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John Evelyn demonstrates an exemplary seventeenth-century economy at Wotton House where architecture and landscape were understood together as a site of trade, ingenuity and philosophy.

## Water in use and philosophy at Wotton House: John Evelyn and the History of the Trades

Juliet Odgers

John Evelyn (1620–1706) is a prominent character in the historiography of seventeenth-century science. His friendships with Robert Boyle, Christopher Wren and Sir Thomas Browne, to name a few, ensure this, as does the huge volume of relevant archival material that he left behind. He was not particularly accomplished as a scientist, or natural philosopher to use the contemporary term, but he did engage earnestly with the project of establishing new experimentalist directions for the investigation of nature, both in the Royal Society after its establishment in the early 1660s, and in other milieux in the lead up to that event.<sup>1</sup> As a figure in garden historiography, Evelyn is equally important. He was not a professional gardener, but a gentleman educated for public office. However, until the Restoration of the Monarchy in 1660, the year he turned forty, he was excluded from public service because of his political allegiances – he was a Royalist. The 1650s were for Evelyn a decade of retirement, and from this time come both the gardens at Wotton – the topic of this paper – and his own famous garden at Sayes Court in Deptford, established in 1653. It was also the time when he composed much of the material on gardening and other virtuoso topics that he published both during that decade and subsequently.

Evelyn's work is central to the historiography of seventeenth-century gardening and it features increasingly in more general garden histories, particularly following the publication of a transcription of his great unfinished garden manuscript the *Elysium Britannicum: or The Royal Gardens*.<sup>2</sup> Given his prominence in both fields – gardening and science – it is curious that there has been little attempt to interpret his gardens in the light of his natural philosophy.<sup>3</sup> In this paper I start with one corner of this field, bringing together two instances from Evelyn's early career, the garden at Wotton in Surrey (the principal Evelyn family estate) and a project that Evelyn was closely involved in, now commonly known as the 'History of the Trades'. The 'History' was one of the cornerstones of Francis Bacon's programme for the reformation of inquiry into Nature and Bacon was an authority of the first

importance to Evelyn. We shall see below that much of Evelyn's written output can be seen in terms of the History of the Trades, including his manuscript for the *Elysium Britannicum*, which provides us with a statement of Evelyn's views on 'Nature' from the 1650s. Here he defines 'Nature herself' as an 'energie' or 'Universal Spirit', defending this largely neo-Platonic conception from the attack that such 'Spirit' was merely a 'Chymical chimæra' or, to use contemporary language, a hallucination of the chemists. For Evelyn, on the contrary, 'Universal Spirit' was the fundamental stratum of the creation and water was the primary 'vehicle' for the movement of 'universal Spirit' through the world, and, of course, through the garden. This is discussed further below.

### Wotton transformed

The new formal hydraulic garden was created at Wotton House in the late 1640s and early 1650s – the result of a collaborative venture between John Evelyn, his elder brother George Evelyn, who owned the estate, and their cousin, Captain George Evelyn, a military engineer. We know of Wotton's state before and after the works through a series of perspective drawings and one print made by John Evelyn which are currently held in the British Library.<sup>4</sup> These provide the primary evidence, almost the sole evidence, of the transformation of the garden from a moated Tudor manor-house plot to what Evelyn wrote of as a modern 'Italian' design, with '... amenitys not frequent in the best Noble mens gardens in England ...', 'a Portico', 'Mount', and 'fountaines in the Parterr'.<sup>5</sup>

Recent discussion of the gardens at Wotton has centred on two issues. The first is the degree to which it is possible to attribute any design input to John Evelyn. Frances Harris argues that it was Captain George Evelyn, the military cousin, who was almost certainly the principal agent in both the design and the supervision of the works. John Evelyn was at this period mostly in Paris, and himself credits his cousin with both the design of the Portico that fronted the new grotto and the engineering techniques used to cut and fill the terraces of the formal mount, carved

out of the hill behind the house. It is clear, however, as Harris also details, that John Evelyn gave his advice on planting, on hydraulics, on decoration of the grotto, and probably on layout. He offered his opinion both by letter and in person on his visits from Paris in the late 1640s and on his return to live in England in 1652. Harris, I believe, overstates the case in claiming that ‘the most important connection between John Evelyn and Wotton was not his influence on the garden, but the influence of the whole topography on him’. The dynamics of collaboration in design are complicated enough to accommodate a considerable creative input from a largely absent partner.<sup>6</sup>

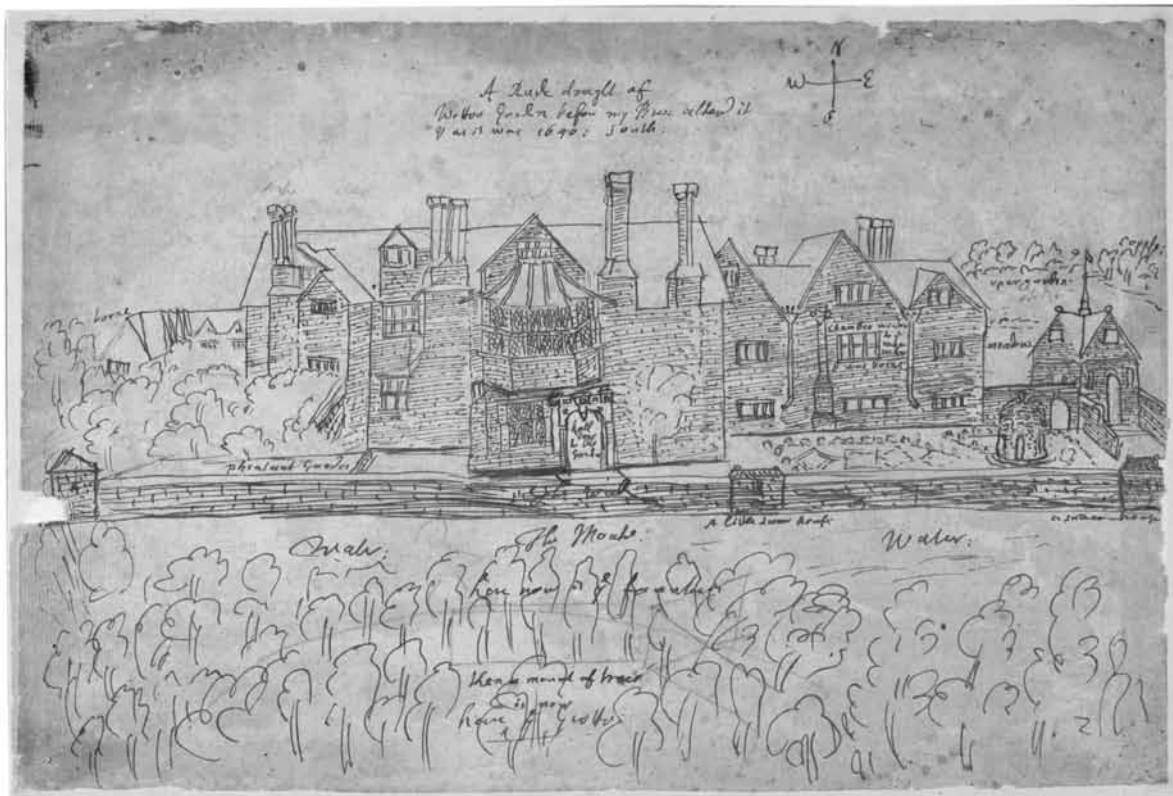
This brings us to the second issue that has received recent attention – the influence of Wotton on Evelyn. Here Harris builds on initial work by Peter Brandon, who describes the estate in terms of the water-powered industry it sustained, particularly the gunpowder mills built by John Evelyn’s grandfather. Brandon notes Evelyn’s attraction ‘to aspects of industrial technology’ and his bent towards ‘the popularising of the arts and sciences that he first learnt at Wotton, notably applied hydraulics, geology and engineering’.<sup>7</sup> Neither Brandon nor Harris, however, mention the project through which Evelyn organised his work in the area of ‘arts and sciences’ – the History of the Trades. In this paper I offer a reading of six of Evelyn’s drawings of Wotton that show the garden and surrounding estate both before and after the works carried out between 1646 and 1653. I show how these six ‘prospects’ record a territory that Evelyn saw as the locus of ‘philosophical’ investigation into nature. Water played an important role in animating the garden and landscape, first as a mechanical hydraulic force crucial to the conduct of Trade production, and second, as the vehicle of what Evelyn called ‘Universal Spirit’ – the energetic principle of ‘Nature’.

