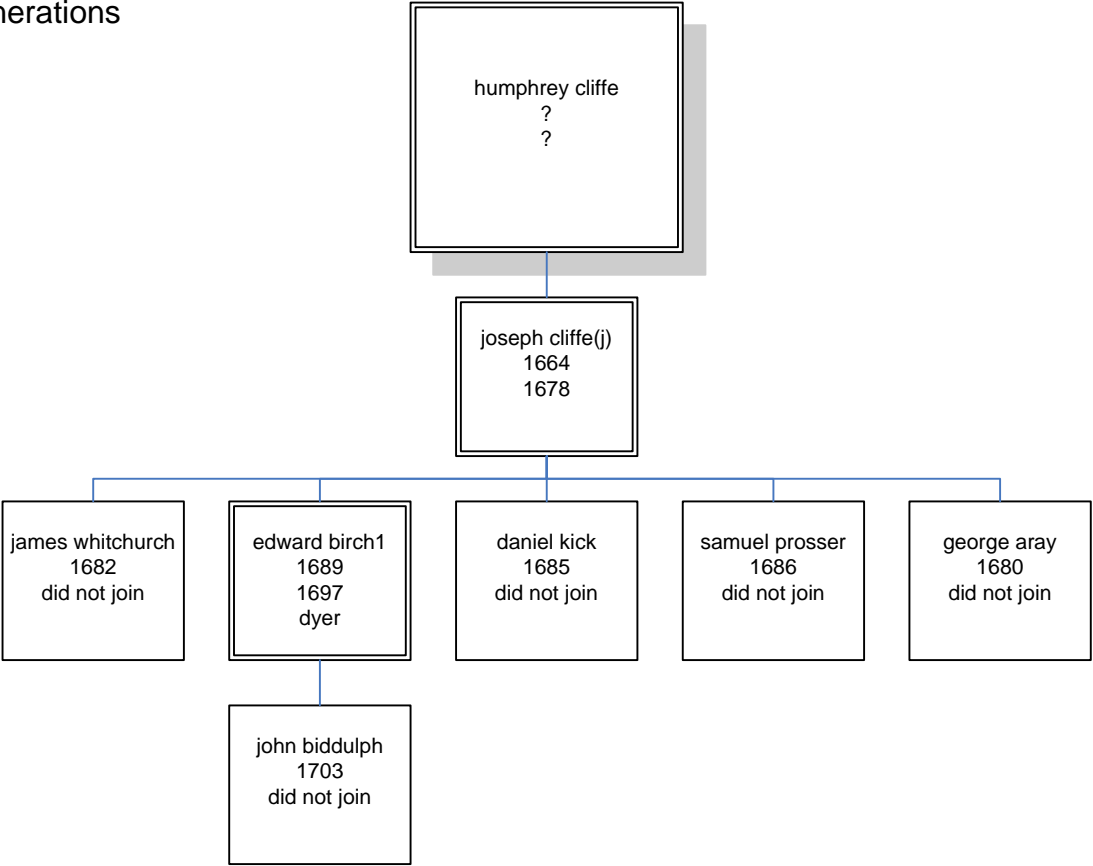
general, Ferdinando Holland, 4 generations



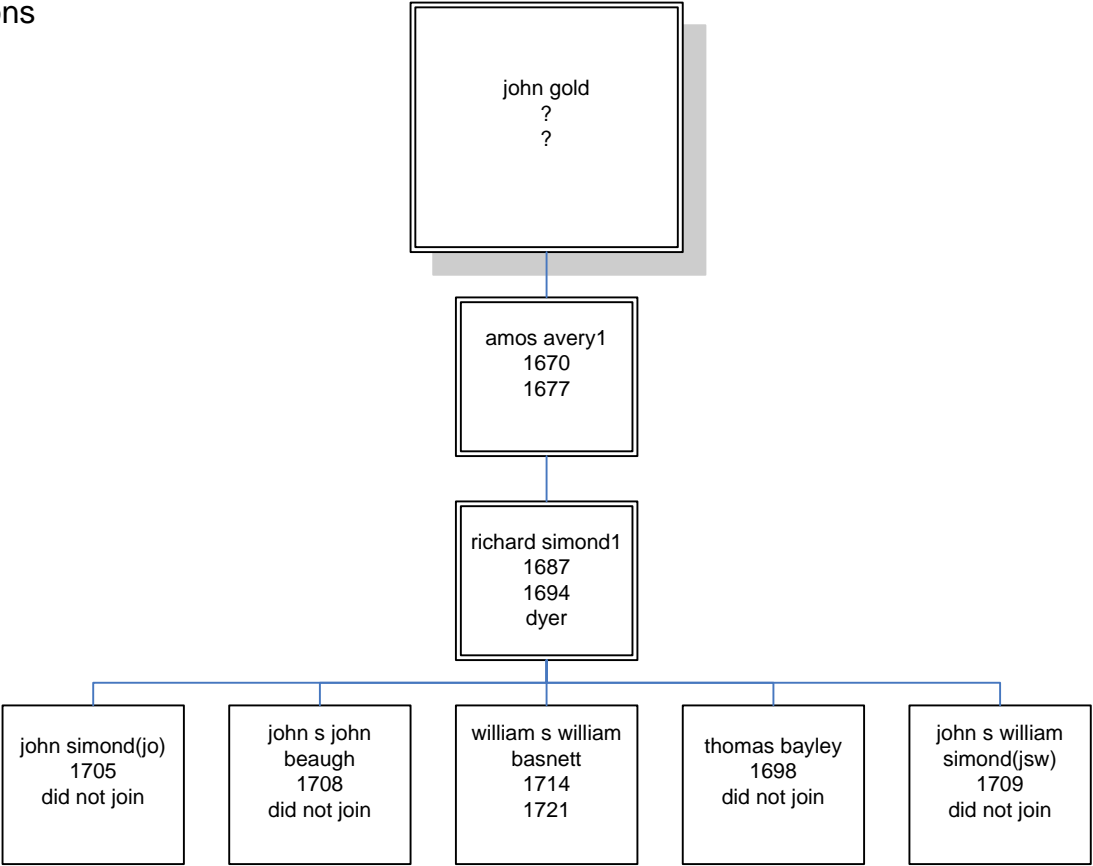
general, George Foard, 4 generations



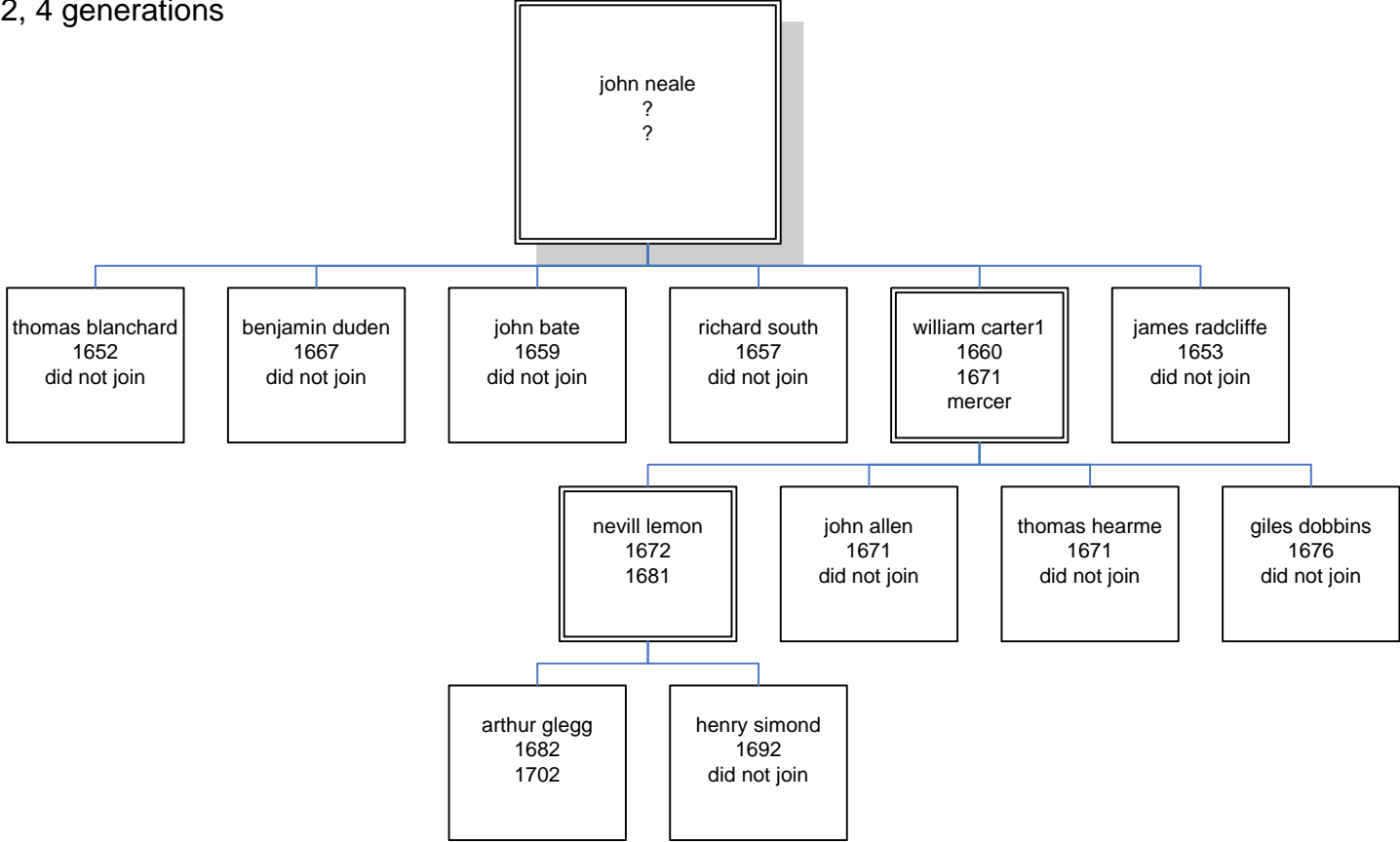
general, Humphrey Cliffe, 1664, 4 generations



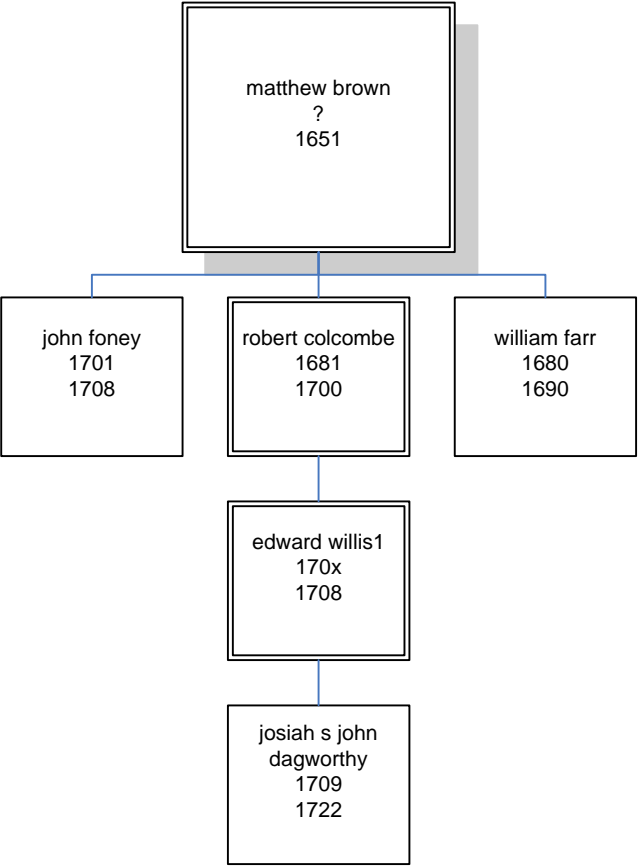
general, John Gold, 166x, 4 generations



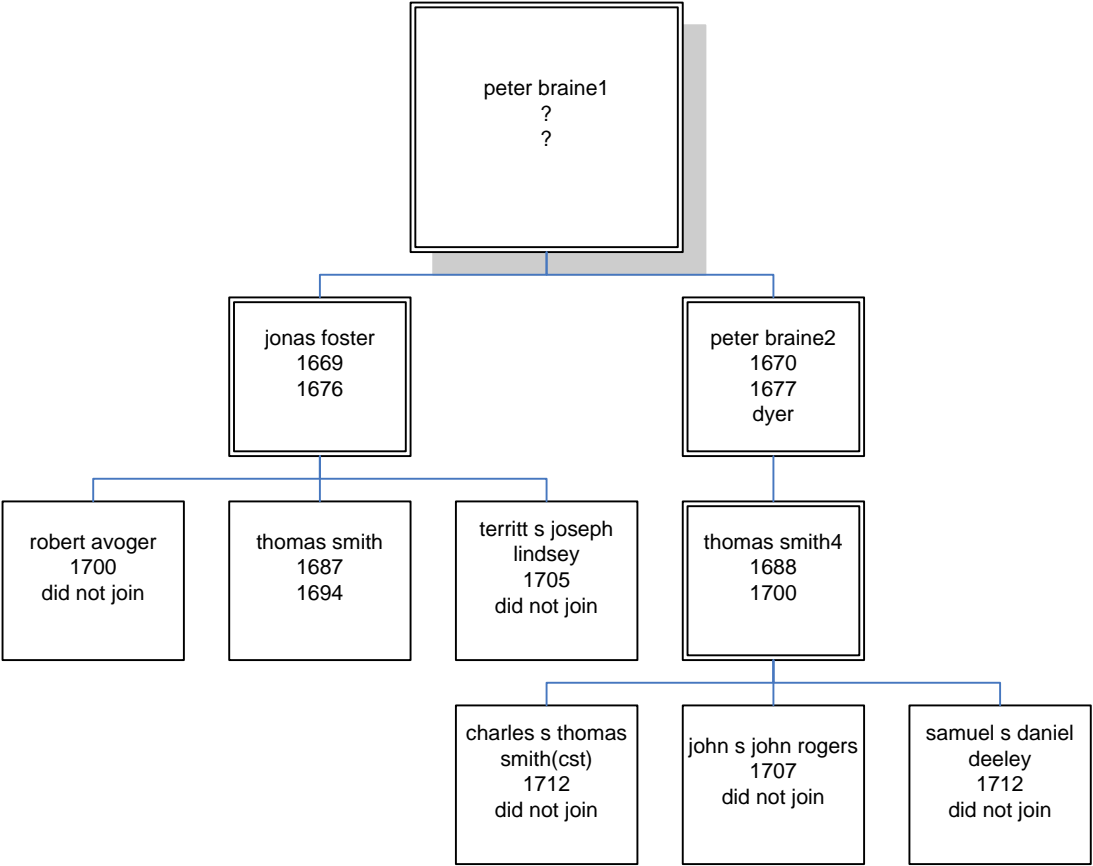
general, John Neale 1652, 4 generations



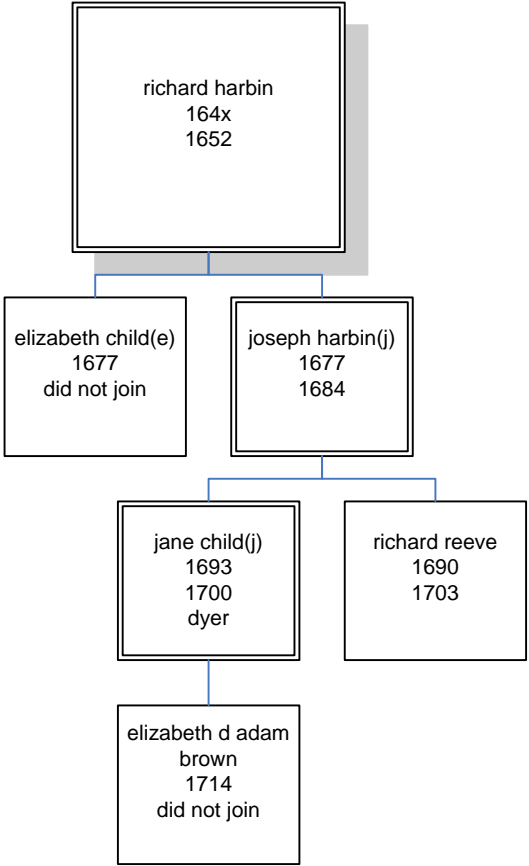
general, Matthew Brown, 164x, 4 generations



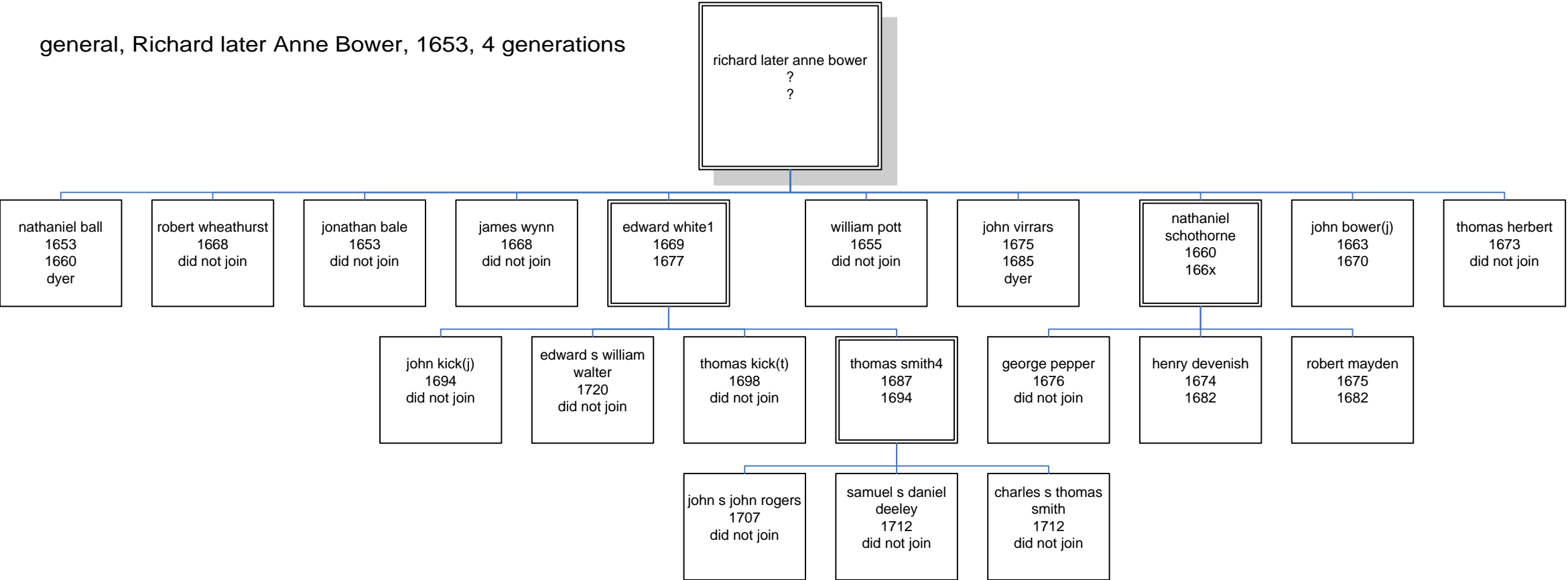
general, Peter Braine, 4 generations



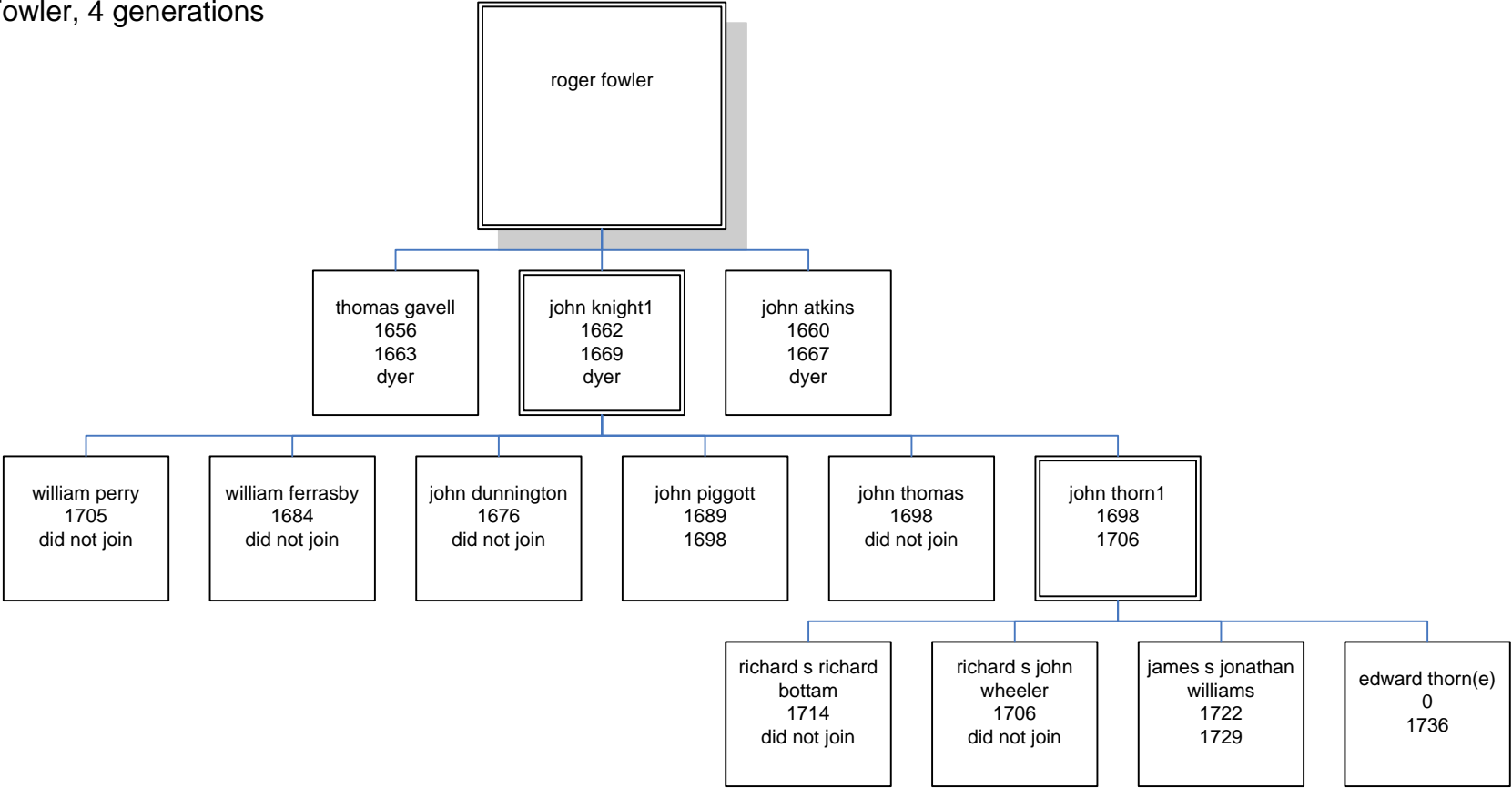
general, Richard Harbin, 4 generations



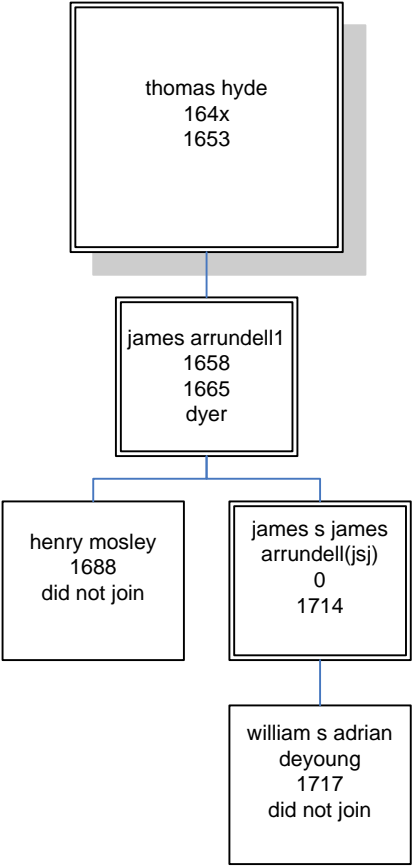
general, Richard later Anne Bower, 1653, 4 generations



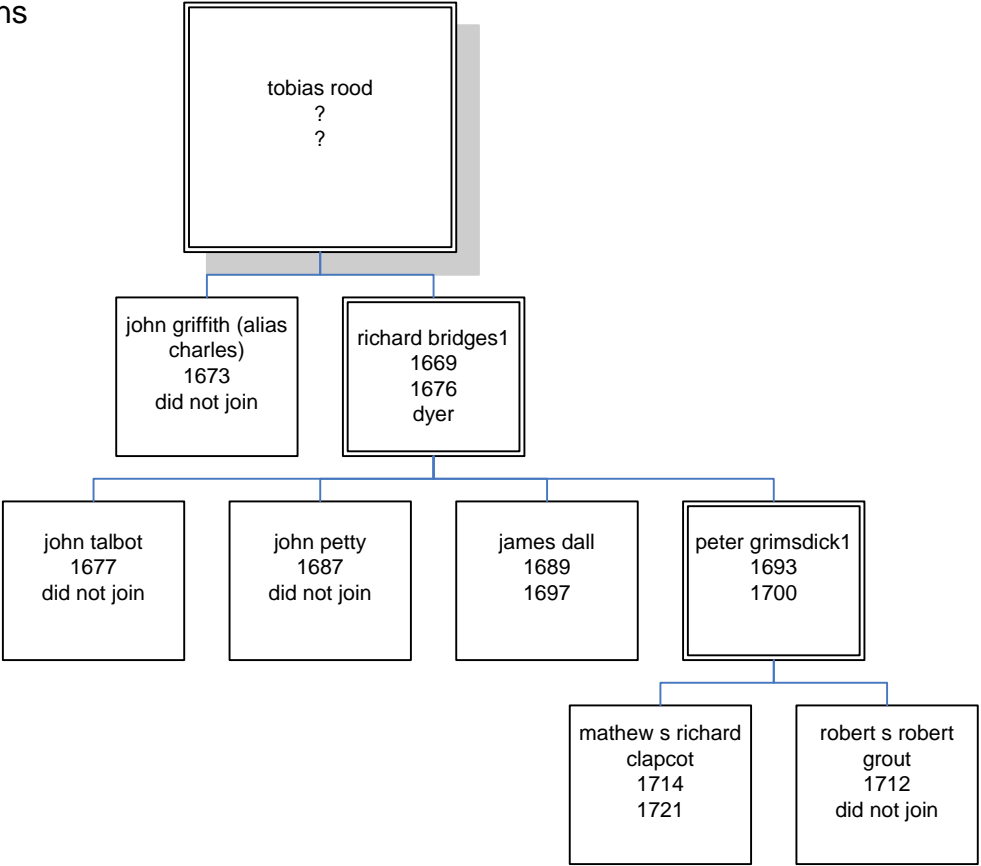
general, Roger Fowler, 4 generations



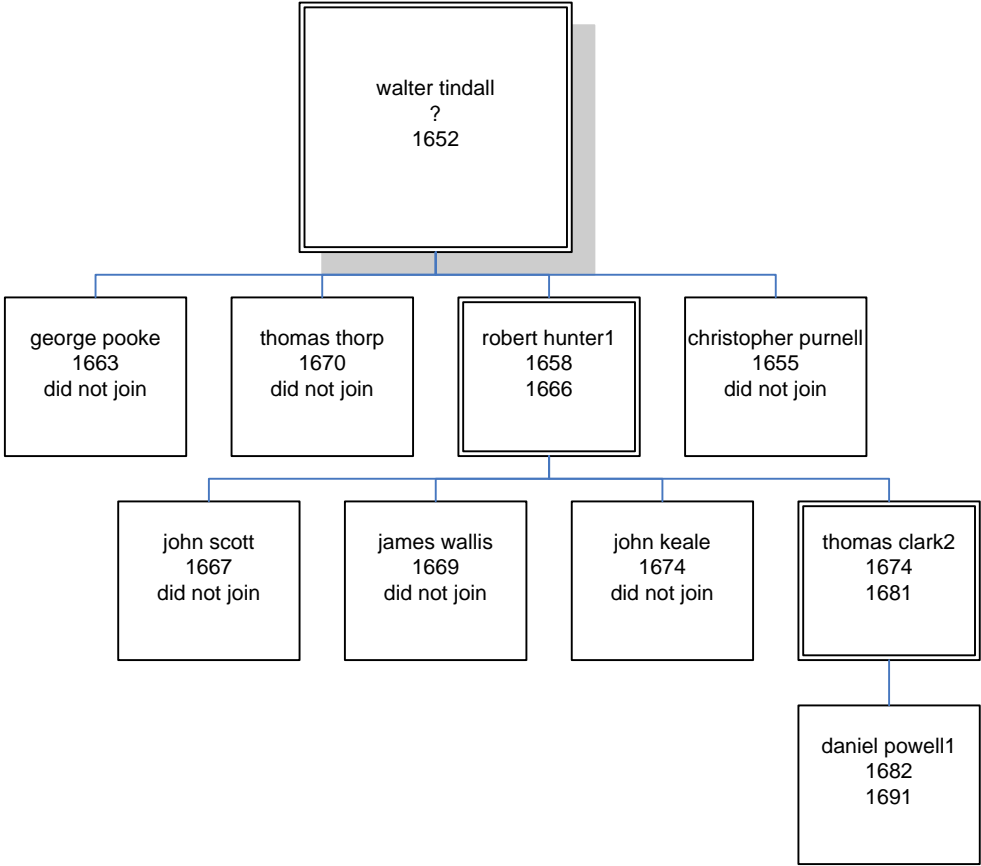
general, Thomas Hyde, 4 generations



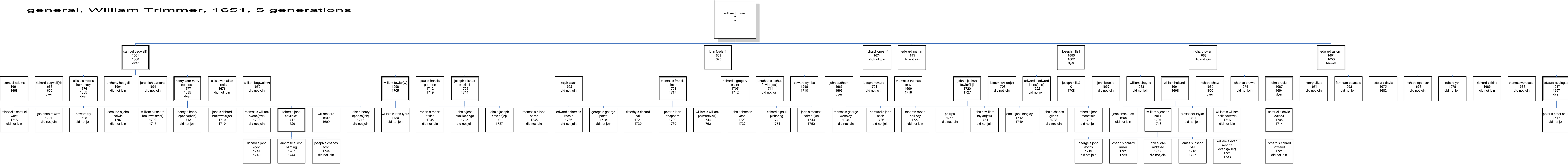
general, Tobias Rood, 1669, 4 generations

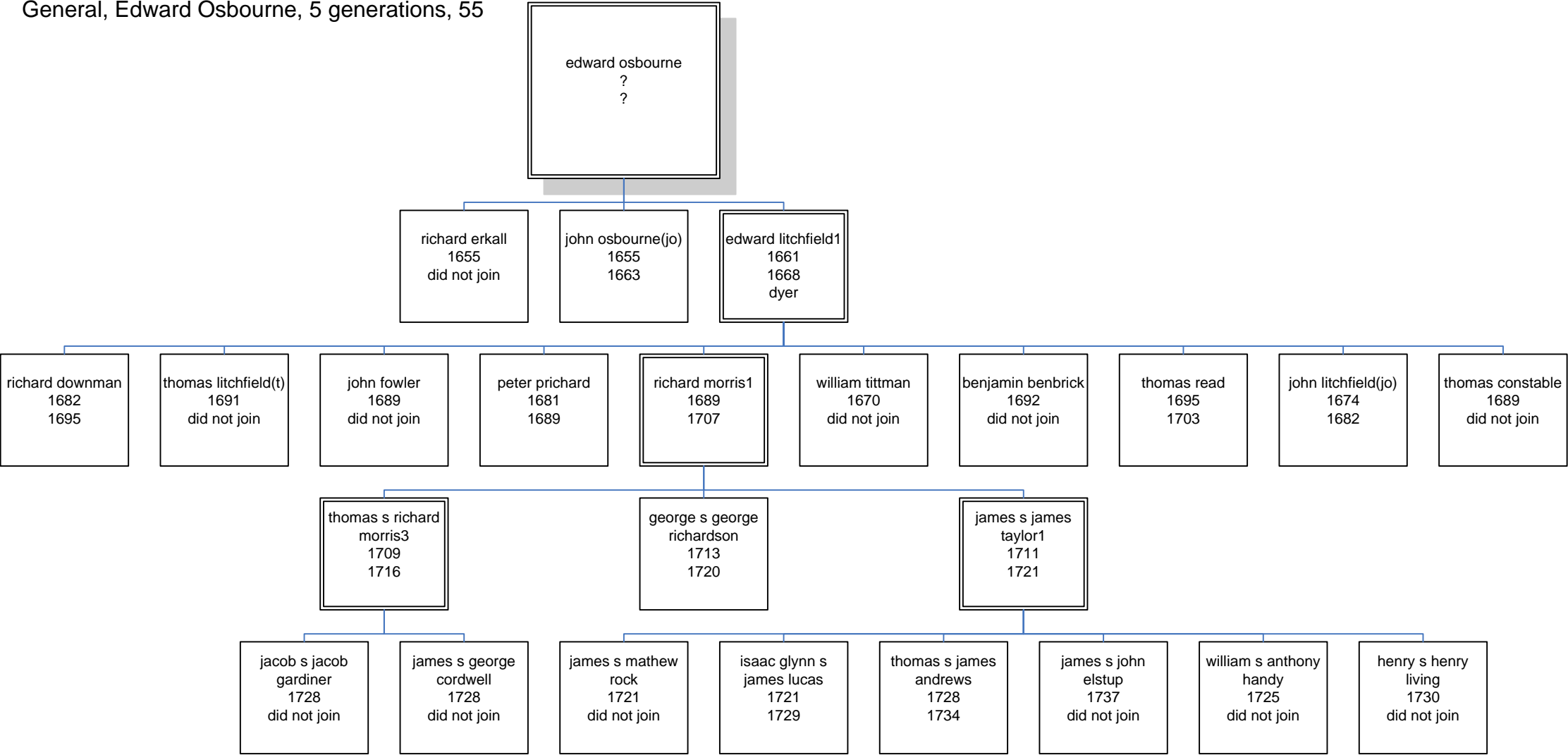


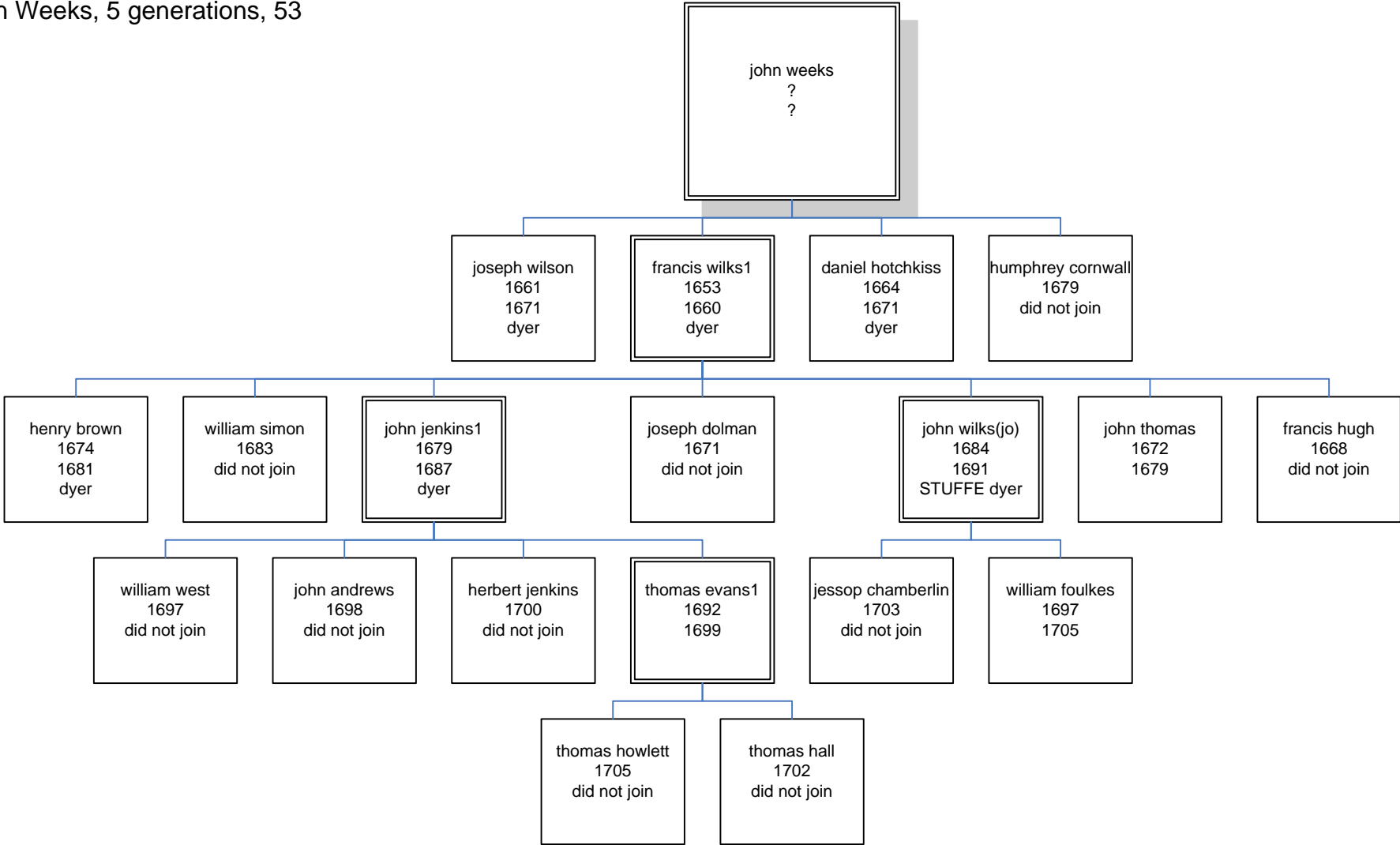
general, Walter Tindall, 4 generations



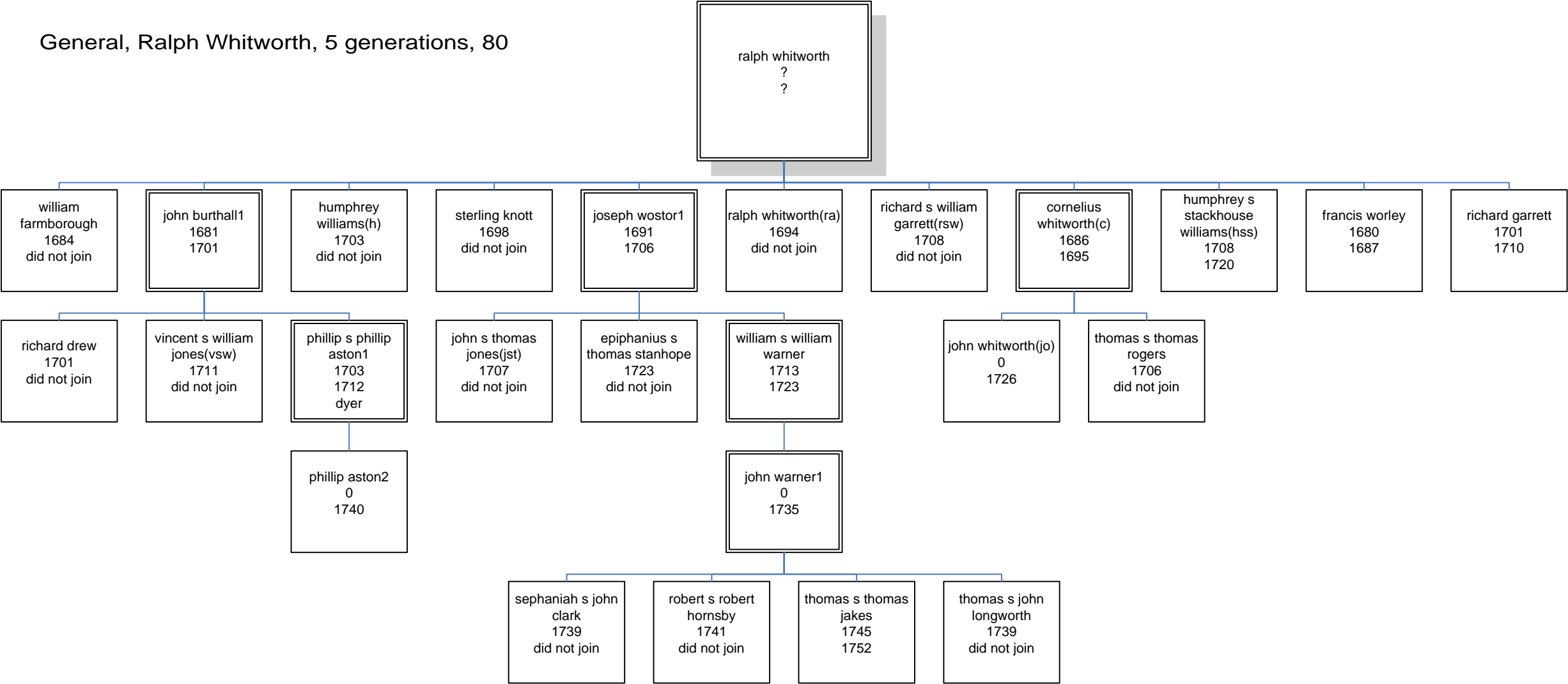
general, William Trimmer, 1651, 5 generations

