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## Pythagorean Number Symbolism, Alchemy, and the *Disciplina Noua* of John Dee's *Monas Hieroglyphica*

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### Abstract

Tant dans sa *Monas Hieroglyphica* (1564) que dans sa *Mathematical Praeface* (1570), John Dee défend une vue des mathématiques qui se veut compatible avec l'idée d'un 'Pythagorically, and Platonically perfect scholar'. Cet article montre que ce furent les doctrines arithmologiques contenues dans les épîtres de Trithème—lues par Dee dans une copie du *De usu et mysteriis notarum* (1550), qu'il acheta à Anvers en 1562/3—qui exercèrent sur les doctrines pythagoriciennes de la *Monas* de Dee un impact en profondeur. Alors que des commentateurs antérieurs ont mis l'accent sur l'orientation alchimique de l'oeuvre de Dee, une lecture serrée des lettres de Trithème (et les annotations portées par Dee sur celles-ci) montre qu'il croyait que la connaissance des mystères arithmologiques de Trithème s'étendait bien au-delà de l'alchimie, et devait constituer une 'discipline nouvelle' appelée à devenir une science occulte universelle.

### Keywords

John Dee; Johannes Trithemius; Jacques Gohorry; Number Symbolism; Alchemy; Cabala

In 1570, Henry Billingsley—to whose English translation of Euclid's *Elements* John Dee contributed a 'very fruitfull Praeface'—introduced the seventh book with a eulogistic appreciation of the importance of number in the sciences. Number, he said,

falleth vnder no sence, nor is represented by any shape, forme, or figure: and therefore cannot be iudged by any sence, but only by consideration of mind, and vnderstanding. [...] Wherefore number, as being only intellectuall, is more pure, more immateriall and

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<sup>\*)</sup> An earlier version of this paper was delivered at the conference *Musique et ésotérisme: l'art et la science des sons face aux savoirs occultes*, held at the Academia Belgica in Rome, 14–18 April 2008.

more subtile, farre then is magnitude: and extendeth it selfe farther. For Arithmeticke not onely aydeth Geometrie: but ministreth principles and groundes [...] to all other sciences. As to musicke, Astronomy, naturall philosophy, perspectiue, with others. [...] The wisest and best learned philosophers that haue bene, as *Pithagoras*, *Timeus*, *Plato*, and their followers, found out & taught most pithely and purely, the secret and hidden knowledge of the nature and condition of all things by numbers [...]. Boethius sayethe *Hoc fuit principale in animo conditoris exemplar* [...]. *Timaus* [...] & also Plato in his *Timeo* [...] show how the soule is composed of harmonick numbers, and consonants of musick. Number compaseth all things and is (after these men) the being and very essence of all things.<sup>1</sup>

This Platonic-Pythagorean understanding of number, which had been widely disseminated in sixteenth-century England by the dominance of Boethius's *De institutione arithmetica* as a quadrivial textbook in the universities of Oxford and Cambridge, was also endorsed by Dee in his preface to Billingsley's Euclid, which he hoped would be beneficial to 'the *Pythagoricall*, and *Platonicall* perfect scholer, and the constant profound Philosopher [...].'<sup>2</sup> Not only does Dee cite the Boethius passage about number as the pattern of the Creation in the mind of God,<sup>3</sup> but he also praises the 'meruaylous newtralitie' of 'things Mathematicall', which allows them to mediate in the

straunge participation betweene thinges supernaturall, immortall, intellectuall, simple and indiuisable: and thynges naturall, mortall, sensible, compounded and diuisible.<sup>4</sup>

In a rapturous passage on the 'profound and diuine Science' of number, Dee describes how the mathematician-philosopher can:

arise, clime, ascend and mount vp (with Speculatiue winges) in spirit, to behold in the Glas of Creation, the *Forme of Formes*, the *Exemplar Number* of all things *Numerable*: both visible and inuisible: mortall and immortall, Corporall and Spirituall.<sup>5</sup>

This mystical, Platonic-Pythagorean conception of number as a means of spiritual ascent, as well as key to the occult harmonies of the material Creation is a central feature of Dee's most mysterious work, the *Monas Hieroglyphica*.