### The History of the Trades

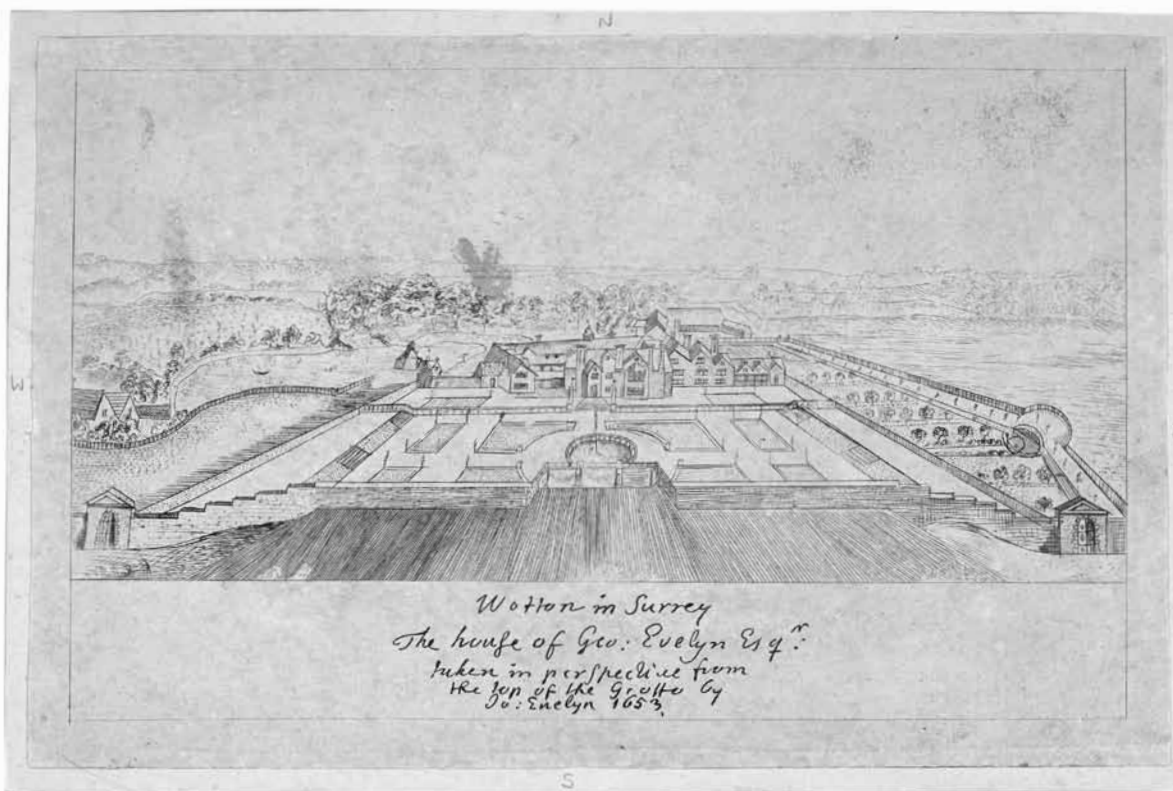
The History of the Trades was a project originally promoted in the English context by Francis Bacon, the great Elizabethan protagonist of a reformation of learning. Bacon first outlined the project in 1605 in *The Advancement of Learning*, a book with which Evelyn was thoroughly acquainted at an early age.<sup>8</sup> Bacon intended the History to be a comprehensive compendium of trade ‘secrets’ or craft practices (‘history’ in this context is not a past-oriented word). This was to perform a crucial part in recasting the study of nature as an experimental and empirical task, moving methods away from Aristotelian scholastic disputation and towards personal observation and witness.<sup>9</sup> In Bacon’s plan, if ‘experiment’ (experience and observation that is, no one had yet invented the idea of hypothesis) was to be the foundation of natural philosophy, something had to serve as a laboratory. But formal laboratories did not become a working reality in England until Evelyn and his generation started to erect them in their gardens and outhouses a good thirty years after the publication of *The Advancement of Learning*. Institutional laboratories came even later in the

1670s.<sup>10</sup> In the absence of specific experimental facilities – ‘instruments’, Bacon calls them – the idea was that the workshops of tradesmen, the kitchen, brewhouse and gardens would serve as the sources of relevant ‘facts’. In these places, ‘nature’ was routinely subjected to all sorts of revealing transformations and tradesmen were consequently in possession of a large amount of knowledge, which, if subjected to informed scrutiny, could further the natural philosopher’s understanding. But, before the trade secrets could be subjected to the philosophical scrutiny of ‘one man’s mind’, they would have to be collected, ordered and written-up into a comprehensive History. What was needed was a young man ready to apply himself to the task – ready to persuade tradesmen to give up their secrets to further the cause of natural philosophy. At this stage, both the compilation of the History and the subsequent philosophical scrutiny were envisaged as solitary tasks. The compilation had to be undertaken by a young man or he would never have time to finish; there was at least that degree of realism about the size of the undertaking.<sup>11</sup>

Behind the History of the Trades lay two religiously motivated purposes: to approach God and increase religious awe through the study and understanding of ‘the Book of Nature’; and to improve the ‘felicitie’ of mankind through the fruits – technological improvements – that were posited as the inevitable result of the improved knowledge. As Houghton explains, Bacon planned experiments of ‘light’, directed towards understanding of nature, and experiments of ‘fruite’, directed towards applications.<sup>12</sup> This combination of ‘usefulness’ and ‘philosophy’, to use Evelyn’s preferred terms, was something that Evelyn took to heart early on and continued to work with throughout his life. It is clear from his first commonplace book that Bacon’s *Advancement of Learning*, alongside Hugo Grotius’ *The Truth of the Christian Religion*, was his staple reading during the 1650s.<sup>13</sup> It is equally clear that Evelyn, for a time during this period at least, thought that he might be the young man needed to make a serious attempt at the History of the Trades. The first evidence we have of this is from 1653, the year in which the works at Wotton were completed, when Samuel Hartlib, the great Commonwealth improver and ‘Intelligencer’, mentions Evelyn as being engaged on the project.<sup>14</sup> The British Library still holds the manuscript volume that Evelyn hoped to fill with details of the Trades. He failed to progress much beyond headings – page after page is left blank – since it proved more difficult than expected to get the Tradesmen to divulge what were after all ‘secrets’ of considerable commercial value. The size of the task must also have been an issue, proving to be well beyond Evelyn’s capacities or indeed the capacity of any one individual. Eventually, in the context of the Royal Society, the History was given a new lease of life in the new guise of a collaborative venture. Evelyn was instrumental in embedding the History of the Trades into their programme. The importance of the History to the Royal Society only declined as formal laboratories became more common, thus allowing



1



2

1 Evelyn's drawing of the back of Wotton House before the creation of the grotto (beneath the draughtsman's feet) and before the formal parterre and fountains. BL Add 78610 Fol. A. 'A Rude draught of Wotton Garden before my

Bro: altered it & as it was 1640: South'; 1640. Pen and ink. Compare with Fig. 2 after the works

2 Wotton house and garden from the south after the works are completed. BL Add 78610 Fol. G, 'Wotton in Surrey/ The house of Geo: Evelyn Esqr taken in perspective from the top of the Grotto by: Evelyn'; 1653. Etched view from the south

the philosophical gentlemen increased independence from what Evelyn once called 'mechanical and capricious persons'.<sup>15</sup>