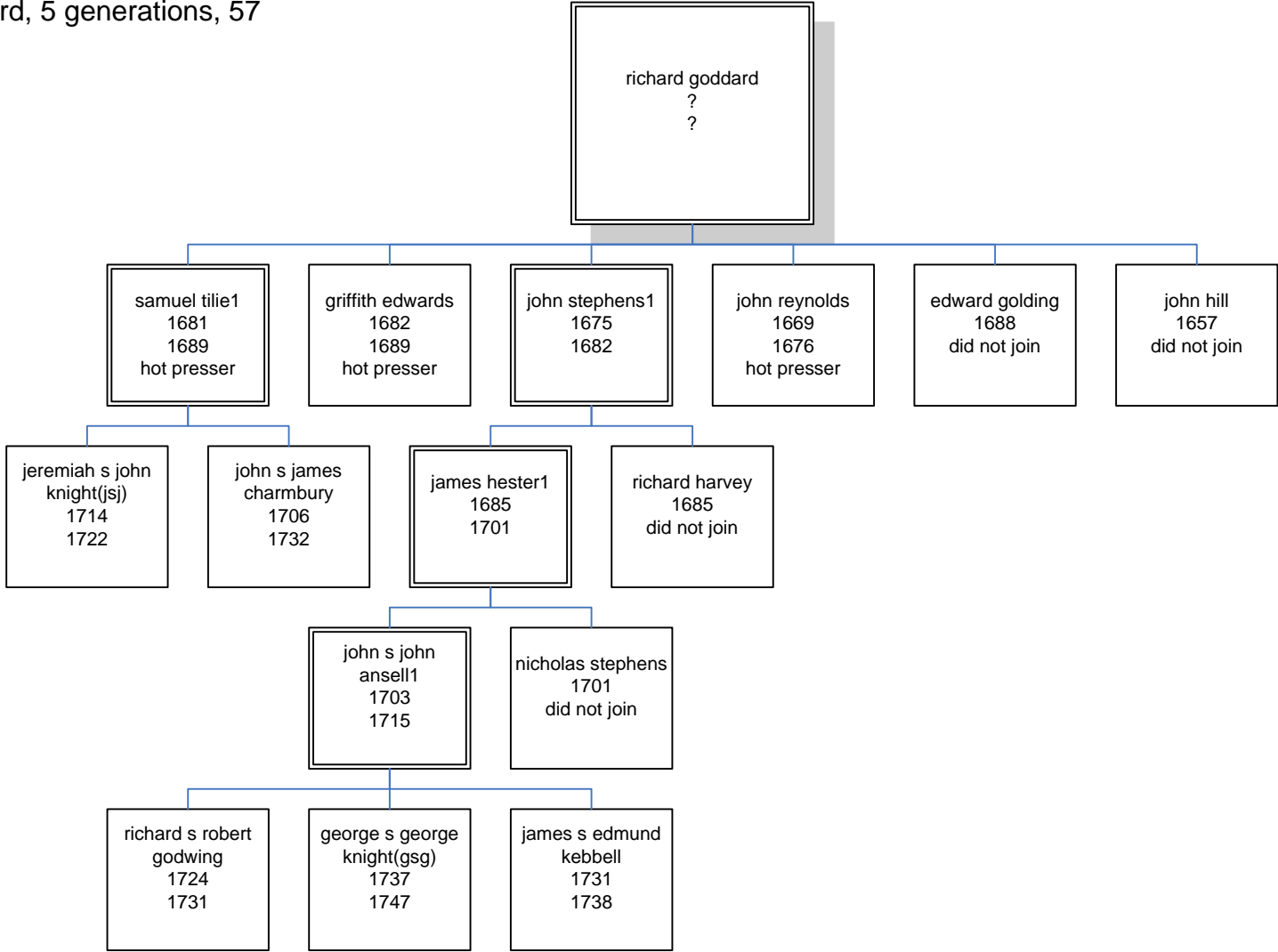




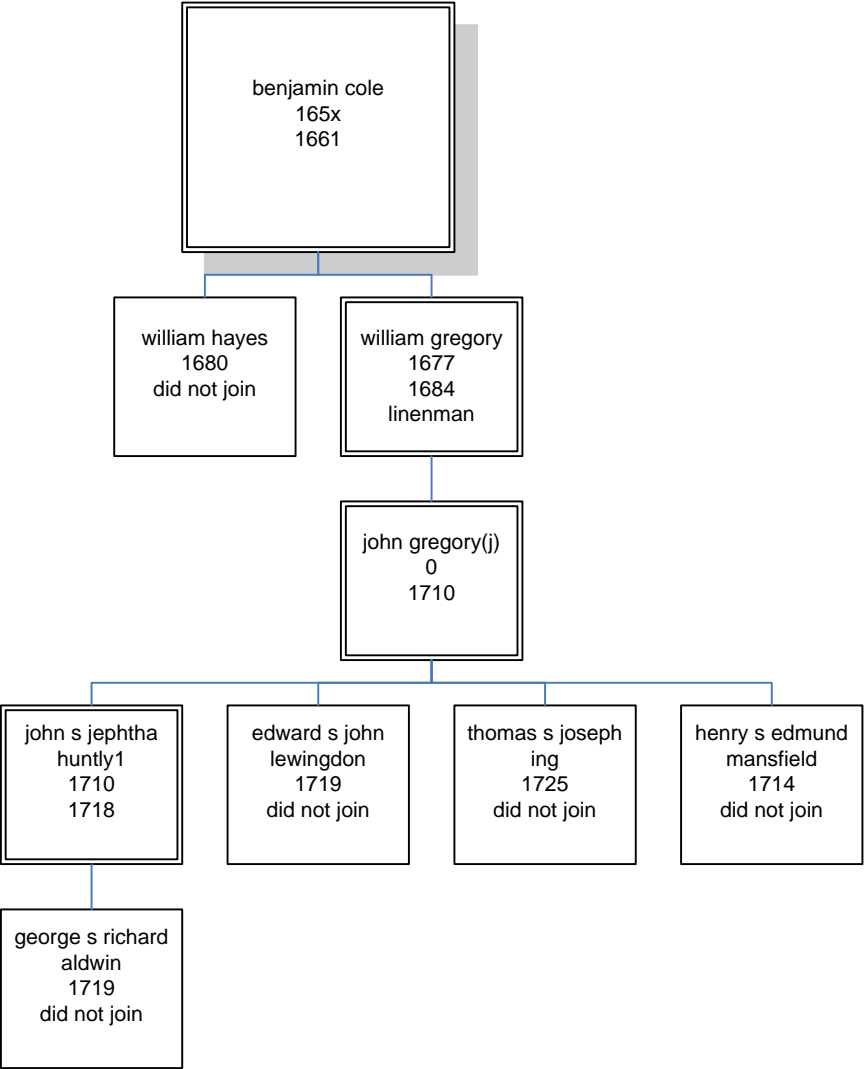


General, Ralph Whitworth, 5 generations, 80

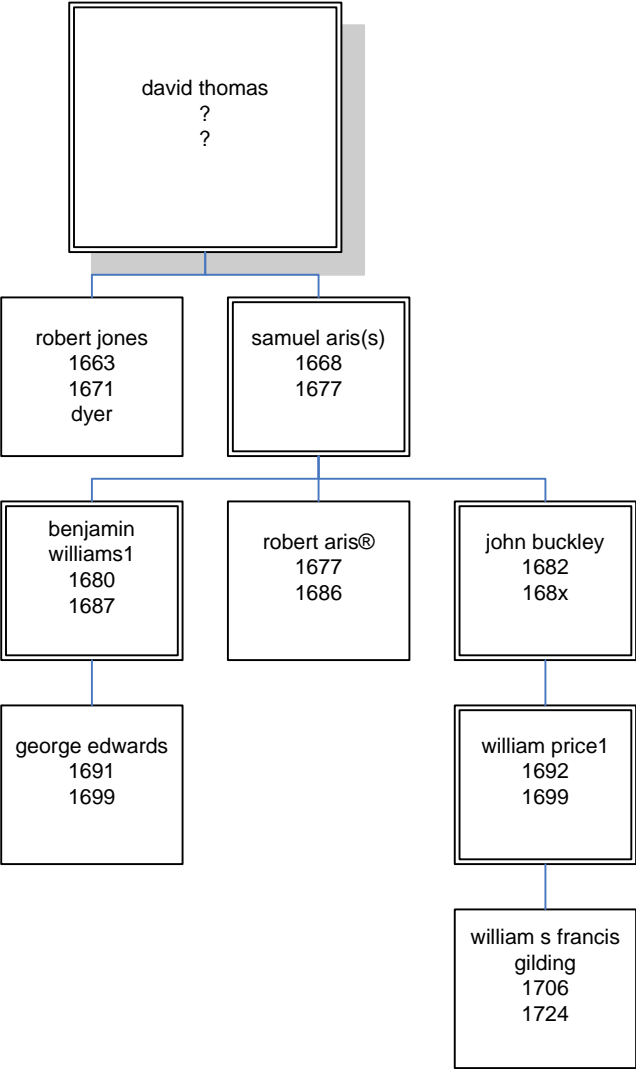




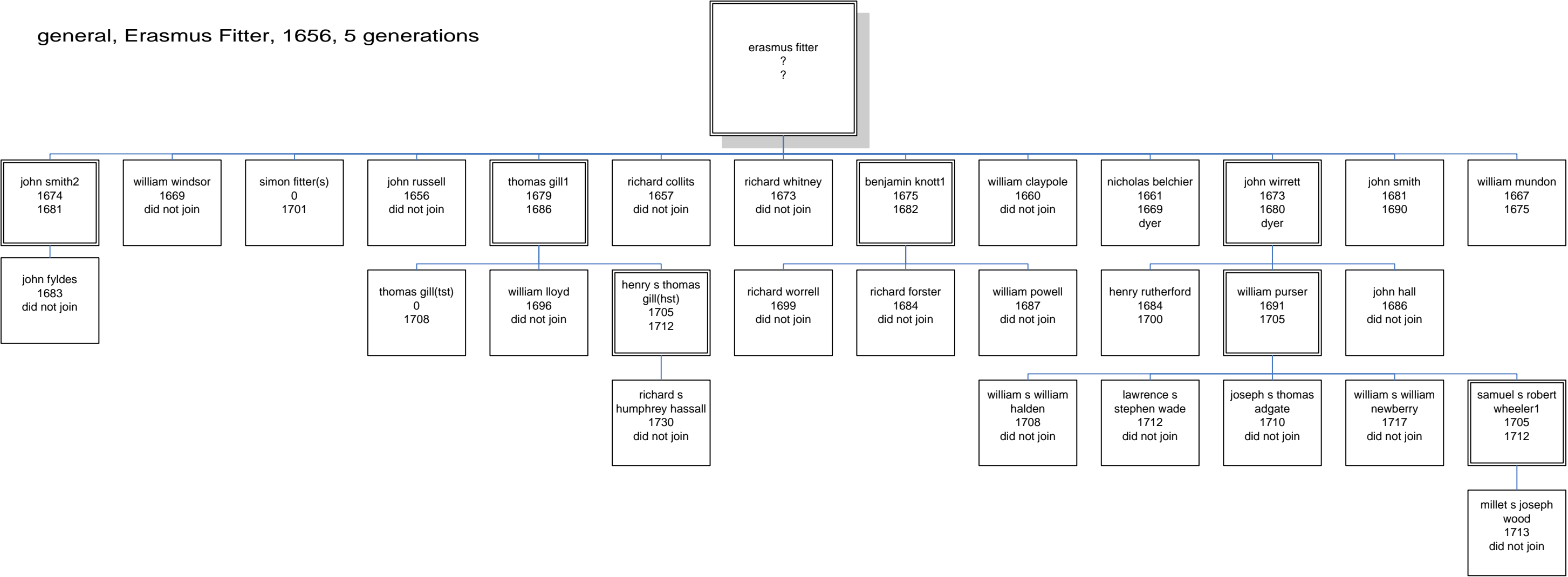
general, Benjamin Cole, 165x, 5 generations



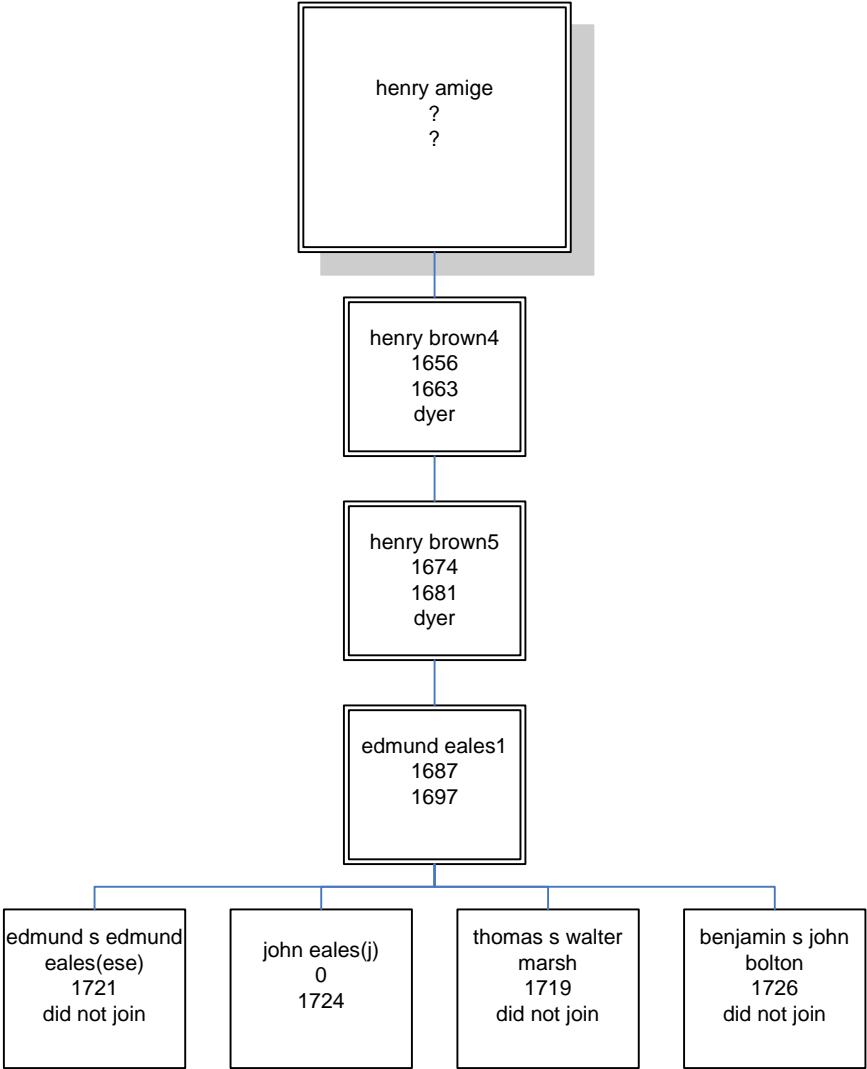
general, David Thomas, 5 generations



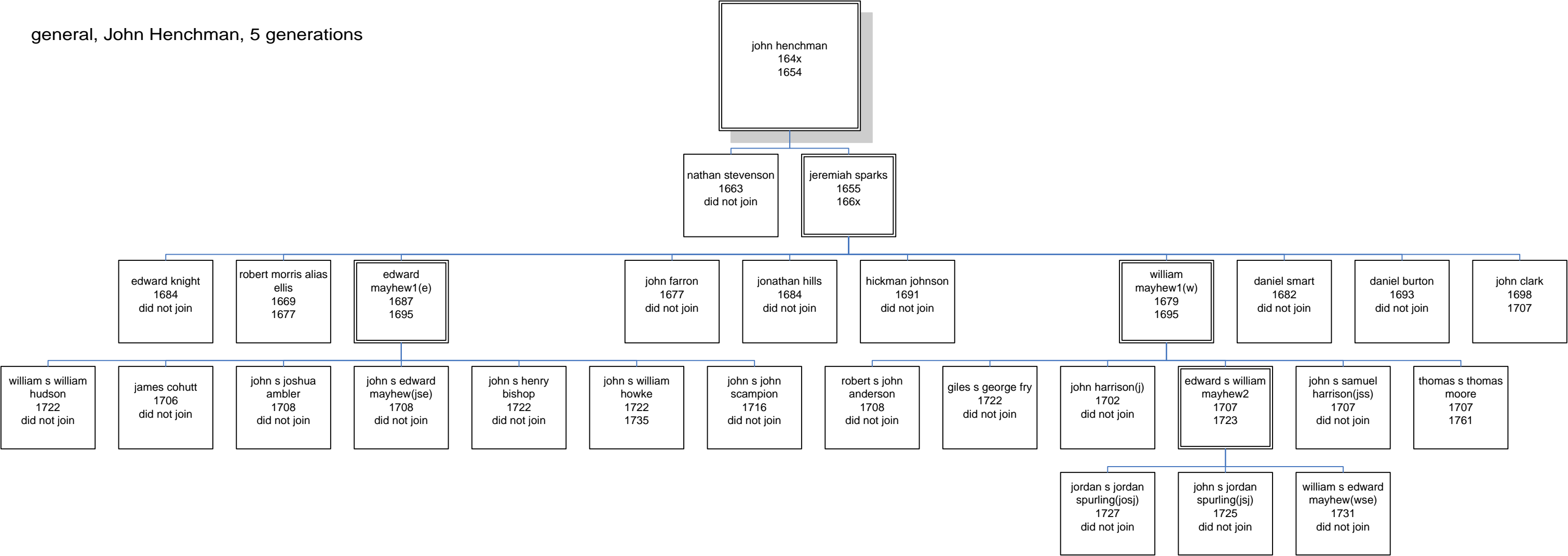
general, Erasmus Fitter, 1656, 5 generations



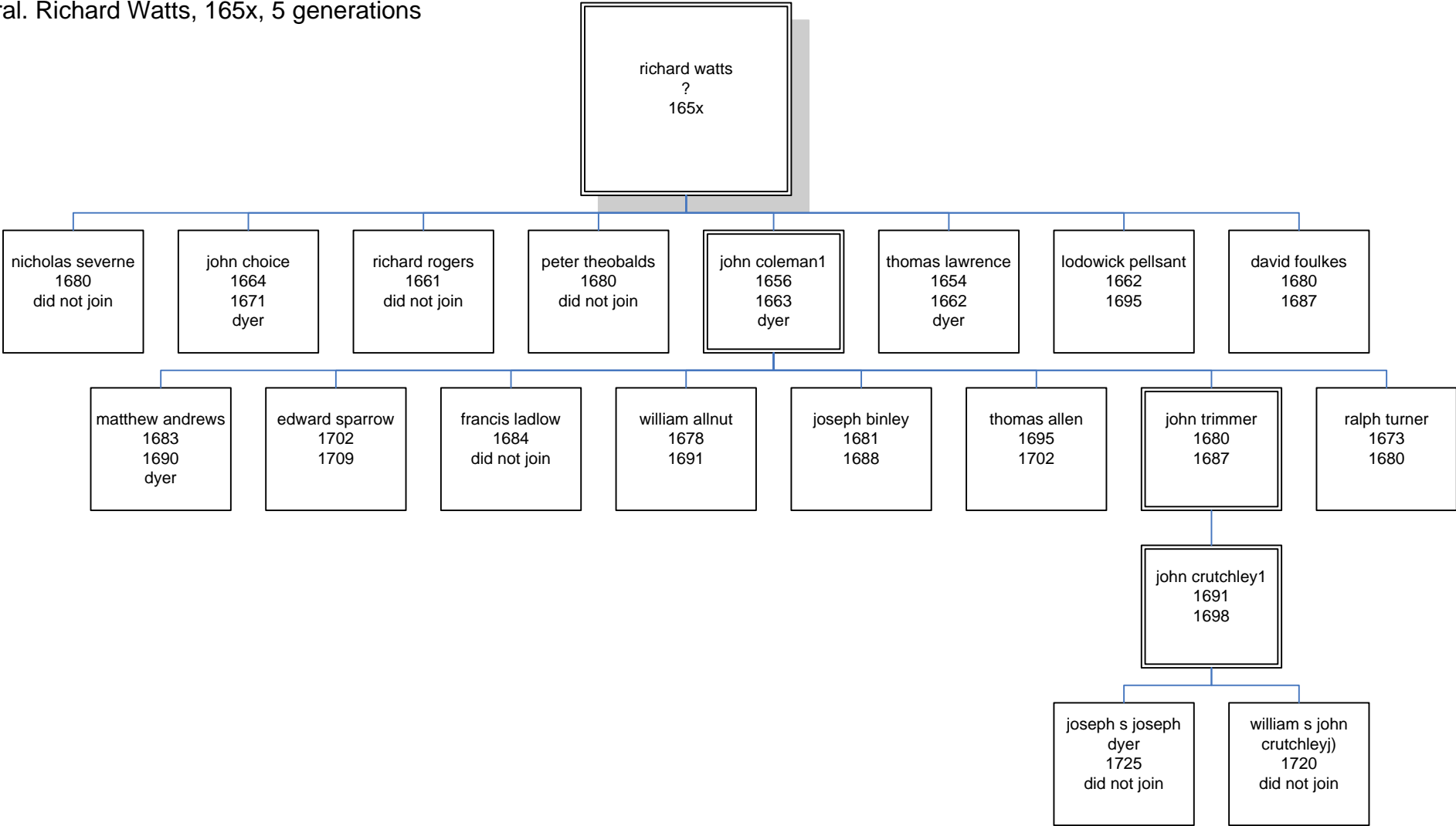
general, Henry Adige, 5 generations



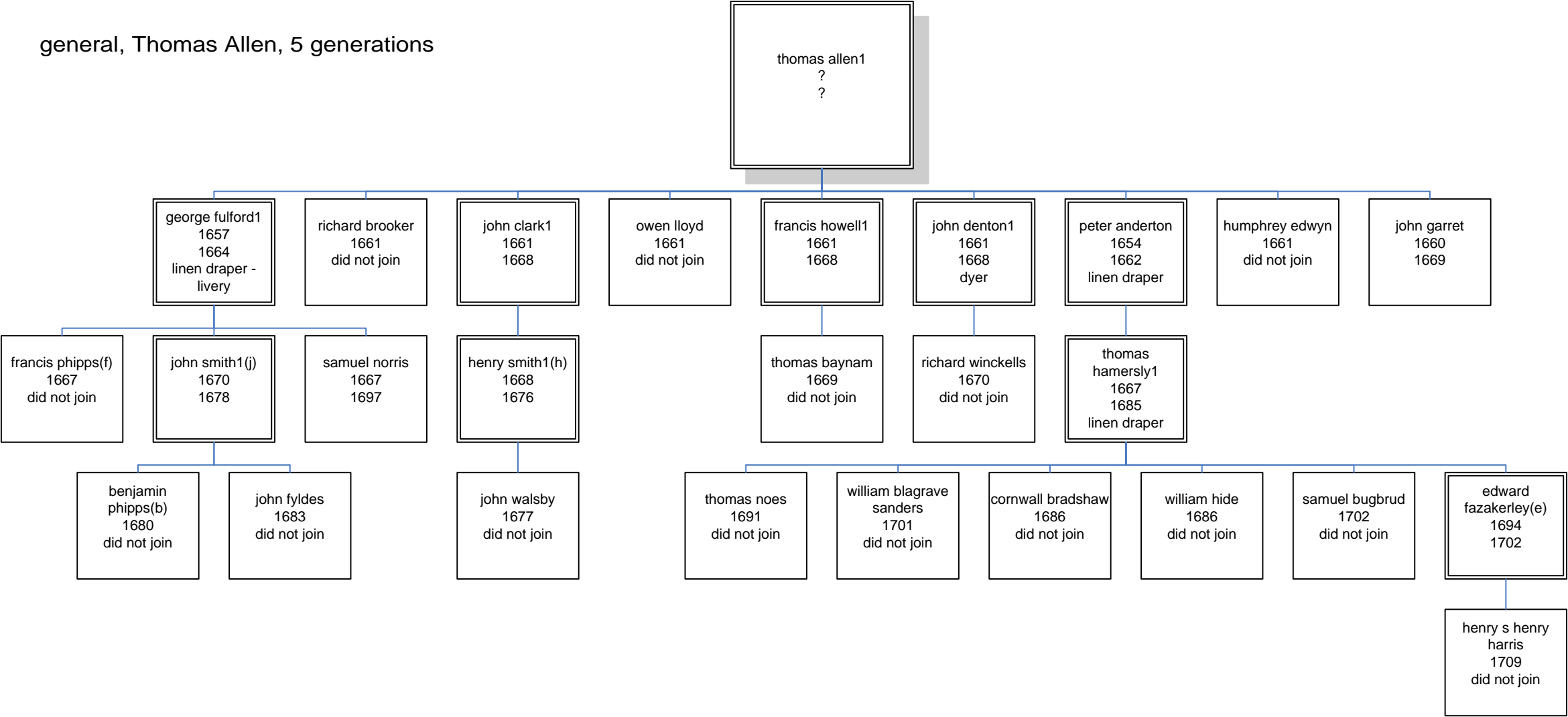
general, John Henchman, 5 generations



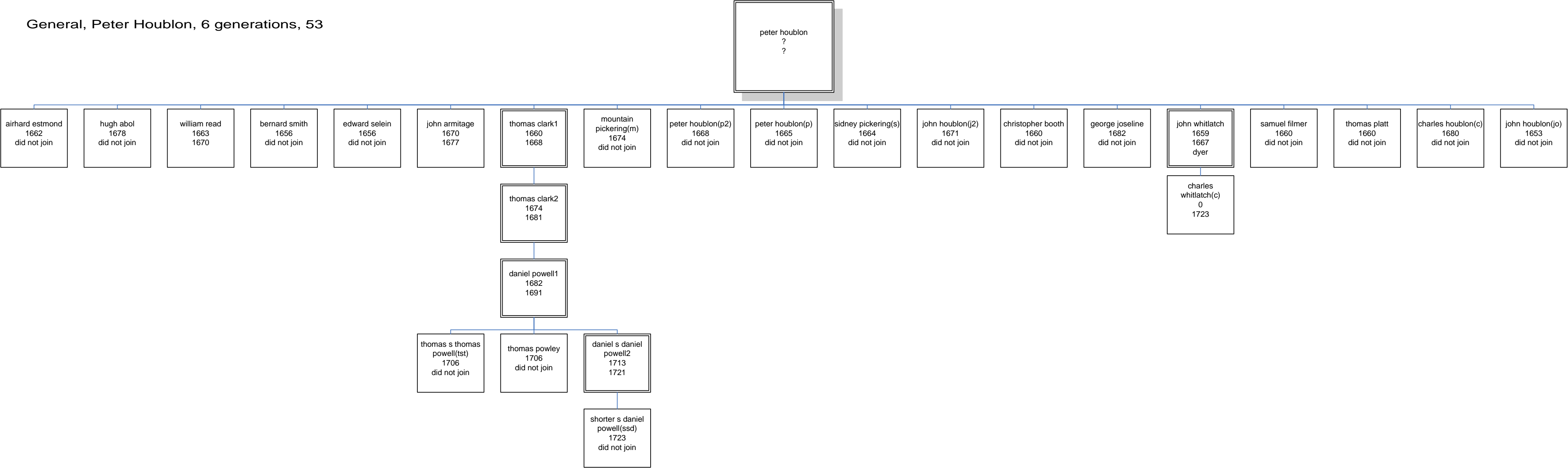
general. Richard Watts, 165x, 5 generations



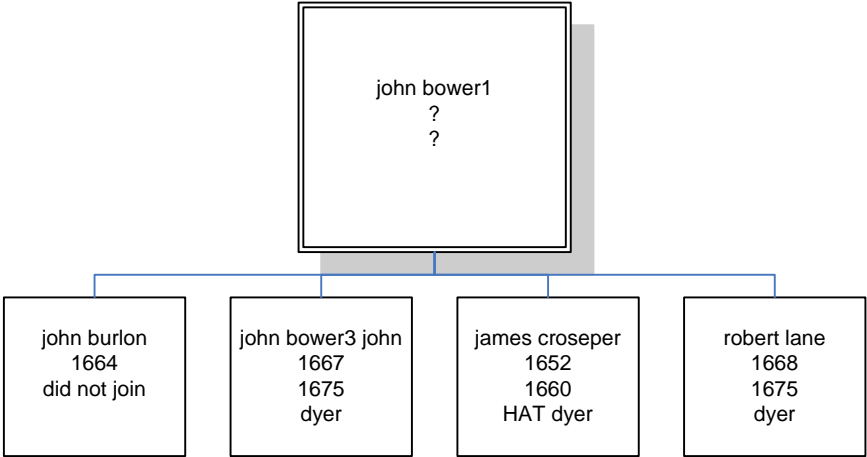
general, Thomas Allen, 5 generations



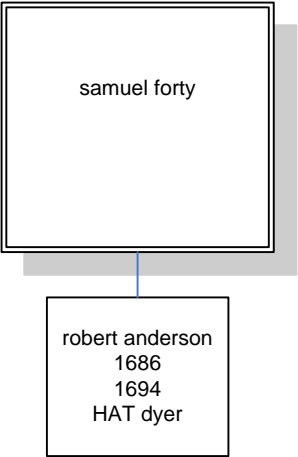
General, Peter Houblon, 6 generations, 53



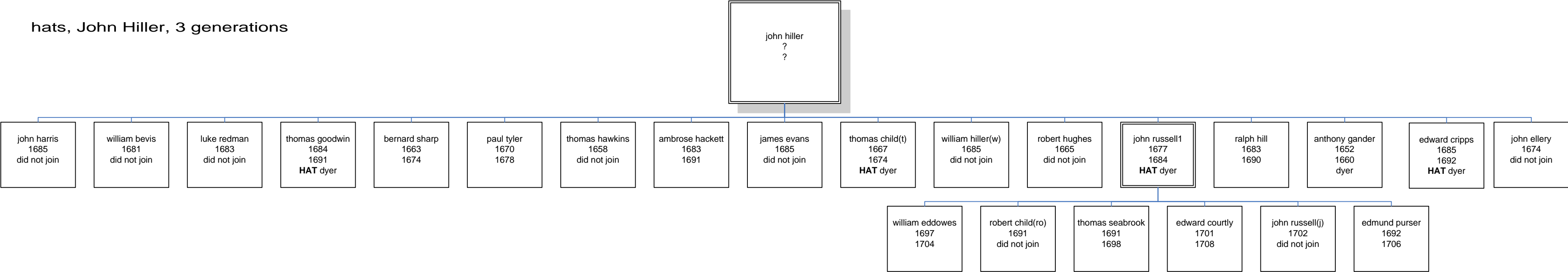
Hats, John Bower1, 2 generations



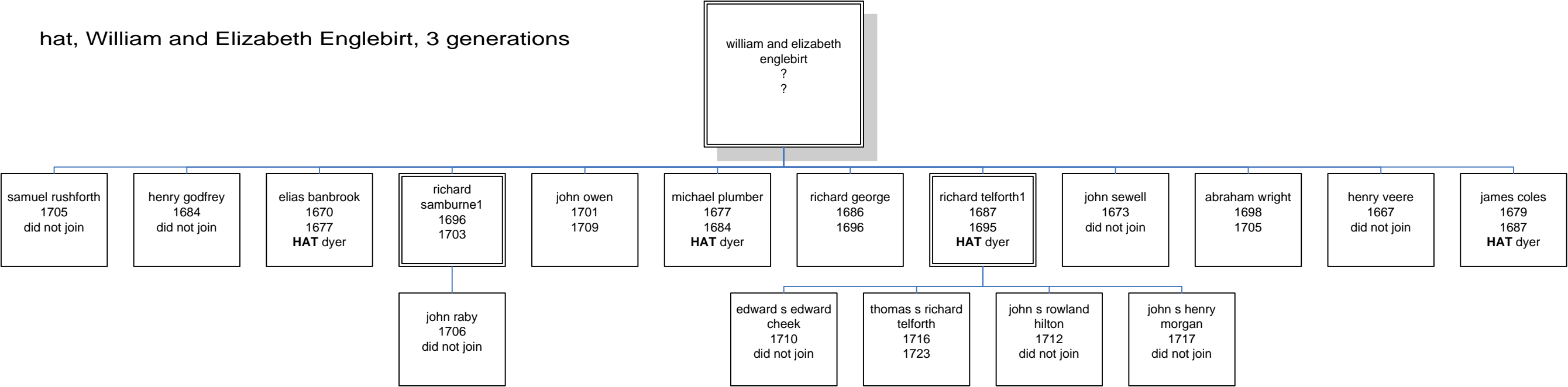
hats, Samuel Forty, 2 generations



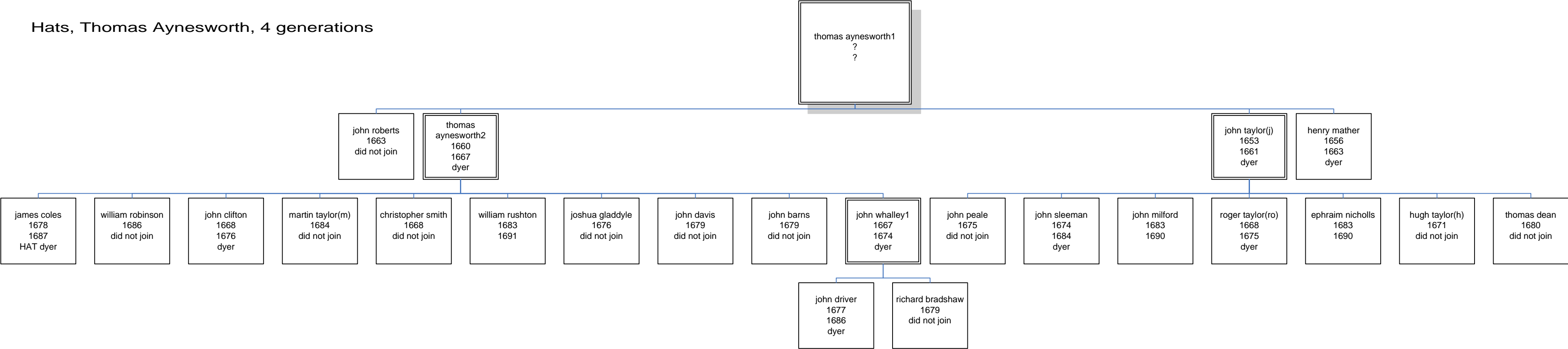
hats, John Hiller, 3 generations



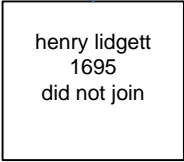
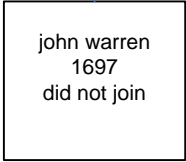
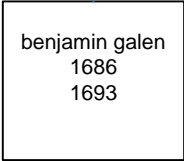
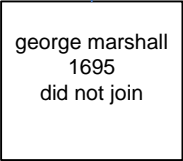
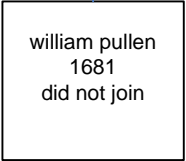
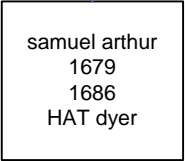
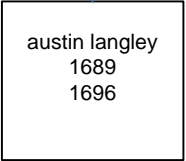
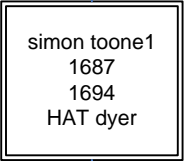
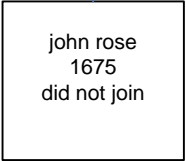
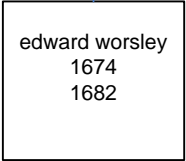
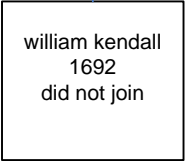
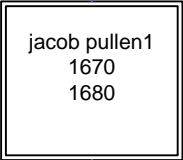
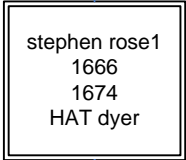
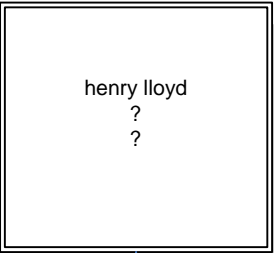
hat, William and Elizabeth Englebirt, 3 generations