<sup>1</sup>) Billingsley, *The Elements of Geometrie*, 183<sup>r</sup>.

<sup>2</sup>) Dee, *Mathematical Praeface* [hereafter MP], sig. [⌘ iiiij] verso.

<sup>3</sup>) MP, sig. \*j recto.

<sup>4</sup>) MP, sig. [⌘ iiiij] verso.

<sup>5</sup>) MP, sig. \*j recto-verso.

Described by Dee himself as a form of ‘inferior astronomy’<sup>6</sup> (or alchemy), a ‘cabala of the real’<sup>7</sup> or as a ‘mechanical magic’,<sup>8</sup> the precise nature of the ‘new discipline’ which the *Monas* purports to teach has long been a matter of debate.<sup>9</sup> In this essay I shall be focussing on one aspect of this complex work: its use of Pythagorean number symbolism as a foundation for the occult sciences and the sources that Dee used in elaborating his arithmological doctrines.

According to Dee, the *Monas Hieroglyphica*—a work in which he expounds the mysteries contained within a geometrically-constructed ‘hieroglyphic’ sign composed of conventional astrological and alchemical symbols—was written in twelve days: it was begun on the 13 January 1564 and completed on the 25 January 1564.<sup>10</sup> Dee addresses a letter to the Antwerp publisher Willem Silvius, dated 30 January 1564, which was written ‘Ex Musaeo nostro Antwerpiensi’ (From our study at Antwerp), and it has been assumed that Dee wrote the *Monas* in Silvius’s house at the Golden Angel near the Camerpoort Bridge in Den Camer Straet.<sup>11</sup> In his prefatory epistle to the Emperor Maximilian I, however, Dee claims that his mind had been ‘pregnant with it during the course of seven whole years,’ ‘as appears,’ he writes in a marginal gloss, ‘in our *Propaedeumata aphoristica*, printed in London, in the year 1558, from aphorism 52’.<sup>12</sup>

<sup>6</sup> Dee, *Monas*, 17<sup>r</sup>, Josten, ‘A Translation’, 175. Dee derived the term ‘astronomia inferior’ from his reading of mediaeval alchemical texts. See, for example, Dee’s annotation to this term in a fifteenth-century manuscript of *Expositio imaginum Josephi*, London, British Library, Sloane MS 2327, fol. 6 verso. This manuscript is inscribed ‘Ioannes Dee 1559’ (fol. 1 verso).

<sup>7</sup> Dee, *Monas*, 7 recto, Josten, ‘A Translation’, 135.

<sup>8</sup> Dee, *Monas*, 13, Josten, ‘A Translation’, 159.

<sup>9</sup> See the various accounts of the *Monas* by Clulee: *John Dee’s Natural Philosophy*, 77–142; ‘John Dee and the Paracelsians’; ‘*Astronomia inferior*: legacies of Johannes Trithemius and John Dee’; ‘The *Monas Hieroglyphica* and the Alchemical Thread of John Dee’s Career’. See also Walton, ‘The geometrical Kabbalahs of John Dee and Johannes Kepler: The Hebrew Tradition and the mathematical study of nature’; Håkansson, *Seeing the Word*, esp. 180–199 and 289–300; Szőnyi, ‘Ficino’s Talismanic Magic and John Dee’s Hieroglyphic Monad’; Norrgrén, ‘Interpretation and the Hieroglyphic Monad: John Dee’s Reading of Pantheus’s *Voarchadumia*’; Forshaw, ‘The Early Alchemical Reception of John Dee’s *Monas Hieroglyphica*’; Cavallaro, ‘The Alchemical Significance of John Dee’s *Monas Hieroglyphica*’.

<sup>10</sup> Dee, *Monas*, 28 recto, Josten, ‘A Translation’, 219.

<sup>11</sup> See Josten, ‘A Translation’, 153 and fn. 37.

<sup>12</sup> Dee, *Monas*, 10 recto: ‘Annos prius continuos Septem, Mente gestaui mea’; ‘Vt apparet in Aphorismis nostris Propaedeumaticis, Impressis Londini, Anno 1558. ex Aph. 52’. Josten, 147.