Evelyn wrote and published on a broad range of topics – gardening, agriculture, etching and engraving, politics, natural philosophy, painting – to give an incomplete list.<sup>16</sup> To architects, he is perhaps known principally as the translator of Fréart de Chambray's *A Parallel of the Antient Architecture with the Modern*, and author of *Fumifugium*, a polemic towards improving the air quality of London. To his contemporaries, however, he was most famous as the author of *Sylva: a Discourse of Forest Trees*. This was the first book to be published by the Royal Society and ran to four editions during his lifetime – it was essentially a manual of arboriculture, though in the later editions Evelyn inserted more speculative and polemical material. Other books on estate management, or 'improvement' to use the contemporary term, include his translations of French gardening works into English – Nicolas de Bonnefons' *The French Gardiner* and Jean de La Quintinie's *The Compleate Gardiner*; and tracts that treat specific aspects of gardening or agriculture, such as *A Philosophical Discourse of Earth and Acetaria*.<sup>17</sup> Both of these last can be seen as extracts from the unfinished larger project, the *Elysium Britannicum: or, The Royal Gardens*, the manuscript of which partially survives.<sup>18</sup> The predominant tone of most of these publications is one of informed practical advice, or useful information. Thus, as Walter Houghton puts it, it is possible to see 'Evelyn's endless and apparently random virtuosity [as] directed towards a single goal'<sup>19</sup> – the History of the Trades. As we shall see, Evelyn's drawings of Wotton are informed by this agenda.

### Drawing the estate

John Evelyn's drawings of Wotton are held together in a single portfolio in the British Library. The first nine sheets of the folder (Add 78610 A-I) show the garden as it developed in stages from 1640, through the first minor improvements in 1646 to the major works completed in 1653 under the direction of the three cousins. Evelyn's drawings can, for the most part, be seen as pairs – one before the works, one after. For example, Fol. A 'A Rude draught of Wotton Garden before my Bro: alterd it & as it was 1640: South' shows the moated house and small enclosed garden seen from the wooded hill immediately to the south of the house [1]. Its pair, Fol. G (an etching), shows the house and grounds in 1653 from the same vantage point, now the roof of the grotto that had been excavated from the hill [2]. The latter shows that the moat was filled and a large formal parterre with a central fountain created at the foot of the grotto. This was flanked by two raised walks, the whole enclosed by walls. What it doesn't show clearly is the cut and fill terracing of the hillside to create a new stepped mount. This is revealed in the next pair of drawings.

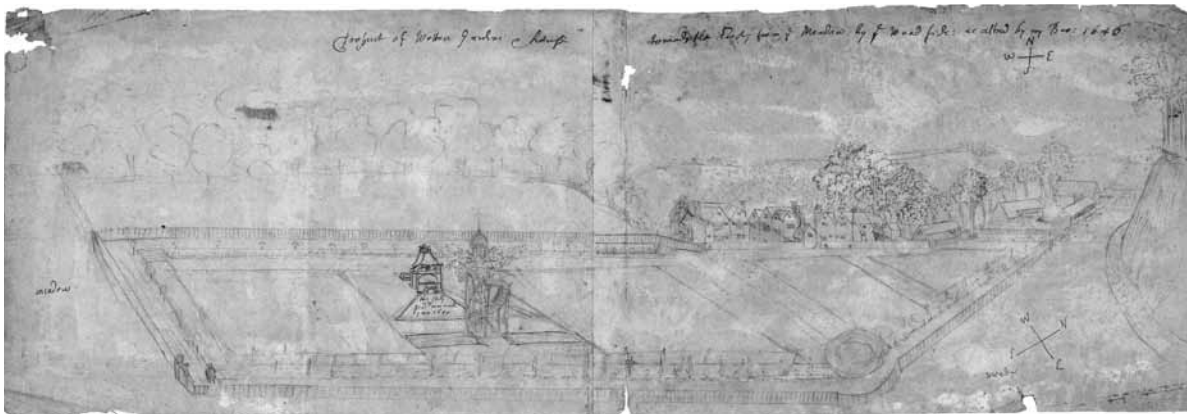
Fol. C 'Prospect of Wotton Gardens & house towards the east [...] as altred by my Bro: 1646', shows some preliminary works – the enclosure of an area in

the foreground to the south-east of the house, and the newly erected treehouse study and pond that John Evelyn saw as the start of all the works that his brother subsequently carried out [3]. Paired with this is Fol. F, taken from the same direction but slightly closer in [4]. Here we see a side view of the newly terraced mount sculpted out of the hill that once encroached on the house. We see the Classical portico of the grotto fronting onto the higher of two parterres; a lower parterre adjoining the house where the moat once was, the whole enclosed by what appears to be partly wall and partly fencing. In addition it is possible to make out some alterations to the grounds at the other side of the house – the entrance front to the north. These are better explained through the final pair.

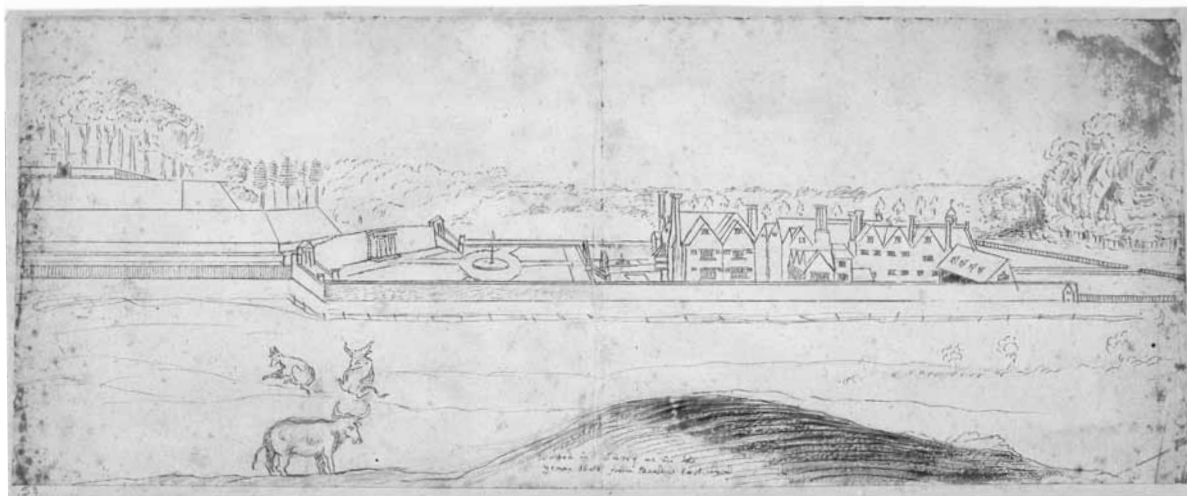
Fol. B 'The Prospect of Wotton 1640 from Broome field' to the north-west is the pair of Fol. I [5, 6]. These show clearly the alterations to the entrance front. The large mill-pond shown in the foreground of Fol. B [5] was partially filled and the stream canalised (this can also be seen on Fol. F [4]) thus allowing a more formal partially symmetrical arrangement to be made of the entrance approach. What appear to be barns were given new Dutch gables and the entry bridge and drive were moved to an axial position. The general tendency of all these alterations is to drain and canalise and to geometricise the layout around a central axis.<sup>20</sup>

It would appear that Evelyn had the intention to illustrate the estate and its improvements fairly systematically through the series. His concern with 'Oeconomie' (management of the household) was no small part of an abiding concern with a thorough ordering of life – his own life and those of others. In 1649, he presented his young bride with a small beautifully bound manuscript book of his *Instructions Oeconomique*. This dealt largely with the moral and religious structures of a 'family' and their possessions, giving little practical advice – no instructions on the place of Trades here.<sup>21</sup> Similar, if more knowledgeable, is the attempt he made for his friend Margaret Blagge in 1676. Finally, in his eighties he wrote his 'Memoires to my Grandson' who was to inherit the Wotton estate.<sup>22</sup> Here he advises that being 'settld & Master of a family [...] is the first in relation to your being usefull to your Country'. His advice starts with instructions for the conduct of household prayers, and proceeds to the disposal of income, the morality of the family and the practicalities of husbandry – the keeping, checking, accounting, nurturing of 'domestique possessions'.<sup>23</sup> These possessions are ordered into natural and artificial; 'movable' – plate and linen, rabbits, cows, barrows, spades and servants; and 'immovable' – woods, barns, pigeonhouse, ponds, mill streams. Evelyn makes it clear in his advice to his grandson that a part of good husbandry is the exercise of Trades on the estate, should it have the potential for such. He was at pains to impress that Trade was an honourable occupation for a gentleman and here he was arguing against predominant opinion.