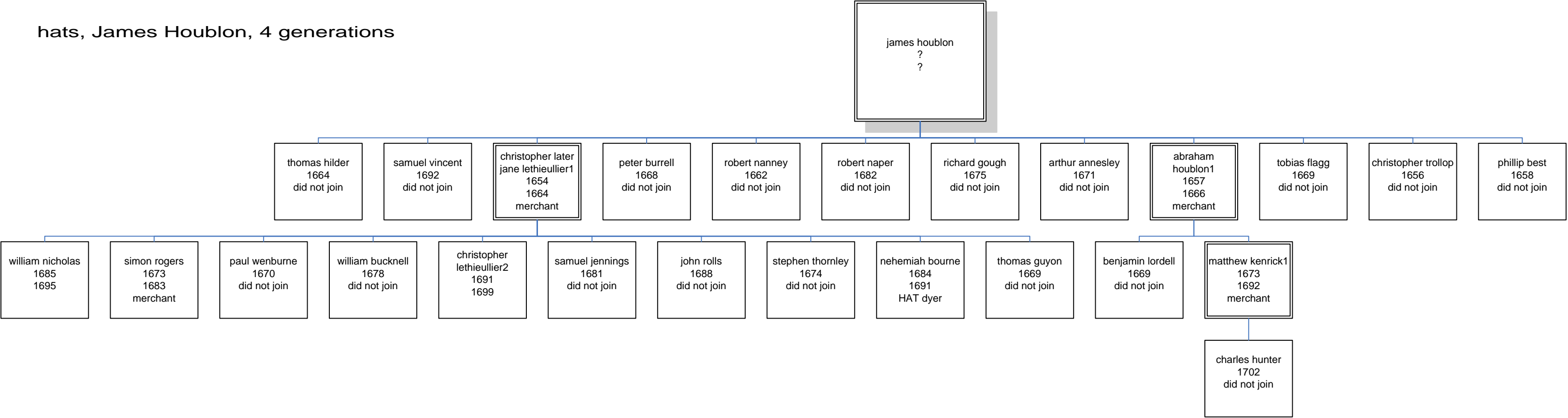
Hats, Thomas Aynesworth, 4 generations



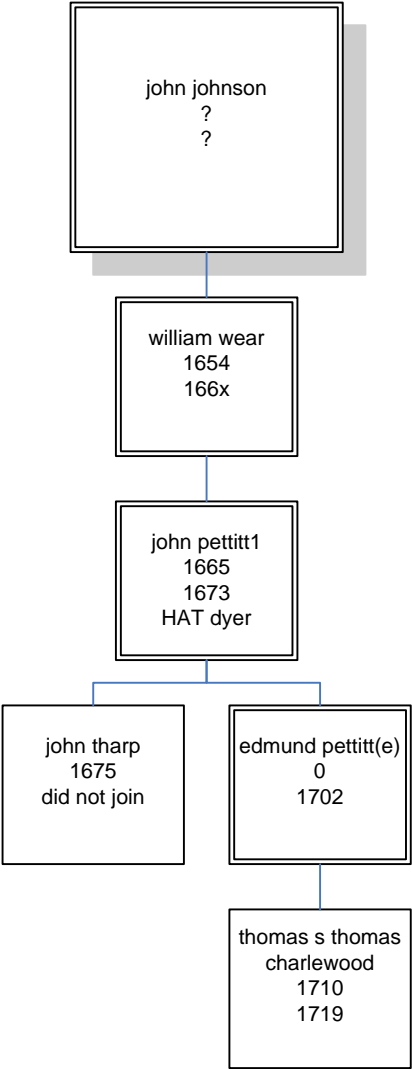
Hats, Henry Lloyd, 4 generations



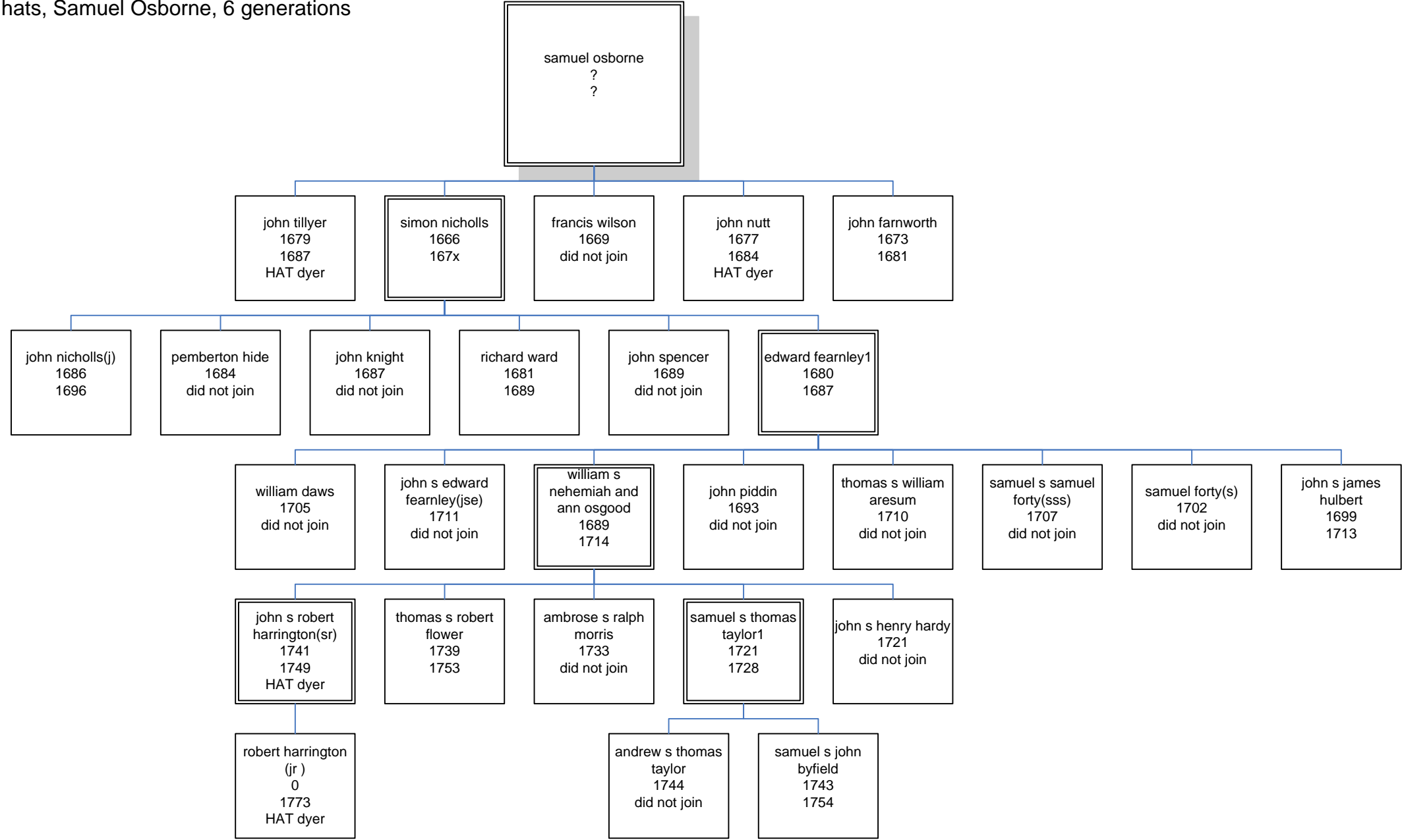
hats, James Houblon, 4 generations



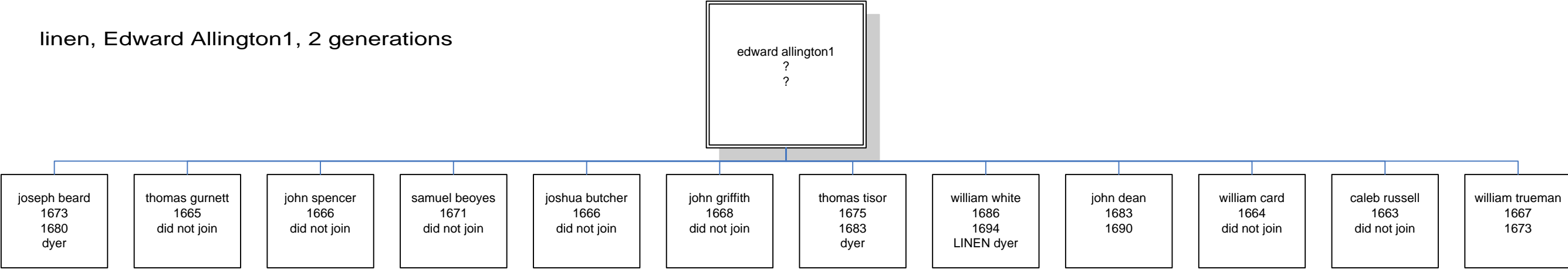
hats, John Johnson, 5 generations



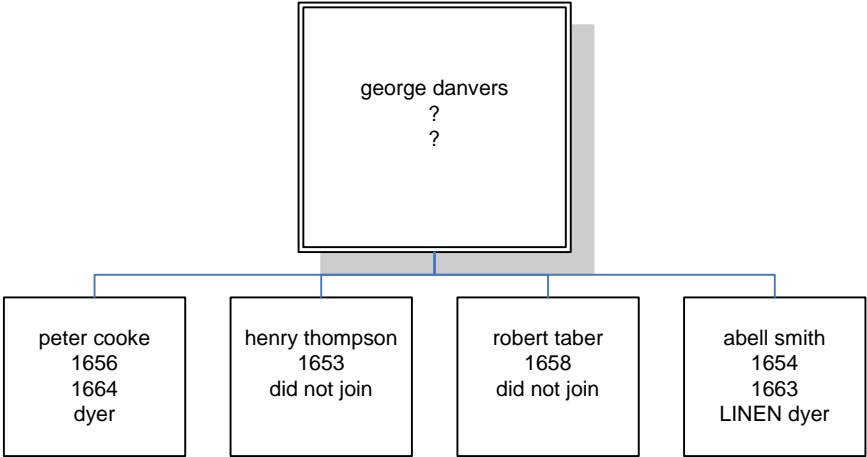
hats, Samuel Osborne, 6 generations



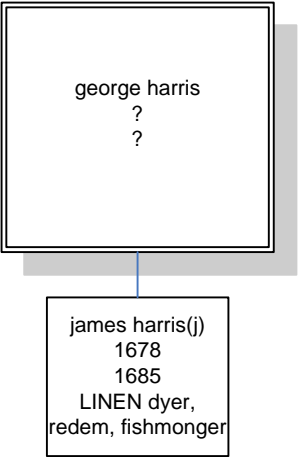
linen, Edward Allington1, 2 generations



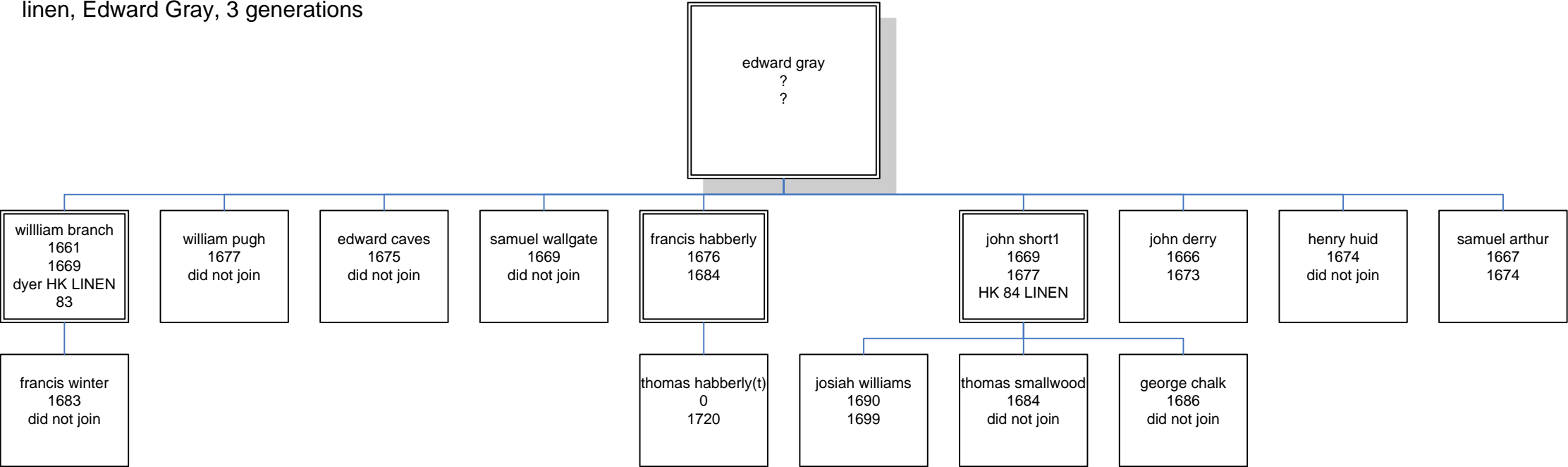
linen, George Danvers, 2 generations



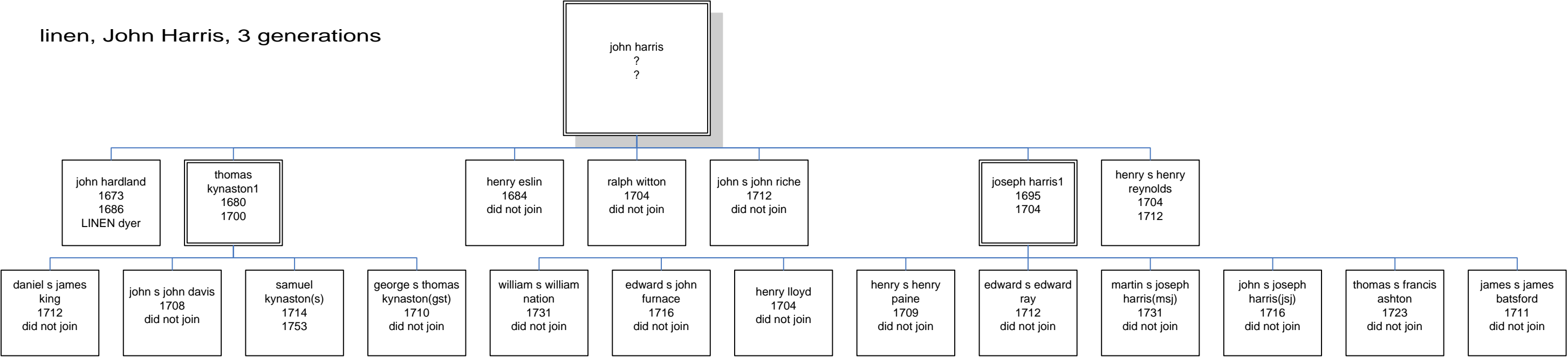
linen, George Harris, 2 generations



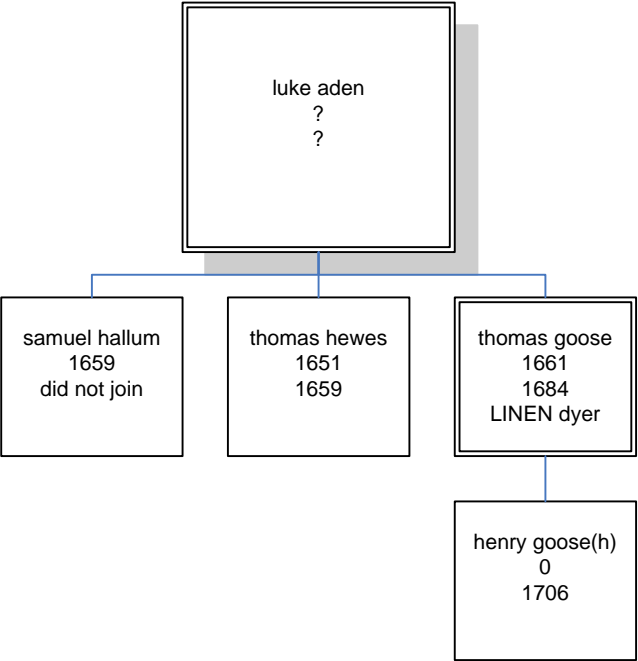
linen, Edward Gray, 3 generations



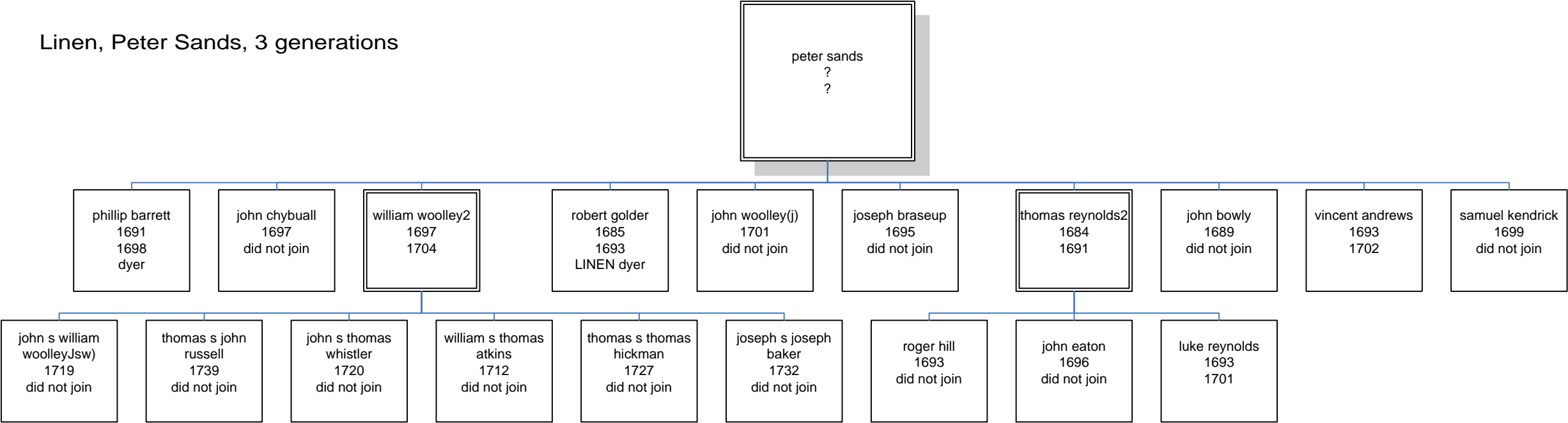
linen, John Harris, 3 generations



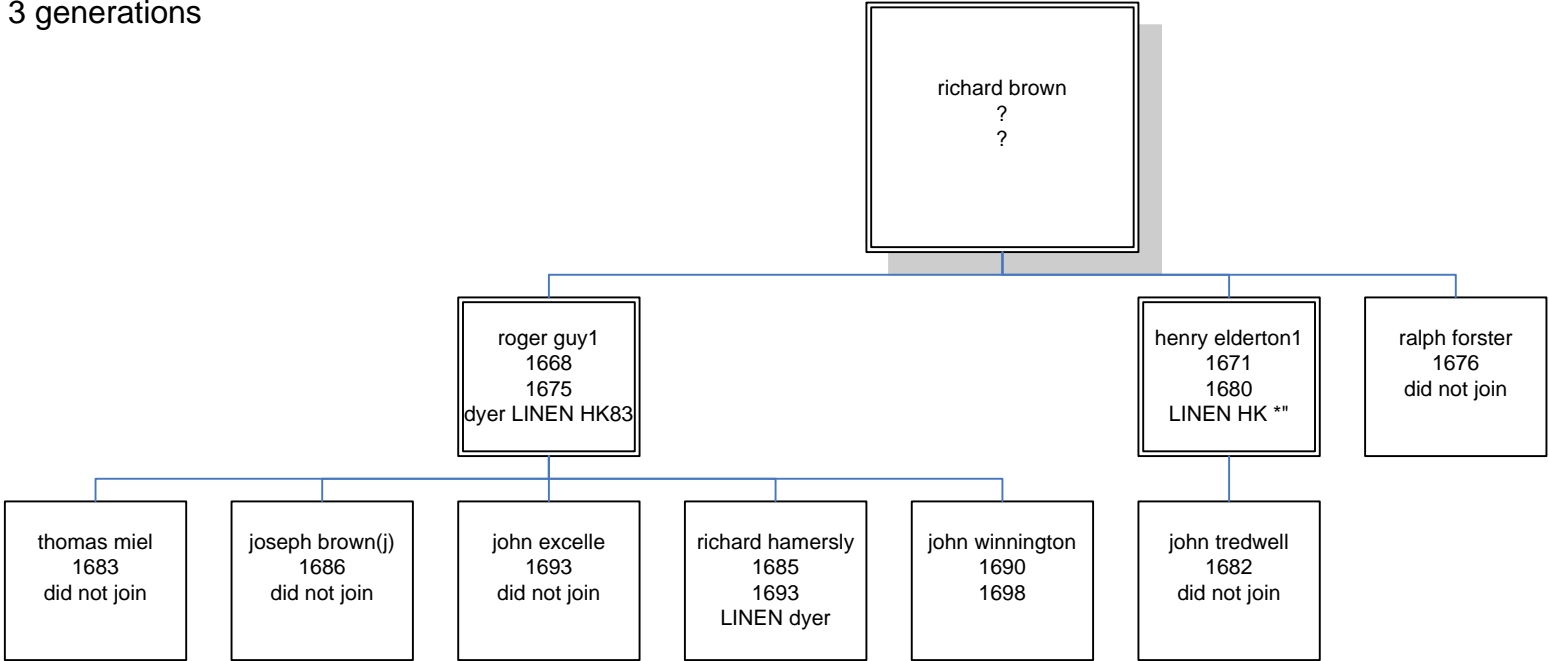
linen, Luke Aden, 3 generations



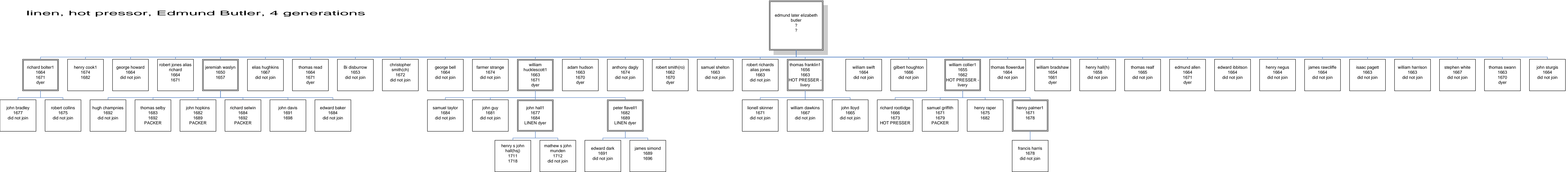
Linen, Peter Sands, 3 generations



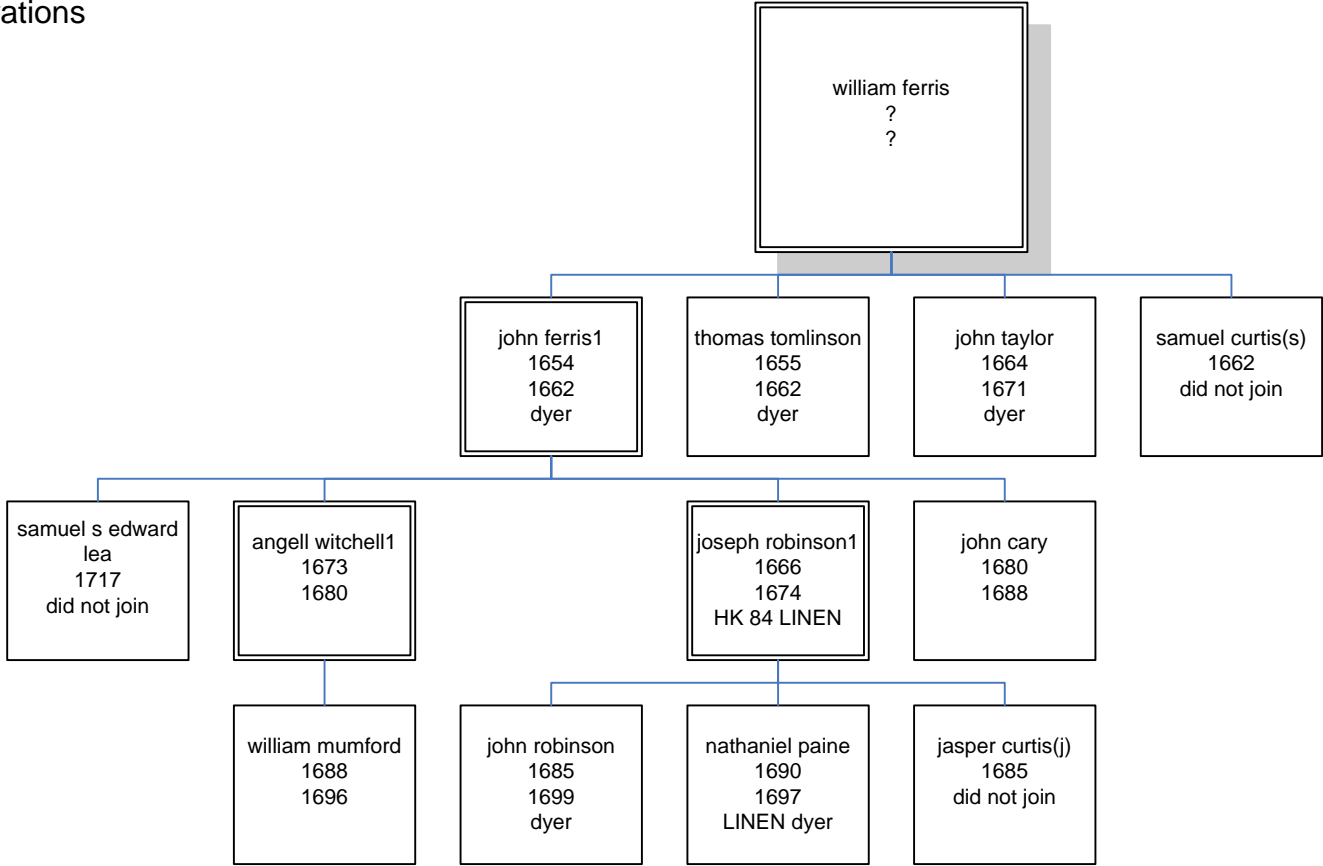
linen, Richard Brown, 3 generations



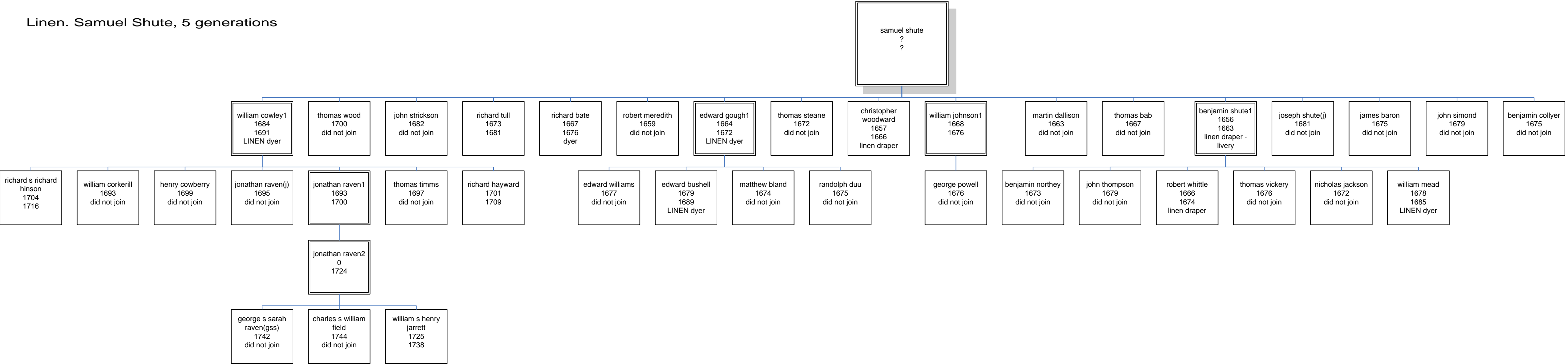
linen, hot pressor, Edmund Butler, 4 generations



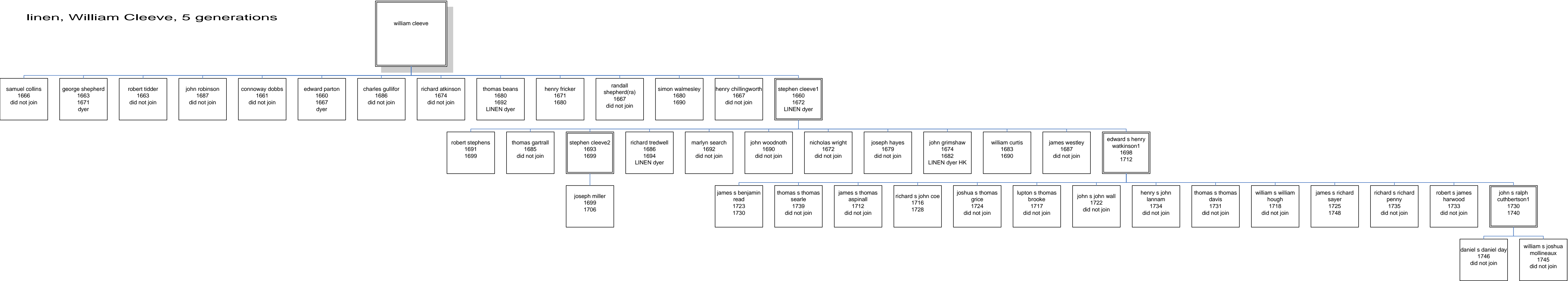
Linen, William Ferris. 4 generations



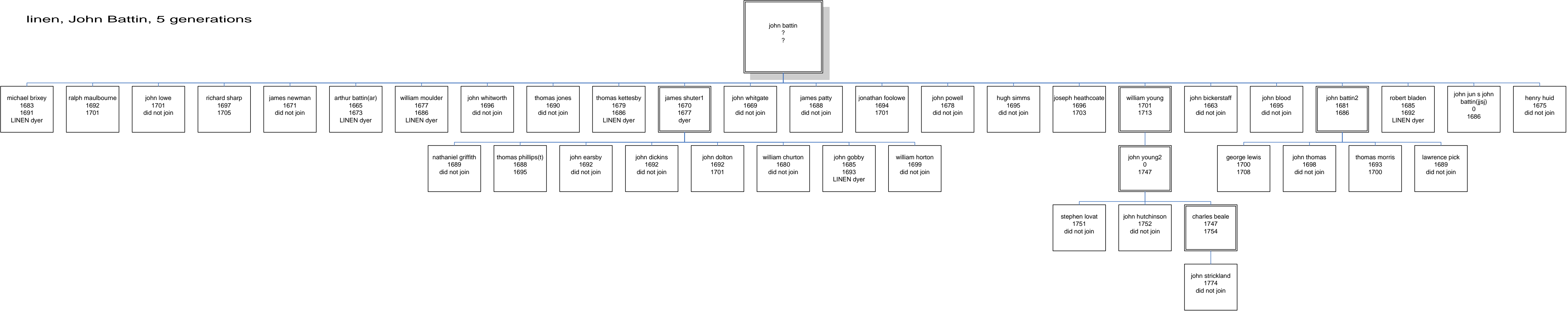
Linen. Samuel Shute, 5 generations



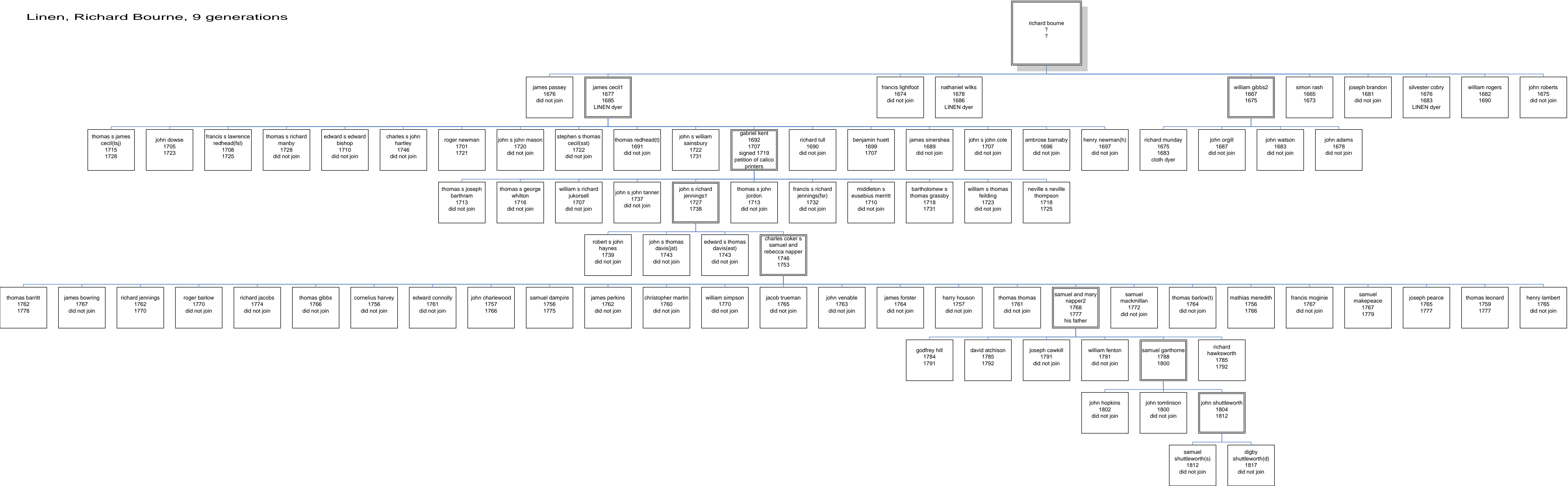
linen, William Cleeve, 5 generations



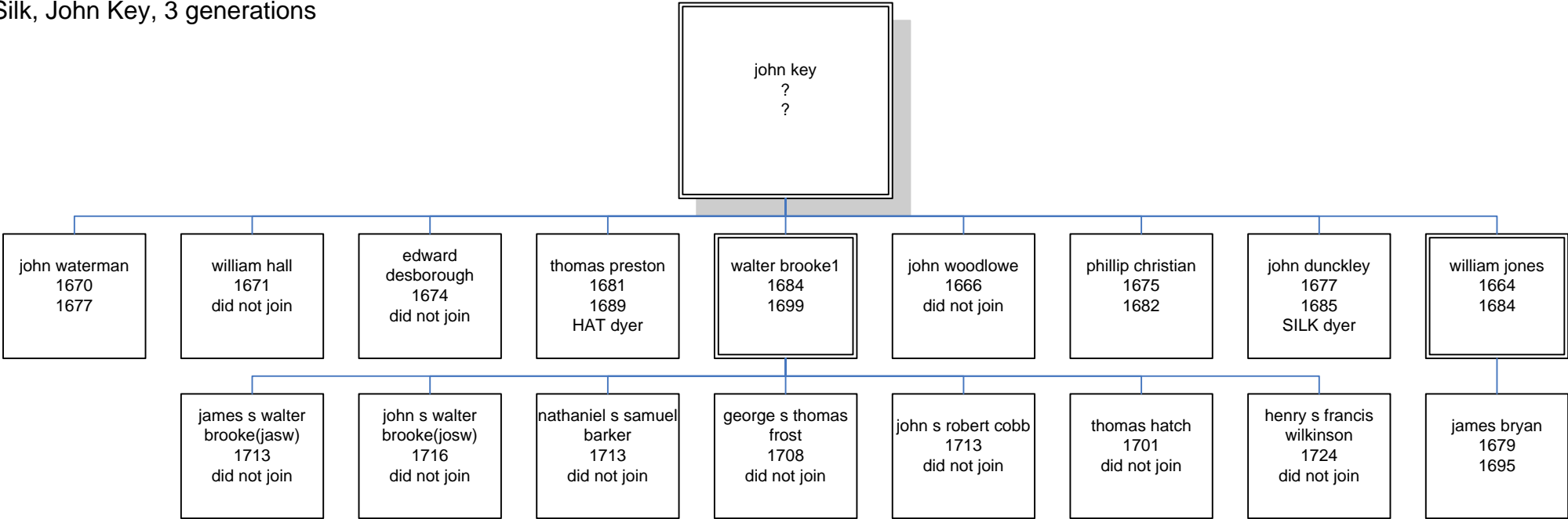
linen, John Battin, 5 generations



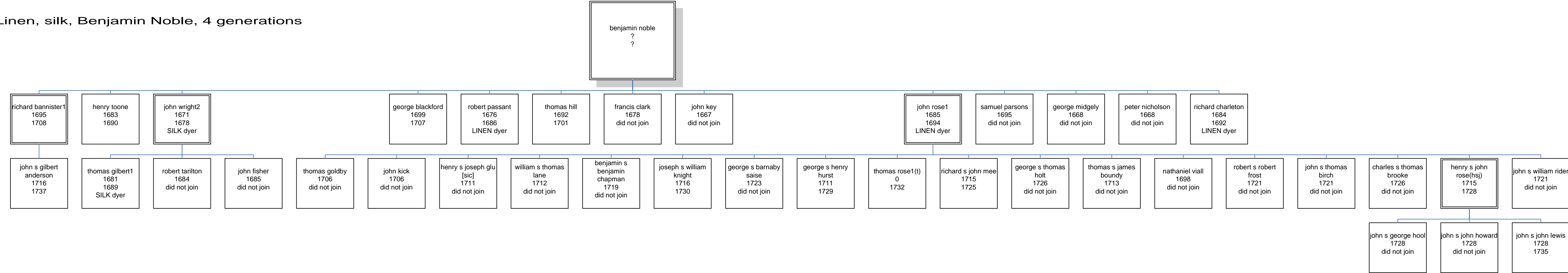
Linen, Richard Bourne, 9 generations



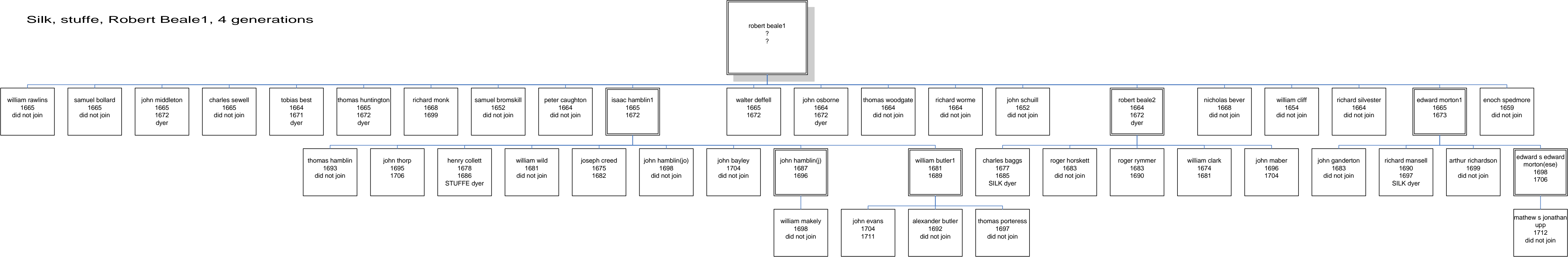
Hat, Silk, John Key, 3 generations



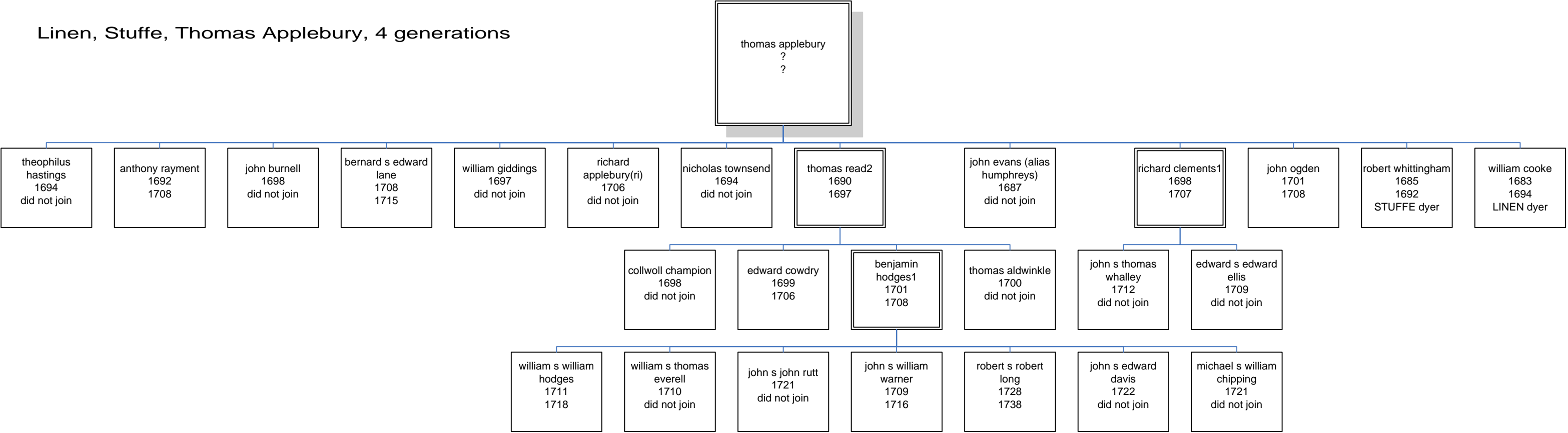
Linen, silk, Benjamin Noble, 4 generations