Dee's Monas hieroglyph does, in fact, make its first public appearance on the title page of the first edition of the *Propaedeumata* in 1558, where it is enclosed in a cartouche and flanked by a scroll which announces 'In this monad there is whatever Wise Men seek' (*Est in hac monade quicquid quaerunt Sapientes*). In aphorism LII of the *Propaedeumata* Dee alludes to a secret or mystery (*arcanum*) of inferior astronomy (i.e., alchemy) which is 'enclosed in a certain Monad' (*in quadam inclusa MONADE*).<sup>13</sup> While the substance of the *Propaedeumata* itself seems to have little to directly connect it with the *Monas Hieroglyphica*, being principally concerned with elaborating a new astrological theory based on the conal propagation of celestial influences,<sup>14</sup> it does, nonetheless, set out some of the general cosmological principles upon which the *Monas Hieroglyphica* depends.

In aphorisms IX–XII, for example, Dee outlines the principle of harmonious agreement which connects the superior parts of the universe to inferior parts. Aphorism IX states that 'Whatever is in the universe possesses order, agreement and similar form with something else,'<sup>15</sup> while aphorism X insists on the possibility of manipulating 'things [which] are of the same order, or harmonious, or of similar form'. 'Therefore, by the union of such natural things', Dee says,

that exist separately in the universe, in their differing fashions, and by the activating of other things placed somewhat higher, seminally, in nature more wonderful things can be performed truly and naturally, without violence to faith in God or injury to the Christian religion, than any mortal might be able to believe.<sup>16</sup>

<sup>13</sup> Dee, *Propaedeumata aphoristica*, aphorism LII, in Shumaker, *John Dee on Astronomy*, 148–149. [Hereafter referred to as 'PA'].

<sup>14</sup> On Dee's *Propaedeumata* and astrological theories see Dunn, 'John Dee and Astrology in Elizabethan England', 85–94, Clulee, *John Dee's Natural Philosophy*, 39–73 and Håkansson, *Seeing the Word*, 274–289.

<sup>15</sup> PA, 124–125. 'IX Quicquid in mundo est, ad aliud quid ordinem, convenientiam, & conformitatem habet.'

<sup>16</sup> PA, 124–127. 'X. Quaecunque res sunt sibi coordinatae, convenientes, vel conformatae, una aliam tum sponte imitatur sua, tum etiam aliquando una ad aliam localiter accurrit: unaque aliam (quantum potest) tuetur & munit, etiamsi interea vis sibi inferri videretur. Per harum ergo rerum naturalium (modis variis) in mundo Separatum existentium, Unionem: & aliarum Seminaliter tantum prius in Natura positarum, Actuationem, miranda magis, vere, naturaliterque (nec violata in Deum fide, neque Christiana laesa religione) praestari possunt, quam quis mortalitatis, credere queat.' Translation slightly altered. For magic as the 'actuation' of seminal reasons in nature see Pico della Mirandola's *Conclusiones magicae*, 9.5 and 9.11 in Farmer, *Syncretism in the West*, 496–499.

Aphorisms XI and XII, represent this harmonious order by means of an analogy:

The entire universe is like a lyre tuned by some excellent artificer, whose strings are separate species of the universal whole. Anyone who knew how to touch these dextrously and make them vibrate would draw forth marvellous harmonies. In himself, man is wholly analogous to the universal lyre.<sup>17</sup>

This idea of the universe as a composition of harmoniously proportioned parts, which—if correctly understood—can be used to perform wonderful things (*miranda*) is essential to the alchemical, cabalistical, and magical theories outlined in the *Monas Hieroglyphica*, which repeatedly refers to the idea of ‘mystical’ or ‘secret’ proportions.

