

# SISTERS OF THE ROYAL SOCIETY: THE CIRCLE OF KATHERINE JONES, LADY RANELAGH

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**T**he first books to be printed in English on medical science and applied chemistry, and attributed to women, were published in the 1650s. Elizabeth Grey's *A Choice Manual of Rare Conceits* (1653), Queen Henrietta Maria's *The Queen's Closet Opened* (1655) and Alethea Talbot's *Natura Exenterata* (1655), emerged after a thirty-year moratorium on any new books of pharmacy, household science and medicine for women, and possibly up to fifty years, in some parts, after being written. My earlier chapter in this collection, 'Women and Domestic Medicine' (see above, pp. 89–107), investigated some of the contexts for the manuscripts: the social and personal history of the writers, household work for women during the period, the participation of women in medical science in particular, and aspects of their education and aristocratic status. I was concerned to ask what kind of science they were engaged in, and how and whether it fitted into our understanding of formal training at the time. The second part of this study will focus on the circle of Katherine Jones, Lady Ranelagh in the 1640–60 period, and add the following questions: how were people at the time *doing* science, where were they doing it, why did they do it, and how were the women practitioners in particular perceived by those around them.

In 'Women and Domestic Medicine' I argued that the compilers or writers of the three texts under study were moving science into an intellectual leisure pursuit, at the same time as deriving their experience of it from the social work they adopted and carried out in their communities. Two of the three books address medicinal, household and food receipts in distinctly different parts of equal weight. Yet the parts on medical and some household chemistry, which were those attributed directly to the women, only went into further editions for a few years, while the parts on general household work and on food were republished well into the eighteenth century. Alethea Talbot's *Natura Exenterata*, which emphasized medical and household science, has only one edition. Hence it would seem that the parts on medical science and applied chemistry were not nearly as popular as the others, and not worth republishing after the early 1660s: so why did printers and publishers take a chance on them in the first place?

If the manuscript texts were written for a small circle of friends with common intellectual pursuits, they were printed and published for rather different reasons. First, it is likely that the printers thought they would make money out of them, possibly believing that in the growing atmosphere of unease at the beheading of Charles I they might capitalize on books attributed to women closely associated with him – and who closer than the exiled queen? A second factor was that Nicolas Culpeper's translation of the London *Pharmacopoeia*, which outlined the legal prescriptions to be prepared by the Society of Apothecaries, had appeared in 1649. This was the first substantial work on pharmacy in the vernacular English to have been published since the society's incorporation in 1617. Although much corroborative research remains to be done, this publication seems to have opened the door for many others that would not have appeared had there not been a need for the receipts among the general public.

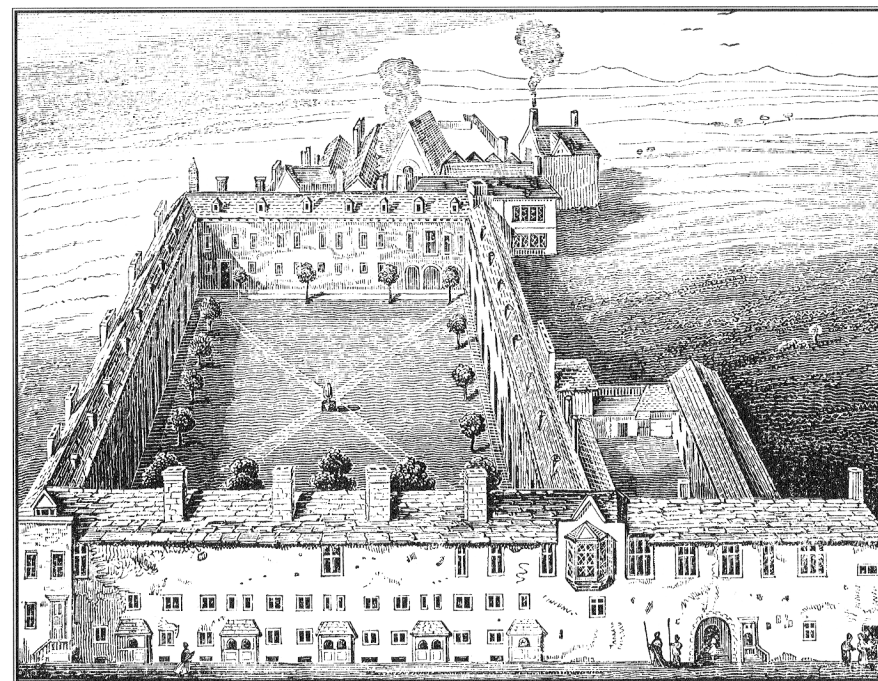
A third factor concerns those who were associated with the publications, either listed as contributors or sources within the texts themselves: by and large these people were men involved in the new experimental science, and these publications may be a recognition of a field of learning that was coming into being. Henrietta Maria's court, both in England and then in exile, brought herself, the sisters Elizabeth Grey and Alethea Talbot, together with a notable circle of men interested in Paracelsian and Baconian science. In addition, Alethea had travelled with her husband to Italy on a number of occasions, probably visiting the de Medici laboratories with him,<sup>1</sup> and offering among her receipts some from continental scientists. Part of the story about these texts involves gentlemen acquiring status for their activities by analogy with the aristocratic status of the women – two of the three writers were at the top of the aristocratic hierarchy of the time. And as I hope to demonstrate, part of the story is also allied to a shift from 'Kitchin-Physick' to 'Ladies Chemistry' that becomes clearer in the 1640–60 period.