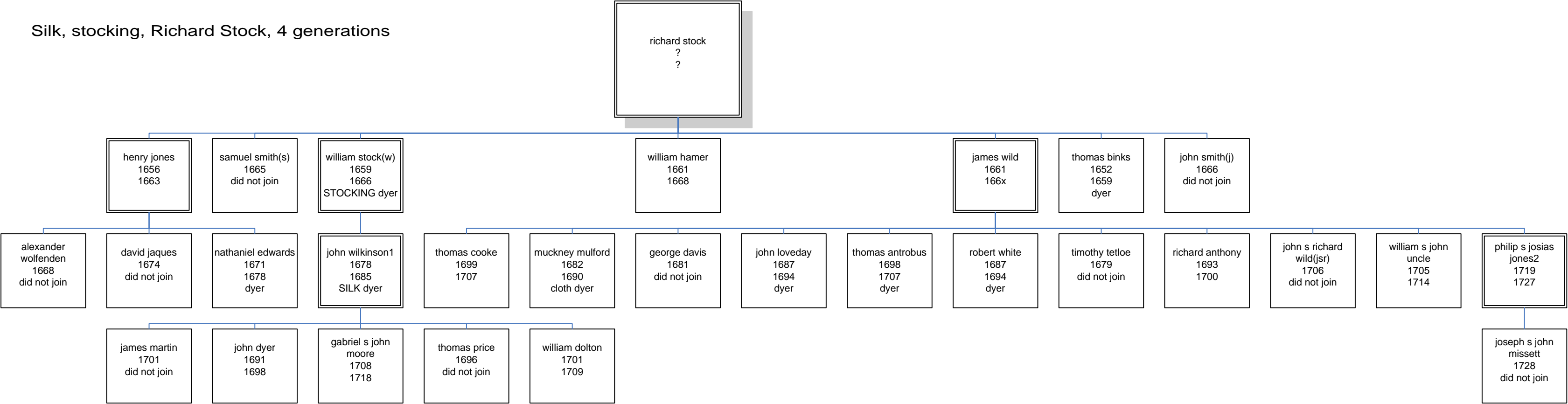
Silk, stufte, Robert Beale1, 4 generations



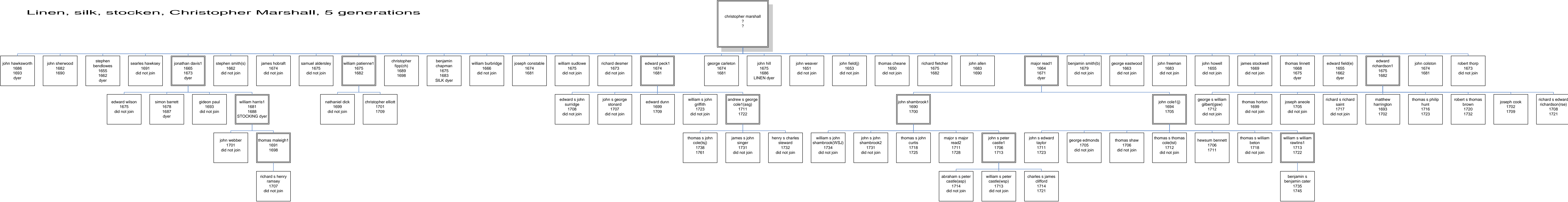
Linen, Stufe, Thomas Applebury, 4 generations



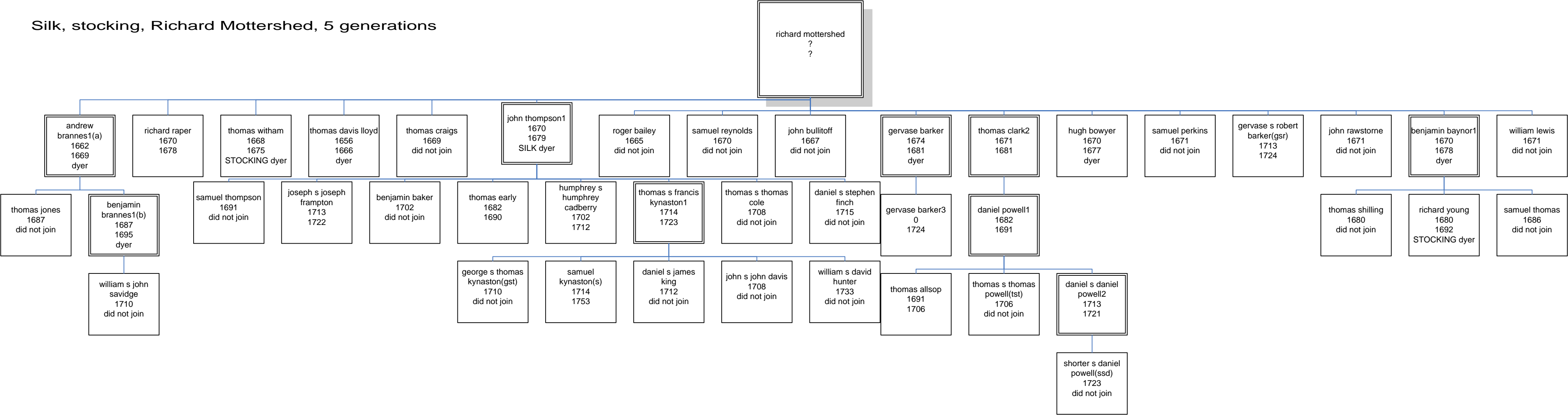
Silk, stocking, Richard Stock, 4 generations



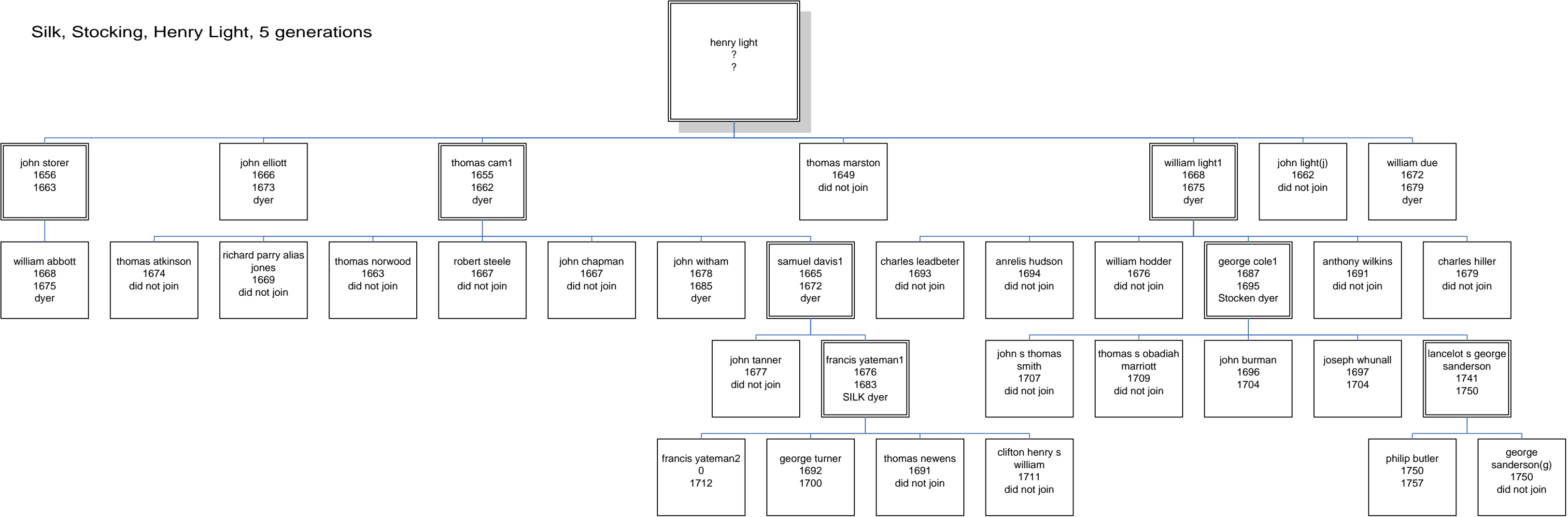
Linen, silk, stocken, Christopher Marshall, 5 generations



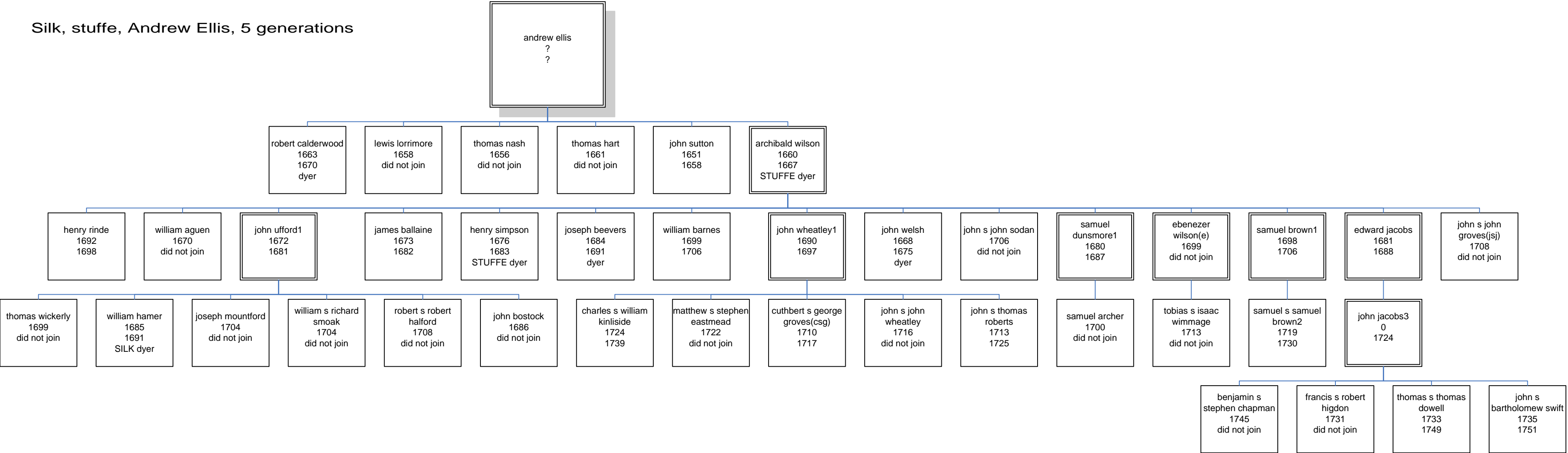
Silk, stocking, Richard Mottershed, 5 generations



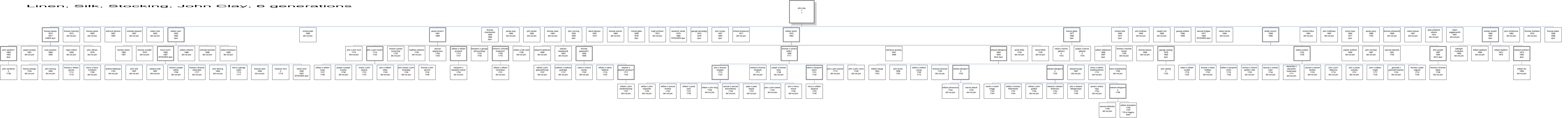
Silk, Stocking, Henry Light, 5 generations



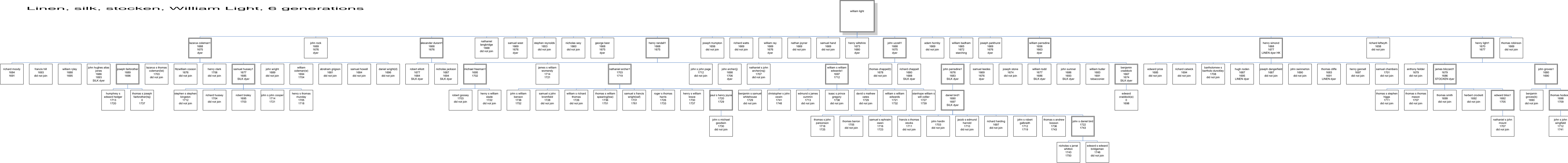
Silk, stuffe, Andrew Ellis, 5 generations



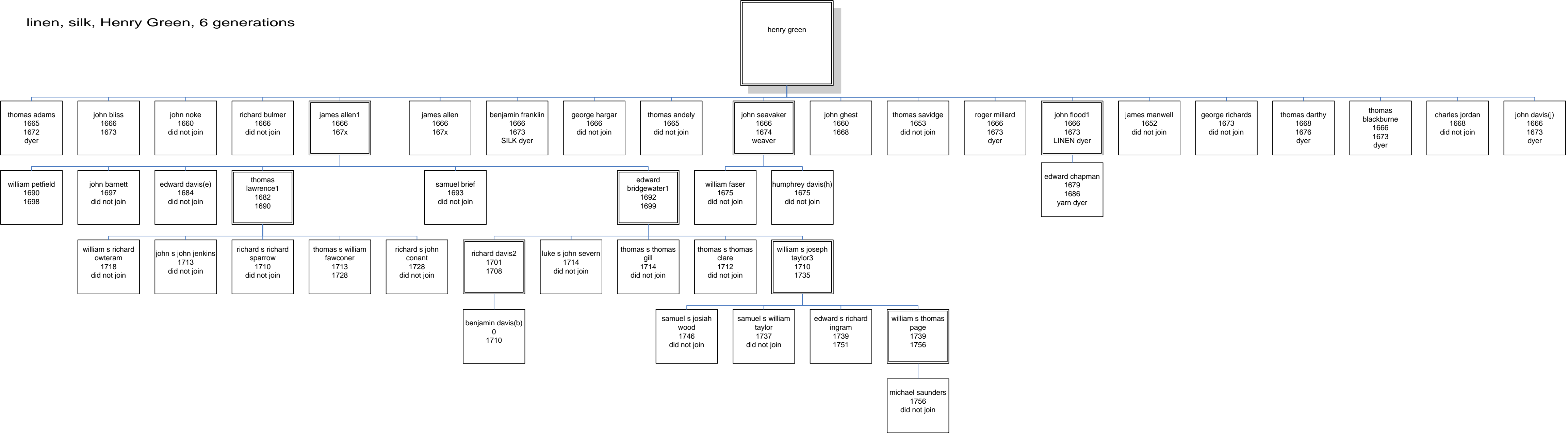
Linen, Silk, Stocking, John Clay, 6 generations



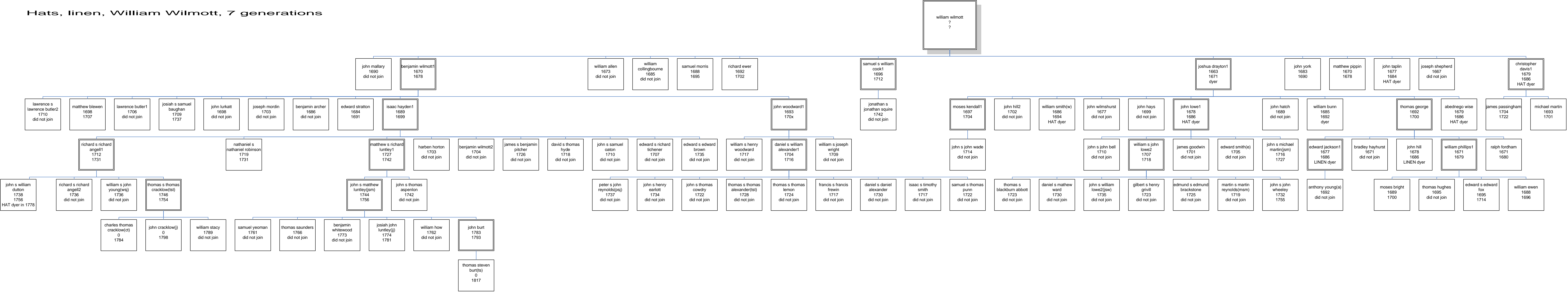
Linen, silk, stocken, William Light, 6 generations



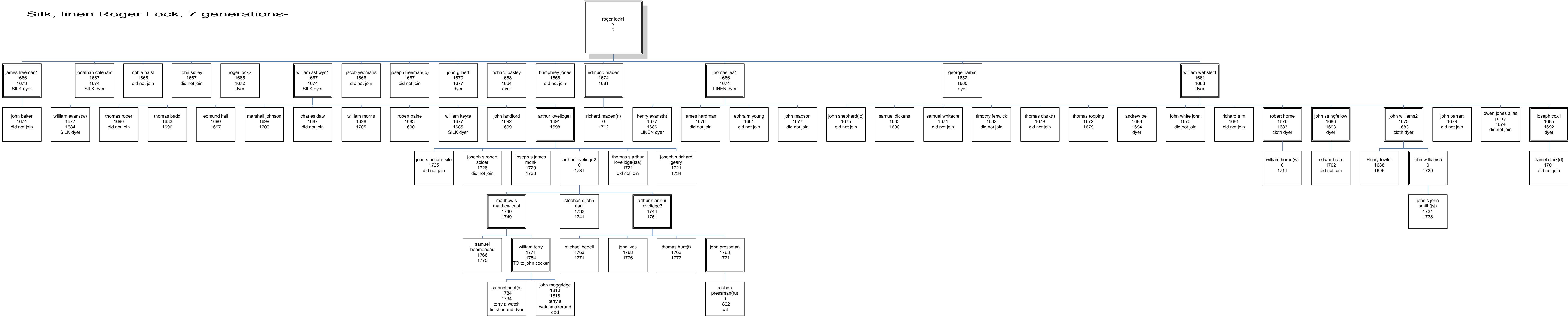
linen, silk, Henry Green, 6 generations



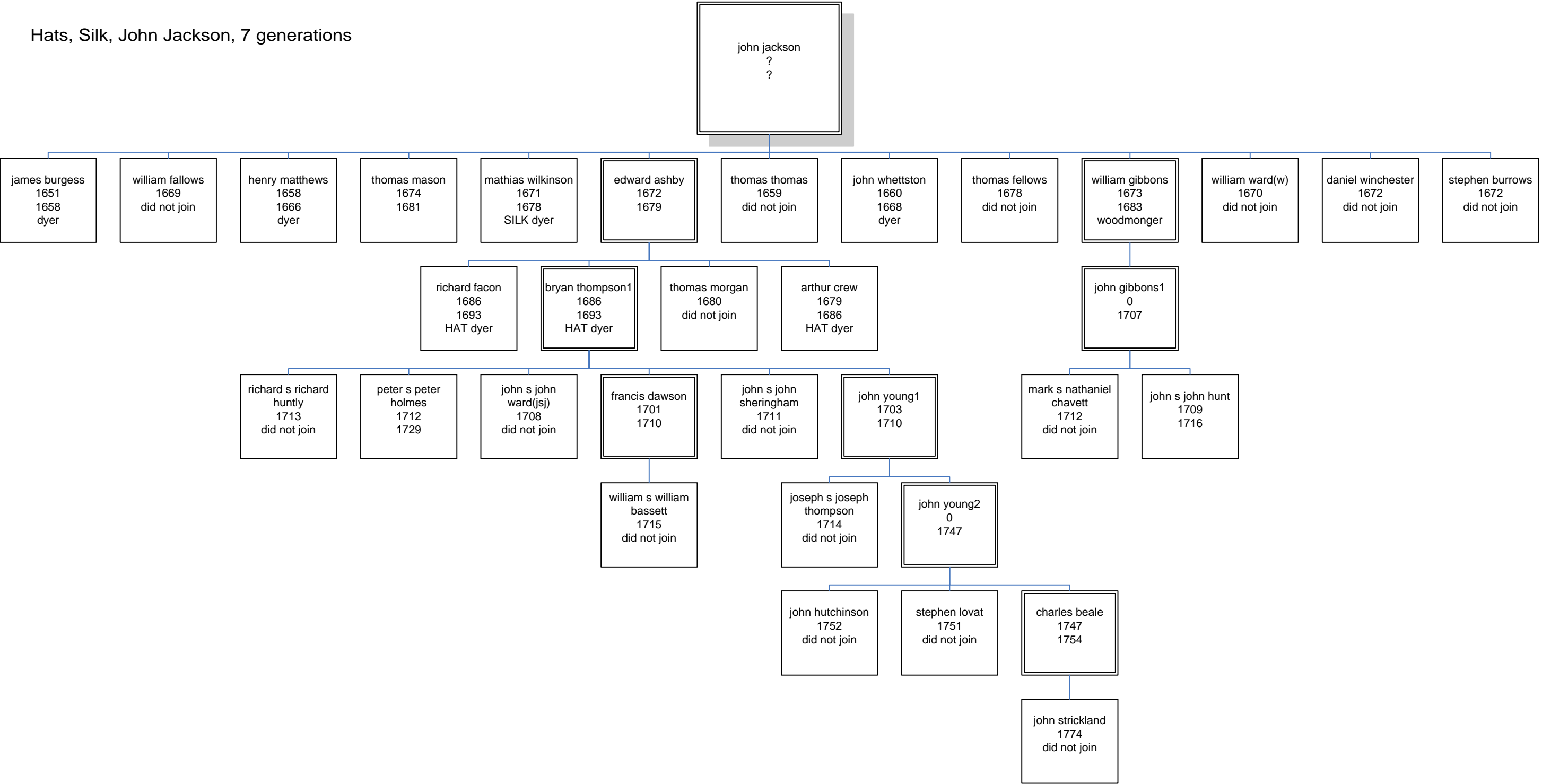
Hats, linen, William Wilmott, 7 generations



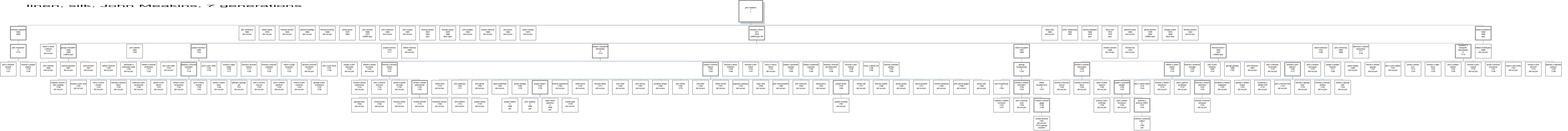
Silk, linen Roger Lock, 7 generations-



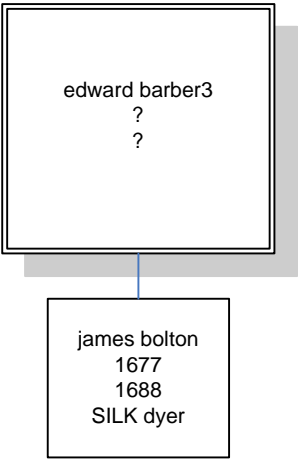
Hats, Silk, John Jackson, 7 generations



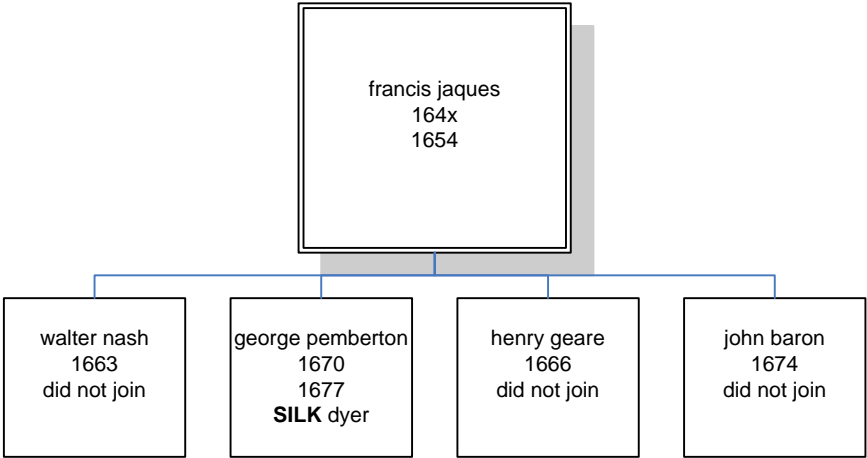
linen, silk, John Meakins, 7 generations