At the end of his *Mathematical Praeface* to Billingsley’s Euclid, Dee repeats a commonplace of sixteenth-century occult philosophy deriving from the apocryphal Wisdom of Solomon (11:20): ‘[U]nto God our Creator, let vs all bee thankefull’, he writes,

for that, *As he, of his Goodnes, by his Powre, and in his wisdom, hath Created all thynges, in Number, Waight, and Measure:* So, to vs, of hys great Mercy, he hath reuealed Meanes, whereby, to attayne the sufficient and necessary knowledge of the foresayd three principall Instrumentes.<sup>18</sup>

That Dee had this idea of a mathematically-structured cosmos, organised by number, weight and measure in mind when he was composing the *Monas Hieroglyphica* can be seen in a letter written to William Cecil, Lord Burghley from Antwerp almost a year before the *Monas* was composed. Writing to Burghley from Silvius’s house on the 16 February 1562 / 3, Dee complains that the English universities have scholars who are ‘right excellent’ in Theology, Latin, Greek and Hebrew, they are nonetheless lacking in certain ‘wunderfull Sciences’ which afford a ‘better Vew of his Powre and Goodnes’. These are:

<sup>17</sup>) *PA*, 126–127. ‘XI. Mundus iste totus est quasi lyra, ab excellentissimo quodam artifice concinnata: cuius chordae, sunt huius universitatis Species singulae, quas qui dextre tangere pulsareque noverit, mirabiles ille eliciet harmonias. Homo autem, per se, Mundanae isti Lyrae, omnino est Analogus.’ Cf. Plotinus, *Enneads*, IV.4. 41. For Dee’s annotations to this section of Plotinus’s work see, *Plotini Divini illius Platonica familia philosophi, de rebus philosophicis libri LIIII*, London, Royal College of Physicians, shelf-mark 53.d.10, xxxvi recto–xl recto.

<sup>18</sup>) *MP*, sig. Aiiij. verso.

the Science *De Numeris formalibus*, the Science *De Ponderibus mysticis*, and [th]e Science *De Mensuris Diuinis*: (by which three, the huge frame of this world is fashioned, compact, rered, stablished & preserved) and in other Sciences, eyther w<sup>th</sup> these Collateral, or from them derived, or to themwards, greatly us fordering.<sup>19</sup>

These sciences of ‘mystical’, ‘divine’ and ‘formal’ number, weight and measure, he claims, have (‘after ... longe serche & study’) been understood by him, and he has come to Antwerp to consult Dutch ‘Printers and other Artificers’ in order that he might ‘Disclose by Writing, such proffitable and pleasant Sciences’ to a wider public. While he has been in Antwerp, he says:

by diligent serche and travaile (for so short a tyme) almost incredible, Such Men, and such bokes are com[m]e to my knowledge, where they are, As, to the former great sciences I hoped never to have had so good ayde, eyther by the one or the other.<sup>20</sup>

One of the books which he has already acquired, he reports, is Johannes Trithemius’s *Steganographia*, ‘A boke for your honor, or a Prince, so meet, so nedefull and co[m]odious, as in humayne knowledg, none can be meeter, or more behofefull.’ Which he has been copying out in his own hand. He promises to present this book (‘the most precyous Iuell, that I have yet [...] recovered.’) to Cecil upon his return as thanks for the ‘sweet leisure’ (*dulcia illa ocia*) that he has afforded him. Cecil, he declares, has already done much good for ‘the avauncement of [...] wonderfull divine and secret Sciences’ and he is hoping to attain further knowledge of Trithemius by ‘Conference’ with Antwerp scholars (‘Men hard to finde, althowgh daily seen’). The fruits of this experience of the neoplatonic culture of the Low Countries can be seen in the *Monas Hieroglyphica* which shows clear signs of having been influenced by Dee’s recent discovery of the works of Trithemius.<sup>21</sup>

It is not so much to the *Steganographia*, however, that we should turn, but to another work which (according to its title-page) Dee bought in Antwerp on the 20 January 1562 / 3: that is, his copy of Jacques Gohorry’s *De usu et mysteriis notarum*, published in Paris in 1550, now in Cambridge University Library.<sup>22</sup>

<sup>19</sup> Dee, Letter to William Cecil, 16 February 1563: ‘*Antwerpiae apud Guilielmum Siluium In Angelo aureo: in platea, vulgariter, Den Camer Straet, vocata.*’

<sup>20</sup> Ibid.

<sup>21</sup> On Trithemius, see Brann, *Trithemius and Magical Theology*; Zambelli, *White Magic, Black Magic in the European Renaissance*; Arnold, *Johannes Trithemius (1462–1516)*.