*Instructions Oeconomique* of 1649, Evelyn used this



3



4

3 Wotton before alteration: 'Prospect of Wotton Gardens & house towards the east, from the Meadow by the Woodside: as altd by my Bro: 1646'. Drawing in red crayon from the

south-east, with a small garden pavilion and pond highlighted in ink and labelled: 'this study & pond was made by me 1640'. BL Add 78610 Fol. C. Compare with Fig. 4

4 Wotton after alteration, John Evelyn: 'Wotton in Surry as in the yeare 16[-] from Meadow Eastward'; circa 1650s. Drawing in pen and ink and grey wash. BL Add 78610 - F. Compare with Fig. 3

### Wotton and the Trades

Wotton House lies in a valley at the foot of the chalk and clay ridge of the North Downs. It is situated at the confluence of two streams, the main one, the Tillingbourne, was a mill stream of considerable economic importance in the seventeenth century.<sup>26</sup> We know something of this, and of Evelyn's concern for the Trades associated with the stream from a letter that Evelyn wrote to John Aubrey in 1676 with information for inclusion in the latter's *History of Surrey*:

*Not far from my brothers house, upon the ponds since fill'd up and drain'd, stood formerly many powder-mills, erected by my ancestors, who were the first who brought that invention into England; before which we had all our powder out of Flanders.*<sup>27</sup>

The powder mills, which were the foundation of the prosperity of the family, were, Evelyn continues, close enough to the house for the latter to sustain damage from an accidental explosion sometime in the early seventeenth century – 'a huge beam of fifteen or sixteen inches diameter in my brothers house (and since cramp'd with a dog of iron)' was broken, he writes. The 1640 view from the north-west, Fol. B [5], suggests one of two possible sites for the mills – to the north-west or north-east of the house, adjacent to the 'pigeonhouse pond'. The pigeonhouse itself is easily recognised in the drawing – it is the little square pavilion with a pyramidal roof surrounded by birds. Proximity to

traditional metaphor for the social ordering of a household – the husband is the head, the wife and children the heart, the servants the hands and feet, but given the new experimental philosophy's emphasis on practical experiment, this relationship was, in theory at least, due for a revision. Evelyn was highly elitist in his thinking so we should not look for any levelling tendencies in his thought; it was more a question of honouring the knowledge of 'hands' as an appropriate part of gentlemanly knowledge.<sup>24</sup> At one time, practising what he preached, Evelyn set up a brick manufacture in Deptford although the clay proved unsuitable. At another, he involved himself in a patent for a water raising and boring device.<sup>25</sup> There was no doubt a financial purpose in these failed schemes, but Trade was more than that to Evelyn as we have seen. We now return to Wotton and to Evelyn's own descriptions of the estate in order to uncover how the trades are embedded into his vision of the estate as a domain of ingenuity directed towards use and philosophy.

the powder works may have been useful, the pigeon shit was a source of saltpetre. The letter continues with details of the other uses of the stream. It is 'naturally full of trouts, but they grow to no bigness, by reason of the frequent draining of the waters to irrigate their lands'. It is the stream as a source of hydraulic power, however, that Evelyn emphasises:

*I do not remember to have seen such variety of mills and works upon so narrow a brook, and in so little compass; there being mills for corn, cloth, brass, iron, powder, &c.*<sup>28</sup>

Not content with furnishing an account of which industries were present on the banks of the Tillingbourne, Evelyn's letter to Aubrey continues with a description of the wire pulling process that he remembered having seen there:

*[...] first they drew the wyre by men sitting harness'd in certain swings, taking hold of the brass thongs fitted into holes, with pincers fasten'd to a girdle which bent about them; and then with stretching forth their feet against a stump, they shot their bodies from it, closing with the plate again; but afterwards this was quite left off, and the effect performed by an Ingenio brought out of Sweden;*<sup>29</sup>

The *Ingenio*, an engine developed by some ingenious person – tradesman or maybe philosophical gentleman – was not described, though Evelyn would, I suspect, have included it if he could. In the late 1640s he was already applying for a patent for a hydraulic machine, though the scheme was abortive, and in the early 1660s we find him trying to acquire copies of works on hydraulic machinery by Ramelli and by Salomon de Caus.<sup>30</sup> An *Ingenio* of this kind was precisely the sort of 'fruitful' improvement that was one of the purposes of the Trade Histories.

Evelyn's description of wire pulling is remarkably similar in tone to his diary entry describing the process used to cut away the mount in the garden at Wotton. The diary, also a *post facto* description, records that in February 1652 he went to Wotton to visit his brother:

*[...] to give him what directions I was able about his Garden, which he was now desirous to put in some form; but for which he was to remove a mountaine, that was over-growne with huge trees, & thicket, with a moate, within 10 yards of the very house: this my Brother immediately attempted, & that without greate Cost for more than an hundred yards South, by digging downe the Mountaine, & flinging it into a rapid streame, which not only carried the Land &c away, but filled up the moate, & level'd that noble area where now the Garden and fountaine is.*<sup>31</sup>

At one level, Evelyn's representation of Wotton through his drawings and writing holds a single intention: to describe the estate as a location of ingenious practices, both of the tradesmen and of the philosophical gentlemen of the family; practices that in turn depend on the specific 'natural' potentials of the land. Returning to his drawings of Wotton, only one, the earliest (Fol. A), the southern view of the house before the start of the works, privileges the house itself over the depiction of the topography [1]. The others show quite clearly the way in which the house sits deep in the valley. They show the encroachment of the wooded hill from the south

and the course of the streams as they pass swiftly by the mill, flowing east to west, or more gently past the vegetable garden from the south. The view from the top of the grotto, drawn after the work was complete, includes not only the house and new gardens, but adjacent fields, the mill pond to the north-east of the house, the pigeonhouse and some small pitched roofed buildings possibly mills, possibly the 'brewhouse' that appears in a much later drawing in that location [2].<sup>32</sup>

Some years after these drawings were made, Evelyn was still promoting the compilation of Trade Histories. He produced a document for the Royal Society in 1661, entitled the 'Circle of Mechanical Trades' and here, among the three hundred or so trades that he lists, we find all the trades of Wotton – 'Miller', 'Brewer', 'Wire-drawer', 'Enginere', 'Fontanier', 'Gardiner', 'Salpeater' – the last entered under a sub-heading 'Alchimy'. The trades of Wotton sit within a structure that was intended to encompass all artisanal knowledge from 'Rat-Catcher' to 'Pr;Rupert's new way of Engraving'. Evelyn's representation of the landscape and garden at Wotton shows an industrious domain where Trade was not a remote or concealed activity but it was instead present on the doorstep of the mansion, an integral part of the household economy.<sup>33</sup>