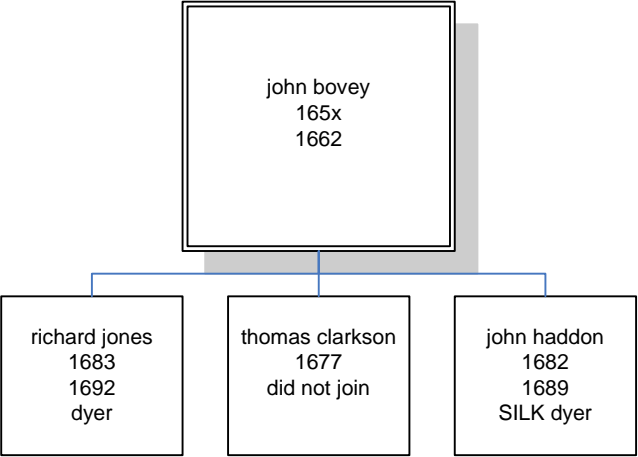
Silk, Edward Barber3, 2 generations



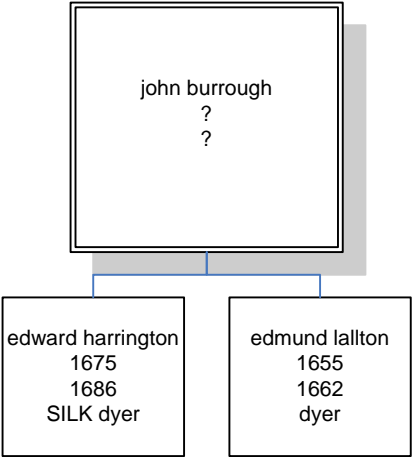
Silk, Francis Jaques, 2 generations



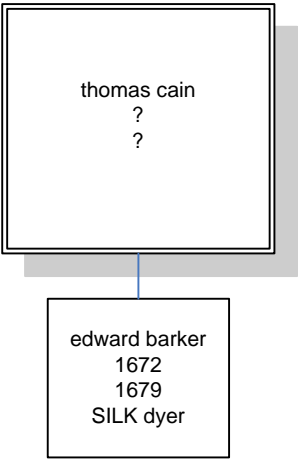
Silk, John Bovey, 2 generations



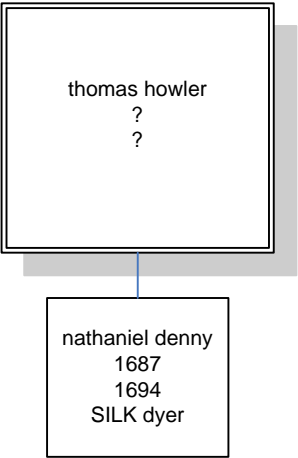
Silk, John Burrough, 2 generations



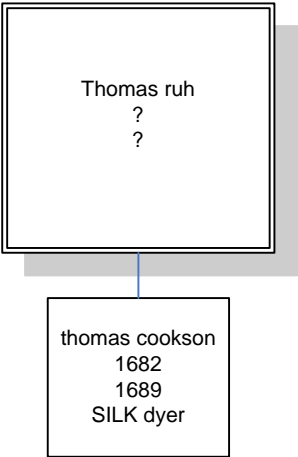
Silk, Thomas Cain, 2 generations



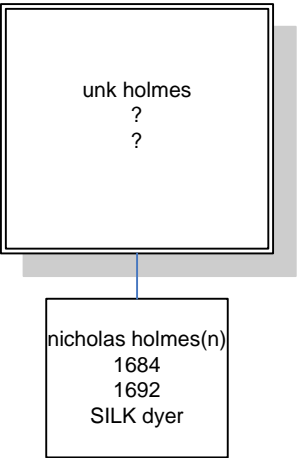
silk, Thomas Howler, 2 generations



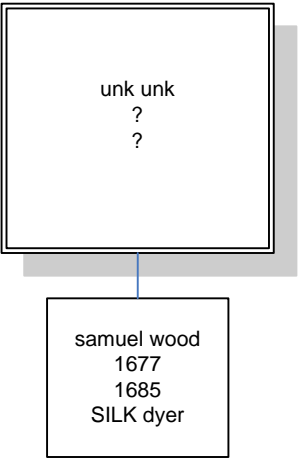
Silk, Thomas Ruh, 2 generations



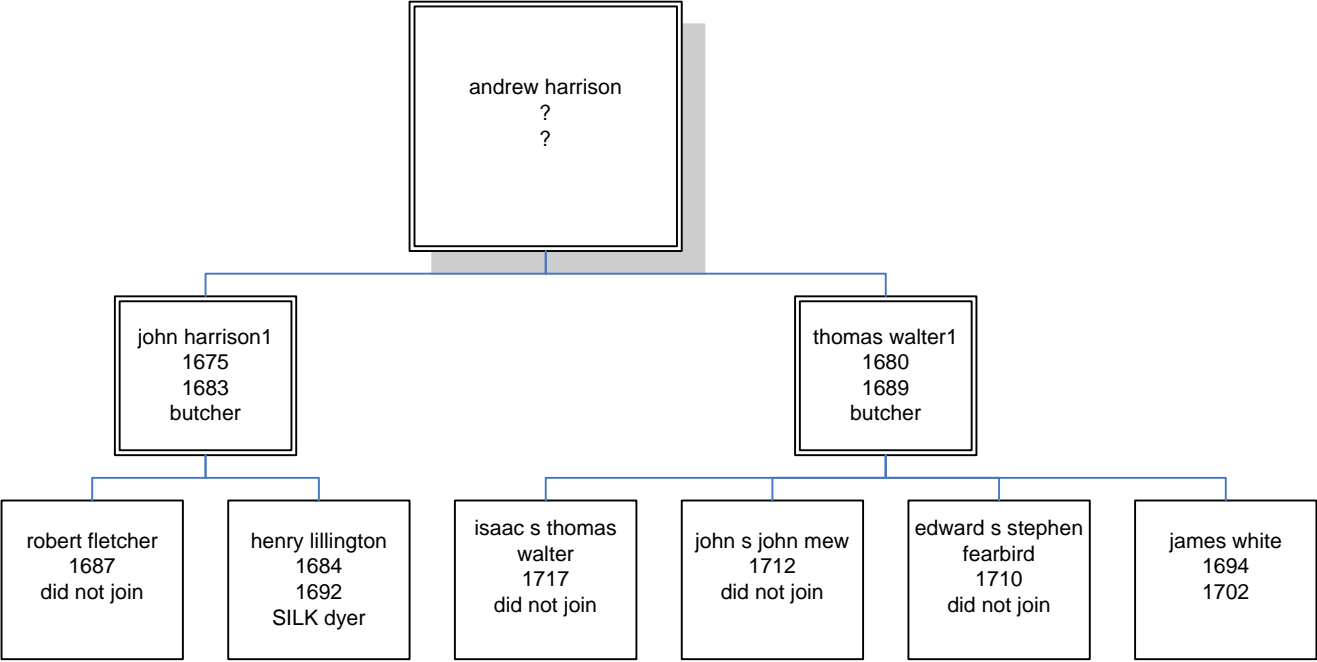
silk, Unk Holmes, 2 generations



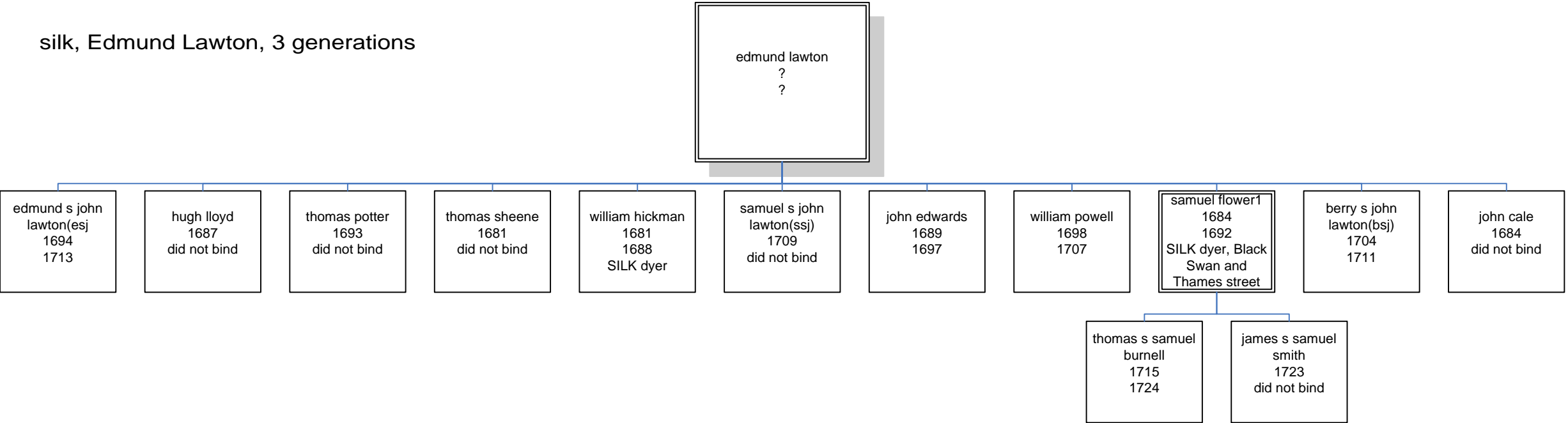
Silk, Unk Unk, 2 generations



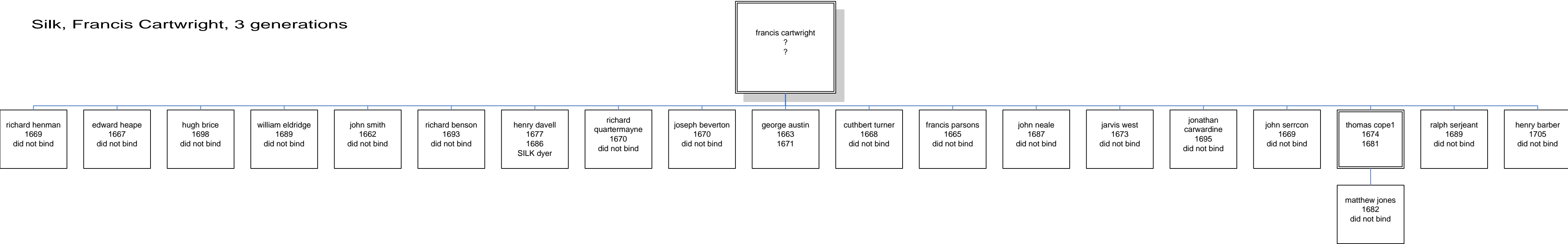
silk, Andrew Harrison, 3 generations



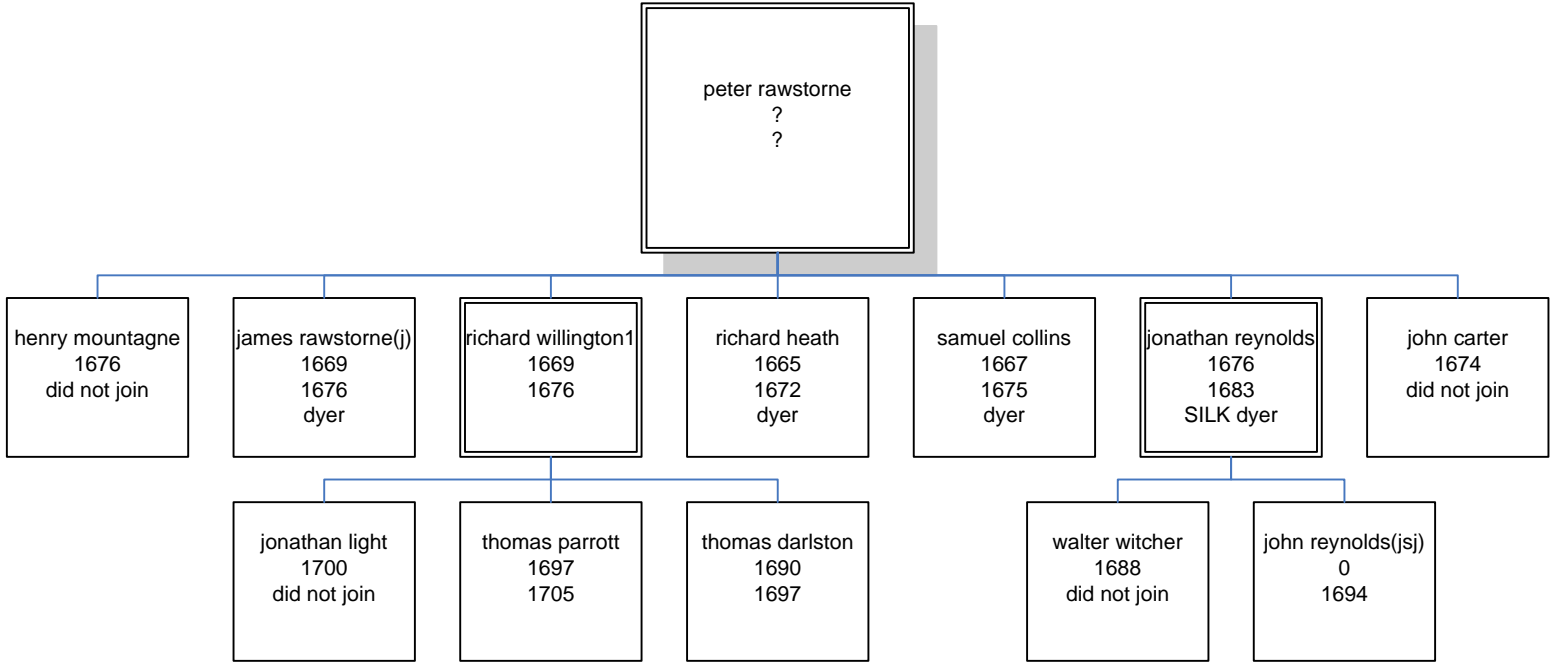
silk, Edmund Lawton, 3 generations



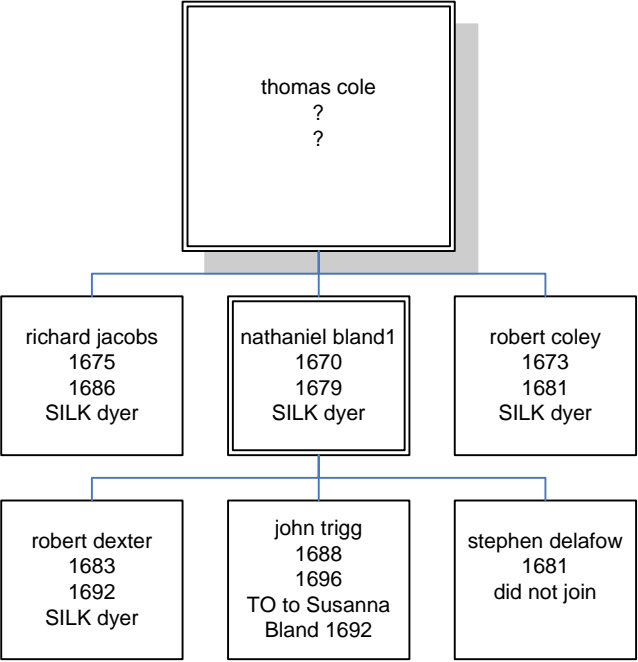
Silk, Francis Cartwright, 3 generations



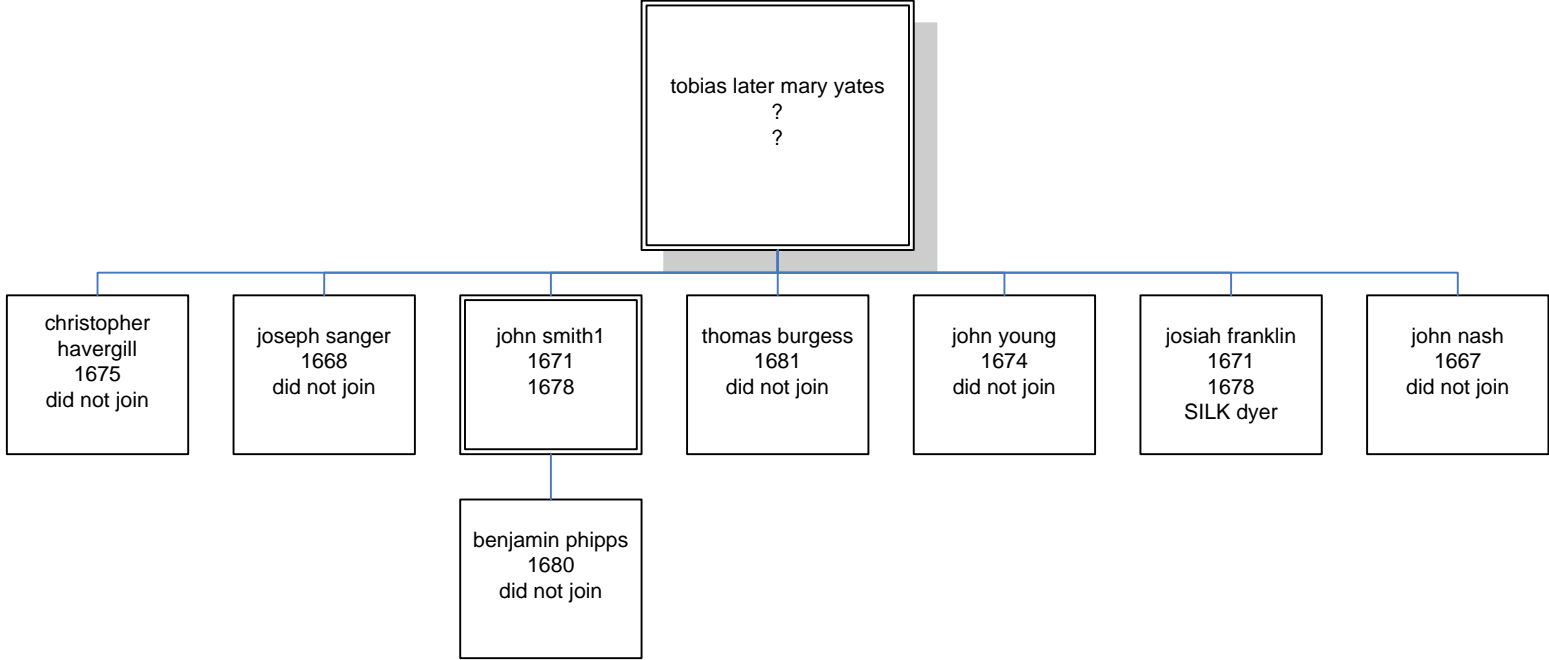
Silk, Peter Rawstorne, 3 generations



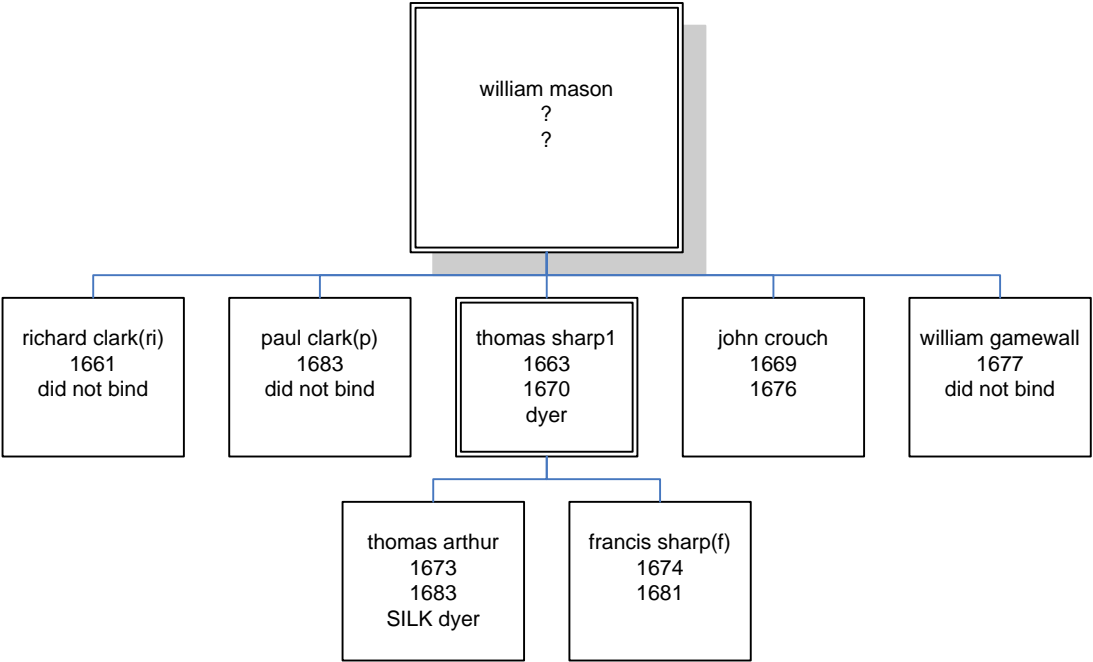
Silk, Thomas Cole, 3 generations



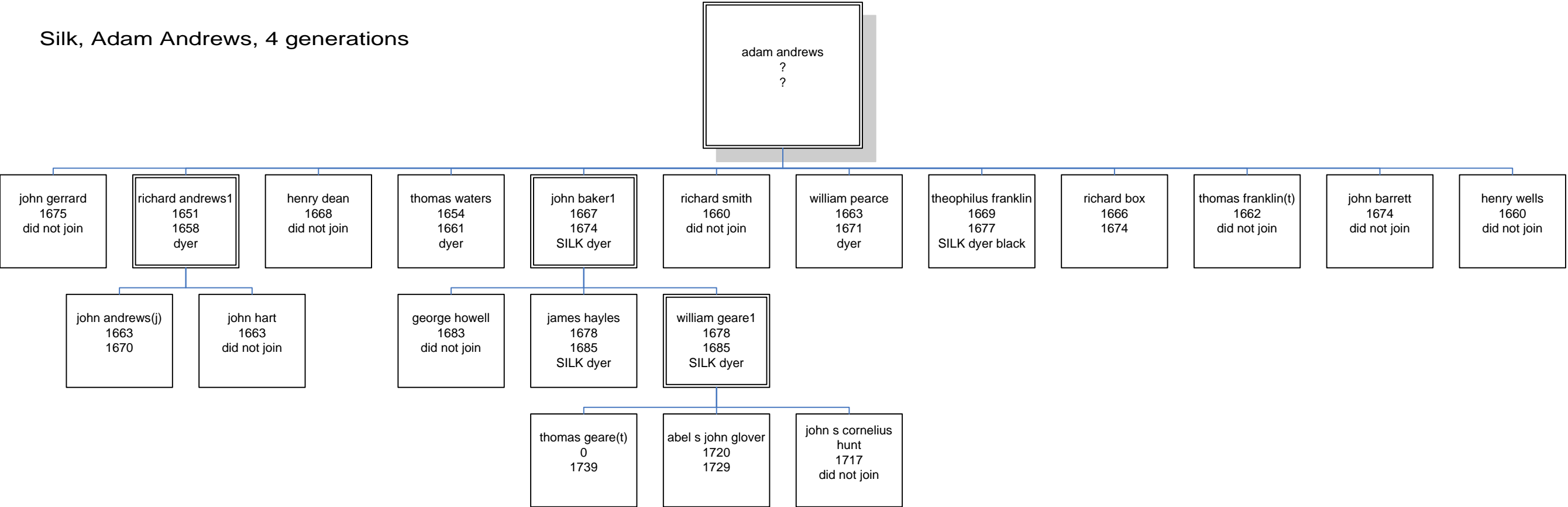
Silk, Tobias later Mary Yates, 3 generations