<sup>22</sup> Gohorry, *De Vsu et Mysteriis Notarum Liber*. Cambridge University Library, shelfmark LE.19.8<sup>2</sup> This volume is inscribed on the title page: ‘Ioannes Dee 1562. Antwerpiae Ianuarij Die 20.’



While Gohorry's text is a rather superficial compendium of occult philosophical themes, it does contain lengthy excerpts from two letters of Johannes Trithemius which were subsequently published as an appendix to the 1567 edition of *De septem secundeis* (although absent from Dee's 1545 copy of that work).<sup>23</sup> The excerpts are from a letter to Joachim Margrave of Brandenburg (dated 26 June 1503) on the qualities necessary to be a true magus,<sup>24</sup> and a letter to Count Johannes von Westerberg (dated 10 May 1503) on the three principles of natural magic.<sup>25</sup> These extracts have either been severely edited and altered by Gohorry, or (as he claims) are based on a 'mutilated and corrupt' copy of the letters, because there are substantial differences between the excerpts in *De usu et mysteriis* and the 1567 edition.<sup>26</sup> The most striking of these alterations is the removal of passages in which Trithemius feels moved to defend magic against the claims of the ignorant that it is performed with the help of demons and is contrary to the Christian religion.<sup>27</sup> Dee was thus exposed to a less problematic and more sanitised version of Trithemius than the one which emerges in the later edition. Nonetheless, the core doctrines of Trithemius's letters are largely in place and Dee's annotations clearly show that these Trithemian extracts—even in their mutilated form—had a profound influence on the final form of the *Monas Hieroglyphica*.

<sup>23</sup> The Trithemius extracts ('ex epistola Tritemii ipsius ad principem Ioachimum Imperii electorem') are *De usu et mysteriis*, sig. [Hiiij] recto—sig. [liiij] verso. Dee's copy of the 1545 edition is Cambridge University Library, Dd\*.4.5: *Ioan. Tritemij Abbatis Spanheymenn. De Septem Secundeis* (1545). See Josten, 'A Translation', 108 and Håkansson, *Seeing the Word*, 232, fn. 592. But, Cf. *Ioannis Trithemii apud Peapolim* (1522).

<sup>24</sup> Gohorry, *De usu et mysteriis*, sig. [Hiiij] recto—sig. I recto. Cf. Trithemius, *De Septem Secundeis* (1567), 114–115: 'Ioannes Tritemivs Abbas Spanheymensis ad illustrissimum Dominu[m] D. Ioachimu[m] Marchionem Brandenburgensem de rebus conuenientibus vero Mago.' On this letter see Brann, *Trithemius and Magical Theology*, 121–123.

<sup>25</sup> Gohorry, *De usu et mysteriis*, sig. I recto—sig. [I iij] verso. Cf. Trithemius, *De Septem Secundeis* (1567), 81–97: 'Ioannes Tritemivs Abbas Spanheymensis Domino Ioanni Vuestenburgh Comiti & viro desideriorum, de tribus naturalis Magiae principiis, sine quibus nihil in ipsa ad effectum produci potest'.

<sup>26</sup> See Gohorry, *De usu et mysteriis*, [Hiiij] verso where the letter is described as 'mutila quidem & corrupta'. 'But I have chosen to give something rather than nothing,' Gohorry adds (*sed talem malui quam nullam dare*).

<sup>27</sup> See, for example, the following passage from the letter to Westerberg as printed in *De Septem Secundeis* (1567), 87, but omitted from the corresponding passage in *De usu et mysteriis*, sig. I iij recto: 'falso nos vel dæmonum adiutorio, vel qualibet co[n]tra sanctiſſimam fidem nostram Christianam superstitione inniti opinantes. Nos autem hæc de nobis iudicantes propter eorum quæ promisimus ignorantiam non miramur.'