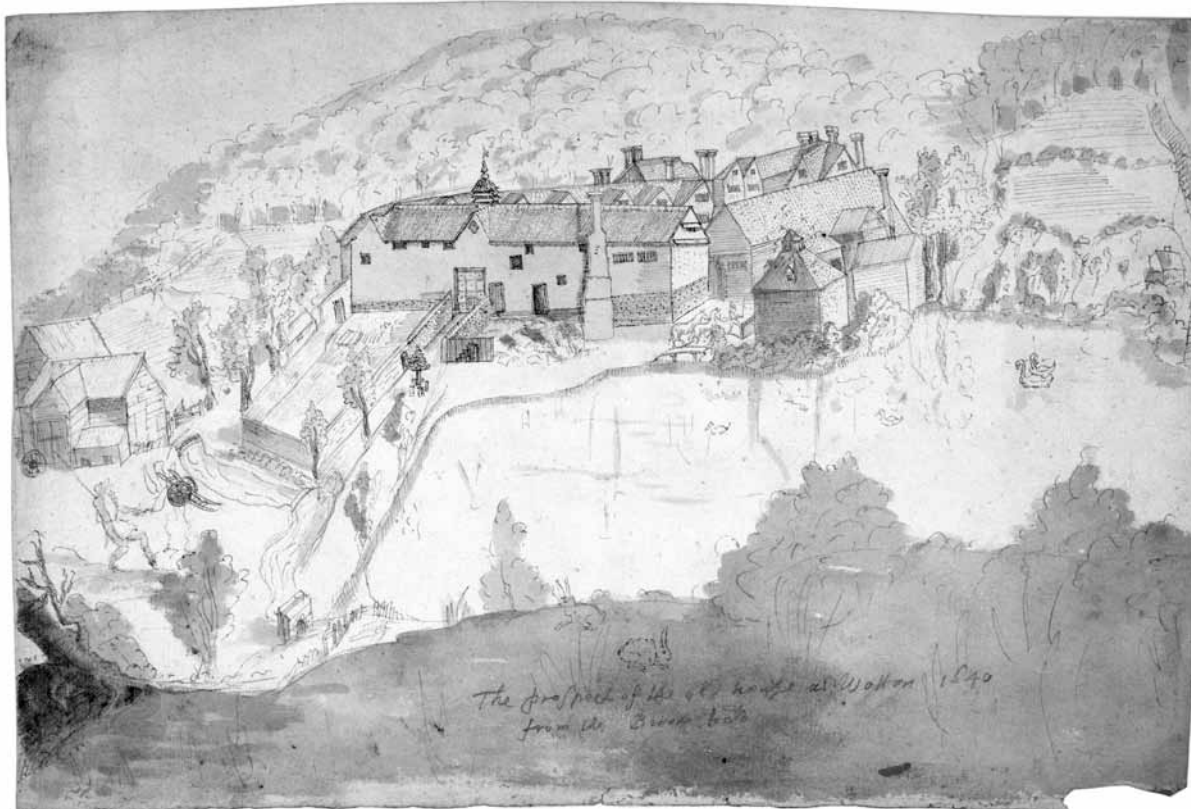
### Water in operation and philosophy

So far, I have emphasised the trade landscape aspect of Evelyn's drawings and descriptions of Wotton while charting his involvement with the History of the Trades, both through the abortive formal compilation that he started in the early 1650s as a sole agent, and in the later collaborative venture of the Royal Society. Diligent compilation and dissemination of Trade practices and secrets was not, however, in itself the prime intention of the History of the Trades, at least not in either its Baconian, or its Royal Society guises. There was the 'higher' purpose – philosophy.<sup>34</sup>

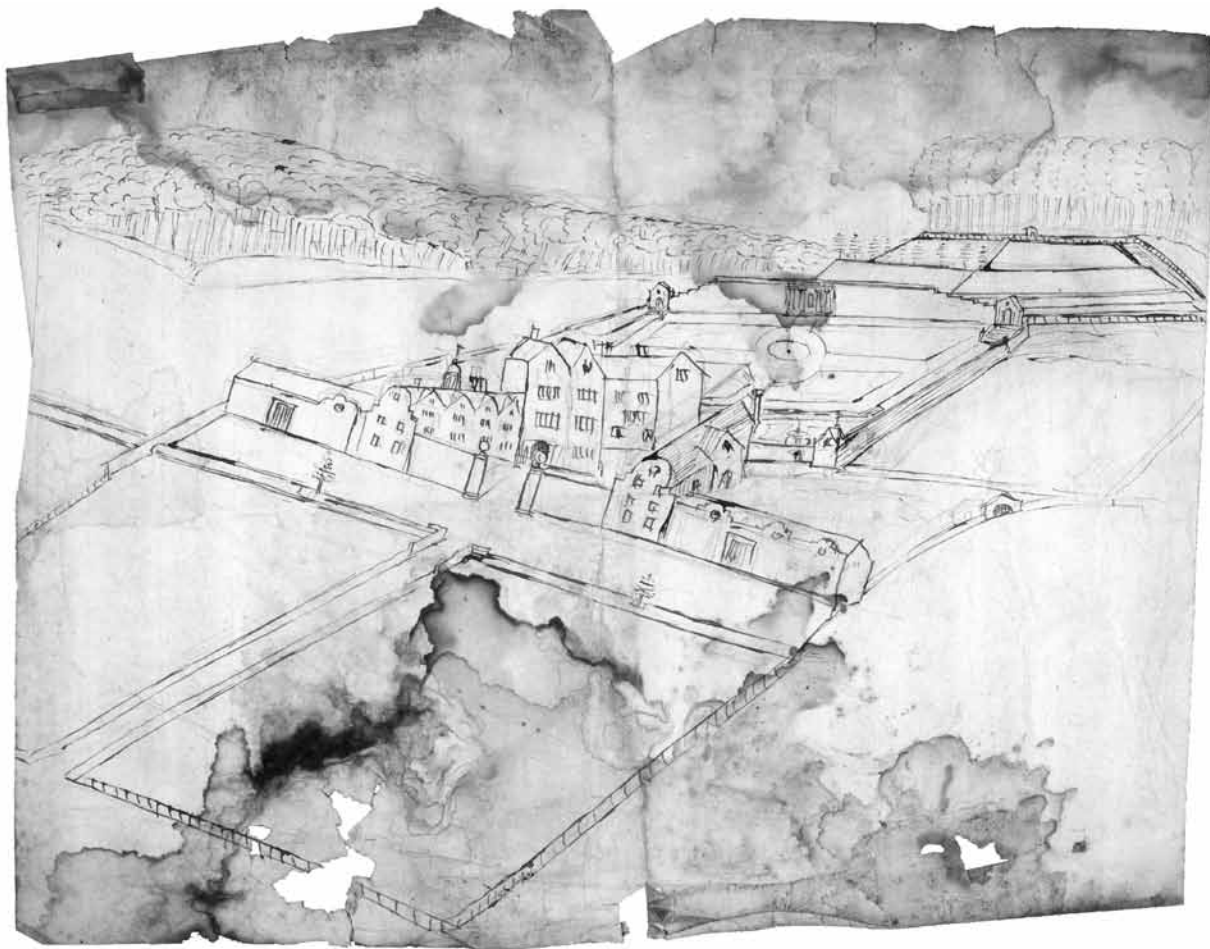
With natural philosophy rather than immediate operational 'fruits' in mind, Bacon had declared some trades to be more useful than others. Those, in Bacon's words, that consist 'principally in the subtle motions of the hands or instruments are of less use' – under this heading we find carpentry, milling and architecture. Those which 'exhibit, alter, and prepare natural bodies and material thing', which subject Nature to 'vexations', are of more use. Agriculture, cookery, chemistry, dyeing, glass, enamel, sugar making, gunpowder manufacture and so on come under this heading, as does gardening.<sup>35</sup> It should

5 John Evelyn, 'The Prospect of the old house at Wotton 1640 from the Broome field'; 1640. Drawing in black and brown inks and grey wash, from the north-west, showing the pigeonhouse and large pond. BL Add 78610 Fol. B. Compare with Fig. 6

6 Wotton from the north-west after alterations. John Evelyn [?] Rough sketch in pen and ink. BL Add 78610 Fol. I. Compare with Fig. 5



5



6



come as no surprise then that Evelyn's great unfinished gardening work, the *Elysium Britannicum*, should be structured according to the basic division of 'operation' and 'philosophy'; or 'Use' and 'Nature'; 'Fruit' and 'Light'. Evelyn wrote the *Elysium* in three parts: Book One was the 'philosophical' part; Book Two contained design guidance and detailed practical gardening advice. The final book, which is lost, but the contents of which we know, contained what might be termed supplementary material: a history of gardens; a gazetteer of world famous examples; how to dry flowers; 'hortulan entertainments'.<sup>36</sup>

If we look at how water is presented in the second, more practical book, we find endless examples of ingenious devices ranging in character from basic to highly sophisticated. For example, Evelyn gives us instructions for how to construct a pipe that does not leak; or how to size cisterns and a pipe network to give a certain height to a water jet. Later chapters detail 'elegant' devices – water dials that demonstrate hydraulic principles of rarefaction, condensation, attraction, non-penetration, gravity; musical automata and rainbow chambers.<sup>37</sup> He describes in detail a watering truck – a barrel on wheels with an integral hand pump – noting that 'of all the Gardiners Instruments, this is the most elegant, usefull, and Philosophical'.<sup>38</sup> Nothing is beneath his notice, nothing too mean to be encompassed within 'philosophy', a term that here includes anything that can be seen as a demonstration of a principle, or an application, or even as a provocation – a wonder. Thus the water dials and the musical automata are artful demonstrations of natural principles, the 'philosophical' water trolley and pump is an ingenious application of a principle, while the rainbow chamber artfully produces a rare effect worthy of investigation. The philosophical gentleman contrives devices which operate at many levels.