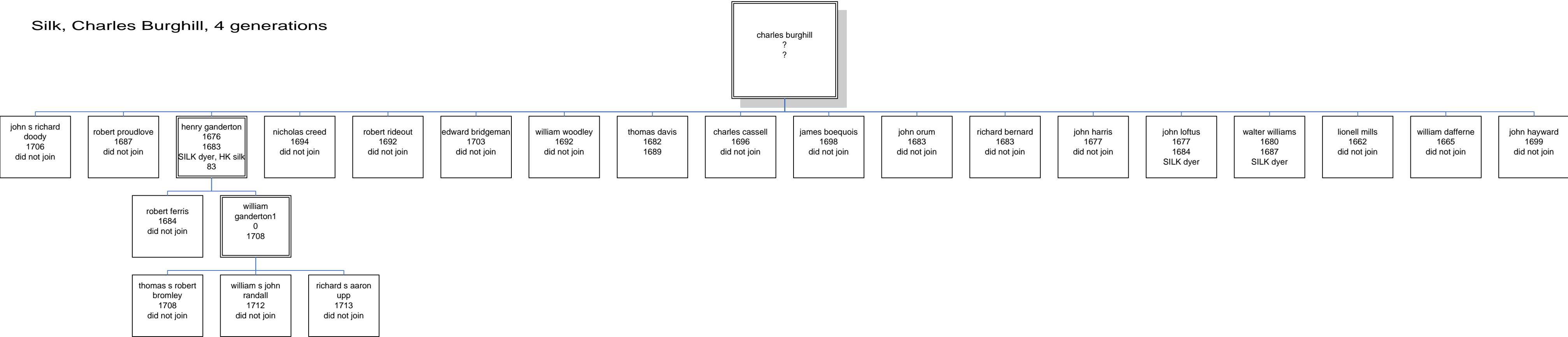
silk, William Mason, 3 generations



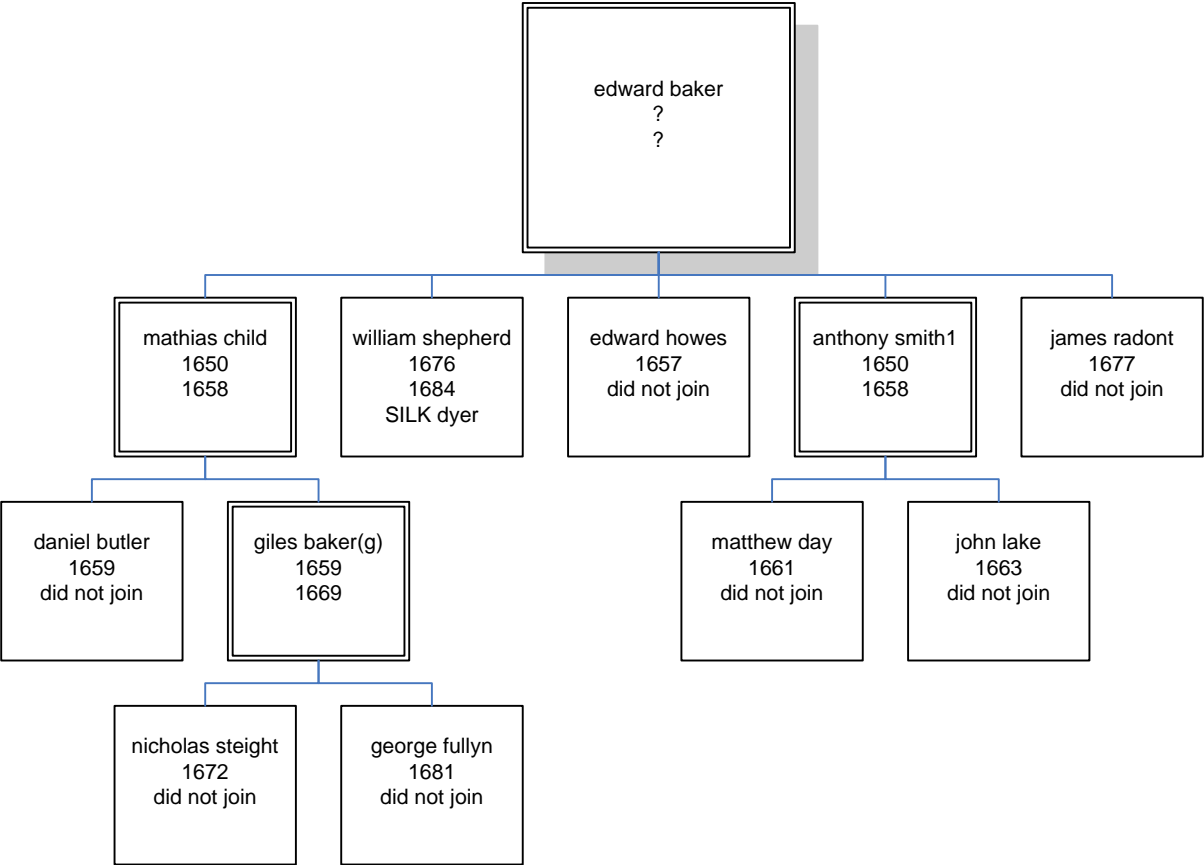
Silk, Adam Andrews, 4 generations



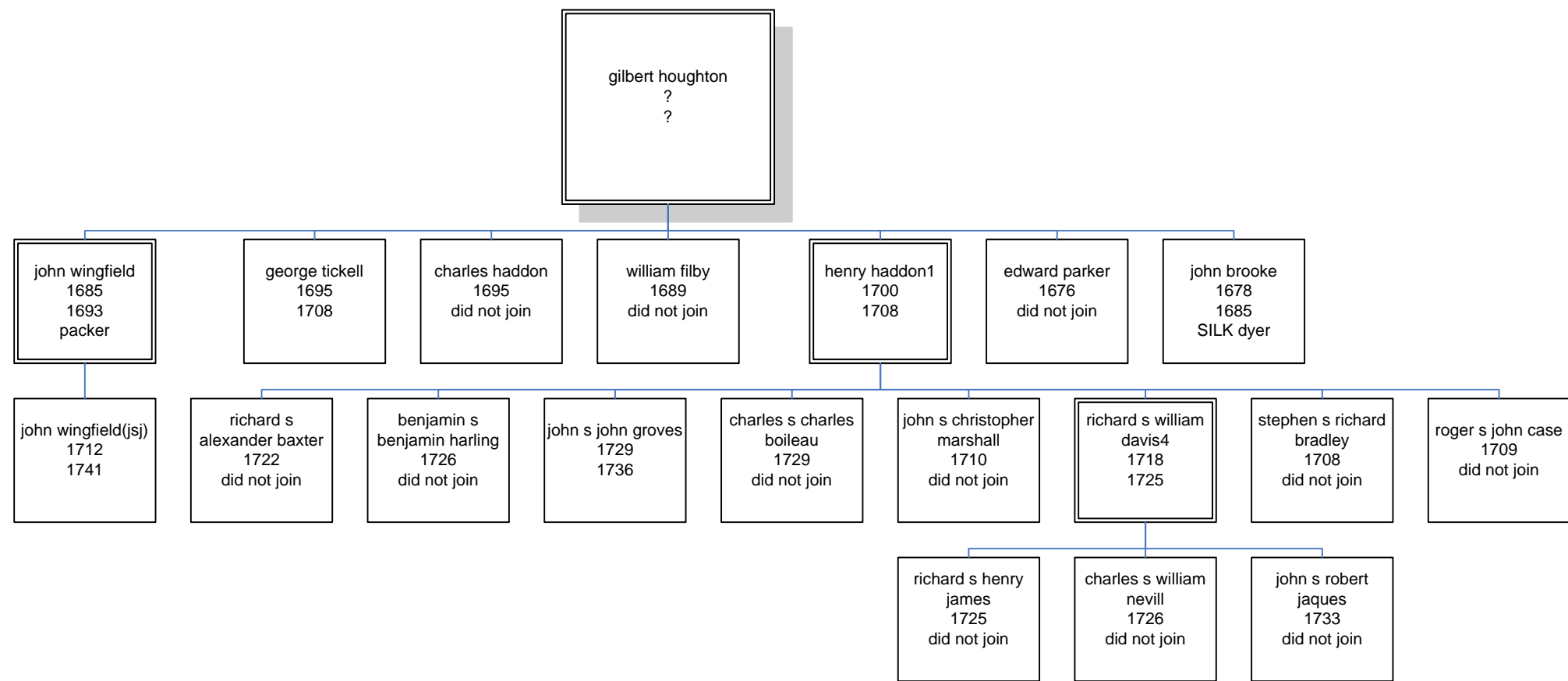
Silk, Charles Burghill, 4 generations



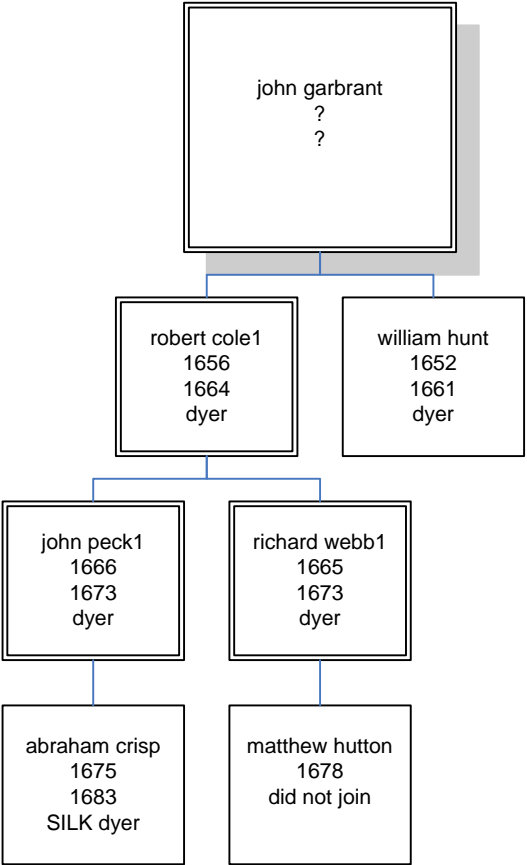
Silk, Edward Baker, 4 generations



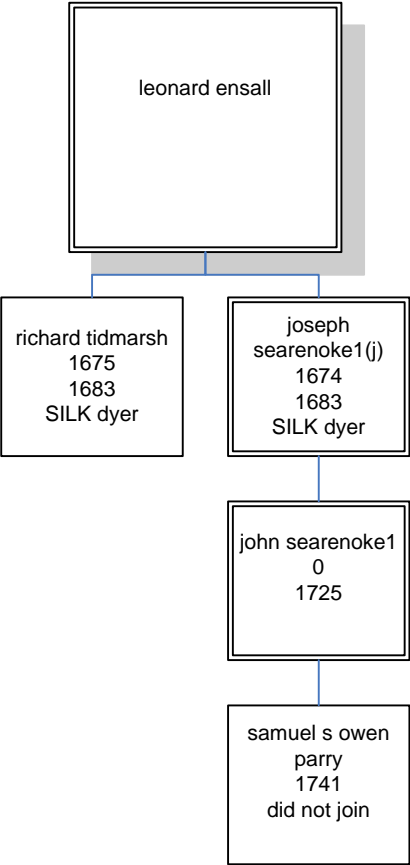
Silk, Gilbert Houghton, 4 generations



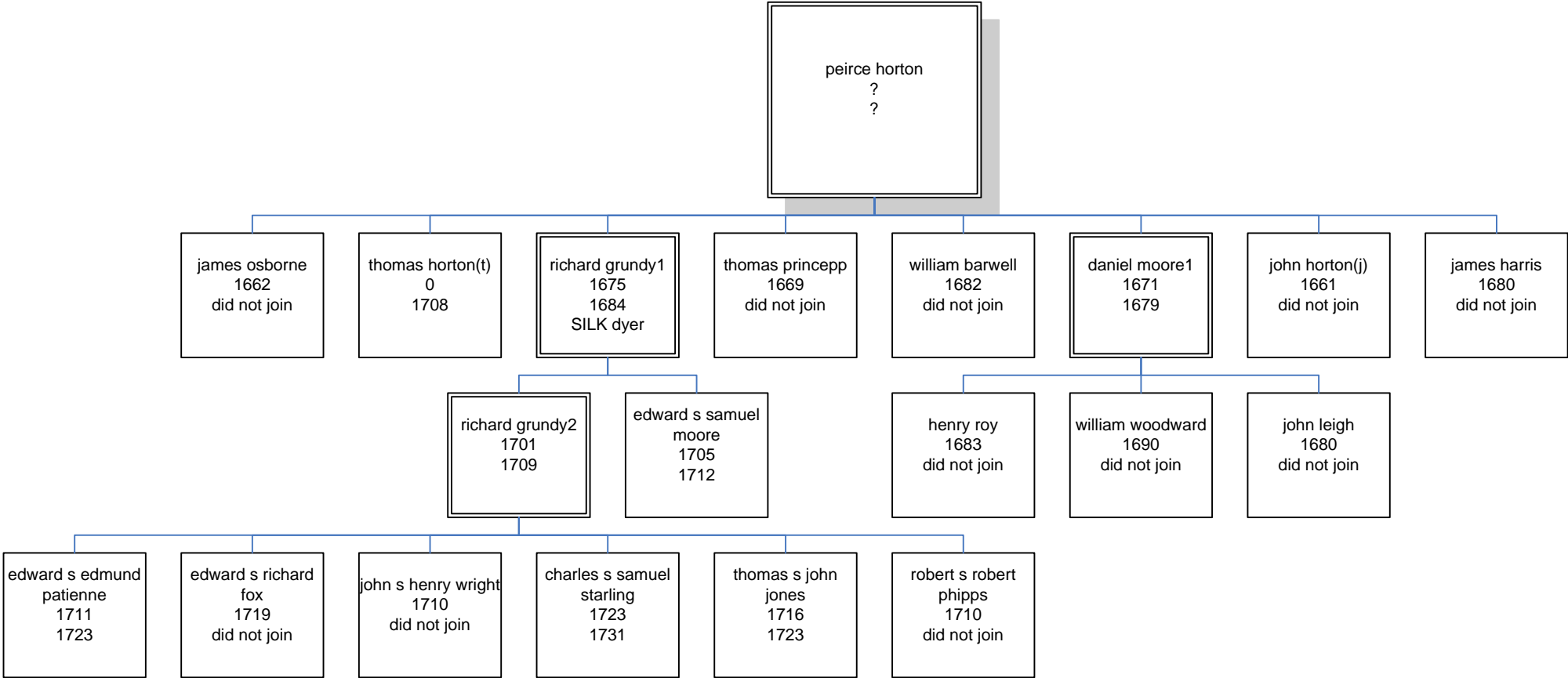
silk, John Garbrant, 4 generations



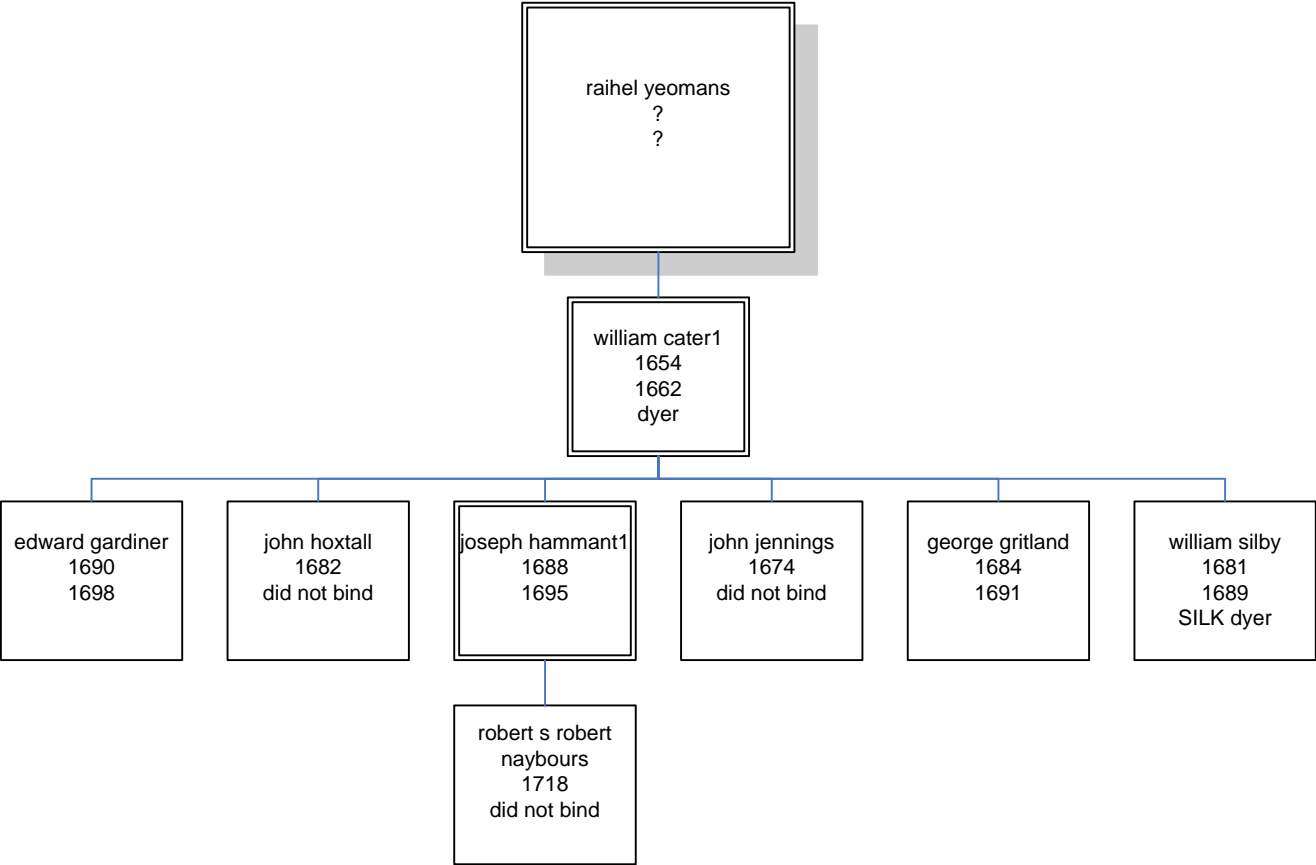
Silk, Leonard Ensall, 4 generations



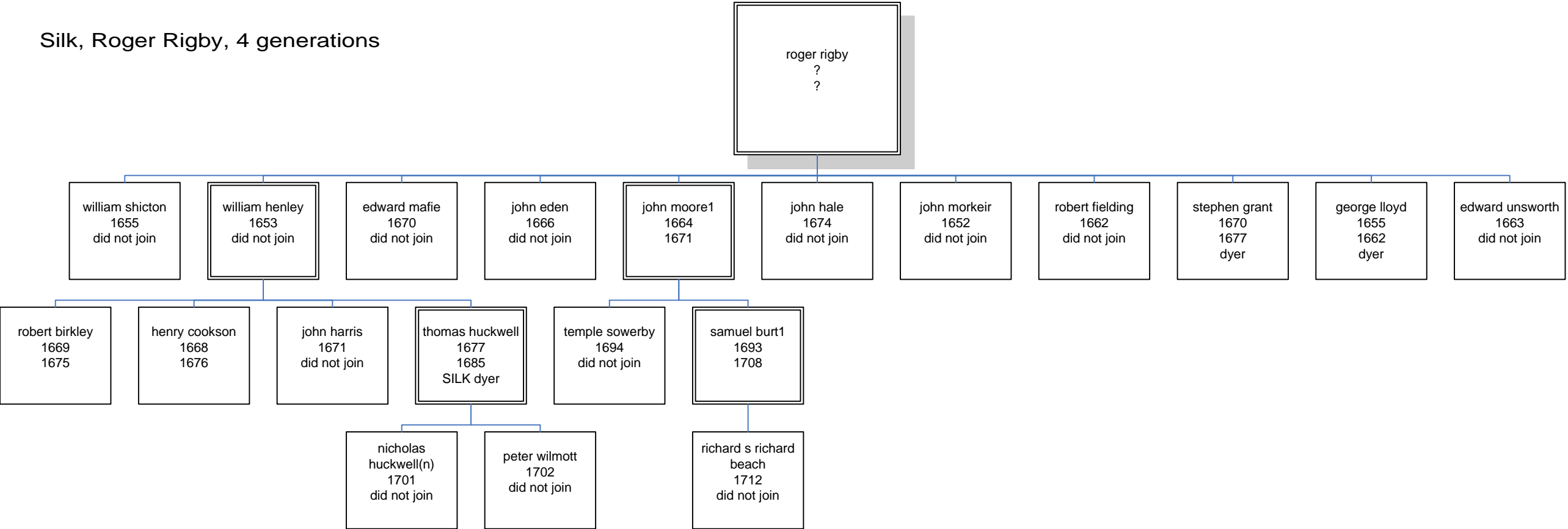
Silk, Peirce Horton, 4 generations



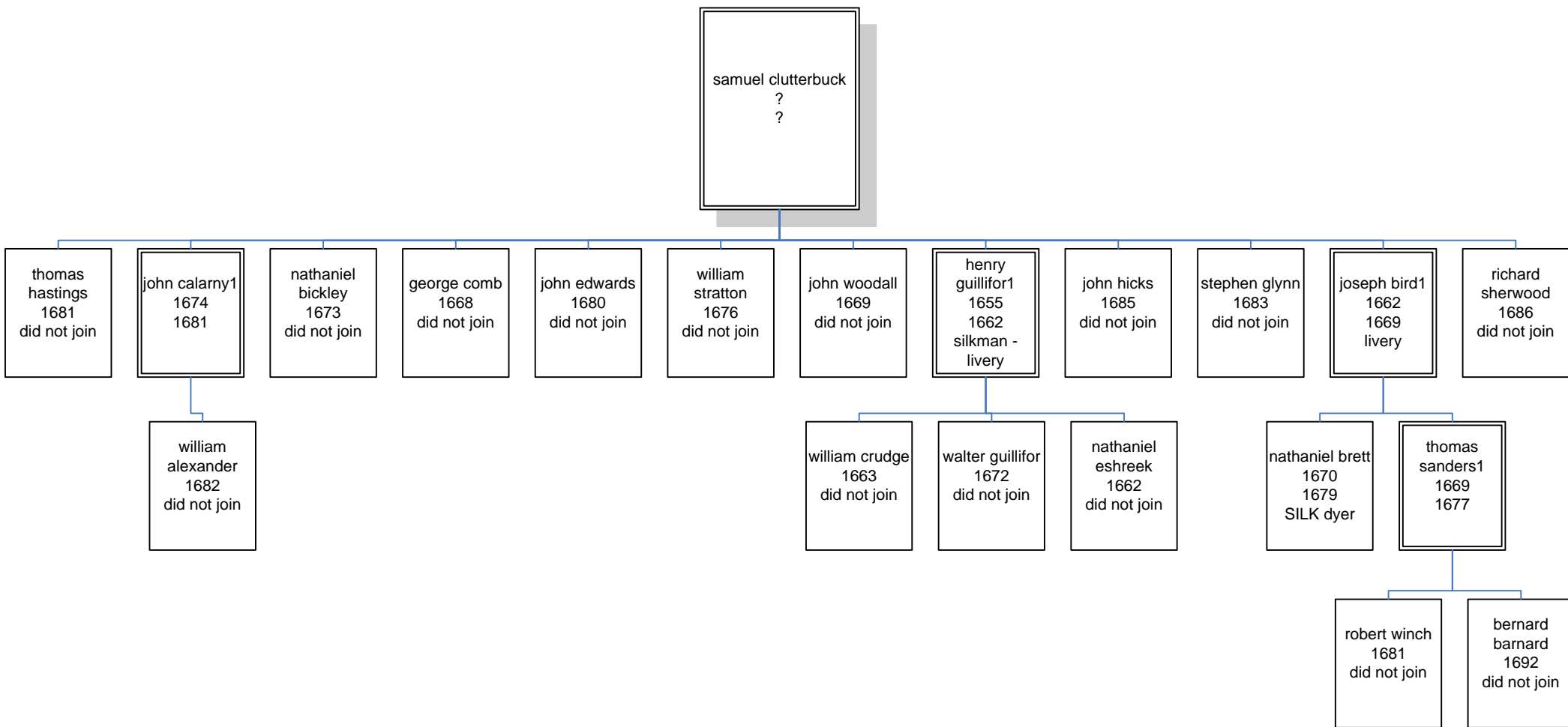
Silk, Raihel Youmans, 4 generations



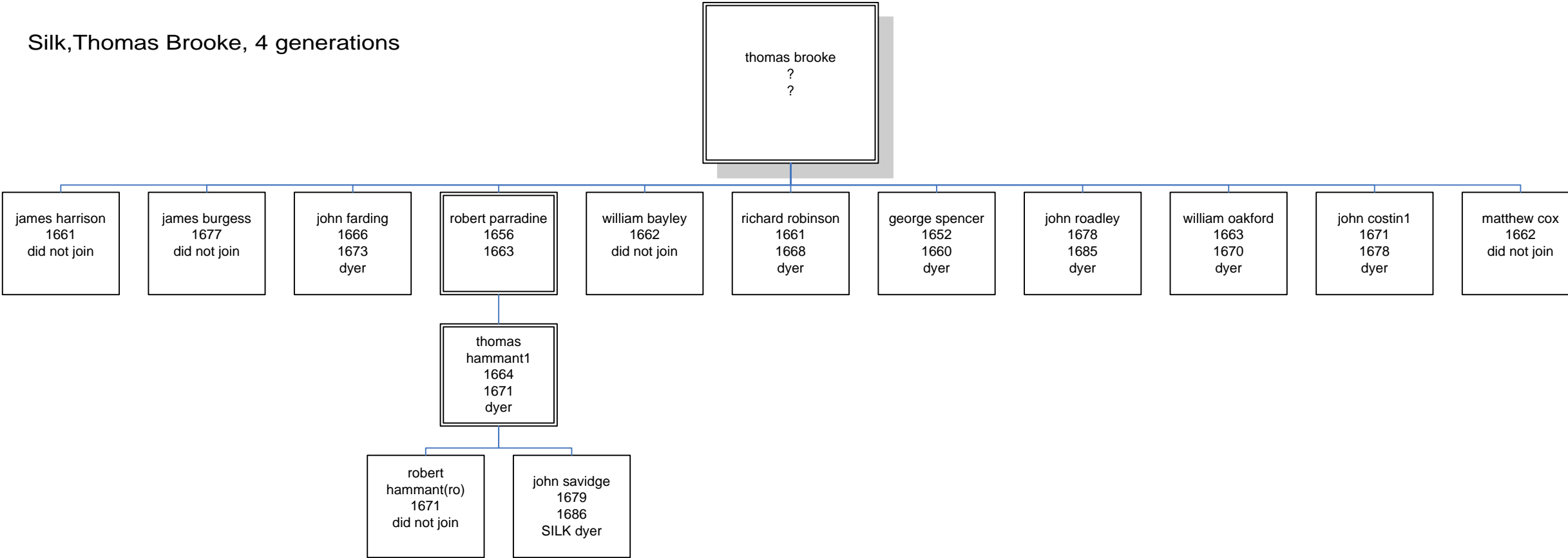
Silk, Roger Rigby, 4 generations



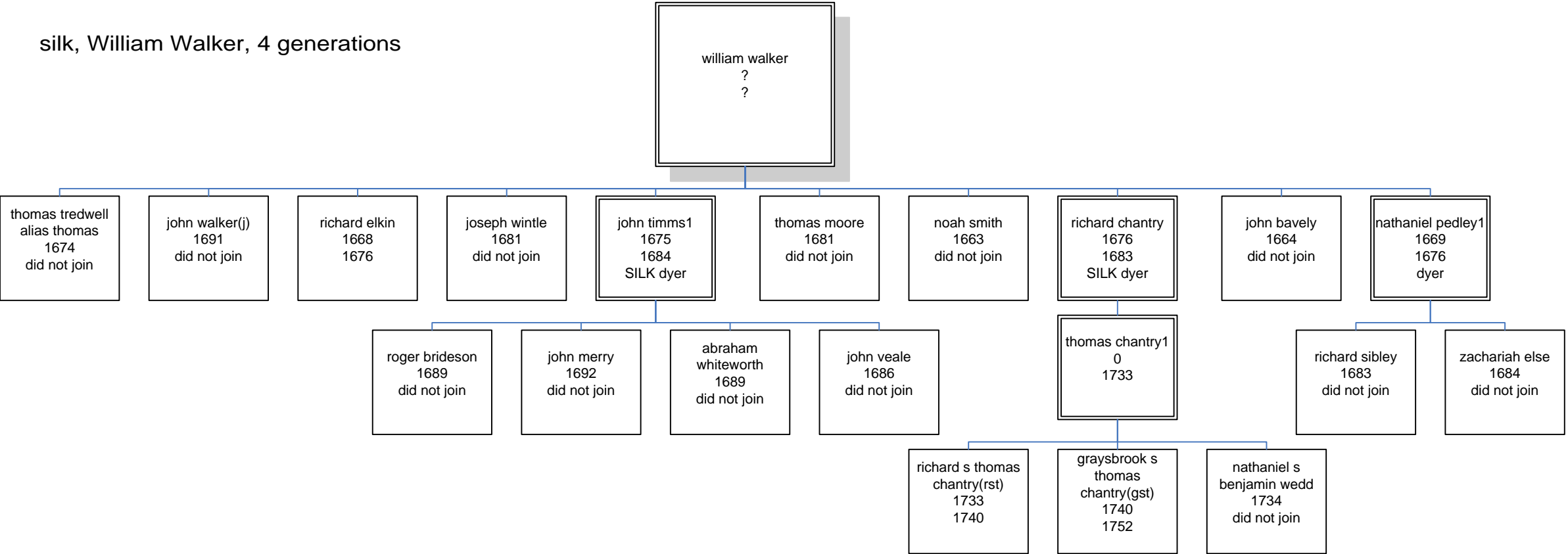
Silk, Samuel Clutterbuck, 4 generations



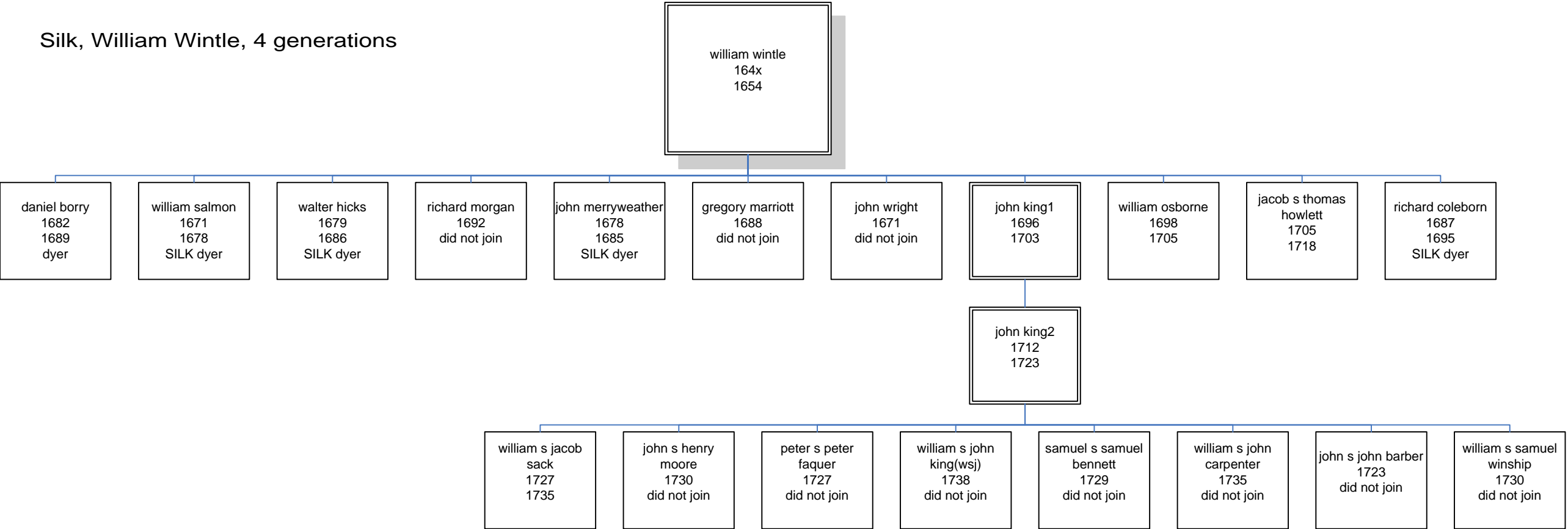
Silk,Thomas Brooke, 4 generations



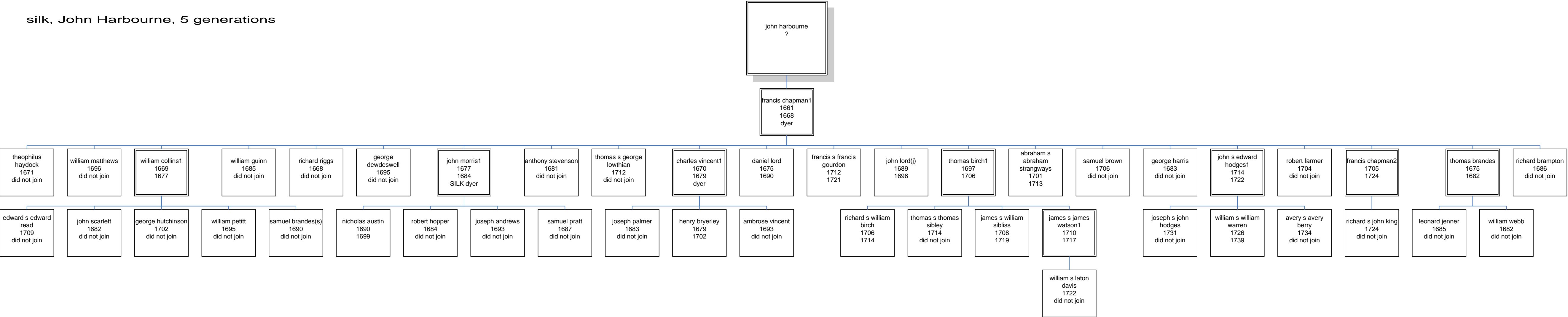
silk, William Walker, 4 generations



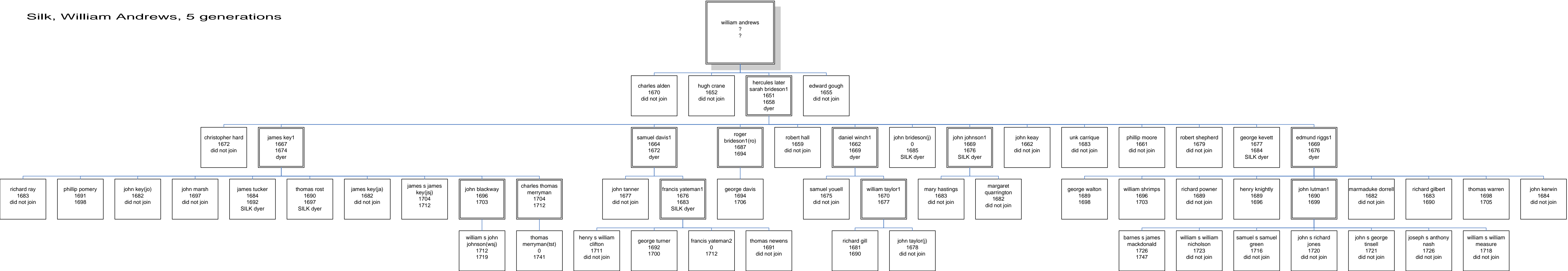
Silk, William Wintle, 4 generations



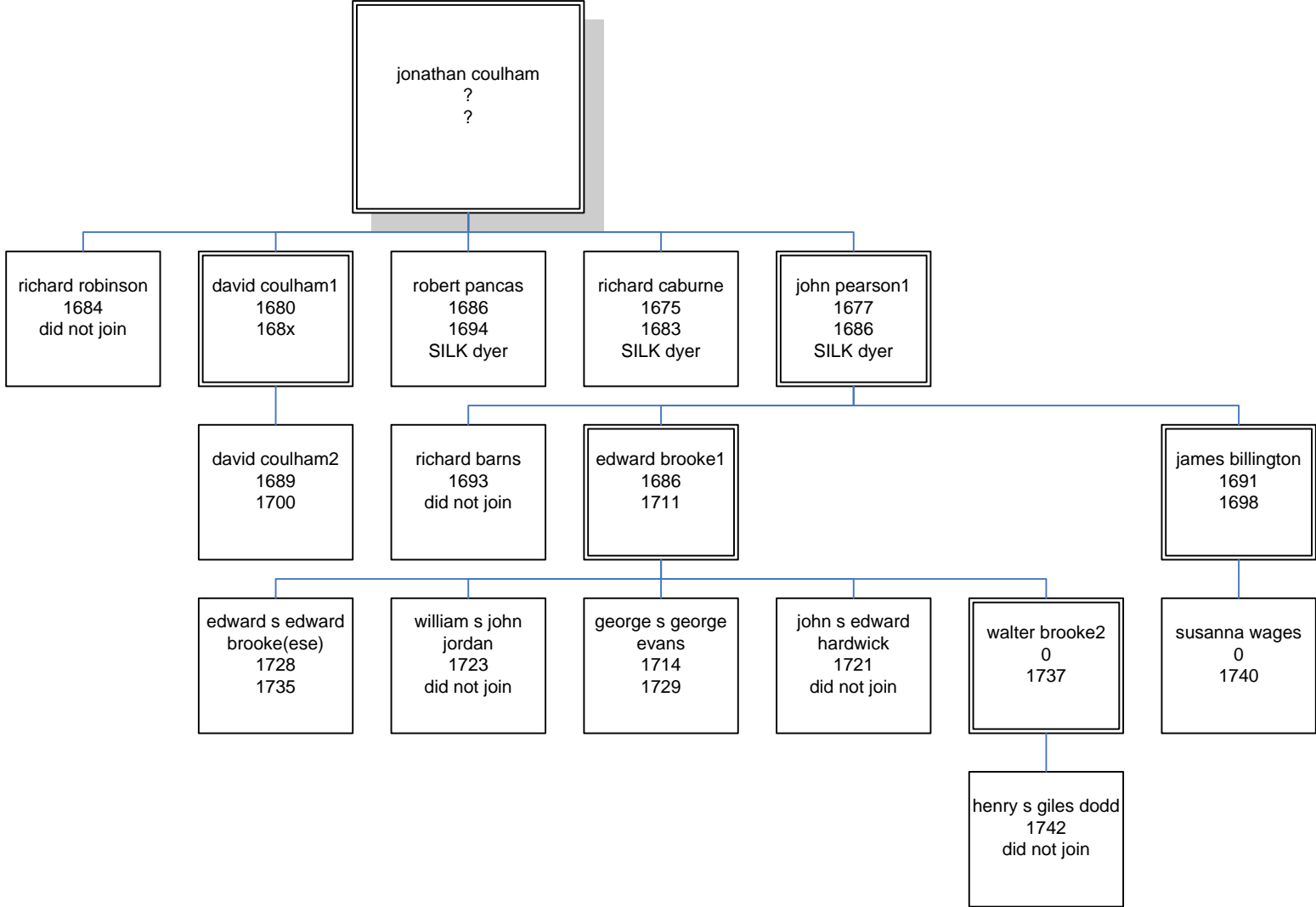
silk, John Harbourne, 5 generations



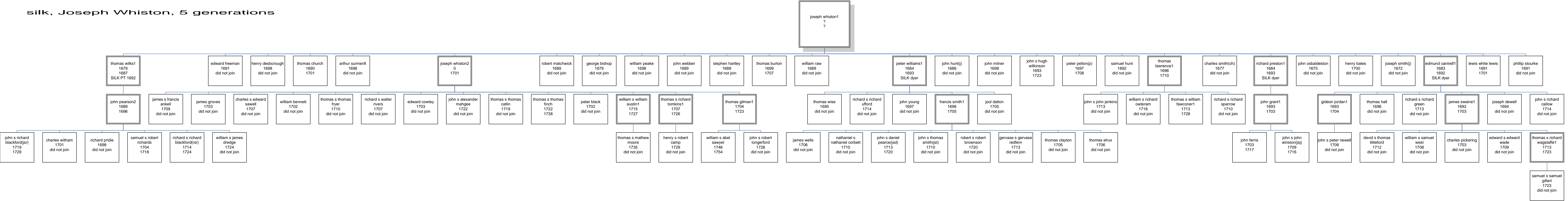
Silk, William Andrews, 5 generations



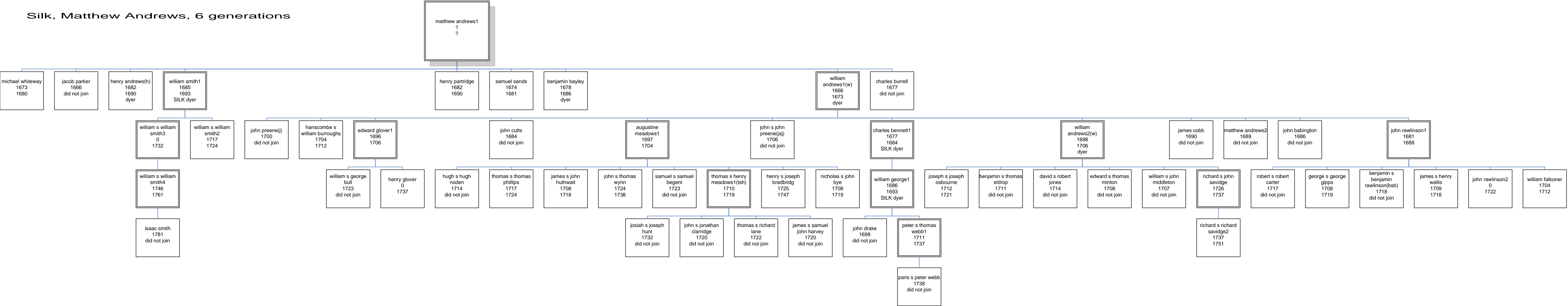
silk, Jonathan Coulham, 5 generations



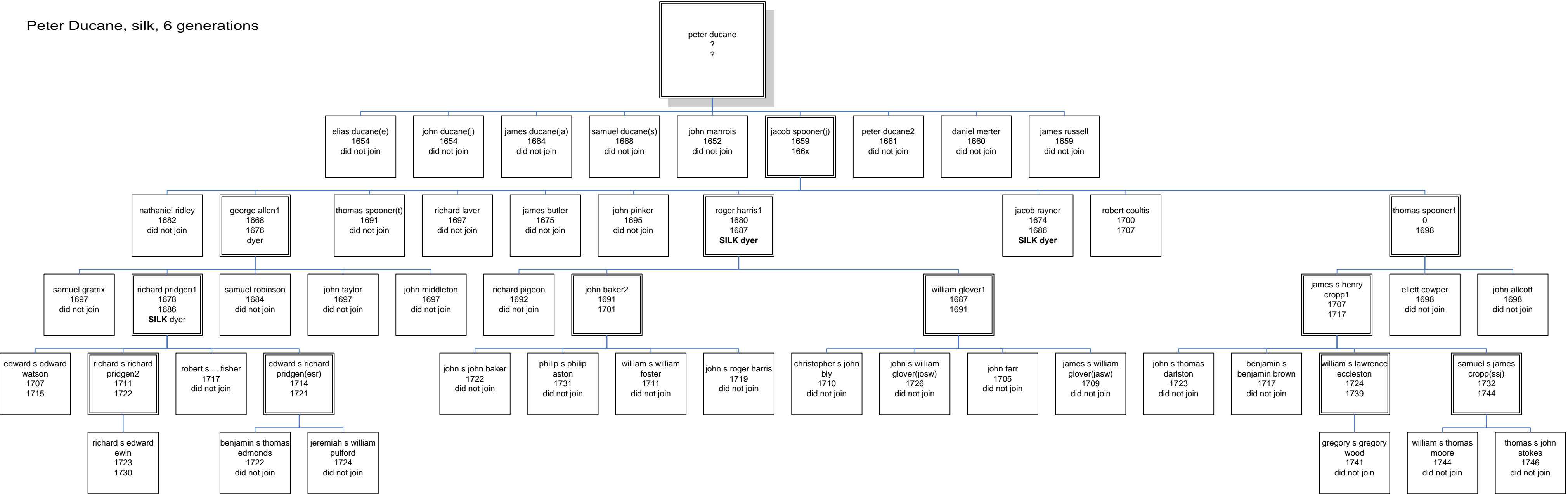
silk, Joseph Whiston, 5 generations



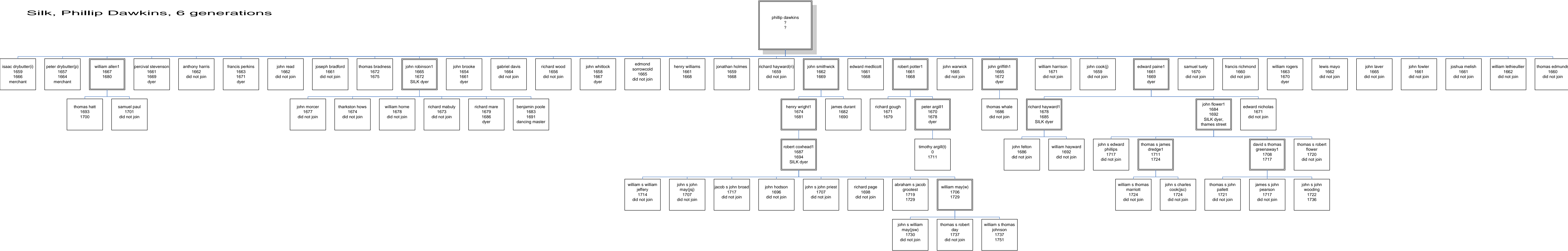
Silk, Matthew Andrews, 6 generations



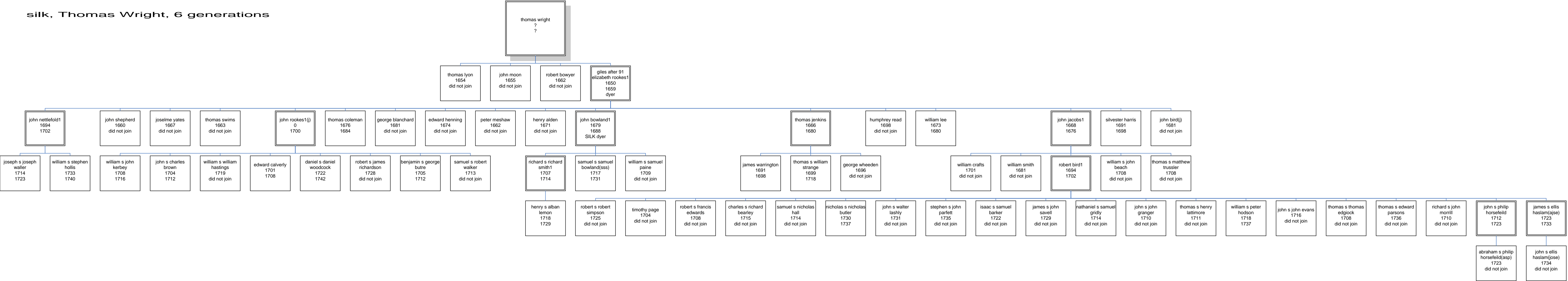
Peter Ducane, silk, 6 generations



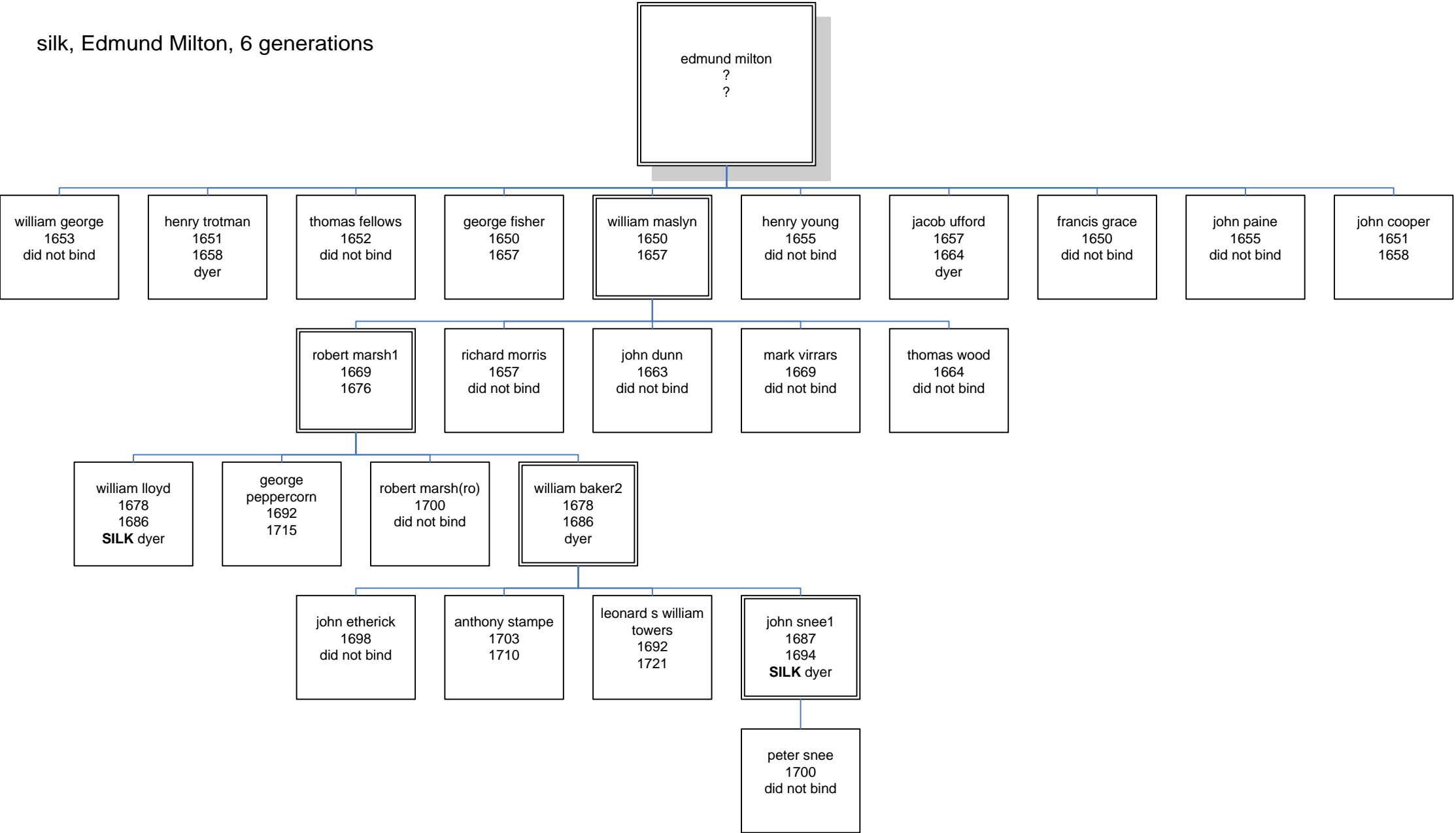
Silk, Phillip Dawkins, 6 generations



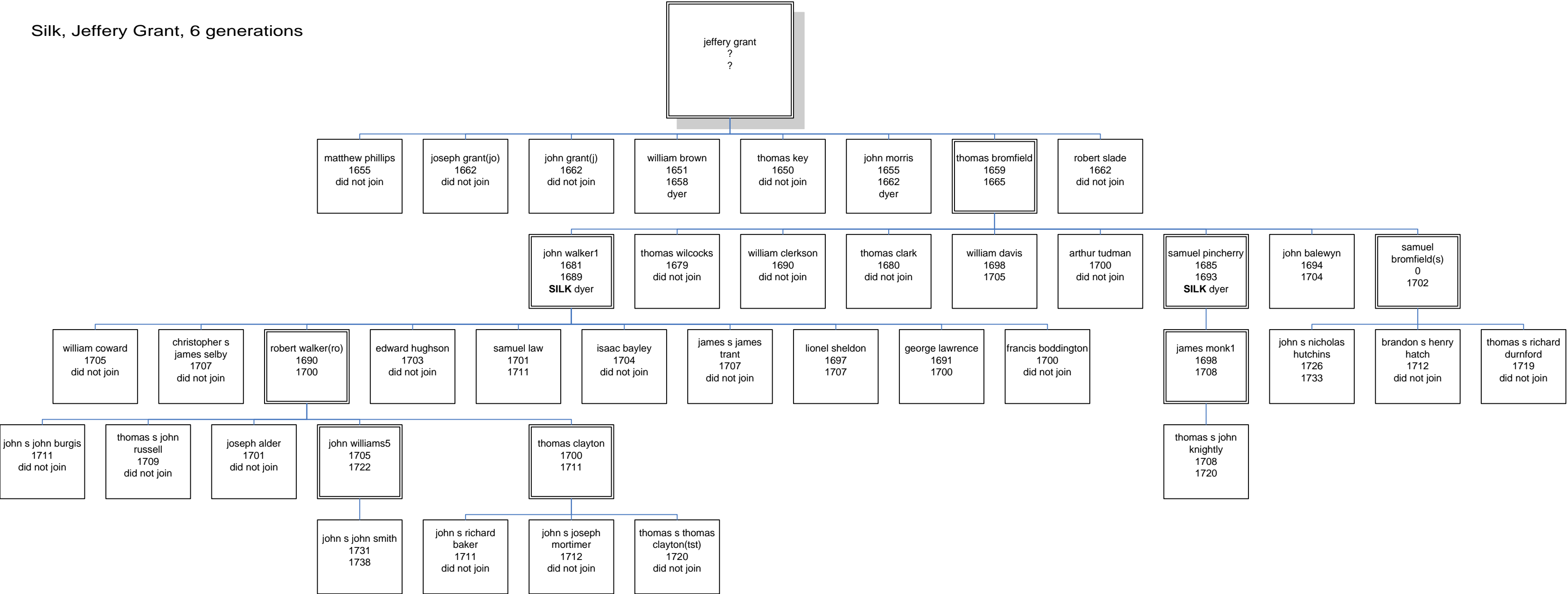
silk, Thomas Wright, 6 generations



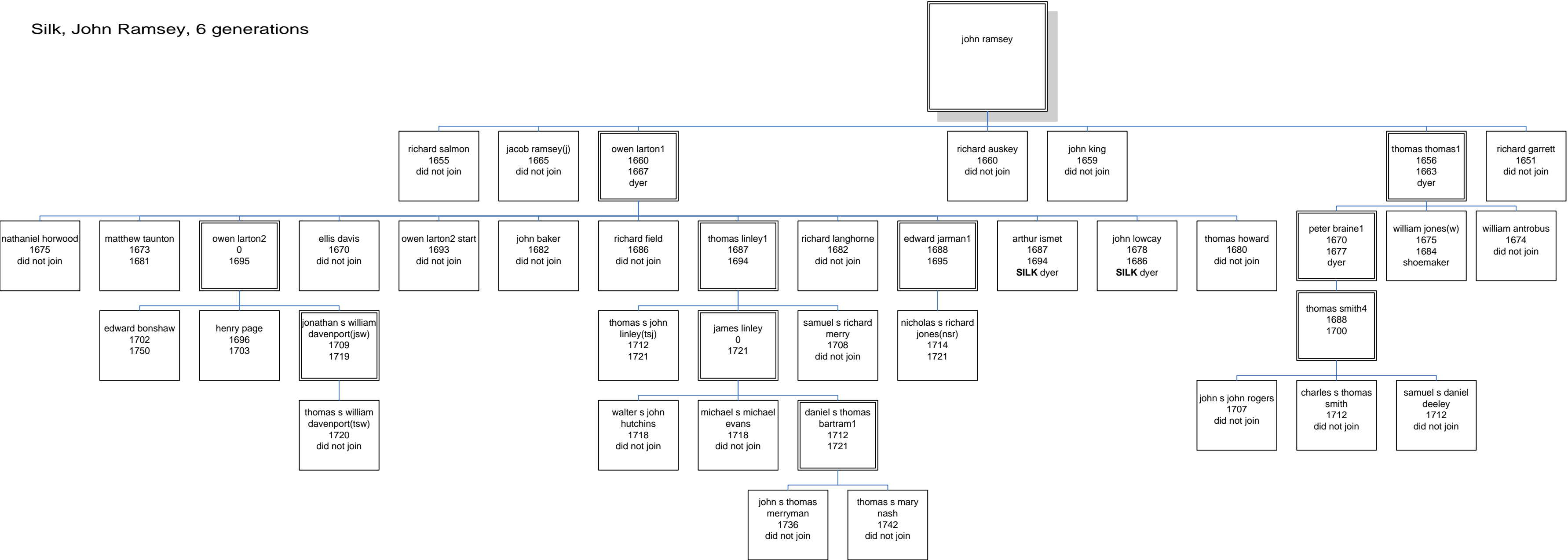
silk, Edmund Milton, 6 generations



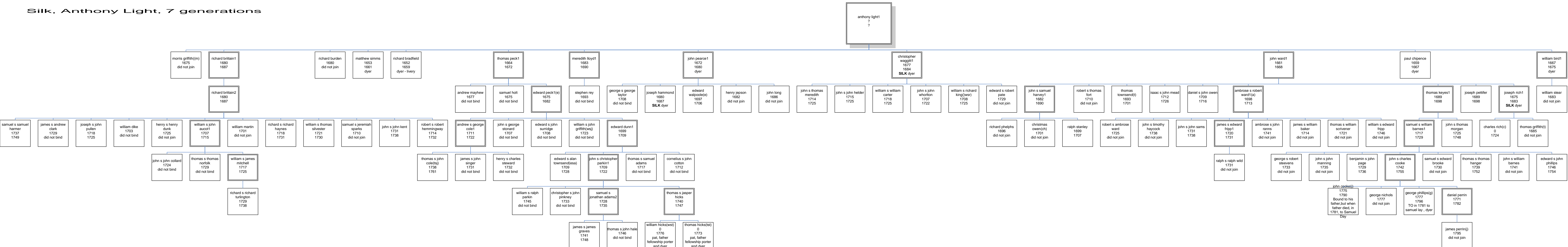
Silk, Jeffery Grant, 6 generations



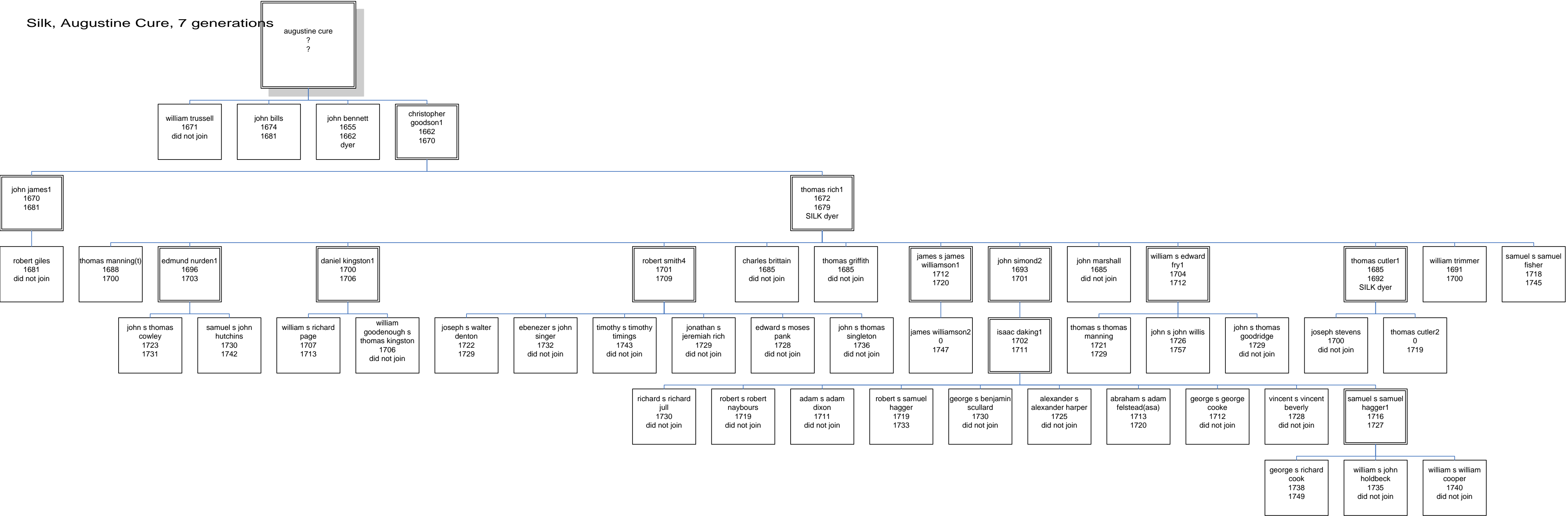
Silk, John Ramsey, 6 generations



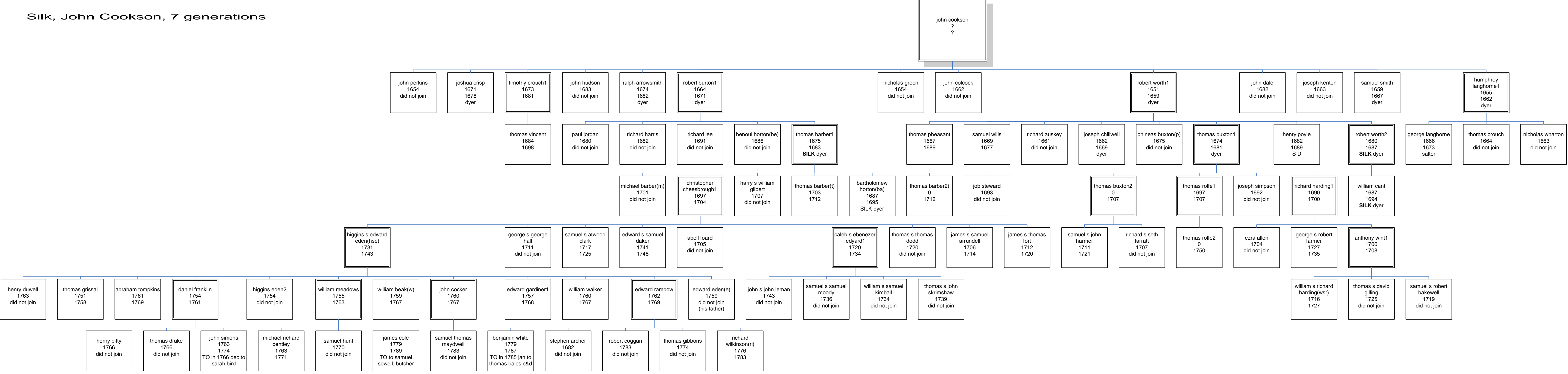
Silk, Anthony Light, 7 generations



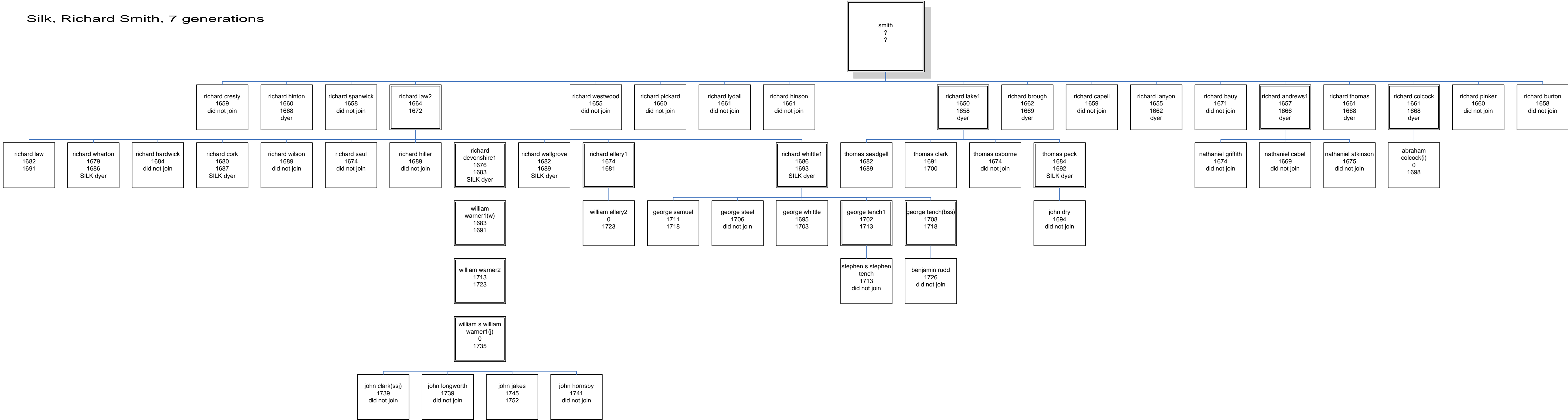
Silk, Augustine Cure, 7 generations



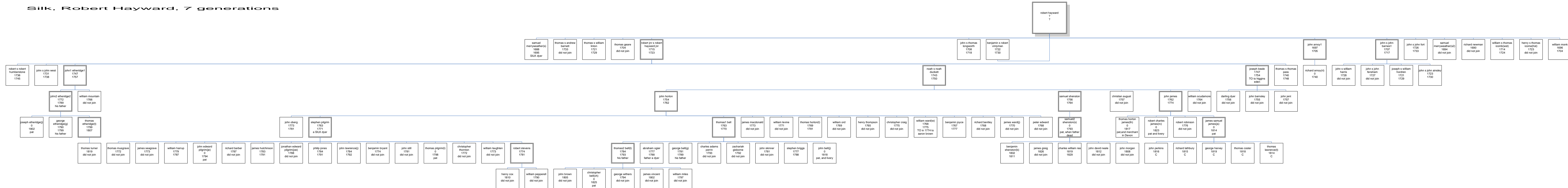
Silk, John Cookson, 7 generations



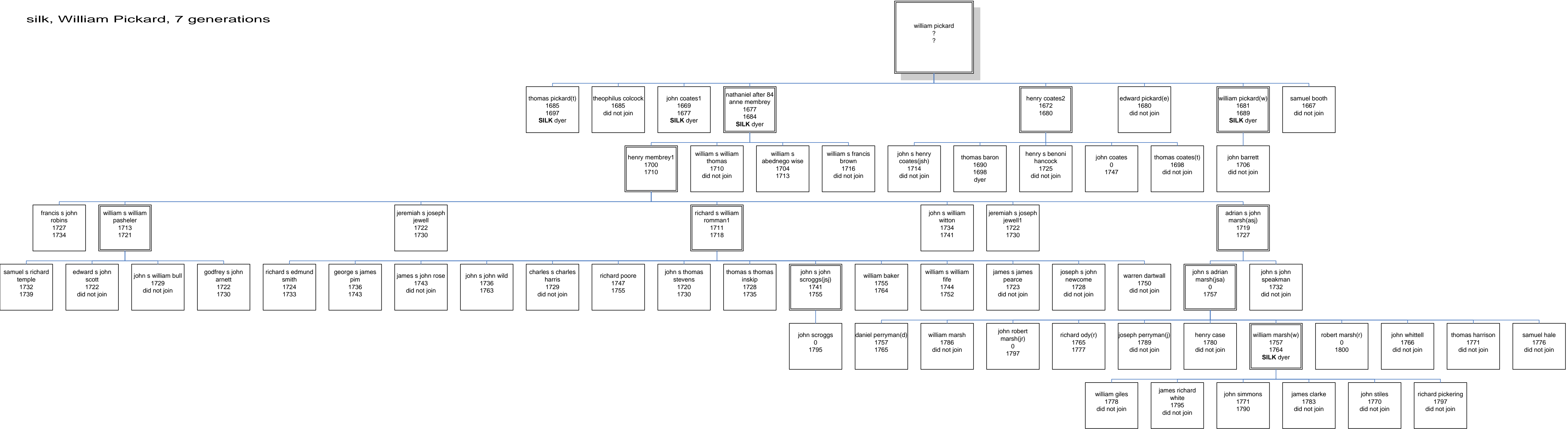
Silk, Richard Smith, 7 generations



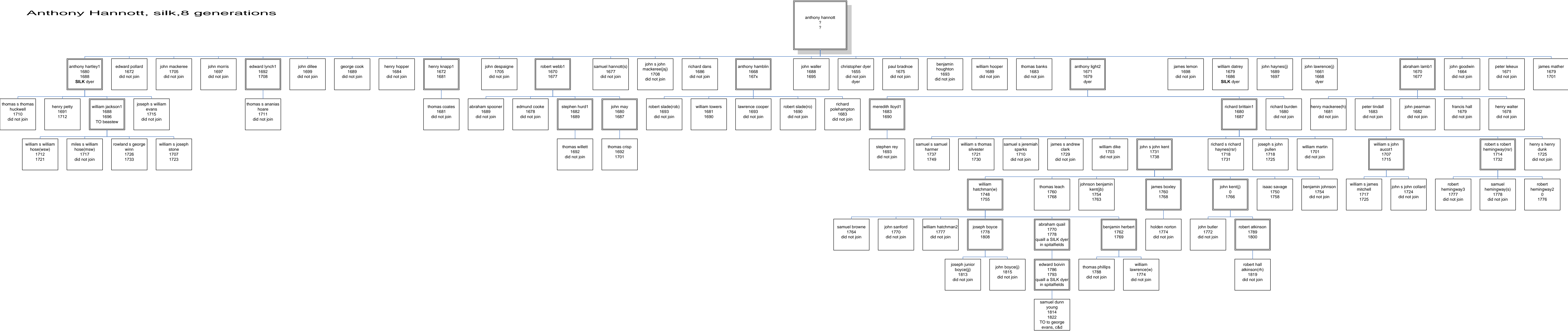
Silk, Robert Hayward, 7 generations



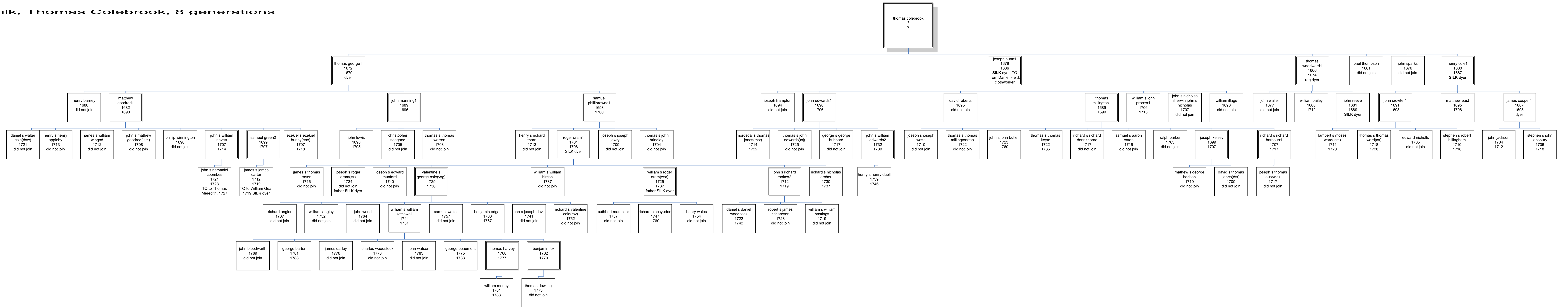
silk, William Pickard, 7 generations



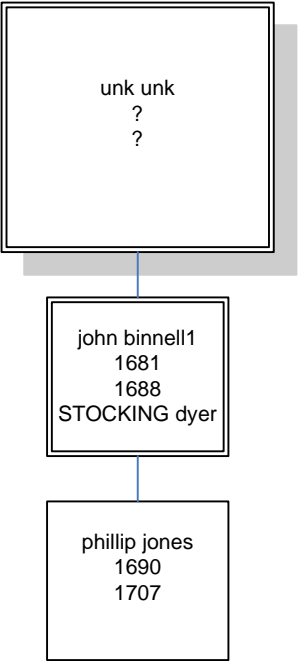
Anthony Hannott, silk,8 generations



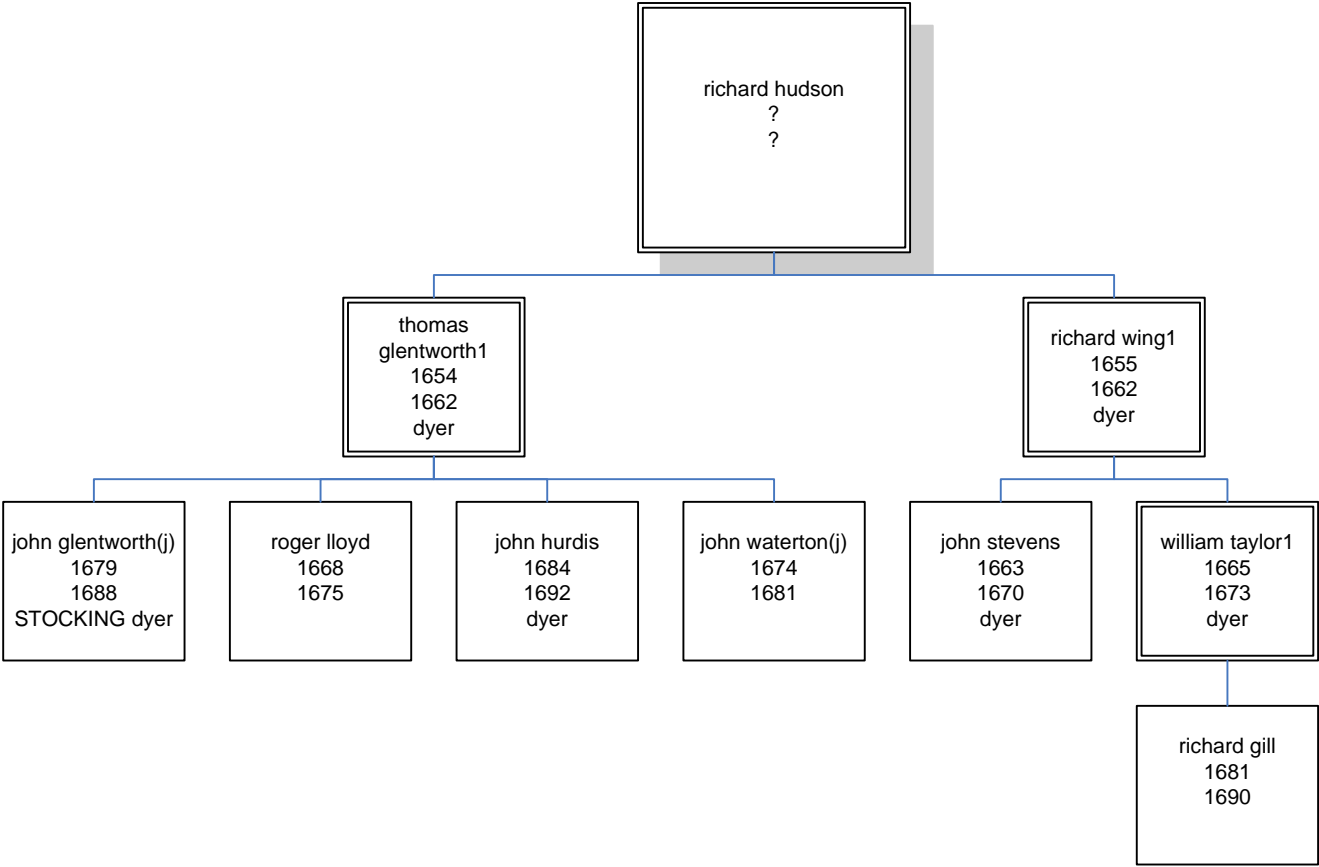
Silk, Thomas Colebrook, 8 generations



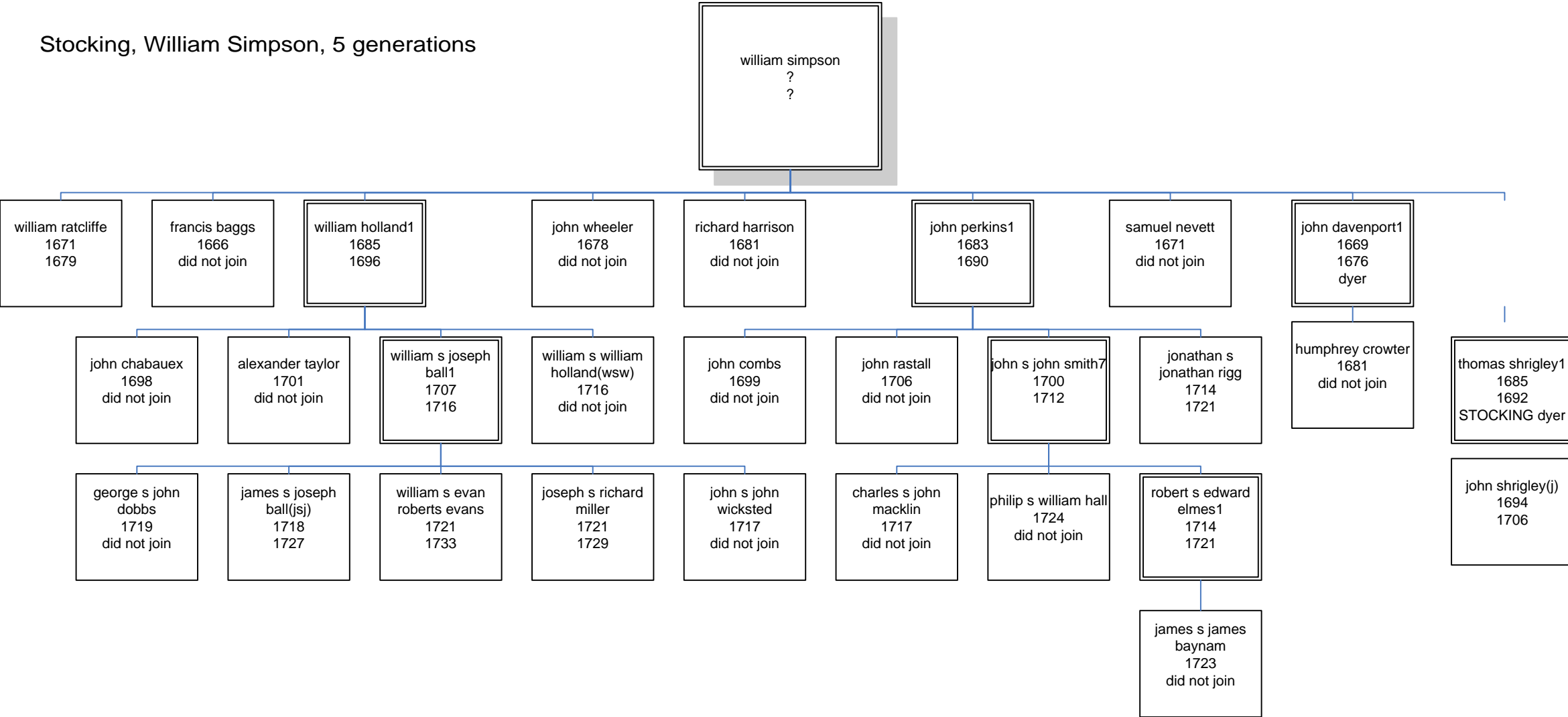
Stocking, John Binnell, 3 generations

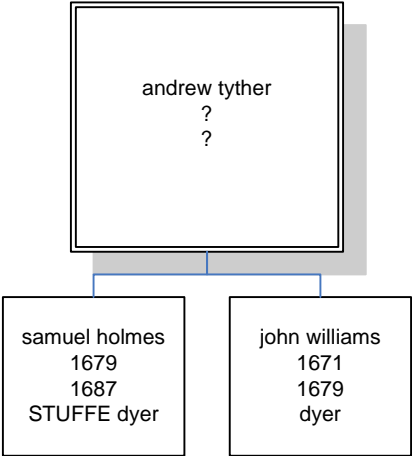


Stocking, Richard Hudson, 4 generations

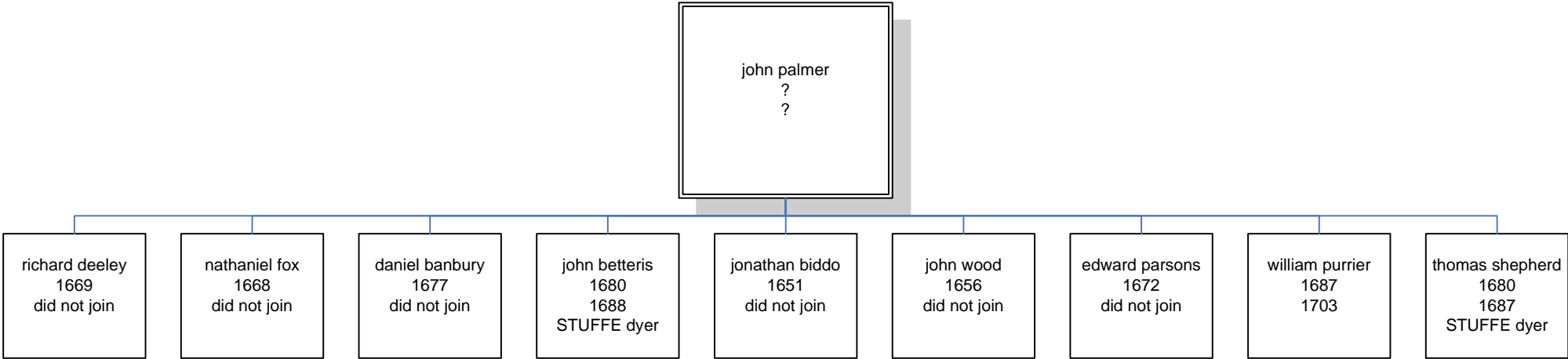


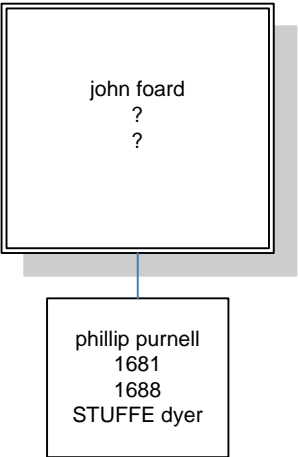
Stocking, William Simpson, 5 generations

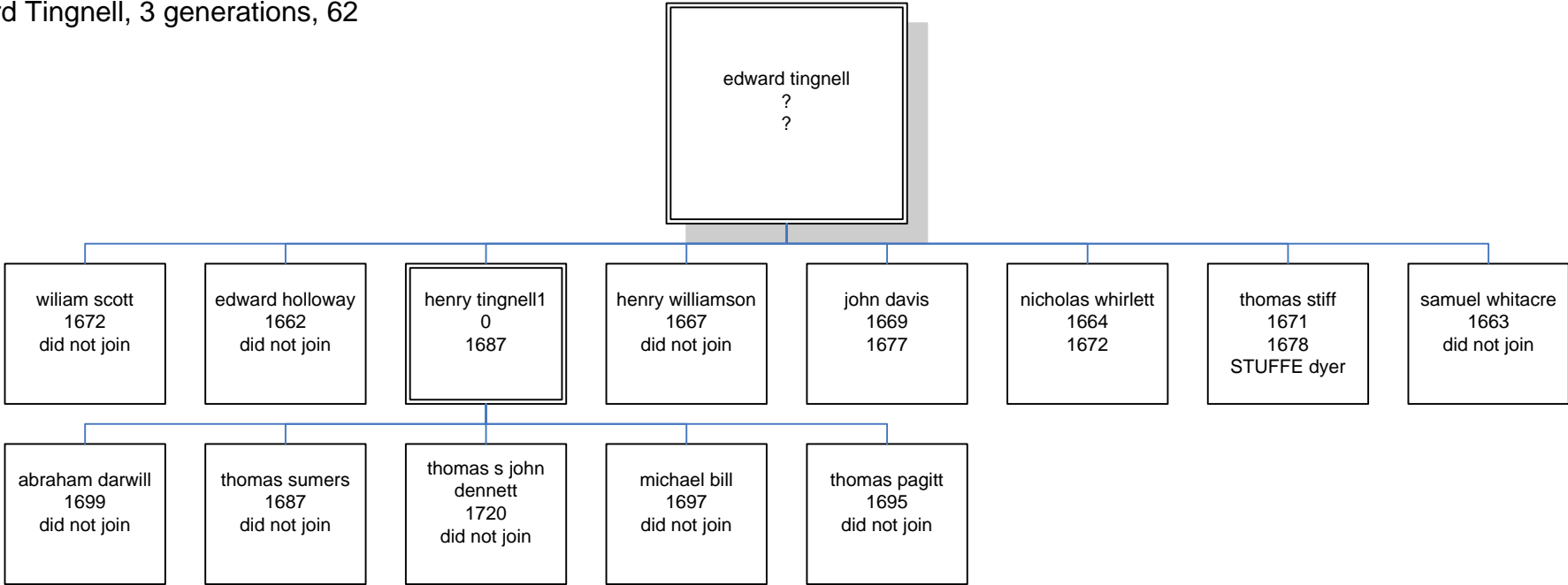




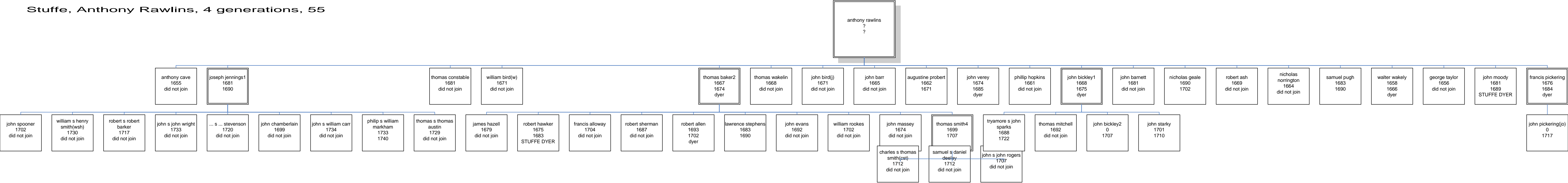
Stuffe, John Palmer, 2 generations

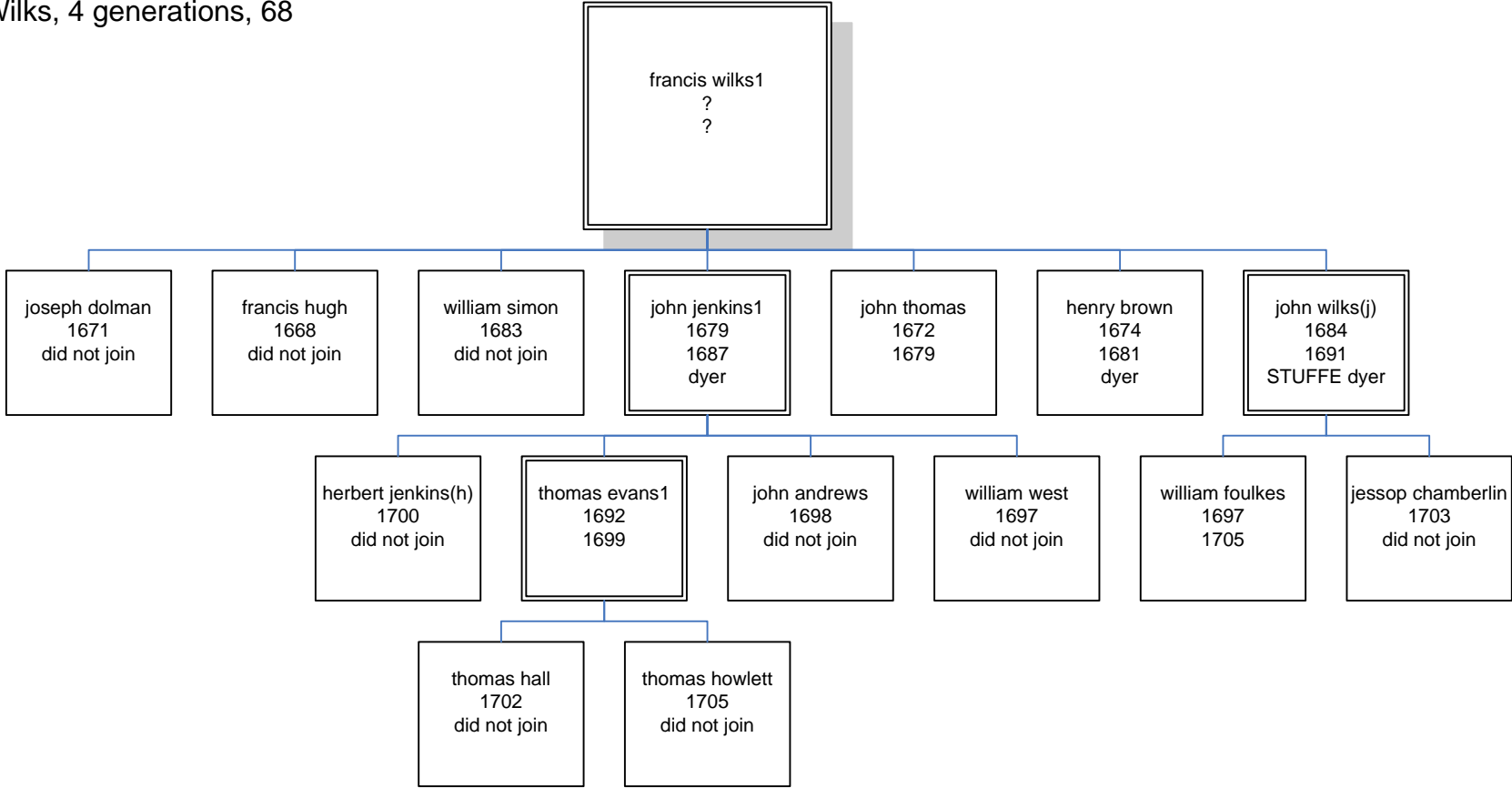






Stuffe, Anthony Rawlins, 4 generations, 55





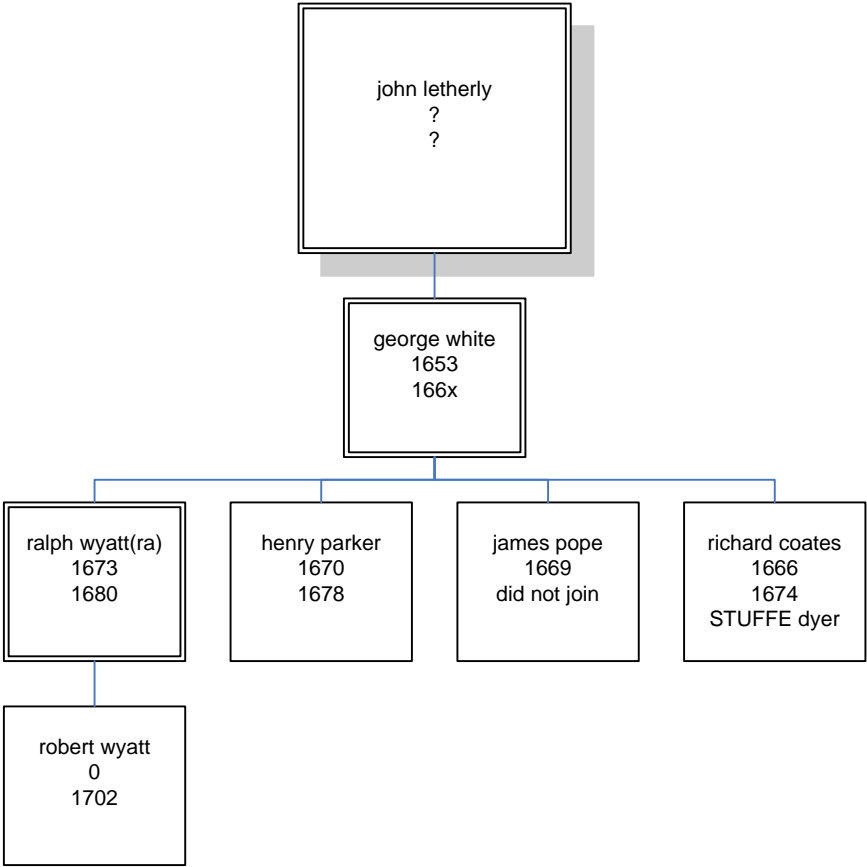


Table 2.9

Apprentices bound to a single master, 1649-1746

1]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
Total (5 yr)	213	258	394	404	378	324	408	324	323	333	331	361	393	276	285	217	185	152	126	53	5738
clay john	1	7	7	10	7	4	3	3	1												43
dawkins phillip	1	7	18	6	3																35
marshall christopher	3	3	3	4	7	8	3	2	1												34
butler edmund	3	3	20	4	2																32
hannott anthony		1	2	1	6	4	3	5	2	3		3									30
meakins john	2	2	4	4	3	5	3	2	1												26
whiston joseph					1	4	2	5	6	7	1										26
light william	1	3	1	17	2																24
aldersey humphrey	2	2		16	2	1															23
chapman1 francis				2	2	3	2	3		3	2	2	3	1							23
denew james	1	4	2		11	2		2													22
beale robert	3	1	7	10																	21
peck george					5	2	3	6	2	1	2										21
rawlins anthony		3	3	5	3	1	5		1												21
wind william						3	5	3		3	5	2									21
bird1 robert											1	2	6	3	2	2	2	2			20
mayo george	1	1	18																		20
cartwright francis			2	5	4	1		3	1	2		1									19
green henry	2		2	14	1																19
hickman john	2	1	5	2	8	1															19
houblon peter	1	3	7	2	3	1	2														19
burghill charles			1	1		3	4	1	3	3	1	1									18
harbourne john	1	1	16																		18
roadley1 william													1	3	4	1	5	2	2		18
smith richard	1	7	9		1																18
hiller john	1	1	1	2	2	1	5	4													17
mottershed richard		1	1	4	10								1								17
rose1 john										1		2	4	4	4	2					17
shute samuel		3	2	3	2	3	3				1										17
cecill james								1	3	3	1	3	1	1	3						16
foard george				1	3		2	4	3	3											16
lee1 william							1	2		3	2	3	2	2	1						16
webster1 william					5	5	3	3													16
applebury thomas							2	3	4	3	1	2									15
hayward robert								1	2	2	1	2	1	1	3	1	1				15
lambert1 william										3	3	2	1	3	3						15
ollive1 joseph														1		1	3	5	3	2	15

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
wilson archibald				1	3	1	3		2	3		2									15
aston1 edward				1	2	2	1	5	3												14
cleeve william			5	3	2		2	2													14
coleman1 lazarus						2	3	4	2	1	1	1									14
fowler1 john							1		1	3	2	3	2		2						14
lock roger	1	2	1	9	1																14
marshall1 stephen															3	3	2	2	3	1	14
watkinson1 edward													1	3	3	1	4	2			14
whiston1 joseph											5	4	1	2	2						14
cookson john	3	2	3		3		2														13
hunt1 henry								2	1	3	2	2	2	1							13
jackson john	1	2	1	1	7	1															13
noble benjamin				3	1	2	2	1	1	3											13
ollive1 benjamin							2	2	2	2	3		2								13
rookes1 giles			3	3	3	2	2														13
taylor adam	2	1	1	4	1		4														13
tradd robert					3	2	1	3	2	2											13
wilmott william			1	1	3	2	1	2	2	1											13
allington1 edward			2	5	2	1	1	1													12
andrews adam	2		4	4	1	1															12
andrews1 william						1	2	2	1	3	2	1									12
brideson1 hercules		1	4	3	1	2	1														12
brittain1 richard											2	1	2	2	1	2	1	1			12
butler2 william													2	4	2	1	3				12
cleeve1 stephen					2	1	1	3	4	1											12
clutterbuck samuel		1	1	2	2	1	3	2													12
fitter erasmus		2	2	2	3	2	1														12
harbin morren		2	3	2	4	1															12
houblon james	1	3	2	2	1	1	1		1												12
larton1 owen					2	2	3	4	1												12
light1 anthony	2	1	2	1	1	2	3														12
mason christopher			5	5	1	1															12
rich1 thomas								4	2	1	3		1	1							12
wild james						1	2	2	1	2		3		1							12
battin anne								1	3	5	2										11
battin john			1	1	2	4	2	1													11
brooke thomas	1	1	5	1	1	2															11
brown1 thomas										4		3	2	1	1						11
kent gabriel												1	3	3	1	1	1	1			11
kerfoot1 nathaniel										3	3	1	3	1							11

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
law2 richard					2	2	4	3													11
lawton edmund							4	2	2	1	1	1									11
mandrell richard				2	4		3	2													11
may jacob	1	3	1	2	4																11
may1 henry							1	1	1	5	1	2									11
moore jonathan												1	3	1	4	2					11
priddith christophe						1	1		2	1	2	2	1	1							11
romman1 richard															3	3		2	3		11
sands peter							1	2	2	4	2										11
sparks jeremiah				2		2	3	1	2	1											11
sweet john											1	2	3	2	1	2					11
whitworth ralph							3	1	2	1	2	2									11
wintle william					2	2	1	2	1	2		1									11
ashwyn1 william						2	1	1	4	2											10
aynesworth1 thomas				3		4	2	1													10
baker2 thomas					1	2	1	1	2	1	2										10
bird1 daniel										1	1	1	3	2	1			1			10
blackhurst roger	3	5	2																		10
bourne richard				2	1	5	2														10
clements walter				2		2	4		1	1											10
corner1 john												2		1	4	2	1				10
daking1 isaac													3	3		2	2				10
delanoy peter	1	2	2	1	2			1							1						10
dew edward											1	1	2	1	3		1		1		10
drayton1 joshua						3		3	1	2	1										10
elliott john												1	1	2	1	1	3	1			10
hackney1 joseph												2	2	3	1		2				10
key1 james							4		2	2	2										10
litchfield1 edward					2		2	3	2	1											10
mandrell william					4	3	3														10
milton edmund	7	3																			10
ollive2 benjamin													2	1	4	3					10
pellon1 peter												1	2	2	1	2		1	1		10
pugh1 samuel										2	1	3	1		1	1	1				10
rigby roger	2	2	3	1	2																10
simpson william				2	2	1	2	3													10
smith1 george								2			2	1	5								10
spence1 henry									1	1	1	2	2	3							10
walker william			2	2	1	2	2		1												10
walker1 john									2	1	4	3									10

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
wilmott1 benjamin							1	2	1	2	1	2	1								10
alexander1 daniel														2	3	1	2	1			9
allen1 thomas	1	1	7																		9
andrews1 matthew				2	2	2	2	1													9
bagwell1 samuel						5	1		3												9
cheesbrough1 christo												2	2	1	2		1		1		9
cliffe humphrey	2	3	2	1	1																9
ducane peter	3	2	3	1																	9
eaton1 jonathan								1	1	2	1	3	1								9
gray edward			1	4	1	3															9
grimshaw1 john							1	1	3	4											9
hamblin1 isaac						2	2	1	1	2	1										9
hannott samuel											2	2	2	3							9
harris1 joseph											1	1	2	2	1		2				9
hayden1 isaac											2	1	1	2		2		1			9
hilton1 jonathan														1	3	1	1	2	1		9
horton1 james											2	2	1	2	2						9
how1 william														1	1	3	2	2			9
hussey john																2	1	3	1	2	9
jennings1 joseph										1	1			1	1	1	4				9