The intellectual circle around Katherine Jones in London in the years 1640 to 1660 is closely associated with the correspondents to the scriptorium run by Samuel Hartlib<sup>2</sup> with which Katherine was considerably involved. Contributors to the scriptorium refer to Elizabeth Grey's receipts<sup>3</sup> and to her book and to *The Queen's Closet Opened*,<sup>4</sup> and they were with a quite different level of energy looking forward to the publication of *Natura Exenterata*.<sup>5</sup> Very little is known directly about Katherine Jones, given the place that she held in scholarly, political and religious circles. Nearly all her letters are gone from the Hartlib collection, and are rare elsewhere. However, one book of her medical receipts is with the British Library, and one book of more general remedies is held in the Wellcome Institute Library. She was close to her brother Robert, and they lived together for the last thirty years of their lives, dying within a few months of each other in 1692. I would like to introduce her by quoting from the sermon read at her brother's funeral:

She lived the longest on the publicest Scene, she made the greatest Figure in all the Revolutions of these Kingdoms for above fifty Years, of any Woman of our Age. She employed it all for doing good to others, in which she laid out her Time, her Interest, and her Estate, with the greatest Zeal and the most Success that I have ever known. She was indefatigable as well as dextrous in it: and as her great Understanding, and the vast Esteem she was in, made all Persons in their several turns of Greatness, desire and value her Friendship: so she gave her self a clear Title to imploy her Interest with them for the Service of others, by this that she never made any use of it to any End or Design of her own. She was contented with what she had: and though she was twice stript of it, she never moved on her own account, but was the general Intercessor for all Persons of Merit, or in want: This had in her the better Grace, and was both more Christian and more effectual, because it was not limited within any narrow Compass of Parties or Relations.

She had with a vast Reach both of Knowledg and Apprehensions, an universal Affability and Easiness of Access, a Humility that descended to the meanest Persons and Concerns, an obliging Kindness and Readiness to advise those who had no occasion for any further Assistance from her; and with all these and many more excellent Qualities, she had the deepest Sense of Religion, and the most constant turning of her Thoughts and Discourses that way, that has been perhaps in our Age.<sup>6</sup>

Katherine Jones came to London from Ireland in 1642, and may have been introduced to Samuel Hartlib by her aunt Dorothy Moore. At the time Hartlib was a good twelve years advanced into a rather extraordinary project to disseminate knowledge. Hartlib undertook to receive letters from people in England, Ireland and Scotland, on religious, educational, scientific and other matters, and copy them to continental writers. The continental writers in return would send him information in letters, essays, sermons and so on, which he had copied for his home audience.<sup>7</sup> By the 1640s Kenelm Digby, John Pell, John Evelyn and Theodore de Mayerne, who were all part of Henrietta Maria's circle, were closely involved, as were John Dury, the scientist Benjamin Worsley, poet John Milton and continental writers such as René Descartes. There is a significant increase in correspondence about natural philosophy and science in the late 1640s and through the 1650s. It has been suggested that this reflected a conscious decision to avoid discussion of the political and religious conflict of the time.<sup>8</sup> But in any event many of the people involved in the scientific discussions of the 1650s at Gresham College and at Wadham College in Oxford that led to the founding of the Royal Society were also contributors to the agency and corresponded with Katherine Jones, whose house on Queen Street was often used as an address by Hartlib himself.<sup>9</sup>



Gresham College, London, 1834.

The correspondence yielded a very considerable exchange of letters initially on religion and then increasingly on education, language and natural philosophy. Unusually for the period, the contributors included a number of women<sup>10</sup>: among others were in the 1630s Lady Barrington, from 1640 Dorothy Moore and from 1643 Katherine Jones. Dorothy Moore was an exceptional woman who was in the Netherlands arguing the case for a woman's ministry with Protestant Reform Church theologians. She and Katherine Jones seem to have had a plan for the education of young women in the early 1640s which was not realized but about which we are given some clues from a letter she wrote several years later outlining the need for an education in reason and intellect rather than dancing and 'curious inventions'.<sup>11</sup> It is also noteworthy that Henrietta Maria herself showed an unusual interest in education for women when she agreed to become the patron for Mary Ward's schools as early as 1625.<sup>12</sup> John Dury, who became Dorothy Moore's husband in 1645, was a key contributor on religious and educational issues, and was close friends with the scientists Benjamin Worsley and William Petty.<sup>13</sup> During the 1650s the Durys became attached to Henry Oldenburg, secretary to the Royal Society from 1662 and editor of its *Transactions*

for many years.<sup>14</sup> The Durys' daughter, Dora Catherina, was left to his care after their deaths, and Oldenburg eventually married her, their own children Sophia and Robert becoming wards of Katherine Jones and Robert Boyle when the Oldenburgs died.

This detail about Dorothy Moore is offered partly because she was Katherine Jones's closest associate but also to indicate the way intellectual and familial ties often overlapped, the intellectual community providing a kind of extended family. Not that Katherine Jones needed one: as a daughter of the immensely wealthy colonialist Richard Boyle, Earl of Cork, she had many family connections: Royalist, Parliamentarian, Roman Catholic, Protestant and Puritan.<sup>15</sup> At Queen Street in the 1640s her house was a meeting place for people of quite different politics and religious persuasions. Later, in Pall Mall, her house became a centre for visiting scientists as well.<sup>16</sup> All her brothers and sisters, with the single exception of Robert, were placed in a variety of aristocratic positions. While their husbands were fighting on opposite sides during the Civil War, two of her well-married sisters continued to develop their interests in sugar-cookery and in medicine. Lettice Goring's recipes occur in a number of manuscripts and books of the period,<sup>17</sup> while Mary Rich, later Countess of Warwick, became well known for her skill as a physician and apothecary in the community in which she lived.<sup>18</sup>