My examples of Evelyn's hydraulics are taken from the second, practical or 'operational' book of the *Elysium*. The first book contains material of quite a different sort. Here Evelyn deals not with useful operations and discrete examples but with theory of Nature. The manuscript is expanded with an accumulation of additions, deletions and marginal notes, carried out over decades and never brought to any final resolution. The text is mostly struck through pending final amendment – Evelyn notes, sometime after 1670, his dissatisfaction with what he had written and inserts a reminder to himself, '[...] consult Malphigii & Dr. Grew, with Mr Boyles Origin of Forms etc. Dr. Cudworth etc.'.<sup>39</sup> He never made the intended revisions that would have updated his book to reflect the mechanistic emphases of his fellow Royal Society members towards the end of the century.

Michael Hunter has argued that the fair draft of the *Elysium* that provided the base layer of all Evelyn's subsequent jottings was developed during the 1650s.<sup>40</sup> It is to this discernible base layer that I turn to extract a reading of Evelyn's thought at the

time when he was planning Wotton. It seems probable from the tenor of the text that his formulation was developed from a foundation of study laid down during the years he spent in Paris. As we will see, the vision of nature that Evelyn presented here was based more on a 'chymical' understanding than on the mathematical and mechanistic understanding that came to dominate the philosophy of the early Royal Society.<sup>41</sup> Evelyn, who was a syncretic thinker, in fact tried to reconcile the two positions: the first 'chymical' position in which 'Spirit' or 'energie' is seen as the base stratum of nature; and the second a 'corpuscularian' position in which atoms and corpuscles act on each other at a material (rather than energetic) level.<sup>42</sup> In Paris, Evelyn acquired a grounding in both views – he studied chemistry and encountered key figures in the revival of the classical atomism, contributing to this revival himself with his translation of Lucretius' poem *De Rerum Natura*, into English. Even while engaged in the translation, Evelyn had considerable reservations about the atomistic mechanical philosophy it embodied,<sup>43</sup> he disliked what he saw as the atheistic tendencies of the Epicurean school to which Lucretius belonged – for Lucretius atoms existed in all eternity – for Evelyn, God created the world *ex nihilo*, and to argue otherwise was dangerous atheism. By 1660, Evelyn was writing of 'the well restored doctrine of *Epicurus*', the phrase coming from his chapter 'Of the Principles and Elements in generall' in the *Elysium*, where he presents his 'reconciliation' of atomistic and vitalist theory.<sup>44</sup> The history of seventeenth-century physics is frequently written as the establishment of what is called the Mechanical Philosophy (mathematically understood atomism or corpuscularianism), which progressively displaced a more 'occult' or 'vitalist' understanding derived from Neo-Platonism and based among Chemical practitioners.<sup>45</sup> Evelyn's own development in understanding of natural philosophy broadly followed this progress, certainly in terms of overall emphasis this is the case. It is clear, however, that even at this quite late date (1660) 'corpuscles' and 'atomes' play a secondary role in Evelyn's understanding of the great economy of Nature. Spirit is more fundamental.

This is a summary of his position filtered from the jumble of the First Book of the *Elysium*. The fundamental stratum of the created universe is not material but an 'energie', the 'Universal Spirit', 'a powerfull emanation from the primarie Cause, seene by few, but felt by everybody, and flowing through all the workes of creation'.<sup>46</sup> This Spirit is 'nothing other than Nature herself. The [...] Soule of all things', not God, but the highest principle in His Creation (above angels and intelligences). This Universal Spirit moves through the universe descending from the stars, as immaterial fiery spirit ('our Sulphur') to 'fertilise the Earth, and the Seminal masses [...] contain'd in it', 'taking to itself an animal, vegetable or mineral body' according to the character of the earthly 'womb' which happens to receive it. On the dissolution of a particular being, a plant for example, the Spirit is 'emancipated' from the material womb to re-ascend

and reunite with the 'One Spirit'. Water plays a crucial role in the process since the Spirit 'begins to corporified [*sic*] it selfe first in the aire in forme of dew etc.'.<sup>47</sup> Rain and dew descending, vapours ascending – water is the primary vehicle by which the Universal Spirit moves through the universe.

Building on this understanding of water as the vehicle of Spirit, Evelyn explains that there is a hierarchy of waters. For gardening 'Raine is best; and especially that which hath bin reserved at the æquinoxes [...] as being most of all impregnate with universall Spirit'.<sup>48</sup> If rain is not available a spring or 'living fountaine' is good. Water that is raised artificially is 'expensive, unwholesome, & wanting the vivacity of its naturall origine'; standing water in general should be managed with care.<sup>49</sup> Good water is 'natural', 'vivacious' and 'spiriteous'. The three terms are practically synonyms in this context: Nature is life is spirit.

Throughout the wandering exposition of the first book of the *Elysium*, Evelyn illustrates his points time and again with examples taken from the practice and theory of chemistry. The perpetual rotation of Spirit in the universe is analogous to the condensation and dissolution of vapours in a laboratory flask; the 'emancipation' and 'recorporification' of Spirit in plant life is similar to the chemical process by which Vitriol is 'despoiled of its Salt and expos'd again sub dio for reanimation'.<sup>50</sup> It appears from the structure of insertions and deletions that Evelyn later intended to supplement the account I have summarised above – the 'Spagyrist Corpuscular Account'<sup>51</sup> as he calls it – with others. He notes an intention to address the 'common and vulgarly received Principles of the Peripatetes' (which represented the old establishment Scholasticism that Bacon sought to reform and that was still dominant in the universities during Evelyn's education); the 'Cartesians', and 'Aristotle'. But still the 'Spagyricall & Corpuscularie' was to be 'larger'.<sup>52</sup> As Hunter remarks Evelyn's theory of nature at this juncture arguably owes more to the 'Magical' Hermetic tradition, associated with figures such as Paracelsus, Sendivogius and Cornelius Agrippa than it does to the mechanical atomism that is frequently posited as the hallmark of seventeenth-century science. It is Evelyn's emphasis on Nature as Spirit, and his setting of perceptual boundaries to include the direct perception of this Spirit that are key 'Hermetic' characteristics that I want to emphasise here. A short passage gives the flavour:

[...] for we sayd, there is a substance besides corporeal matter, which is the Soule, seminal forme and Archæus [...] it is that Universall Spirit of the World, so much talked of, but little understood, by such as from canting ignorance, or envie of some writers, have taken it for a Chymical Chimæra.<sup>53</sup>

Evelyn was not eccentric in adopting this outlook. Hermetic approaches were thoroughly embedded in the natural philosophy of the period, and in all sorts of unexpected places. Evelyn's close friend Thomas Henshaw, for example, was both a Hermetic chemist and an active member and staunch supporter of the