key john			1	1	3	2	2														9
lethieullier1 christ				1	3	1	2	2													9
mandrell1 william								4	4	1											9
millington1 thomas										1	1	1	1	2	3						9
morris1 phillip				1		1		2	2	1	1	1									9
nicholls anne									3	2	1	3									9
palmer john	1	1		2	1	1	2	1													9
palmer1 thomas														1	2	1		2	3		9
pippin1 john													3	2	2	1	1				9
richardson1 edward									1	1	1	2	1	2	1						9
riggs1 edmund							3	3	1	2											9
simond henry							1	3	2	1	1	1									9
spooner jacob				1	1	1	2		1	2	1										9
stockton1 john														2	1	3	1	1	1		9
ward1 john						1	1	2	1	1		1	2								9
willoughby1 george											2	1	2	2		2					9
archer1 nathaniel															1	3	2	2			8
barnes henry		2	1	4	1																8
barnes1 samuel																1	2	2	2	1	8
bower richard	2	1	2	3																	8

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
bromfield thomas						1	2	1	2	1	1										8
brown joseph		1		6		1															8
carrington1 edmund									3	1	1	1	1	1							8
cole2 john															1	3	4				8
coleman1 john					1	1	4			1	1										8
coxhead1 robert										2		3	1	2							8
cross john	4		4																		8
ellery john									3		4	1									8
fearnley1 edward								1	1	1	1	2	2								8
fowler2 john																2	2	2	1	1	8
gale1 edward													2	2	4						8
glentworth1 thomas				2	1	1	2	1	1												8
goodred1 mathew										2		3	2		1						8
grant jeffery	2	3	3																		8
haddon1 henry												2	1	1	1	3					8
halford1 william														1	2	1	2	1	1		8
king1 john															1	3	2	2			8
lamb1 william							1	1	3	1	2										8
meadows1 augustine												2	2	1	2	1					8
monk1 george										2	2	2	1	1							8
oram1 roger													1	1		2	2	1	1		8
pickard edward										2	4		2								8
pickard william				2	1	1	2	2													8
rookes1 john											2	2	1	1	1	1					8
salisbury william	3	4			1																8
shuter1 james							1	3	3	1											8
smith1 francis												3	4		1						8
sowton1 john													2	2		2		1	1		8
stanlake anthony	5	2	1																		8
taylor1 john				1	2	1	3		1												8
thompson1 john							1		1		2	1	2	1							8
todd john				1		2		2	3												8
ward1 ambrose													1		2	1	1	1	1	1	8
watts richard	1	1	3				3														8
woodruffe william		1	1	2	1	2	1														8
worth1 robert			2	2	1	1	2														8
allington2 edward									1	2	2	1	1								7
bailey john										2	3	2									7
baker3 thomas							1	2	1	1	2										7
bridgewater1 benjami		1	1	1	4																7

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9**Apprentices bound to a single master, 1649-1746**

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
cam1 thomas			1	4	1	1															7
cole1 john												3	3	1							7
collins john						1		1		1	1	1	2								7
cowley1 william									2	3	2										7
denew nathaniel				3	2	2															7
englebirt william				1	2	2	1	1													7
fearnley1 randall											1	2	3	1							7
gibbs thomas				1	2		1	2	1												7
gilman1 edward														3	3	1					7
gray thomas					1		1	2	2	1											7
ham1 john														1		1	1	3	1		7
hamersly1 thomas								2	2		3										7
harris john					1		2			1	2		1								7
herbert1 william													2	2	1	1	1				7
hodges1 benjamin												1	2		3	1					7
houghton gilbert						2		2		2	1										7
ledford john						1	2	1		1	1	1									7
litchfield1 george												2	1	2		2					7
lloyd evan			1	2	3	1															7
lowe2 william														1	2	1	2	1			7
lutman1 john														2	3	2					7
mandrell1 richard									2	2	3										7
mayhew1 edward												3		1	3						7
mills job											1	1	3		1	1					7
nunn1 joseph								1	1	3		2									7
ollive thomas																	1	6			7
orton peirce			2	1	1	1	2														7
paine1 william													2	1	1	2	1				7
parradine william				2	1	2	1	1													7
pitts1 richard												1	1	1		2	2				7
purser1 edmund												1	4	1			1				7
ramsey john	1	3	2	1																	7
randall1 henry										3	1	1	2								7
richards1 samuel															2	1	2	1	1		7
rootlidge1 richard							1	1	2	1	1		1								7
sharp william	4	1	2																		7
stockwell clement				1	4		2														7
tingnell edward			3	2	2																7
trimmer william	1	1	1	2	2																7
waite john							1	1	2	3											7

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
wilks1 francis				1	3	1	2														7
allen1 james							2		3	1											6
allen2 thomas							2	1	1	1	1										6
allington3 edward																1	2	1	2		6
andrews2 william												2	3			1					6
barber1 thomas								1	1	1	2	1									6
birch1 john											2		1	2				1			6
brooke1 walter											1	1	2	1	1						6
cantrell1 edmund									3	1			2								6
cater1 william					1		3	1	1												6
coe1 william				3		1	2														6
crabb1 william													1	2	2	1					6
darby thomas									1	2	1	1	1								6
dury isaac	1	1	4																		6
eastmead arthur											1	1	1	2		1					6
ellis andrew	1	2	3																		6
frewin1 edward																		3	3		6
goddard richard		1		1		1	2	1													6
gough1 edward					3	3															6
gould john	1	1	2	2																	6
grundy2 richard													3	2	1						6
hardland1 john							2			1	3										6
harris1 richard										2	1	1	1		1						6
hinds1 john																1	2	1	2		6
hopkins matthew	3	3																			6
knight1 john						1	1	1		2		1									6
light henry		2	1	2	1																6
light1 william						2		1	3												6
mason john			3	3																	6
mayhew1 william											1	4			1						6
membrey1 henry													2	1	1	1	1				6
neale john	2	2	1	1																	6
nicholls simon							3	3													6
osgood ann															2		1	1	2		6
pearson1 george														1	3	2					6
pearson2 john										1	2		1	1	1						6
procter richard			1	4		1															6
russell1 john									3	1	2										6
sanders richard							1	1	2	2											6
shute1 benjamin				1	2	3															6

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9**Apprentices bound to a single master, 1649-1746**

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
simpson1 daniel																	1	2	1	2	6
sleemaker1 john															1	1	3	1			6
smith4 robert															1	2	1	1	1		6
stone benjamin												1	3	1	1						6
tasker1 thomas													2		2		1	1			6
taylor1 james															2	2	1	1			6
thompson1 bryan											2	1	3								6
ufford1 john								2		1	2	1									6
waggitt1 christopher												2	1	2		1					6
waslyn jeremiah							4		2												6
westfield1 john									1	3	2										6
white robert		2	1		3																6
woolley2 william													1	1	1	1	1	1			6
yates tobias				2	3	1															6
allen1 george						1	1			3											5
andrews3 william												2	2	1							5
archer samuel												3	2								5
bailey thomas						1	1	2		1											5
baker edward	2	1				2															5
baker john	2	2	1																		5
ball1 william														3	2						5
battin1 john								1	1	2	1										5
beale1 robert					1	1	2			1											5
beastew george								4	1												5
blizzard1 james									2	1		1	1								5
bradley richard					3		1					1									5
bridgewater1 edward											1		4								5
bryerley1 henry											1	2	2								5
burton1 robert						1	2	1	1												5
cater dorothy									1	1	2	1									5
champnies thomas	2	1	2																		5
chelsham1 stephen						1	2	1	1												5
clarkson william											1	1	1		1	1					5
cliffe joseph							2	3													5
cole1 george										2		2							1		5
collins1 william							1		1	1	1	1									5
coulham jonathan						2	2	1													5
coulson william	2	1	2																		5
crow john	1	2	2																		5
davis edward	2	3																			5

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

9]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
davis1 edward						1		1		2	1										5
delme peter			1	1	1	1	1														5
devall henry									1		1	1	1	1							5
ebbitt edward							1	1	2	1											5
edwards1 william													1		1	3					5
ellery1 john												1	1		1	1	1				5
englebirt elizabeth								1		2	1	1									5
foster1 abraham													2	2	1						5
foster1 thomas											3	2									5
gaitscarth1 thomas												1	1	2	1						5
george thomas					3	2															5
gibbs william	1	1	2	1																	5
gildersleeve john									3	2											5
glover michael	1	1		2	1																5
goddard george								1	1	1	1	1									5
green1 william						2	3														5
gregg thomas														1	1		1	1	1		5
hamblin anthony							2		3												5
hancock1 thomas											1	1	1	2							5
harris2 william											2	2	1								5
henley william				3	1	1															5
herbert thomas								3	1	1											5
holland ferdinando							1	2		2											5
holland3 william															1	3				1	5
honeyman1 john										1	1	1	1		1						5
humston1 thomas														2	1		1	1			5
jacobs1 john							1		1		1	2									5
johnson richard	1	1	3																		5
kimball1 thomas											2	1	1	1							5
lakin john	1	1		1	2																5
lamb1 abraham						2	3														5
lethieullier abraha							1		1	1	2										5
lovelidge1 arthur															2	3					5
lowe1 john											1	2	1	1							5
maslyn william		1	2	2																	5
mason william			2	1		1	1														5
matson1 jacob											1	3	1								5
may1 jacob												1						3	1		5
meare william		2	2	1																	5
miller1 thomas													2		1	2					5