The following passage from the letter to the Margrave of Brandenburg, for example, has been heavily underlined by Dee:

Firstly, it is necessary that the man who studies magic should not only be inclined towards it but also properly formed [for it] by nature, or be formed by a master through rectification from the ternary into unity by means of the divided binary: I cannot declare it to you more clearly [than] in the previous letters from the one to the quaternary resting in the ternary, he will know the order of ascent and descent, grade, number, ebb and flow, being<sup>1</sup> and <sup>2</sup>non-being, one and three: [That] which it is most difficult to know and the root of all wonderful effects is the foundation in both natural and supernatural magic. And he who comprehends this order and understands the method, will be perfect in every profound science, without which [all] work in magic will be useless and in vain.<sup>28</sup>

In the margin beside the passage referring to the ‘quaternary resting in the ternary’ Dee adds three characters: the signs for mercury and sulphur and the sign for his ‘hieroglyphic monad’ (which we can understand, on one level, as the ‘unity’—the *una res*—of the Philosophers’ Stone). Dee was sufficiently impressed by this passage to incorporate a variant of the phrase ‘Quaternarius in ternario conquiescens’ into the title-page of the second edition of his *Propaedeumata aphoristica* in 1568, immediately underneath the cartouche containing the hieroglyphic monad symbol.<sup>29</sup> What Trithemius presents as a necessary means of preparation (or formation) of the magus’s soul Dee clearly sees also possessing alchemical significance. This is a conclusion that Gohorry’s text itself would have helped him to reach—as elsewhere in the book Gohorry praises Trithemius for his simultaneous grasp of magical and alchemical mysteries. ‘Skill in the abstruse arts is necessary’, says Gohorry:

whose mysteries are usually concealed by the coverings of new writing: such as Trithemius shows in magic and alchemy, which two things (as he says) are desired by many

<sup>28</sup>) Gohorry, *De usu et mysteriis*, sig. [Hiii] recto: ‘Imprimis (inquit) necessarium est homini magiae studioso, vt natura sit ad eam non solum propensus, sed etiam dispositus, aut à magistro disponatur per rectificationem à ternario in vnitatem per binarium diuisum: Clarius declarare tibi litteris nec possum superioris ab vno vsque ad quaternarium in ternario quiescentem, noueritque ordinem ascensus & descensus, gradum, numerum, fluxum, refluxum, esse<sup>1</sup> & <sup>2</sup>non-esse, vnum & tria: Quod scire difficillimum est, & omnium mirandorum effectuum radix est fundamentum in magia tam naturali quam supernaturali. Et qui hunc ordinem comprehenderit, ipsumque modum intellexerit, erit in omni profunda scientia consummatus, sine quo vanus est & inutilis in magia labor.’ The underlinings and annotations are Dee’s.

<sup>29</sup>) See Håkansson, *Seeing the Word*, 233.

leaders: although their virginity remains inviolate. Only an understanding of tables and orchemata with all the transpositions of letters clears the obscurity.<sup>30</sup>

Beside this passage Dee writes in the margin the words ‘magia’ and ‘chimia’, and his use of Trithemius in the *Monas* clearly indicates that he believed Trithemius’s use of the Pythagorean tetraktys (which assigns mystical significance to the first four cardinal numbers and their product) was as valid for alchemy as it was for magic.<sup>31</sup> In fact, the *Monas* presents itself as an art which will surpass the traditional wisdom of the arithmetician, the geometer, the grammarian, the musician, the astronomer, the scholar of optics (or *perspectivus*), and those versed in the mediaeval science of weights (*scientia ponderis*) and in the ‘craft of hydraulics’ (*Hydraulicorum ... Artificium*),<sup>32</sup> and as such adheres to Trithemius’s claim that those who master the tetraktys will be ‘perfect in every profound science’. The *Monas* thus has pretensions to becoming a universal occult science of the Trithemian type.

Gohorry’s other reference to Trithemius’s abilities in the *De usu et mysteriis* is also relevant to Dee’s application of Trithemian number symbolism in the *Monas*. The following passage (underlined by Dee) dwells on the Pythagorean conception of number:

Numbers, moreover, when they are used for purposes other than calculation are true characters, which were used very willingly by Pythagoras and other very holy philosophers for the adumbration of the greatest matters. Which Trithemius freely owns to have imitated in the *Polygraphia*’s infinite number of alphabets, having woven together the mysteries of natural and celestial magic under the simplicity of numbers.<sup>33</sup>

<sup>30</sup> Gohorry, *De usu et mysteriis*, sig. Dij verso: ‘Quae solertia in abstrusis artibus est necessaria, quarum mysteria fere inuolucris nouae scriptionis caelantur: qualem in magia & chaemia ostendit Tritemius, quae duae cum à procris (vt ait) plurimis appetantur: virginitatis tamen sunt inuiolatae. Sola autem cognitio tabularum & orchematum omnis transpositionis literarum obscuritatem patefacit.’ On Trithemius’s ‘orchemata’ or alternative alphabetic sequences created by the systematic ‘skipping over’ of letters (as dealt with in his *Polygraphia*) see Mendelsohn, ‘Blaise de Vigenère and the “Chiffre Carré”’, esp. 118–119.