Royal Society. His first report to the Royal Society was a collection of some empirical observations on that mystical substance May Dew – dew collected on a May morning was thought to be even more fecund than the average.<sup>54</sup> Anyone educated in Chemistry during this period would be familiar with this Hermetic outlook – it was one of the key loci of challenge that the established University Scholastics had to contend with, and was certainly more 'empirical' and 'experimental' than the atomist mechanical theories that formed another such challenge. Evelyn claimed that everyone can feel Spirit and some few could see it, but whoever claimed to be able to see an atom?<sup>55</sup>

### Laboratory

When Evelyn was in Paris, he attended lectures and chemical demonstrations at the newly established laboratory at the Jardin du Roi, but he also learnt chemistry in the workshops of individual apothecaries – Annibal Barlet, for instance, his first chemistry teacher.<sup>56</sup> This was typical at the time and represents a prime example of trade practices serving as the investigative site of natural philosophy. Chemistry – or 'Chymistry' – encompassed a range of trades. Evelyn lists a few under 'Alchimy' in his 'Circle of Mechanical Trades' – 'Bay Salt, White Salt, Alum, Coprose, Salpeter, Sulphur, &c.'<sup>57</sup> Each individual operation practised in each different specialist trade might reveal a different 'secret'. The aim of the gentleman philosopher was to encompass them all the better to understand their nature, and thus Nature herself.

In June of 1653 Samuel Hartlib marked in his *Ephemerides* that he had heard that 'Mr Evelin at Dedford [*sic*] a chymist hath studied and collected a great Worke of all Trades, and wants no more to it but the description of 3 Trades'.<sup>58</sup> As we know, this was a vastly over-optimistic assessment of Evelyn's progress on the project, but it does provide us with clear evidence that at the time when the works at Wotton were nearing completion, Evelyn already had a reputation for engagement in the project. 1653 is also the date of Evelyn's etching of the completed garden from the vantage point on the grotto roof [2]. To make this drawing, Evelyn placed himself on the central axis of the garden and at its highest point – at the 'head', we might say. Immediately in the foreground is the 'heart' of the garden – the parterre with its fountains; to the left are the pond, pigeonhouse, the brewhouse; to the right some regular planting in what looks like an orchard cum vegetable garden; behind the house the Tillingbourne flows, hidden, to nearby locations where human hands pull wire and hammer plate. Each element has its use and is known, placed and managed in a vision of an exemplary household. But the view shows more than this, it shows a philosophical domain, each locus of trade or ingenuity serving, in effect, as a discrete laboratory for the philosophically minded younger son, a site where the elegant fountains and water-powered mills are rivalled by the vegetable garden and brewhouse as watery 'instruments' of philosophy.

## Notes

- For a recent biography, see Gillian Darley, *John Evelyn: Living for Ingenuity* (New Haven, CT/London: Yale University Press, 2006). For archive see Theodore Hofmann, Joan Winterkorn, Frances Harris and Hilton Kelliher, 'John Evelyn's Archive in the British Library', *Book Collector*, 44 (1995), 147–209. Michael Hunter, *Establishing the New Science: The Experience of the Early Royal Society* (Woodbridge, Suffolk/Wolfeboro, NH: Boydell Press, 1989).
- Now transcribed John Evelyn, *Elysium Britannicum, or The Royal Gardens*, John E. Ingram (ed.) (Philadelphia: University of Pennsylvania Press, 2001). For commentary Therese O'Malley and Joachim Wolschke-Bulmahn (eds), *John Evelyn's Elysium Britannicum and European Gardening* (Washington DC: Dumbarton Oaks, 1998).
- Exceptions are Carola and Alastair Small, 'John Evelyn and the Garden of Epicurus', *Journal of the Warburg and Courtauld Institutes*, 60 (1997), 198–214, critiqued by Frances Harris, "'My Most Cherished Place on Earth": John Evelyn and Wotton', in *A Celebration of John Evelyn: Proceedings of a conference to mark the tercentenary of his death*, Mavis Batey (ed.) (Wotton, Surrey: Surrey Gardens Trust, 2006), pp. 53–73 discussed below; see also Douglas Chambers, "'Wholly New and Ambiguous": The Discourse of Nature', in Batey, pp. 75–84.
- BL Add 78610. Three are reproduced in Harris, 2006.
- Esmond Samuel De Beer, *The Diary of John Evelyn. Now First Printed in Full from the Manuscripts ... And Edited by E. S. De Beer, Etc.* (Oxford: Clarendon Press, 1955), vol. 1, p. 55.
- Harris (2006), Harris comments on and refutes, correctly, the arguments of Small (1997).
- P. F. Brandon, 'Land, Technology and Water Management in the Tillingbourne Valley, Surrey, 1560–1760', *Southern History*, 6 (1984), 75–103, p. 78.
- Francis Bacon, and Thomas Case (ed.), *The Advancement of Learning: And, New Atlantis* (London: Oxford University Press, 1951). For 'Instruments' see pp. 288–96.
- For Evelyn in relation to the History of the Trades and see Walter E. Houghton Jr, 'The History of Trades: Its Relation to Seventeenth-Century Thought: As Seen in Bacon, Petty, Evelyn, and Boyle', *Journal of the History of Ideas*, 2 (1941), 33–60; Michael Hunter, 'John Evelyn in the 1650s', in O'Malley (1998); and Kathleen H. Ochs, 'The Royal Society of London's History of Trades Programme: An Early Episode in Applied Science', in *Notes and Records of the Royal Society of London* (London: The Royal Society, 1985), pp. 129–58.
- Steven Shapin, 'The House of Experiment in Seventeenth-Century England', *Isis*, 79 (1988), 373–404.
- Houghton, pp. 34–38; Michael Hunter (1998).
- Op. cit.; for an introduction the 'two books' to Kenneth J. Howell, *God's Two Books: Copernican Cosmology and Biblical Interpretation in Early Modern Science* (Notre Dame, IN: University of Notre Dame Press, 2001) and Charles Webster, *The Great Instauration: Science, Medicine and Reform, 1626–1660* (London: Duckworth, 1975).
- Hunter, in Ingram (ed.), p. 86. Hugo Grotius, *Sensus Librorum Sex, Quos Pro Veritate Religionis Christianae Batavice Scripsit H. Grotius* (Paris, 1627).
- Hunter, in O'Malley (1998), pp. 86–87.
- Evelyn to Boyle, 9 August 1659, quoted in Hunter, in O'Malley (1998), p. 91.
- For a full bibliographic study of Evelyn see Geoffrey Keynes, *John Evelyn. A Study in Bibliophily with a Bibliography of His Writings* (2nd edn) (Clarendon Press: Oxford, 1968).
- Roland Fréart, sieur de Chambray, *A Parallel of the Antient Architecture with the Modern; ... by J. Evelyn* (London, 1664); John Evelyn, *Fumifugium: Or the Inconvenience of the Aer and Smoak of London Dissipated ...* (London: printed by W. Godbid for Gabriel Bedel & Thomas Collins, 1661); John Evelyn, F. R. S., *Sylva, or a Discourse of Forest-Trees, and the Propagation of Timber in His Majesties Dominions* (London: printed by Jo. Martyn & Ja. Allestry, 1664); followed by editions 1670, 1679, 1706. Nicolas de Bonnefons, translated by John Evelyn, *The French Gardiner, Instructing How to Cultivate All Sorts of Fruit Trees and Herbs for the Garden* (London, 1658); Jean de La Quintinie, translated by John Evelyn, *The Compleat Gard'ner; or Directions for Cultivating and Right Ordering of Fruit-Gardens and Kitchen-Gardens* (London, 1693); John Evelyn, *A Philosophical Discourse of Earth As It Was Presented to the Royal Society, April 29, 1675*, (London: printed for John Martyn ..., 1676.); John Evelyn F. R. S., *Acetaria. A Discourse of Sallets. By J. E. S. R. S. Author of the Kalendarium* (London: printed for B. Tooke, 1699).
- Before transferral to the British Library the MSS was held in Corpus Christi Oxford, where its catalogue ref was MS 45. The BL no. is Add 78342. Commentary on manuscript John E. Ingram, 'John Evelyn and His "Elysium Britannicum"', in Evelyn, (2001), pp. 5–9 and Frances Harris, 'The Manuscripts of the "Elysium Britannicum"', in Evelyn (2001), 13–19.
- Houghton, p. 56.
- There is some doubt over the authorship of this sketch. It is similar to one attributed to Aubrey (Bodleian MS Aubrey 4) reproduced in O'Malley, p. 155. Stylistically it shows some similarities to Evelyn's work, but the perspective is perhaps too naïve for Evelyn.
- Evelyn, 'Instructions Oeconomique', (1649), BL Add 78430.
- Darley, p. 2, Evelyn, 'Oeconomique instructions to a newly married friend', (1676) Add 78386; John Evelyn, transcript by Geoffrey Keynes, *Memoires for My Grand-Son* (Bloomsbury: Nonesuch Press, 1926).
- Evelyn (1926).
- Evelyn, Add 78430, Fol. 13. On body metaphor: Joanna Picciotto, *Labors of Innocence in Early Modern England* (Cambridge, MA: Harvard University Press, 2010), p. 131; Vaughan Hart, 'Inigo Jones, "Vitruvius Britannicus"', *Architectural History: Journal of the Society of Architectural Historians of Great Britain*, 53 (2010), 1–39, p. 9.
- Darley, p. 76.
- P. F. Brandon (1984); unfortunately the plates in Brandon's article were given the wrong captions, one plate being printed twice, and presumably one plate intended for inclusion, omitted. The view printed twice is in fact a drawing of Wotton by Evelyn from c. 1700 not 1640. The 'missing' plate must be Add 78610 Fol. B. The etching he shows is of Albury Park. The errors are clearly mishaps during printing, Brandon's knowledge of the estate is extensive. See also P. F. Brandon, *The Tillingbourne Story* (Shere, Homershall & Peaslake Local History Society, 1984).
- John Evelyn to John Aubrey, 1676, in William Upcott (ed.), *The Miscellaneous Writing of John Evelyn, Esq. F.R.S.* (London: Henry Colburn, 1825), pp. 687–91.
- Ibid.
- Ibid.
- Darley, p. 161.
- De Beer (ed.), *Diary*, entry for 22 Feb 1652, vol. iii, p. 60. Evelyn transcribed most of his diary at some date after 1660 see De Beer p. 46.