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

10]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
mills1 william														1	1	1		1	1		5
morton edward							1		1	3											5
ollive2 thomas																			5		5
osborne samuel				2	1	2															5
pearce1 john							2	1		1		1									5
peck1 edward										1		2	1		1						5
purser william												2	2	1							5
rawlinson1 john											1	2		2							5
rawstorne peter				4	1																5
rose1 joseph																1	3	1			5
rymmer thomas			1	2	1	1															5
shakerly william			1	1	1	2															5
shambrook1 john												1	1	1			2				5
sharp richard	4	1																			5
simond1 richard										1		3	1								5
smith david	1		2	1	1																5
stock richard	1	1	1	2																	5
swaine1 james											1	2	2								5
taylor2 william																2	3				5
tingnell1 henry							1			3					1						5
tuck samuel										1	2	1			1						5
walker1 robert											2	2	1								5
wheatley1 john													2	1	2						5
whittle1 george										1	1	2	1								5
wilkinson1 john									1	1	2	1									5
williams1 peter										3		1	1								5
wincule1 isaac			1	2	1		1														5
allington william											4										4
andrews william	2	1			1																4
angell1 richard																		3		1	4
ashby edward						1	1	2													4
atkins1 henry									2	1	1										4
aynesworth thomas	1	1	2																		4
baker2 john													1	1	1		1				4
baker2 william								1	1	1	1										4
barnes1 john															2	2					4
battin2 john								1	1	1	1										4
bettely1 william			1	2	1																4
biggs1 william									4												4
birch1 thomas												2	2								4

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

11]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
bonfoy thomas	1	1	2																		4
boulter richard						1	2		1												4
brett charles																			2	2	4
bridges1 richard						1		2	1												4
brooke1 edward													1		2	1					4
brown2 thomas																2	1	1			4
callingwood1 thomas											1	1	2								4
canter william	2	2																			4
carbonnell1 john							2			1	1										4
carter1 william					3	1															4
catlin1 martin																	4				4
clark zephaniah				2			2														4
colcock theophilus				2	1	1															4
coleham1 jonathan										2	2										4
collier1 william				1	2	1															4
corner1 thomas													2		1	1					4
crackenthorp richar														2	1	1					4
cropp1 james														1	2		1				4
crossland1 thomas							1	1				2									4
crowter1 john												1	2	1							4
cure augustine		1	1		2																4
danvers george	2	2																			4
davis william			3	1																	4
davis1 jonathan						2	1		1												4
dunn1 edward												2	1	1							4
edwards1 john													1	1		1	1				4
ellery2 john												1		1		2					4
ferris william	1	1	2																		4
ferris1 john				1	1		1							1							4
flower1 john												1	1	1	1						4
foulkes1 david										1	2		1								4
george1 thomas							2	1	1												4
glover1 william												2	1			1					4
goodwin james					2		2														4
green william			1	1	2																4
gregory john													2	1		1					4
guy1 roger								2	2												4
hanchett justinian												2	2								4
hartley1 anthony								1	1				1	1							4
hirrock william					1		1	1		1											4

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

12]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
hodson aurelius												1		1	1	1					4
holland1 william										1	1	1		1							4
holland2 william										1	1		1	1							4
hucklescott1 william						1	3														4
hunter1 robert				2	2																4
hussey1 samuel										1		1	2								4
jackson1 william												1	1	1		1					4
jackson2 william												1		1	1		1				4
jacobs3 john																	2	1		1	4
jaques francis			1	1	2																4
jeffery thomas	1	2		1																	4
jenkins1 john									1	2	1										4
jennings1 john																		1	2	1	4
johnson william	1	2				1															4
jones1 john											2	2									4
knowles thomas	2	1	1																		4
kynaston1 thomas												1	3								4
lake1 thomas					1		2		1												4
lambton1 robert											1	2	1								4
lawrence1 thomas													3	1							4
lea1 thomas						3	1														4
ledyard1 caleb																	1	2	1		4
lee1 jonathan																1	2	1			4
lefever1 isaac													1	1	2						4
legassick1 henry										1	2	1									4
lowe1 william												2	1	1							4
marsh1 robert						2			1		1										4
mason1 joseph						1	1	2													4
mather1 james											1	1	2								4
may1 william																	1	3			4
meadows1 thomas															3		1				4
medlicott james	2	1	1																		4
membrey anne											2		1	1							4
morris1 john							1	1	2												4
morris1 richard												1	2	1							4
parkin1 john																1	1		1	1	4
pasheler1 william															2	1	1				4
perkins1 john										1	1	1	1								4
perry hugh			4																		4
phillibrowne1 samuel											2	1	1								4

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

13]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
phillips1 william								2		2											4
pinchen1 james																	2		2		4
price1 william												2	1		1						4
pridgen1 richard												1	2	1							4
read thomas	2	1	1																		4
reed2 thomas										2	2										4
robins john					1	1	1				1										4
somner thomas			1	3																	4
stock john		1	3																		4
tankard dillington	1		2	1																	4
taylor3 william																		3		1	4
telforth1 richard													2	2							4
timms1 john								3	1												4
tindall walter		2	1		1																4
toone ralph												2	2								4
walshaw1 thomas												1	2		1						4
walter1 thomas									1				2	1							4
warner1 john																		1	2	1	4
watts1 robert birdse															2	1		1			4
webb francis		4																			4
webb1 robert						1	2	1													4
webster2 william									3	1											4
weeks john	1		2			1															4
whinnell joseph														1	3						4
white george				2	2																4
white1 edward								1	1	1					1						4
whorlton1 john															2		2				4
woods1 thomas																1	1	1		1	4
wright thomas	2	1	1																		4
wright1 valentine															1	2		1			4
wynne john	2	2																			4
aden luke	1	1	1																		3
allen1 william									1		2										3
andrews1 nathaniel				1	1	1															3
andrews1 thomas							1	2													3
andrews2 richard										1	2										3
ansell1 john															1		1	1			3
aris1 samuel						1	2														3
aynesworth robert								1	2												3
baker1 john						2	1														3

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

14]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
baker3 john													1		2						3
baynor benjamin							2	1													3
beadle william	1	2																			3
bennett william						1	1	1													3
benson1 edward																	1	1	1		3
betterice william										1	2										3
bickley1 john								1	1		1										3
biffin1 john															1	1	1				3
birkley john								1		1	1										3
bland1 nathaniel							2	1													3
bloodworth1 george													2	1							3
booker hugh				2			1														3
bovey john						1	2														3
bower anne			1		1	1															3
bower1 john			1	2																	3
bowland1 john												2		1							3
boyfield1 robert														1	1			1	2		3
bray1 jonathan													1	1	1						3
bridgeon richard											2	1									3
bridges1 james			3																		3
bromfield samuel													1	1		1					3
brown mathew							2				1										3
brown richard				1	1	1															3
burghill1 rowland				2	1																3
burthall1 john											2		1								3
butler1 william									1	1	1										3
buxton1 thomas									2	1											3
carleton robert					3																3
castle1 john													3								3
castle1 peter															2	1					3
chandler1 charles																		1	2		3
chantry1 thomas																	2		1		3
chinn1 daniel												1	1	1							3
coales henry	2								1												3
coates1 henry										1			1			1					3
coldbrook thomas			1			1	1														3
cole thomas					2	1															3
cole1 andrew																	2	1			3
cole1 henry								1	1	1											3
cope thomas			1	1	1																3

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
crane1 charles											2	1									3
crane1 john				1	1	1															3
davis1 richard							1	1		1											3
davis4 richard																2	1				3
dickenson peter		1	2																		3
dunn robert		2					1														3
dury caleb	2	1																			3
ensall1 charles				2	1																3
fassett2 thomas															1	1	1				3
fell thomas	2	1																			3
folliott1 samuel															2	1					3
forster jonas								1			1	1									3
fowler roger		1	2																		3
franklin1 thomas				2	1																3
fry1 william															1	2					3
fulford1 george				2	1																3
ganderton1 william												1	2								3
gardiner1 john												1	1	1							3
gingell1 joseph																		1	1	1	3
gray francis	1	2																			3
greenaway1 david														1	2						3
griffin thomas	3																				3
guillifor1 henry			2		1																3
hagger1 samuel																		2	1		3
harbin andrew	1	2																			3
harrington1 thomas													2	1							3
harris1 roger								1	2												3
hart1 john															1				2		3
harvey1 john										2	1										3
hayward jnr.1 robert																	1	1	1		3
hoard george						1		1		1											3
hodes1 john																1	2				3
horton thomas										1	1	1									3
howler john							1			1	1										3
hudson thomas												1	1		1						3
jackson1 thomas																		1	2		3
jenkins thomas									1	2											3
jones edward		1	1	1																	3
jones1 henry				1	2																3
jones1 mathias								1	1					1							3

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

16]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
jurin john	1	2																			3
kimball1 henry								1		1	1										3
knott1 benjamin							1	1		1											3
knowles1 william																1	1	1			3
langbridge john					1		1			1											3
langhorne1 humphrey			2	1																	3
lawrence ralph		1	1	1																	3
leavis john														2	1						3
lethieullier willia							1	1	1												3
light1 henry						2	1														3
linsey james													1	2							3
lister1 john																		2		1	3
lloyd richard	1	2																			3
lloyd1 hugh															1	1	1				3
lovelidge2 arthur																	1		2		3
manning1 john										1		2									3
matthews1 thomas								2			1										3
may1 job					1	1		1													3
mayhew2 edward																2	1				3
meredith1 george									1	2											3
meredith1 john																2	1				3
mills1 robert								2		1											3
moore1 daniel							2		1												3
morris virtue															2	1					3
mould thomas												1	2								3
nutting1 george												1	2								3
orchard francis			2	1																	3
osbourne edward		2	1																		3
osgood1 william													2	1							3
parker henry				1		2															3
pearson1 john								1	2												3
peck1 thomas						3															3
percival1 john			2	1																	3
perry1 andrew																3					3
platt1 george								1	1		1										3
potter john					1	2															3
powell1 daniel												2	1								3
priddith thomas	3																				3
pullen1 jacob							1	1		1											3
pullen1 morgan								1	2												3

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

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Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
raven2 jonathan																1			2		3
reynolds2 thomas									2	1											3
roades john		1	1									1									3
robinson1 john					1	2															3
robinson1 joseph								2	1												3
robinson2 john					1	1	1														3
rolfe2 samuel												2			1						3
rookes elizabeth									2	1											3
rose1 henry																3					3
rose1 stephen					1	1		1													3
rose2 stephen						1		1	1												3
russell1 joseph														3							3
schothorne nathanie					1	2															3
schuill john			2	1																	3
sheering stephen						1	2														3
shelton isaac					1	1	1														3
sherwood1 john									1	1	1										3
short1 john							1	1	1												3
simpson joseph												2		1							3
smith1 thomas						1	1	1													3
smith4 thomas												1	2								3
smith7 john													1	1	1						3
spicer1 joseph				2	1																3
spooner1 thomas										2		1									3
stephenson1 john						1	2														3
sweet2 john																	1		2		3
taylor ann																			1	2	3
tayne1 james																1	1	1			3
tedder andrew				2		1															3
thomas david			1	2																	3
thomas1 thomas					2	1															3
thorn1 john												1	1		1						3
tysoe1 hugh																1	1	1			3
vincent1 charles						1	1		1												3
walker1 henry																1	2				3
waller henry	2		1																		3
wallis edward			1		2																3
webb1 thomas															3						3
weeks thomas							1	1	1												3
weritt john							1	1	1												3

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

18]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
whitaker nicholas			1	2																	3
white1 hugh								2	1												3
white1 thomas									1	1		1									3
wildblood1 john												1	1	1							3
wilkins gertrude																	1	2			3
willington1 richard									1	1	1										3
wing1 richard			1	2																	3
winnington richard										1	1	1									3
wint1 anthony														2		1					3
woodward1 john											1	1		1							3
woodward1 thomas						1	1	1													3
woster1 joseph												1	1		1						3
wright2 john							2	1													3
wyles john	3																				3
yateman1 francis									2				1								3
adams2 samuel																			1	1	2
allington1 charles											2										2
ambler thomas				2																	2
andrews1 richard			2																		2
aucot1 william														1	1						2
austin thomas				2																	2
austin1 william																		1	1		2
baker anne									1		1										2
baker1 giles					1		1														2
bartram1 daniel																		1	1		2
baughan1 josiah																			2		2
bennett john										2											2
benson samuel	1	1																			2
bent1 thomas														1	1						2
bird1 john																			1	1	2
bird1 joseph				1	1																2
bolter1 richard						2															2
boulton1 amos											1		1								2
boulton2 amos												1	1								2
brand william											1	1									2
brandes thomas							1	1													2
brannes1 andrew								2													2
bridgen1 henry																1		1			2
bridges elizabeth										1	1										2
bromfield1 matthew												1		1							2

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

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Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
bunting1 john																		1		1	2
burrough john		1				1															2
butler elizabeth					2																2
buxton2 thomas												1	1								2
capper harrington		2																			2
carbonnell2 thomas													1		1						2
carrington1 henry												2									2
cecil1 thomas																1				1	2
child1 mathias		2																			2
clark humphrey	2																				2
clark robert	2																				2
clark1 isaac												1			1						2
clarkson john																1		1			2
clayton thomas													1		1						2
clements1 richard												1	1								2
colcombe robert											2										2
cole benjamin						1	1														2
cole matthew							2														2
cole1 robert				2																	2
cole1 valentine																			2		2
coo william			1		1																2
cooper1 james											1	1									2
cording robert														2							2
corner2 john																		1		1	2
cropp1 samuel																			1	1	2
crozier1 joseph														1				1			2
crutchley1 john															1	1					2
cuthbertson1 john																				2	2
cutler1 james						1	1														2
davis1 charles											1			1							2
davis1 christopher									1		1										2
dawkins william			1	1																	2
dean1 thomas					2																2
deleilew jacob							1	1													2
dew1 richard																1			1		2
donne robert								2													2
dorsett1 john																1		1			2
dredge1 thomas															2						2
drinkwater william	2																				2
ducer elianor				2																	2

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

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Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
durant1 alexander						1		1													2
eales1 edmund														1	1						2
edwards2 william																		1	1		2
elam1 john								1	1												2
ellis1 owen													1	1							2
english john	1	1																			2
ensall leonard					1	1															2
evans1 thomas											1	1									2
fitts theophilus	1	1																			2
flavell1 peter								1	1												2
flower1 samuel														1	1						2
follett william											1	1									2
foster1 william														1	1						2
freeman1 michael											1				1						2
garbrant john	1	1																			2
geare1 william														1	1						2
gearee stephen		2																			2
gibbons1 john												1	1								2
gibbs anne						1		1													2
gibbs1 william						1	1														2
gibbs2 william						1		1													2
gill1 thomas										1		1									2
gilman1 thomas																1				1	2
goodson1 christopher					2																2
goodwin wassell	1	1																			2
gossage john			2																		2
grant1 john											1	1									2
graves1 william														2							2
green1 thomas										1	1										2
greenaway elizabeth																	1	1			2
grimsdick1 peter													2								2
groves1 john									1	1											2
grundy1 richard											1	1									2
hackett john	2																				2
hague william													2								2
hall1 john													2								2
hammant1 thomas					1	1															2
hannott john			2																		2
hannott1 james																1	1				2
hanson richard										2											2

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

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Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
harbin richard						2															2
harbin1 joseph									2												2
hardin1 richard											2										2
harding john					1			1													2
hardland mary													1	1							2
hare1 william											1	1									2
harris1 william									1		1										2
harris2 roger																			1	1	2
harrison andrew						1	1														2
harrison john							2														2
harrison1 john							1	1													2
hayward1 richard								1	1												2
head charles							2														2
henchman john		1	1																		2
hetherly john	1	1																			2
hickcock william				1		1															2
hollingworth franci	2																				2
holmes1 joseph											1	1									2
horkwell clement						1	1														2
horwood nathaniel											1		1								2
horwood sarah													1		1						2
horwood1 joseph																1		1			2
houblon peter (juni			1	1																	2
houblon1 abraham				1	1																2
huckwell thomas											2										2
hudson phillip		1	1																		2
hudson richard	1	1																			2
hukman john					2																2
hunter john												1						1			2
ingleburt william		1	1																		2
jackson george			2																		2
jacobs2 john													1	1							2
johnson john	1				1																2
johnson1 john							2														2
jones2 henry																			1	1	2
key joanna													2								2
keyes1 thomas														1		1					2
kingston1 daniel												2									2
kirkman zachariah		1	1																		2
larton2 owen										1	1										2

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
lassells edward												1		1							2
laughton edmund				1	1																2
lawrence1 joseph													2								2
legee john						1	1														2
lemon neville							1		1												2
light samuel							1		1												2
lingham richard		1	1																		2
linley1 thomas												1	1								2
litchfield mary										1	1										2
lloyd henry				1	1																2
lowe elizabeth																		1	1		2
luntley1 matthew																			2		2
lynch1 edward												1	1								2
mackender1 george												1	1								2
marcroft1 jonathan												1	1								2
mason richard				1	1																2
mather william	1		1																		2
maybank1 john													1	1							2
mittchell thomas									1		1										2
mittchell1 thomas													1		1						2
moore1 john									2												2
morgan1 john													1		1						2
morris hannah											1	1									2
morris3 thomas																2					2
mosley1 jacob														1		1					2
mould mary														1	1						2
nettlefold1 john													1				1				2
nicholls richard	1	1																			2
nicholson robert		1		1																	2
norgrave edward					1		1														2
oakley jonathan									1			1									2
ouldroyd ebenezer											2										2
owen1 daniel														2							2
paine1 edward					1		1														2
pare thomas				1		1															2
patienne1 william										1	1										2
peck charles												2									2
pedley1 nathaniel							2														2
pellsant1 francis																1	1				2
percival john			2																		2

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
potter1 robert					2																2
powell1 william			2																		2
powell1 george							2														2
pridgen1 edward															2						2
probart thomas					2																2
proctor1 william													1		1						2
pugh1 roger								1		1											2
pullen mary											1	1									2
purser lucy																			1	1	2
quincy1 thomas																		1		1	2
rawlins john					1						1										2
rawstorne1 peter						2															2
read1 major									2												2
read1 stephen				1		1															2
reynolds mary											2										2
reynolds1 thomas				2																	2
rood tobias				1	1																2
russell peirson			1		1																2
sadler william		1		1																	2
salter richard		1	1																		2
sanders1 thomas							1		1												2
sanger1 stephen														1	1						2
searle christopher		1	1																		2
seavaker john						2															2
sewell1 john						1	1														2
sewell2 john										2											2
sharp1 thomas					2																2
sherwood1 francis													1		1						2
shorney1 nathaniel										1	1										2
singleton1 john						1			1												2
skidmore1 joseph																		1		1	2
smith james							2														2
smith1 anthony			2																		2
smith1 john						1	1														2
smith1 jonathan															2						2
smith2 henry														1		1					2
smithwick john					1		1														2
sparrow1 edward													2								2
spurling1 lawrence											2										2
stable leonard	1	1																			2

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
stanton1 william			1	1																	2
stephens1 john								2													2
stevens samuel												1	1								2
stork richard		1	1																		2
taylor jonathan		1		1																	2
taylor1 samuel																			2		2
taylor1 william						1	1														2
temple1 richard												1	1								2
teyes nicholas				2																	2
thorn1 edward																		1	1		2
tilie1 samuel												1	1								2
tillyer samuel											1	1									2
toole isaac		2																			2
toone1 simon										2											2
tyther andrew					1	1															2
uzzell1 john						1	1														2
vivers andrew										1		1									2
vokes1 henry																		1	1		2
vokins richard												1	1								2
waldo joseph					1		1														2
wankely william		2																			2
ward1 james									2												2
weale1 thomas																			2		2
webb richard				1	1																2
whalley1 john						2															2
wheldon1 james							1		1												2
widmore1 walter															1	1					2
widowes george				1	1																2
wilkins anthony															2						2
wilks1 john										1	1										2
williams1 benjamin									2												2
willis samuel							2														2
winch1 daniel					1	1															2
winston1 john														1		1					2
wintle ann													1	1							2
woodley1 thomas												1	1								2
woodward mary														1		1					2
abbott george	1																				1
abbott thomas												1									1
abeales william				1																	1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9**Apprentices bound to a single master, 1649-1746**

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
alexander richard	1																				1
allen2 william													1								1
allis andrew		1																			1
amblerton edward										1											1
amige henry		1																			1
anderton edward										1											1
anderton peter				1																	1
andrews sarah							1														1
andrews thomas					1																1
andrews2 matthew										1											1
angell robert																	1				1
applegath edward														1							1
archer1 richard																		1			1
archer1 samuel														1							1
arrundell1 james								1													1
arrundell2 james														1							1
asgood james		1																			1
ashton1 william																			1		1
ashwyn william							1														1
astill rebecca																			1		1
aton1 jonathon								1													1
aucot elizabeth																1					1
austin edward				1																	1
avery1 amos								1													1
ayme henry	1																				1
ayme thomas			1																		1
bailey james												1									1
baker1 thomas					1																1
baker1 william							1														1
baker3 robert		1																			1
baldein john												1									1
balior william									1												1
baltin john				1																	1
bamsey john					1																1
banks gilbert	1																				1
banks1 robert			1																		1
bannister1 richard														1							1
bannister1 william											1										1
barber2 thomas													1								1
barber3 edward						1															1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
barlow edmund											1										1
barry thomas	1																				1
barson john										1											1
bartholomew1 john ("pizzy")							1														1
barton robert							1														1
batchellor francis		1																			1
baxton thomas												1									1
baynam1 george															1						1
baynon1 thomas															1						1
beaker anne										1											1
bean john	1																				1
beane isaac		1																			1
beastew mary									1												1
belleine james									1												1
bennett1 charles								1													1
berry thomas	1																				1
berry1 henry													1								1
best thomas														1							1
biggs1 edmund														1							1
binnell1 john									1												1
birch richard														1							1
birch1 edward											1										1
birch1 richard															1						1
bird sarah																			1		1
bird1 william							1														1
blake john													1								1
blakeway john													1								1
bland susanna									1												1
blewen hannah															1						1
blewen1 matthew												1									1
blinkinsop jacob	1																				1
bliss1 edward												1									1
bloseman thomas							1														1
boddington1 charles																		1			1
bond john	1																				1
booden1 oliver												1									1
bourne samuel				1																	1
bower john	1																				1
bowle william		1																			1
bowler john												1									1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

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Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
bradley1 john														1							1
bradshaw1 josias					1																1
bradshaw1 william				1																	1
braine peter						1															1
braine william												1									1
braine1 peter								1													1
branch william							1														1
branfield elizabeth											1										1
brannes1 benjamin													1								1
bray edward			1																		1
bray peter							1														1
brickley george								1													1
brideson sarah								1													1
brideson1 roger									1												1
brock1 john												1									1
brockett1 edward														1							1
brooke grace			1																		1
brooke hugh					1																1
brooke william												1									1
brooke1 walter													1								1
brooke2 walter																			1		1
brown1 aaron							1														1
brown1 henry					1																1
brown2 henry								1													1
bryan1 guy																			1		1
buckley john									1												1
bullen jacob									1												1
burt daniel																1					1
burt1 samuel													1								1
burthall margaret														1							1
butler edward			1																		1
butler lancetot			1																		1
butler thomas											1										1
cain thomas					1																1
calarny1 john							1														1
callingwood elizabe														1							1
cappes mary																			1		1
carradine1 richard				1																	1
carrington edward											1										1
castle peter																	1				1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

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Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
cater robert							1														1
cauliez bartholomew		1																			1
chapman humphry		1																			1
chapman2 francis															1						1
charles john										1											1
cheshire anne									1												1
child1 jane													1								1
chinn daniel												1									1
chitnell1 john									1												1
clark mary									1												1
clark1 john				1																	1
clark1 thomas							1														1
clayton1 thomas													1								1
cleeve thomas								1													1
cleeve2 stephen										1											1
cockshead robert														1							1
coe alice									1												1
colbrook thomas					1																1
cole ann																			1		1
cole henry			1																		1
cole john															1						1
colebrook thomas				1																	1
coley jarvas							1														1
cook1 james																			1		1
cook1 samuel																			1		1
cook1 william															1						1
cooke edmund	1																				1
cooke henry										1											1
cookson george				1																	1
cooly robert							1														1
cooper1 attwood																				1	1
cope1 thomas							1														1
corile(?) james													1								1
coston1 john							1														1
cotterell richard			1																		1
cotton john							1														1
coubrick william										1											1
coulham1 david								1													1
cowley john						1															1
cox1 joseph											1										1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

29]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
crew robert	1																				1
crick(?) james													1								1
crick1 william																	1				1
croft elizabrth																			1		1
cropp elizabeth																		1			1
crouch charles																1					1
crouch1 timothy							1														1
crow robert		1																			1
crowter1 thomas																	1				1
crutchfield1 william							1														1
cutler1 thomas											1										1
dann robert						1															1
davenport1 john							1														1
davenport1 jonathan															1						1
davis1 samuel						1															1
davis2 samuel						1															1
davis3 samuel															1						1
davis4 samuel																		1			1
dawson francis													1								1
dealtrey1 william										1											1
deck george											1										1
delanoy anne						1															1
dennis silvester				1																	1
dent daniel						1															1
denton1 john					1																1
desormeax1 abraham																				1	1
devonshire1 william							1														1
dew joseph	1																				1
dickson edmund		1																			1
dike daniel				1																	1
dilley1 anthony														1							1
dillington tankard		1																			1
dixon thomas													1								1
dow edward											1										1
dren joseph		1																			1
ducer isaac			1																		1
due edward											1										1
duid william						1															1
dun joseph											1										1
duns1more samuel										1											1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

30]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
dunsmore1 samuel											1										1
dyer christopher						1															1
dyer1 richard										1											1
eales2 edmund																1					1
ebenezer george																				1	1
eccleston william																			1		1
edwards jnr. willia																	1				1
edwards2 john																		1			1
elderton1 henry							1														1
elforth richard													1								1
ellard john															1						1
ellard1 richard															1						1
elliott1 joseph							1														1
elmes1 robert															1						1
envale charles					1																1
eshreek matthew					1																1
evans ann																		1			1
evans2 john														1							1
fairbrother1 joseph													1								1
farmer john									1												1
farmer samuel												1									1
farmer1 george																		1			1
farmer2 george																	1				1
farnham john			1																		1
farr1 william											1										1
farrington john												1									1
fassett1 thomas								1													1
fawconer1 thomas																1					1
fazakerley1 edward												1									1
fearnley edmund											1										1
felstead ann																				1	1
felstead1 abraham															1						1
ferris2 john															1						1
fether sam							1														1
field daniel														1							1
fleet robert	1																				1
flood1 john						1															1
foard john							1														1
foard richard							1														1
focksey philip				1																	1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

31]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
foot eliza							1														1
forster john																		1			1
forty samuel								1													1
foster james											1										1
foster2 thomas													1								1
fowler1 william																	1				1
frayling1 samuel															1						1
freeman1 james					1																1
fripp1 james																	1				1
frisly william	1																				1
gadd george			1																		1
gamull1 william										1											1
ganderton1 henry							1														1
gardiner2 john															1						1
gavell francis			1																		1
gaylor benjamin											1										1
george1 william										1											1
george2 william													1								1
gibbs john																	1				1
gilbert2 thomas											1										1
gildersleeve isaac								1													1
gill1 henry																	1				1
gilly martin											1										1
glentworth1 john										1											1
glover anne					1																1
glover john						1															1
glover1 edward															1						1
gold john					1																1
goode1 thomas																				1	1
goodwin1 stephen									1												1
gordon paul															1						1
gossling anselme					1																1
goulding edward														1							1
grandy jnr.richard													1								1
granger anne	1																				1
gray2 thomas											1										1
graybee john													1								1
green samuel						1															1
green1 elizabeth														1							1
green1 samuel													1								1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

32]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
griffith hannah									1												1
griffith1 john								1													1
grigg thomas																1					1
grimshaw eliza											1										1
gross john	1																				1
groves1 samuel																1					1
guest1 joseph								1													1
gunnis1 edward									1												1
gunstone1 thomas									1												1
guy roger							1														1
hackett1 william									1												1
hackney mary																		1			1
hakerlea edward							1														1
halhead1 nicholas																	1				1
hamblin eliza			1																		1
hamblin1 john										1											1
hammant1 joseph														1							1
hands john																		1			1
hann john														1							1
hannott thomas						1															1
hannpot henry							1														1
hanson1 arthur													1								1
harbourne george			1																		1
harcourt1 richard														1							1
harding ann												1									1
harding1 william																1					1
hardy thomas																	1				1
harns john										1											1
harris benjamin														1							1
harris edward																	1				1
harris george						1															1
harris1 lawrence								1													1
harris2 richard																1					1
harrison1 henry																1					1
harvey richard															1						1
harwood nathaniel												1									1
haslam1 james																	1				1
hassett edward						1															1
haunsome peter								1													1
hawell peter									1												1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

33]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
haws1 james										1											1
hayden elizabeth																			1		1
hayden isaac													1								1
hayes thomas															1						1
hayes1 claude													1								1
hayes1 lewis														1							1
hayward jnr. 1obert																			1		1
heal richard												1									1
healey william					1																1
heath elias							1														1
heath thomas													1								1
henry gentry freder																				1	1
herbert1 thomas													1								1
hester james											1										1
hester1 james											1										1
hevitt samuel							1														1
hewke john																		1			1
hickman zachary		1																			1
hildez edward							1														1
hills joseph				1																	1
hilton edward		1																			1
hoble benjamin					1																1
hodes edward									1												1
hodges henry	1																				1
hodgson richard	1																				1
hodgson roger		1																			1
hodson1 thomas													1								1
holloway henry											1										1
holmes john												1									1
holtham john									1												1
hordland john										1											1
horne john													1								1
hornwood sarah													1								1
horsefeild1 john															1						1
horton peirce			1																		1
houghton george																1					1
how mary																		1			1
how1 joseph															1						1
how2 william																			1		1
howard john														1							1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9**Apprentices bound to a single master, 1649-1746**

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
howell1 francis				1																	1
howler roger		1																			1
howler thomas								1													1
hucknoll thomas								1													1
huckwell elizabeth												1									1
humpman john										1											1
hunsdon william					1																1
huntly1 john														1							1
huntpatch seabright							1														1
hurd1 stephen									1												1
hussey samuel											1										1
hyde john		1																			1
hyde thomas		1																			1
ives thomas		1																			1
jackson1 edward									1												1
jacobs john (senior)									1												1
james1 john							1														1
janes arthur													1								1
jarin john	1																				1
jarman1 edward													1								1
jendwyn1 stephen																1					1
jenks1 peter												1									1
jewell1 jeremiah																	1				1
john charles alias									1												1
johnson1 william						1															1
johnson2 john								1													1
johnson2 william														1							1
jones thomas	1																				1
jones william						1															1
jones1 philip																1					1
jones1 william									1												1
jones2 philip																1					1
jones2 william									1												1
jordan john	1																				1
jordan1 gideon												1									1
joyce paul																	1				1
jurin jacob	1																				1
keet thomas																	1				1
kelsey joseph													1								1
kelsey1 joseph												1									1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

35]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
kemsler thomas													1								1
kendall1 moses													1								1
kenedy1 joseph															1						1
kenrick1 matthew											1										1
keny james										1											1
kerfoot ann																1					1
kerfoot2 nathaniel																	1				1
kimball1 samuel													1								1
king anthony							1														1
knapp1 henry							1														1
knightly1 thomas																	1				1
knott thomas																	1				1
kynaston2 thomas																	1				1
lake margaret											1										1
lambert ann																1					1
lambton richard											1										1
langham richard		1																			1
larton3 owen												1									1
law1 richard				1																	1
lawer richard							1														1
lawrence richard			1																		1
lawrence1 john																		1			1
lawrence2 john																				1	1
lawrence2 thomas																				1	1
leavis deborah																1					1
lee william													1								1
lee1 john																				1	1
letherly john	1																				1
lethieullier jane									1												1
levill john										1											1
lewis william														1							1
limfield edward						1															1
linsey1 james																	1				1
lloyd john					1																1
lloyd william							1														1
lloyd` evan		1																			1
lloyd1 meredith									1												1
lock1 roger					1																1
lowe richard				1																	1
lowry john									1												1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
lowton john																1					1
luiley thomas											1										1
mackins john		1																			1
maleigh1 thomas												1									1
mandry william					1																1
manning edmund	1																				1
manning martha													1								1
manning thomas																			1		1
manning`1 thomas																	1				1
manning1 thomas																		1			1
manson richard					1																1
marsh1 adrian																	1				1
maslyn jeremy						1															1
mason edward						1															1
mason mary									1												1
masters1 robert												1									1
maston jacob										1											1
mather elizabeth															1						1
mather2 james															1						1
matthews1 john																			1		1
maurois james		1																			1
mawins philip										1											1
may george				1																	1
may john				1																	1
may1 john									1												1
may2 john									1												1
maybank martha													1								1
maybank1 richard															1						1
mayhew martha																			1		1
mayleigh thomas												1									1
mayo john	1																				1
mayo1 john					1																1
medlicott edmond		1																			1
miller1 thomas														1							1
millington john											1										1
mittchell james					1																1
mittchell1 william																1					1
monk1 james												1									1
monk1 richard											1										1
moody1 thomas							1														1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

37]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
moore1 samuel																	1				1
morris richard														1							1
morris1 thomas		1																			1
morton william									1												1
morton1 edward													1								1
myeroth jonathan												1									1
nash walter					1																1
negus henry					1																1
nevett john															1						1
nevett samuel								1													1
neville lemon									1												1
nicholls samuel													1								1
northey benjamin							1														1
norton thomas										1											1
nott1 thomas																			1		1
nurden edmund															1						1
nurden1 edmund																	1				1
nutkin george	1																				1
nutting george			1																		1
offord john											1										1
oram1 william																				1	1
orton john						1															1
osbourne robert												1									1
pain richard	1																				1
paine2 edward						1															1
palmer1 henry						1															1
parker francis												1									1
parradine robert			1																		1
parradine1 john									1												1
parton1 edward				1																	1
paule daniel									1												1
pearce thomas									1												1
pearson ann																		1			1
peck										1											1
peck daniel											1										1
peck jnr.john																	1				1
peck1 john						1															1
peck2 john									1												1
pelett edmund											1										1
pepar john															1						1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

38]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
peppercorn1 george														1							1
pettitt1 edmund													1								1
pettitt1 john						1															1
phipps1 edward			1																		1
pickard ann														1							1
pickard1 robert															1						1
pickard1 william												1									1
pincherry samuel										1											1
poland peter													1								1
potter thomas					1																1
powell john																		1			1
powell2 daniel															1						1
preston1 richard									1												1
price robert			1																		1
price1 john															1						1
price1 thomas			1																		1
prideson herruld					1																1
pridgen elizabeth															1						1
pridgen2 richard															1						1
probart2 william																		1			1
purser edward															1						1
rawlins1 william																		1			1
reeve sarah												1									1
reeve1 christopher					1																1
reynolds1 jonathan								1													1
reynolds1 robert														1							1
rich1 joseph								1													1
rigby elianor					1																1
rish thomas													1								1
road thomas			1																		1
roadley1 alice																			1		1
roberts thomas					1																1
robinson richard		1																			1
rock1 humphrey																			1		1
rock1 john													1								1
rockter richard			1																		1
rollinson john														1							1
rookeby george			1																		1
rose1 thomas																	1				1
roseby john														1							1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

39]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
rowland john										1											1
ruh thomas							1														1
russell1 john										1											1
salisbury gabriel				1																	1
salisbury rebecca							1														1
sallweay william	1																				1
salter edward	1																				1
samburne1 richard												1									1
sandall thomas													1								1
sanders1 henry																				1	1
savidge2 richard																		1			1
scotney1 john																			1		1
searenokel john																			1		1
shaw1 john												1									1
shaw1 robert														1							1
shaw2 john															1						1
sheldon1 lionel												1									1
sherwood edward								1													1
shilrock william									1												1
shrigley1 thomas									1												1
shules james										1											1
shute thomas				1																	1
sibley henry												1									1
simond ann														1							1
simond2 john											1										1
simpson john						1															1
sims william																	1				1
sinckler richard																1					1
smallbones2 john										1											1
smedley1 thomas														1							1
smith daniel						1															1
smith john			1																		1
smith william																				1	1
smith1 abiel				1																	1
smith1 henry						1															1
smith1 richard														1							1
smith2 john							1														1
smith2 richard															1						1
smith3 richard																	1				1
snee1 john											1										1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

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Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
snore edward																			1		1
soper thomas							1														1
spence mary															1						1
spicer1 samuel													1								1
sprosley1 george																				1	1
stable leo							1														1
stanlake1 anthony			1																		1
stanton william				1																	1
stanton2 william									1												1
stawller henry														1							1
stepmaker john															1						1
stiles1 william															1						1
stirley1 robert																1					1
stockton thomas																1					1
stone john														1							1
stone samuel												1									1
storer john				1																	1
storer1 william						1															1
stranger nicholas			1																		1
strangways1 abraham													1								1
stratton1 george															1						1
stringfellow john											1										1
sturley robert																1					1
styles william													1								1
tanton matthew								1													1
taylor james													1								1
taylor1 bartholomew								1													1
taylor2 thomas																	1				1
tench1 benjamin																1					1
tench1 stephen												1									1
teymmer richard				1																	1
thacker james												1									1
thacker1 john														1							1
thackstone howes							1														1
thomas brown thomas																		1			1
thomas harrington														1							1
thomas jeffery			1																		1
thomas1 roger				1																	1
thorn ralph													1								1
thorn sarah																1					1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

41]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
thorney nathaniel																1					1
thornton1 robert				1																	1
tomkins1 thomas																1					1
toney john												1									1
torksey phillip			1																		1
trench samuel													1								1
trimmer john									1												1
trip1 charles					1																1
trull thomas								1													1
tuns john								1													1
turner1 benjamin								1													1
varndell 1john											1										1
varndell1 john													1								1
vaughan thomas								1													1
waggitt1 thomas																1					1
wagstaffe1 thomas															1						1
waite anne												1									1
waite1 richard											1										1
walker elizabeth														1							1
walker henry		1																			1
walker1 thomas											1										1
walker2 william																		1			1
walker3 john																		1			1
waller william						1															1
wallis eliza						1															1
wallis1 richard											1										1
walter john										1											1
walton john							1														1
wankyln john			1																		1
ward1 richard										1											1
warr lambert															1						1
wastefeild john										1											1
waterman1 john						1															1
watkins george		1																			1
watson1 james															1						1
weale1 john												1									1
wear william				1																	1
webb1 peter																		1			1
webb1 richard						1															1
west1 robert																	1				1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

42]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
westwood simon					1																1
wheathy john						1															1
wheatley martha																	1				1
wheeler1 samuel													1								1
whiston john							1														1
white1 michael																			1		1
whitehurst robert							1														1
whiting thomas	1																				1
whitworth cornelius												1									1
widow charles							1														1
wigelsworth henry													1								1
wilcocks john			1																		1
wilcocks richard		1																			1
wilkins1 anthony																			1		1
wilks thomas								1													1
williams2 john								1													1
williams5 john																	1				1
willis1 edward												1									1
wilmar1 cartwright																	1				1
wilson elizabeth													1								1
wilson william												1									1
wilton edmund	1																				1
wind1 robert													1								1
winter1 thomas														1							1
wintors anthony													1								1
wipine john		1																			1
wise1 william														1							1
witchell1 angell								1													1
woldor james								1													1
wood edward											1										1
woolford1 william																				1	1
worth2 robert								1													1
woster easter																1					1
wright william			1																		1
wright1 henry								1													1
wright1 robert					1																1
wyatt samuel				1																	1
yates mary							1														1
yeomans edward	1																				1
yeomans raihel	1																				1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.

Table 2.9

Apprentices bound to a single master, 1649-1746

43]

Master's name	1650	1655	1660	1665	1670	1675	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	Total
yesbury william			1																		1
young l john													1								1
yowins matthew				1																	1

Sources: London Dyers, MS 8167, MS 8169 and MS 8171 vol 1.