<sup>31</sup> The *Tetraktys* is usually arranged in the form of a triangle of dots (representing units). The sum of the first four numbers ( $1 + 2 + 3 + 4 = 10$ ) was held to be a ‘perfect’ number. In his commentary on the *Timaeus* Proclus says that Pythagoras considered the tetraktys to be the ‘fountain of perennial nature’. See Proclus, *Commentaire sur le Timée*, vol. 1, 44. Cf. *Aureum Pythagoreorum Carmen*, lines 47–48.

<sup>32</sup> Dee, *Monas*, 5 verso–6 verso. Josten, ‘A Translation’, 129–133.

<sup>33</sup> Gohorry, *De usu et mysteriis*, sig. H ij verso: ‘Numeri porro cum extra calculum trahuntur, verae sunt notae, quibus Pythagoras alique sanctiores philosophi ad rerum maximarum adumbrationem vsi sunt perlibenter. Quod Tritemius ille in alphabetorum Polygraphiae

As an avid reader of Johann Reuchlin—who stressed the close connections between Pythagorean and cabalistical doctrines—Dee would thus have seen Trithemius as a cabalistic thinker, and he presents his Trithemius-inspired arithmological reflections as ‘good cabalistical reasoning’ (*optima Demonstratione Cabalistica*).<sup>34</sup>

Dee’s annotations to Trithemius’s letter to Johannes von Westerberg also reveal his alchemical understanding of Trithemius’s magical dicta. Dee writes ‘separation’ (*separatio*), for example, next to a passage in which Trithemius describes the ‘root of all created things’ which ‘produces the first dividing branch of perfect knowledge’.<sup>35</sup> This branch is further divided into what Trithemius enigmatically refers to as ‘their four mothers’ and ‘their four fathers’, although the root remains as the ‘nexus’ of them all, pure and simple.<sup>36</sup> The letter then goes on to describe the pure and simple (*simplex*) element of earth, which ‘proceeding from the one’ is ‘not compounded, not mutable, [and] does not permit commixture but remains what it is, incorruptible’. ‘For One is not a number’, says Trithemius, but ‘remains one in unity and through combination (*complexio*) becomes the ternary, which combining eight times wondrously reduces all natural things to one.’ In the margin here Dee writes ‘octonarius 7–1’. The power of this unifying principle, Trithemius says, ‘cannot be entirely explained by any of the magi’.<sup>37</sup> Trithemius’s remarks are clearly

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infinite imitatum sese profitetur, magiaeque mysteria omnia tum naturalis tum caelestis sub numerorum simplicitate texisse. Underlinings by Dee.

<sup>34</sup> Dee, *Monas*, 16 recto, Josten, ‘A Translation’, 173. On the identification of Pythagoreanism and the cabala in the late fifteenth and early sixteenth century (and especially Johann Reuchlin) see Moshe Idel’s introduction to Reuchlin, *On the Art of the Kabbalah*, xi–xvi. In his prefatory epistle to Pope Leo X, Reuchlin presents his work as a ‘reborn Pythagoras’ and asserts that Pythagoreanism ‘derives in origin from the teachers of Kabbalah’. See *Art of the Kabbalah*, 38–39.

<sup>35</sup> Trithemius here seems to be alluding to the Pythagorean ‘Y’ (or *Littera Pythagorae*), allegorized in an epigram in the *Anthologia Latina* attributed to Virgil. Dee makes use of this emblem of man’s life in his ‘arbor raritatis’ diagram in the *Monas* (see 2<sup>v</sup>–3<sup>r</sup>).