Katherine herself kept those two books of receipts. One is a general book of household science and specialized food cookery receipts, a combination that came to be known as 'Kitchin-Physick'.<sup>19</sup> It also included the receipt for Spirit of Roses 'My brother Robert's way' which is appended at the end of this chapter to indicate the kind of skills and technological expertise that were expected in day-to-day household work. The other notebook is a more detailed and focused account of herbal preparations and chemistry,<sup>20</sup> akin to Alethea Talbot's *Natura Exenterata*. The manuscript contains technical receipts with a guide to chemical symbols at the back which are referred to as 'our' symbols – possibly Katherine's and Robert's. The symbols are derived from commonly known alchemical symbols, and while there are many more of them, they are identical to those in Alethea's book. The measurements are accurate and the descriptions precise, in tune with the new chemical or 'spagyricall' methodology. Yet the receipts are for the same medical complaints as those in many contemporary manuscripts, and use largely similar ingredients.

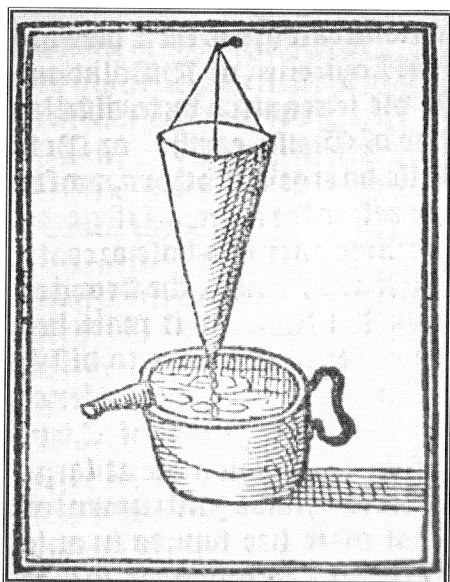
Where did Katherine Jones practise this science? Just as Mary Sidney, Lady Pembroke allowed her brother Philip and son William to use her 'facilities' in the 1590s, so Katherine seems to have had facilities that both she and her brother used.<sup>21</sup> The histories of laboratory work are rather coy about what these facilities were. There are suggestions that experimental equipment was brought in via the continent, or adapted from alchemical technology, and both suggestions are highly probable. But it is also clear that virtually everything that they might have needed was readily available in the kitchen or still room of any substantial estate,



Alembics used in the distilling process, from *The Practise of New and Old Physicke* (1599).

which may provide a reason for the absence of a specific word to denote an area for scientific practice until much later in the seventeenth century.<sup>22</sup> Access to water, to heating and cooling methods, to weights, to preparation tools for chopping, grinding, sifting, straining and so on, had been necessary to both the alchemist, the cook and the housekeeper, and was also necessary to early scientific work in chemistry and medicinal experiment. In addition, all used the equipment of the distillation room with its alembics, collecting vessels and furnaces.

Illustrations from 1707 of the Golden Phoenix laboratories, a construction thought to have been akin to that built by Robert Boyle on to the back of Katherine's house in Pall Mall,<sup>23</sup> show a variety of tools identical to those in a well-stocked *batterie de cuisine*, ranging from instruments to deal with the heating of various items, to knives, long-handled forks, trivets, straining ladles and tongs, to sieves, jelly-bags, cutting blocks and pestles and mortars. The illustrations also show the importance of a variety of regulated sources of heat<sup>24</sup> that is mirrored in the variety of cooking and cooling sources in the kitchen. There are open fires, closed fires of various kinds to heat air, furnaces controlling heat by controlling the temperature of water in a *bain marie*, charcoal braziers, and three-legged heating pots for on-the-floor fires. While



A piece of equipment used in distilling, from  
*The Practise of New and Old Physicke* (1599).

most kitchens would have had an open fire and possibly on-the-floor bake-stone fires, more substantial houses would have had bread ovens, as well as rows of braziers maintained at different temperatures for stewing and simmering; the distillation rooms contained furnaces and tubs of water with pipes running through them for cooling down distilled liquors, as well as conserving equipment such as large charcoal-fed braziers for preparing comfits and sugar preserves; the brew houses often had screw presses. The most heavily used piece of equipment is the alembic or distillation vessel, many of which are illustrated in the 1707 laboratory, and which provided the essential technology of the commercial distillation houses of the 1590s,<sup>25</sup> of earlier alchemical distillations and,

of course, of the distillation rooms of houses on estates.

The technology upon which the 1707 laboratory depended was long-lived. It had been in place for many years and would continue with roughly the same structure until the end of the nineteenth century. A listing of the contents of Kenelm Digby's laboratory at Gresham College in 1648 indicates the consistency implied in the similarity between the illustrations from the 1590s' book on distillation and the 1707 Golden Phoenix:

In Sir Kenelm Digby his Laboratory  
at Gresham College

In the first Room

A Great Glass Case with several great Glasses  
An Anatomy Board with drawers

In the Next Room

A Driving Oven  
An oven with Iron retorts  
A deliquium stone & Cellar  
A Closet and little lodging Room, A Table and forms

In the great Room

A Reverberating Calcining Oven  
A [Balneum] Mariae  
3 Sand Retort furnaces  
A furnace for Retorts in open fire  
An Ashanon a digest Furnace  
20 Limbeck bodies of several sizes  
2 Glass basins  
6 Glass Funnels and some Galley Glasses  
A pair of Tongs 2 supporters for Recipients  
13 Iron Trevells  
Several pieces of earthen vessels  
A water Cistern Cock and Sink  
Several old materials  
A Large Table, dresser board, shelves & drawers  
& small Iron Grate  
A chopping plank  
Several Glass bottles of several Sizes  
2 Grinding stones of speckled marble