32. Add 78610 -J, reproduced Darley, Fig. 29.
33. A. F. Sieveking, 'Evelyn's "Circle of Mechanical Trades"', *Transactions of the Newcomen Society*, 4 (1923), 40–47 gives transcription of the 'Circle of Mechanical Trades', the MSS is in the Library of the Royal Society.
34. Kathleen H. Ochs, 'The Royal Society of London's History of Trades Programme: An Early Episode in Applied Science', *Notes and Records of the Royal Society of London*, vol. 39, No. 2 (Apr. 1985), pp. 129–58 p. 136.
35. Francis Bacon, *Parasceve, or Preparative towards a Natural and Experimental History*, affixed to the *Novum Organum* (1620), pp. 257–58, quoted in Houghton, p. 38.
36. Evelyn, (2001) 'the First Booke', pp. 29–80; 'the Second Booke', pp. 81–419. For the contents of the missing third book see, pp. 423–24.
37. Evelyn, (2001), Chapter IX 'Of Fountaines, Cascad's, Rivulets, {Canals} Piscina's, and Waterworkes', pp. 169–86, 'Musical Automata', pp. 242–47. See also two appendices 'Of the Conduct of Water', pp. 429–36 and 'On Waterworks', pp. 437–39.
38. Evelyn, (2001), p. 89. Evelyn's drawn illustrations of these devices are reproduced in op. cit.
39. My dating of this note as being made after 1670 is based on the assumption that the Cudworth work referred to is *The True Intellectual System of the Universe* (Richard Royston: London, 1678), his only published book on natural philosophy.
40. Hunter (1998).
41. For a succinct overview of context see John Henry, *The Scientific Revolution and the Origins of Modern Science*, 3rd edn (Basingstoke: Palgrave Macmillan, 2008); for the early Royal Society see Michael Cyril William Hunter, *Science and Society in Restoration England* (Cambridge: Cambridge University Press, 1981) and K. Theodore Hoppen, 'The Nature of the Early Royal Society', *British Journal for the History of Science*, 9 (1976); also Allen G. Debus, *The Chemical Philosophy: Paracelsian Science and Medicine in the Sixteenth and Seventeenth Centuries* (Mineola, NY; [Great Britain]: Dover Publications, 2002).
42. The two positions were not mutually exclusive. For commentary see Antonio Clericuzio, *Elements, Principles and Corpuscles* (Dordrecht/Boston/London: Kluwer Academic Publishers, 2000).
43. John Evelyn, *An Essay on the First Book of T. Lucretius Carus De Rerum Natura: (Animadversions Upon the First Book, Etc.)* (London: G. Bedle and T. Collins, 1656): see also Repetzki, Michael M. (ed), *John Evelyn's Translation of Titus Lucretius Carus De Rerum Natura: An Old-Spelling Critical Edition* (Frankfurt am Main/New York: Peter Lang, 2000).
44. Evelyn (2001), p. 40.
45. See for example, Marie Boas Hall, *The Mechanical Philosophy* (New York: Arno Press, 1981) and Allen George Debus, *The Chemical Philosophy: Paracelsian Science and Medicine in the Sixteenth and Seventeenth Centuries* (New York: Science History Publications, 1977).
46. Evelyn (2001), p. 38.
47. 'Our Sulphur', along with 'our Mercury' and 'our Salt' are the means 'with which it composes all other individuals (the vulgar Elements)'. These are not the 'grosse substances commonly known by those names', but 'Spirituall' or energetic Principles. Confusingly the Principles are also sometimes referred to as Fire, Water and Earth ... but are not to be confused with what Evelyn calls the 'Vulgar Elements' Fire, Water, Earth and Air, which are material. Evelyn, (2001), p. 38, p. 39, p. 50.
48. Evelyn (2001), p. 51.
49. Evelyn (2001), p. 169 and p. 94.
50. Evelyn (2001), 38.
51. A 'Spagyrist' is a chemist. Spagyric operations are those that separate substances into their constituent parts.
52. Evelyn (2001), p. 36, n. 2.
53. Evelyn (2001), p. 37.
54. Thomas Henshaw, 'Some Observations and Experiments on May-Dew', *Philosophical Transactions of the Royal Society*, 1 (1665), 33–36.
55. For background Allen G. Debus, *The French Paracelsians: The Chemical Challenge to Medical and Scientific Tradition in Early Modern France* (Cambridge University Press, 1991). On weak empirical base of seventeenth-century atomism see Christopher Meinel, 'Early Seventeenth Century Atomism: Theory, Epistemology, and the Insufficiency of Experiment', *Isis* (1988), 68–103.
56. A manuscript in Evelyn's hand of his notes for Barlet's lectures is inscribed 'my Master Monsieur. Barlet. of Paris under whom I went my first. curriculum. Ergotechnica.' BL Add 78335. For a discussion of Evelyn's chemistry, F. Sherwood Taylor 'The Chemical Studies of John Evelyn', *Annals of Science*, 8 (1952), 285–92.
57. Sieveking, p. 46. 'Alchemy' in no way indicating a different set of practices from Chymistry in Evelyn's usage, for a discussion of the etymology of both terms see L. M. Principe and W. R. Newman, 'Alchemy vs. Chemistry: The Etymological Origins of a Historiographic Mistake', *Early Science and Medicine*, 3 (1998), 32–65.
58. Darley, p. 130.

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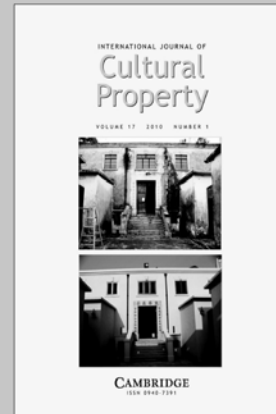
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