In the other Room

A great screw Press  
A stone mortar and wooden Pestle  
2 Grinding stones  
A search  
A Great Balneum Mariae  
3 Vaporatories  
2 Vesicae cum Refrigeratoris  
2 sand furnaces  
A Balneum Roris: or for Land  
4 stools to set Recipients  
Pieces of lead for the Balneum Mariae  
A Great Iron Plate<sup>26</sup>

There is little in the list that would not also have been found in the domestic setting of a wealthy household except possibly the cooling vessels, although there were ice houses and cooling equipment in continental households from at least the sixteenth century.<sup>27</sup>

It seems likely that Katherine Jones practised her general and her experimental chemistry in her kitchen and distillation room, but how was that practice perceived? While there is a great deal of evidence that many women practised 'Kitchin-Physick', with several examples up to 1600, there are many



more during the seventeenth century including Lady Mildmay whose epitaph from the 1620s refers to her skills in these areas,<sup>28</sup> Lady Barrington who was corresponding with Hartlib on religious matters in the 1630s and sending him receipts,<sup>29</sup> and the already mentioned Mary Rich, Katherine's sister, who was working in her community during the 1660s and '70s. In 1993, in the 1680s Lady Masham complained to John Locke that she had so many responsibilities in this area that she scarcely had the time to read a book (Hutton, 1993) – and there were many others. As to Katherine Jones herself, throughout the 1640s and '50s she was in continual contact with Samuel Hartlib and his correspondents. The authors of many letters addressed to him ask to be reminded to Katherine Jones and Dorothy Moore, and while there are few of her own letters in the archive there is a constant flow of letters to her. It was a rich intellectual community that included several women, increasingly non-aristocratic women, up to the end of the 1650s.

Many of the correspondents were also part of the Oxford circle concerned with matters of natural philosophy; it was made up of Robert Boyle, Thomas Willis and John Wilkins<sup>30</sup> and Katherine Jones visited it once. It was said of this circle, possibly rather caustically, that 'The Lords are the Lords and the Ladies are the commons',<sup>31</sup> a comment which combines an implicit devaluing of the women with an indication of their unpredictability, even their unruliness and, given the historical context, their willingness to debate. Thomas Willis was the writer who updated Mayerne's *Pharmacopoeia* into a text of chemical experiments in the 1660s; he was also a renowned physician and one of the first to work on a vocabulary for physiology. He seems to have worked alongside Katherine Jones; certainly he completed her medical receipt book and some of her receipts ended up in his *Pharmacopoeia Rationalis*. Given that later in life he employed the apothecaries Hazelwood and Guthrie to make up his receipts, Katherine may have acted in this capacity during their work together. It may be significant that Willis was fairly ordinary by birth, and was apprenticed to a tutor whose wife was a well-respected doctor.<sup>32</sup>

Willis recognized Katherine Jones's skill in using her receipts, just as Hartlib's *Ephemerides* or commonplace book records dozens of receipts and remedies which he is receiving from ladies and gentlemen throughout the 1640s and '50s; Robert Boyle notes the usefulness of women's receipts in many of his manuscripts;<sup>33</sup> Kenelm Digby's 'Closet Opened' of 1657 attributes many receipts to women and John Evelyn's diary describes working alongside his wife at experimentation.<sup>34</sup> The practice of chemistry, general or experimental, was clearly seen as appropriate to the aristocratic lady, possibly even peculiar to her class in the 1640s.<sup>35</sup> There are, after all, no manuscripts from the pre-1617 period written by aristocratic men that are published in the 1650s. It may be that the kind of experimentation these women were doing, which was new and subject to great scepticism, was in common with the work of a number of non-aristocratic men, who saw the status of these ladies as legitimating their work.



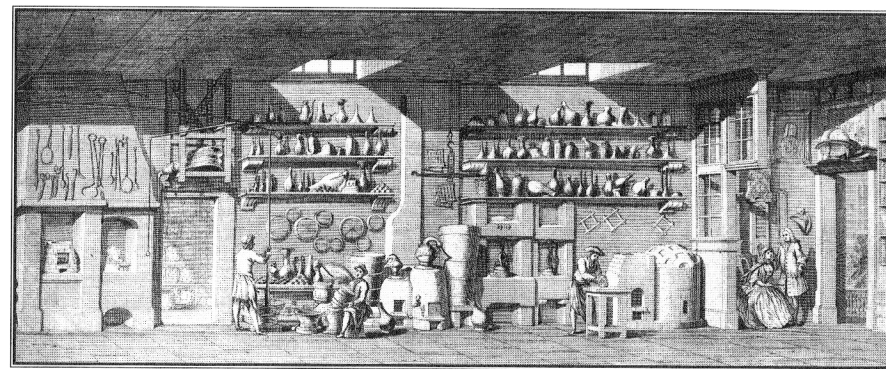
A page from Nicholas Bonnefons' *Le Jardinier Français* (1661).

At the same time it may be that there were growing numbers of aristocratic men who, like the ladies, had time on their hands, and while practising this kind of science felt it inappropriate to publish. So just as women in this period did act on behalf of men in politics – both Dorothy Moore<sup>36</sup> and Lady Verney represented the cases of specific men directly to Parliament<sup>37</sup> when those men were prevented from entering England – equally these women could be seen as acting on behalf of their male counterparts, testing the water so to speak. The fact that the experimental science was for them a leisure activity appears to have been decisive. Women lower down the social scale were being educated as usual in cookery, sugar work and household chemistry as domestic skills, but increasingly also as vocational skills with commercial value.<sup>38</sup> Yet Dorothy Moore was severely criticized for wanting to earn money by selling chemicals in 1649;<sup>39</sup> she was just too close to the aristocracy for this to be acceptable. Indeed, it has been suggested that Boyle's 'Invisible college' of the 1640s never materialized in public precisely because it may have been a scheme to make money from the new science.<sup>40</sup>

But then something odd occurs. Amid this general recognition, respect and even reliance on chemical practices by aristocratic women, John Beale, who had been corresponding with Katherine Jones and other women for a number of years through Hartlib's agency,<sup>41</sup> exchanging receipts with them quite happily, suddenly turns around in 1658 and disparages the triviality of these women who practise 'Ladies' Chemistry'.<sup>42</sup> His phrase is significant for a number of reasons. First of all it indicates that chemical practices were definitely perceived as a realm for 'Ladies' to engage with; secondly, it indicates a new and unexpected undermining of such activity, echoing the view that 'the ladies are the commons'. However, Beale partly retracted the criticism in a series of letters in 1659, including one praising 'illustrious Lady-Physicians', possibly Katherine Jones who was an important patron, although he continues to insist that lady chemists should emulate their husbands rather than pursue their own whims.<sup>43</sup>

Beale's critique raises several issues, and I would like to put one hypothesis in this way: as medicine and chemistry become an activity for aristocratic men during the 1650s, those men needed a way of differentiating their work from that of their female counterparts, partly to avoid being trivialized, partly to enter the public realm, and partly because of a growing differentiation between gendered activities. In addition, as Steven Shapin has recently argued, these men needed a way of legitimating the activity for upper-class gentlemen, preferably of the aristocracy.<sup>44</sup> The Royal Society was markedly aristocratic in make-up, and there were even complaints about the number of ordinary gentlemen proposed for membership partly because of this concern for legitimation.

The shift from kitchen to laboratory is minimal in terms of technology and expertise, except that the kitchen is the woman's preserve and the laboratory the man's. In practical terms the development of the laboratory must have been



Ambrose Godfrey [Hanckwitz]'s chemical factory in Covent Garden.

useful because of the increasing use of specialized equipment upon which many early members of the Royal Society focused. Yet that equipment could have its application in the kitchen just as well as in the laboratory, as did Denis Papin's 'Digester' or pressure cooker.<sup>45</sup> Furthermore, as gentlemen wanted to spend more time doing chemistry it would be impractical to stay in a busy kitchen or still room. But the development is also part of a seventeenth-century trend to separate gender-distinguished work that resulted in the use of different rooms for activities that were predominantly male or female, such as the work of the butler and that of the housekeeper, and eventually in the separate wings of houses on eighteenth-century estates.<sup>46</sup> This is an element that becomes acutely obvious when the Royal Society institutes its demonstrations: the society would be a place where people could demonstrate proven and repeatable experiments,<sup>47</sup> repetition being a central element in the methodology of proof needed by the new science.<sup>48</sup> In effect this meant that experiments had to be tried out, tested and perfected elsewhere – if the practitioners were wealthy enough and committed enough, possibly in a purpose-built laboratory, but more likely in their kitchen. After which testing and perfecting, they would go up to London to demonstrate.<sup>49</sup> The experimental work would be carried out in the proximity if not company of servants, wives, daughters and others, while by contrast the demonstration displayed the lone man as the scientific individual.<sup>50</sup>

The notion of the individual scientist runs counter to the circles of intellectual exchange that operated around Henrietta Maria, Elizabeth Grey and Alethea Talbot; and counter to the circles of commonly discussed knowledge in the world of Katherine Jones, Dorothy Moore, Benjamin Worsley, Robert Boyle and Thomas Willis. Just as the three published books in question follow manuscript practice and acknowledge their sources, so one of the earliest publications by

Robert Boyle in 1655<sup>51</sup> was a call for a sharing of knowledge and acknowledgement of its source. Interestingly, several years after the inauguration of the Royal Society, that unintentional encourager of the myth of original genius, Boyle's agenda runs counter to this as he expresses concern in a letter to Henry Oldenburg<sup>52</sup> about people putting their names to experiments he attributes solely to himself.<sup>53</sup> The earlier impulse was communal but also born from there being no financial need to insist on ownership, the later both an understandable concern with private ownership but also a product of the institutional science they were creating.

The problem for these aristocratic gentlemen, unlike for their female counterparts, was legitimation of the usefulness or value, often in religious and social terms,<sup>54</sup> of this science. Especially in the field of medicine and pharmacy<sup>55</sup> the work being carried out by the Hartlib group, the Oxford Circle, the men of Gresham College and then the members of the Royal Society,<sup>56</sup> was an investigation of the difference between Galenic medicine and chemical remedy.<sup>57</sup> The signal aspect of Galenic medicine was the doctor's advice, dependent upon knowledge of the patient's whole body, life and community, knowledge firmly tied to the diet and specific conditions of the individual.<sup>58</sup> One of the reasons for the continued success of women in medicine and their continued employment as nurses and sources of remedies must have been their often domestic position within the community which allowed them to observe these aspects in minute detail.<sup>59</sup> Their remedies, which are found in many manuscripts in the seventeenth century, are only implicitly generic. They rarely claim to be able to cure specific diseases or disorders, often providing fifteen to twenty receipts for one illness. Instead, they offer guides to possibilities open to the patient and physician. Yet their scripts are heavily reliant on tacit knowledge, and are as devoid of generalized commentary on the patient as physicians' texts were of receipts.

The aristocratic gentlemen taking over this science were not taking over the variety of social roles that went along with them in the lives of women, even in the lives of aristocratic women. Neither were they after making money, nor after the esoteric knowledge of the pedantic scholar, but nor were they after direct application to medical or technological practice. Earlier researchers (including myself in the early 1980s), tended to put their investigations firmly down to the privileging of rational analysis and empirical experiment, but recently many commentaries, including this one, want to emphasize the fuzzy area occupied by the mixture of hypothesis, experiment and application/explication that began to emerge and the difficulty that it posed for its practitioners.<sup>60</sup> Robert Boyle's second published work was *Some Considerations touching the Usefulness of Naturall Philosophy*, as if the elaboration of natural philosophy could offer a legitimation and use for experimental science.<sup>61</sup> In effect, we can also see this as part of a development in the traditions of printed

texts for men, parallel to those for women: books of husbandry, secrets and herbs. As this tradition developed into writing by men such as John Harrington and John Evelyn, far more discussion and explication is added.<sup>62</sup> Kenelm Digby comments in the preface to a translation he makes in the 1650s of a sixteenth-century book of secrets<sup>63</sup> that the earlier writer had paid too much attention to substance and not enough to the form, had focused exclusively on the receipts rather than describing method or offering explanation. Again, much research has been carried out on the rhetorical and literary basis for this change, usually with reference to the work of Francis Bacon. Yet we need also to consider that it was possibly just because these gentlemen were not drawing on shared tacit knowledge that they needed to develop explication; they needed a language or discourse to legitimate their otherwise hypothetical, fictional, almost fantastical work.<sup>64</sup>

The manuscript tradition of women's texts on medicine and household chemistry finally achieves publication in the 1650s, at precisely the time that it was taken over. It is a much more complex story than I have told here, of course: issues of economics, religion and the perception of print and its public audience would tell other parts of the story. On the positive side, after publication of the books by Henrietta Maria, Elizabeth Grey and Alethea Talbot many more women began openly to print works of cookery, domestic technology, kitchen physick and related daily work. But few seem to have moved along the lines of 'Ladies' Chemistry' after 1660.<sup>65</sup> Some women did continue to develop elements of natural philosophy, women such as Anne Conway and Margaret Cavendish about whom Sarah Hutton has written for this collection (see pp. 218–34). They even acquire a vocabulary for extensive commentary, although as Sarah Hutton discusses, given the disparaging remarks made about Cavendish's style one wonders how seriously it was taken.

One more example, I hope, of many more yet-to-be-found texts, is a brief notebook by a Sarah Horsington,<sup>66</sup> which is constructed as a commonplace book as were so many scientific notebooks of her male counterparts. It consists of quotations, detailed descriptions of experiments (frequently from Boyle's *Usefulness of Naturall Philosophy*), commentaries on method, observations on the effects of her own and her husband's remedies, and some pages of hypothesis on the physiology of women. The effect is patterned on Boyle's style and Willis's commentaries, yet is hard at work hammering out a distinctive vocabulary and syntax for discussion. However, for the most part women did not become published writers of experimental methodology or scientific and medical hypothesis from experiment, for centuries: Katherine Jones' receipts were published under the name of Thomas Willis and Robert Boyle,<sup>67</sup> and no doubt of many others – unquestionably with her support. Why this became so after the brief flurry of publication in the 1650s is clearly a topic for further research.



*Appendix A*

## SARAH HORSINGTON HER MANUSCRIPT. 1666

Arcana

or

Mysteries, in the Theory of Physiology and Chymistry,  
Being Authentick Rules for Preparing Spagyricall Medicaments, for my owne  
observation and satisfaction.

Also

Manyfold Rare Private Receipts, and Remedies, Prescriptions of T: H: M: D:  
Collected by the Industry of the Transcriber of this Manuscript uxoris ejus S:  
H:

making Salis Armoniack according to Robert Boyle

Sal: Armoniack XXX Brick and unslakt lime and loij, pound them all severally, and grossly in an Iron Morter mix them not, till you are just ready to put them into the retort because of a subtl fetid urinous steame which will xhale from the Misture, Lute on a Glasse Body as a receiver, close the Joynt round the Neck well with Past & wet double Browne Paper, increase the fire Gradually at the first, as is requisite in all Distillations, but this preparation requires a very strong fire, (which Regiment of heat hereafter I shall vie the Appellative Ignis Rota) to draw it off. The next morning when you take it up, sometimes you will find the flowers sublim'd into the neck of the retort of a yellowish colour, which to preseve must be kept in some warmth.

2 other wayes according to Mr Boyle, the 1st is, by mixing 2 parts of S: Armoniack with 3: or 4 of quicklime, whose vertur has not bin impayred by being exposed to the Aire. This way, as that worthy Person Mentions, afforded some dry sublimate in the Neck of the Retort, a little volatile salt in the Receiver, & a very strong and yellowish sp: so exceeding penetrant, and stinking, that 'twas not easie to hold ones nose, to the open mouth of the viall wherein t'was kept without danger of being struck down, or for a while disabled to take breath, by the plenty and violence of the exhaling spirits but the liquor forced over by this method, though exceding vigorous, was inconsiderable as to its quantity, therefore to vary this way a little, we proceed to the second

Let the Quicklime ly abroad in the open Aire, but protected from all other moisture except that of the ayre for divers dayes, in which time the imbib'd humidity of the Ambient ayre, would in some degrees slake it, and make it somewhat brittler, then it was before, and the lime thus prepar'd, being mingled with S: Armoniack & distilld in all circumstances after the former manner afforded a liquor so copious, & yet so strong that we hitherto acquiesce in this way of distilling this wild salt.

The sp: Sal: Armoniack may serve for a succadaneum to the spiritis of Hartshorne urine, & Blood &:

The salt is much of the same nature with that of urine & soot, whereof sal: Armoniack consists being a factitious preparation consisting of urine, soot and sea-salt.

The vertues, use, and dose,  
is it singular good to smel to for giddyness of the head & in violent Headaches, & in epileptick fits. but by reason of its Diuretick qualitie, being given 0, 10, 20, or 30 gr: in a cup of beere or any convenient vehicle first, & last, it provokes urine.

In a Human body, great alterations may be made by very subtil effluvia, appeares evidently as, many are purg'd by the bare odour of Potions & a greater prooffe of the power of steams upon the body may be taken from the Propagation of Infectious Diseases, which being convey'd by insensible Effluvia, from a sick into a healthy body, are able to disorder the whole oeconomy of it, & act those sad tragedies, which Physitians do so often unsuccessfull indeavor to hinder, but you will cease to doubt the corpuscles, though so small, as to be below the sense, should be able to performe great matters upon Humane Bodies; if you consider what alternations may be produc'd therein by the bare Actions of the parts upon one another. This may appear by the effects of several passions of the mind, which are often excited by the bare, if attentive, thoughts of absent things in obstinate grieve & Melancholy, there is that alteration made in the disposition of the heart, & perhaps some other parts by which the blood is to circulate that the lively motion of that liquor is thereby disturb'd and obstructions and other no easily remov'd distempers are occassion'd. The bare remembrance of a loathsome potion does oftentimes produce in me a Horror attended with a very sensible comotion of divers parts of my body, especially with a kind of a convulsive motion, in, or about the stomach & I doubt not, but the like though may have the like operation in many others.

read next what is written in the last leaf of all. . . .

Really, it seemes to me not only Highly dishonorable for a Reasonable soule to live in so Divinely built a Mansion, as the Body she resides in, altogether unacquainted with the exquisite structure of it; but I am confident, it is a great obstacle to our rendring God the Praises due to Him, for His having so excellently lodg'd us, that wee are so Ignorant of the Curious workmanship of the Mansions our Soules live in; for not only the Psalmist, from the Consideration of the Divine Art display'd by God, in the moulding and fashioning his body in the wombe, takes a just occasion to celebrate his Maker, Psalm: 139 verse 14, 15, 16, I will praise Thee (Sayes he) because I am



fearfully & wondrfully make; marvellous are thye works, and that my soul noweth right well: my substance was not hid from thee, when I was made in secret, and curiously wrought (with as much curiosity as Tapestry or Embroder, as the Hebrew Rukkamti seemes to import). In the lowest parts of the Earth, thine eyes did see my substance, yet being imperfect; and in Thy Book all my Members were written, which in Continuance were fashion'd, when as yet there were none of them. But even from Gallen himself Anatomical Reflections have bin able to Extort Expressions of Devotion, & from the consideration of so dispicable a part as the skin of the sole of the foot He takes occasion to Magnify, the wisdom of God & sayes rearely well, though some creatures seem made of much courser stuff then others yet, even in the vilest the Makers Art shines through the despicableness of the matter, for idiots admire in things the Beauty of their material, but Artists that of the workmanship: to which after a great deale of Phylosophical discourse, Gallen, he adds, Nor is th foot worse contriv'd then the Brain or eye, provided each part be duly dispos'd for performance of the actions to which it was design'd: Since the Braine could not conveniently want the foot nor the foot the braine, for I conceive that one stands in need of a support for local motion, and the other of a source from whence to derive the faculties of feeling

*Natura desidera preservare te ipsam*

what power the passions have to alter and determine the course of the blood, may appeare more manifestly in modest & bashful persons, especially women, when meerly upon the remembrance or thought of an unchast, or undecent thing, mention'd before them, the motion of the blood will be so determin'd as to passe suddently and plentifully enough into the cheeeks (& somtimes other parts) to made them immediately weare that livery of vertue (as an old Philosopher styl'd it) which we call a Blush and Passions, may not only alter the motion of the Juyces of the body, but likewise make some separation & evaluation of them, may appeare in greife, which is wont especially in women to make all the Passions commotions requisite to weeping: whereby oftentimes a considerable quantity of Briny liquor, is excluded at the eyes, under the forme of teare, by which divers (especially Hysterically) persons are wont to find themselves much refreshed, though with some it fares otherwise in teeming women. also that vehement desire we call longing, may well be supposed to produce great alterations in the body of the Mother, which leaves such strange and lasting impressions upon that of the infant; since tis the mother only, and not at all the infant that conceives those importunate desires.

William Andrews Clark Memorial Library MS

### Appendix B

FROM KATHERINE JONES'S GENERAL RECEIPT BOOK (PUNCTUATION ADDED)

To make Sprts of Roses my brother Robert Boyls way

Take of damask Roses both leaves and seeds, for the seeds yield the most oyle, what quantity you please; and so many leaves as you can possibly grasp with your hand put as much salt as you can cover with your hand; and in a stone mortar beat them very well. Then take this mass out of the mortar and put in the like proportion of salt and roses and beat fine as the others, and so do till you have the quantity you please. Then take them all and put them into some well glazed earthen pott and to every Bushell of Roses you have salted pour a quarte of beare wherein the quantity of a walnut of leaven hath bine first desolved. This may be stilled in Aug: or Septr in a limbeck, and will yeald odoriferous watter with a spirit swimming at the tope of it of a snow white culler, which must not be take off with anything of iron . . . but with some ivory or some other inodorous matter.

Lozenges for the Cough, Dr Coks

Take of the purple of marshmallow roots extracted by decoction in the distilled water of Scabious and Hyssop, an ounce of the finest powder of Spanish Liquorice, 3 drames of white gumme of Brinian, 3 scruples of the whitest hard sugar, a quarter of a pound of sugar candy, mingle all these very well in fine powder and with as much of the clammy juice of marshmallows as will suffice make it into paste adding a bout a quarter of an ounce of the purest wheat flower. Of this past you must make Lozenges to be hild under the tongue which will melt and so by degrees to be swallowed downen.

Wellcome Institute MS  
Boyle Family Western MS 1340

### Notes

1 Thomas Howard visited the Medici estate and its still-room facility during 1613 (see Brennan 1991), and Alethea was travelling with him on this journey (Howarth 1985).

2 Since the Hartlib Project at the University of Sheffield produced these letters as an electronic database (1989–94) much has been written about the scriptorium; for earlier helpful studies see also Turnbull (1947) and C. Webster (1970).

3 For example Hartlib letter 28/1/32B.

4 Hartlib letter 62/25/1A.

5 Hartlib letter 26/72A

6 The quotation is taken from Maddison (1969), p. 183.

7 For some sense of the extent of this influence see the early work of C. Webster (1970).

8 For this suggestion see Maddison (1969).

9 Several letters in the Hartlib archive from the 1650s indicate this.

10 Although Smith (1982) has noted that the Commonwealth period opened up many opportunities for women, which it undoubtedly did, few institutions for what we would now think of as higher education recognized women

11 This later letter is quoted in full in Hunter (1997).

12 See Fraser (1987), who also notes several other educational plans for women including a more conventional boarding school for girls in Hackney run by a Mrs Winch in the 1630s as well as Lettice Falkland's plan for the education of young gentlewomen in 1649.

13 My thanks here to Frances Harris of the Manuscripts Room at the British Library who alerted me to the Petty papers.

14 See Porter (1989) for a sense of the way in which the *Transactions* are almost a continuation of the Hartlib letters.

15 For an account of some of this background, see Kaplan (1993).

16 Maddison's (1969) biography of Robert Boyle offers a reconstruction of the use of Katherine's home.

17 For example *The Ladies Companion* (1653).

18 Among other accounts, see Mendelson (1987), p. 99.

19 Wellcome MS 1340.

20 British Library, Sloane MS 1367.

21 Maddison suggests this to have been the case (1969), p. 129.

22 James (1989).

23 Illustrations of the Golden Phoenix may be found in the Wellcome Institute for the History of Medicine, London.

24 In an often quoted letter of 1646, Robert Boyle complains to Katherine of yet another furnace that he has purchased at great expense failing to arrive in one piece at his home in Stalybridge; see Maddison (1969), pp. 70–1.

25 For detailed examples, see Baker (1599).

26 Hartlib letter 16/1/6A–B.

27 For some background to English and continental use of refrigeration techniques see David (1979b) and Stallings (1979).

28 See Beier (1987), p. 239.

29 See Nagy (1988) not only for an outline of work by Lady Barrington, but also for a broad discussion of the participation of women in this field.

30 Many of the Oxford circle were also the correspondents of Samuel Hartlib.

31 Hartlib letter 15/17A.

32 For some of the fascinating background to Willis' life, see Isler (1968).

33 See Sargent (1995).

34 Thanks to Frances Harris of the British Library for pointing this area out, and offering invaluable help in finding the manuscripts.

35 That the women were practising may have been as much of an incentive for men to marry them as was the possibility that these women could also provide funding for their husband's activities (see Webster 1975, p. 85); and it may be significant that the celibate professors of Gresham College were not pursuing the natural sciences, but geometry, astrology, rhetoric, divinity, law, mathematics, music and physic, while associated scientists, such as Digby, who were married, were doing so.

36 Throughout 1644 Dorothy Moore was continually writing on behalf of Dury to various people in England, and she journeyed to London on at least two occasions to speak on his behalf.

37 George (1988, p. 38) quotes William Denton on this event, which is recorded in Verney (1970, vol. 2, p. 240).

38 A prime example of this trend would be Hannah Woolley, whose *Gentlewoman's Companion* (1664) stresses the need for ingenious ladies to learn such trades.

39 Hartlib letter 26/33/1.

40 Maddison suggests that this is why we know so little about the 'Invisible college', that it may have had as one of its aims the garnering of profit (1969), p. 69.

41 See for example Hartlib letters 55/21/3A–4.

42 Hartlib letter 51/147.

43 Hartlib letter 19/3/59.

44 See Shapin (1991).

45 Papin (1687).

46 For a detailed account of the shift from late sixteenth century to the early nineteenth century, see Brears (1996).

47 Dear (1991), p. 153.

48 Cantor (1989), p. 162.

49 Golinski (1992), p. 3.

50 Shapin (1988), p. 375.

51 Boyle (1655), published in Hartlib (1655) it may have been written in 1647 and 'Philaretus to Empiricus', see Kaplan (1993).

52 Oldenburg (1965–86).

53 But see Porter (1989) for a rereading of the idea of attribution.

54 Shapiro (1991).

55 F. Holmes (1991), p. 165.

56 Hoppen (1970) notes the very large number of members of the Royal Society drawn from the Society of Physicians.

57 Webster (1982).

58 Rawcliffe (1995), p. 112; Wear (1989), p. 294; and on Boyle's concern with holistic medicine see Kaplan (1993), p. 4.

59 Both Cook (1986) and Pelling (1994) discuss the employment of women in medicine during the seventeenth century.

60 Shapiro (1983), p. 53.

61 For an extended discussion see Kaplan (1993).

62 Porter (1989), p. 278.

63 Digby (1654), p. A4v.

64 Wear (1989) outlines the dilemma at length.

65 Evidence for things that do not happen is scarce; but see Crawford (1984) for the lack of commercial ventures into medicine by women in the late seventeenth century.

66 In the William Andrews Clark Memorial Library, Los Angeles; extract above.

67 In Willis (1684) and Boyle (1692).