<sup>36</sup> Gohorry, *De usu et mysteriis*, sig. I recto: ‘Haec (inquit) radix omnium creaturam prima diuisionalis ramum scientiae consummatae producit. Cuius aduocatione ista quatuor sunt matres eorum, quae in nouissimo ordine quatuor sunt patres eorum, quae in primo nexus omnium horum primum & vltimum, simplex & purum vnicum omnia tangit.’

<sup>37</sup> Gohorry, *De usu et mysteriis*, sig. I recto-verso: ‘Terra, simplex elementum, purum & primum, ab vno procedens, non componitur, non mutatur, non patitur commixtionem: sed manet quod est incorruptibile, in vno consistit vnum: vnum enim non est numerus, in vnitatem manet vnum, & per complexionem efficit ternarium, quem octies complectens mirabili natura reducit ad vnum. Virtus eius nulli magorum explanabilis omnia potest.’

alluded to in the sixth theorem of the *Monas* (in which he offers a ‘hieroglyphic interpretation’ of the rectilinear cross of his symbol). In this theorem Dee refers to the octonary which ‘offers itself in a most secret manner’. This consists of a ‘remarkable septenary’ conjoined by a common point. Like Trithemius, Dee sees the octonary as a mystery imperfectly understood by the magi (‘I doubt whether our predecessors the magi ever beheld it’).<sup>38</sup> According to Federico Cavallaro, Dee’s Septenary refers to the ‘seven types of metal generated by the Elements’, and as such the octonary could be seen as an expression of the relationship between the metals and the ‘one thing’ which underlies them all.<sup>39</sup> Trithemius’s octonary, however, is more than simply an alchemical doctrine. Whoever is acquainted (*sublimatus*) with this ‘pure simplicity,’ says Trithemius, ‘will be perfect in all occult and natural knowledge’.<sup>40</sup> Trithemius’s further observations however, do seem to imply an alchemical tenor. While earth is a pure element of nature and simple and only rendered multiple (*multiplex*) and impure by ascent, he says, it is ‘reducible by fire and love, into a celestial water, and from that into one simple thing, that is the soul of the world.’<sup>41</sup> This one thing, which is ‘not the unconditional one but the conditional one’ (*vnum non absolutum, sed inclusum*) is ‘made by God and not nature’ (*deo & non natura factum*).<sup>42</sup> If it is ‘purified by fire’ and ‘reduced to simplicity by suitable washing’, it is possible ‘to accomplish all the mysteries of profound knowledge’.<sup>43</sup> ‘Composite earth, however, is an element,’ says Trithemius,

but not the element through which the ternary is reduced to the binary, four grades distant from the one. It contains wonders, it is varied and multiple, corruptible, and

<sup>38</sup> Dee, *Monas*, 12 recto, Josten, ‘A Translation’, 155.

<sup>39</sup> See Cavallaro, ‘The alchemical significance of John Dee’s *Monas Hieroglyphica*’, 164. For other arithmological interpretations of the number eight see Agrippa, *De occulta philosophia*, 283.

<sup>40</sup> Gohorry, *De usu et mysteriis*, sig. I verso: ‘Et dico quicumque huius purae simplicitatis & simplicis puritatis notitia sublimatus est, in omni scientia naturali & occulta consummatus erit.’

<sup>41</sup> Gohorry, *De usu et mysteriis*, sig. I verso: ‘Terra, elementum naturae purum & simplex est, quia compositum ascensu fit multiplex & impurum, reducibile tamen per ignem & amorem, in aquam scilicet coelestem, ab illo in vnum simplex, id est anima mundi.’ Dee underlines these lines and glosses the passage in the margin: ‘Anima mundi’.

<sup>42</sup> Trithemius may be thinking here of Boethius’s distinction in the *prologus* to his *De institutione arithmetica* between *numerus absolutus* and *numerus relatus*.

<sup>43</sup> Gohorry, *De usu et mysteriis*, sig. I ii recto: ‘sed per ignem purificatum ad simplicitatem congrua latione reducitur, omniaque mysteria scientiae profundae operari potest.’ Underlining by Dee.

yet it does not stray outside the circle of unity. This, along with the ternary through the binary into the one, is the secret magisterium of all things.<sup>44</sup>

Gohorry describes these Trithemian mysteries, not unfairly, as ‘complex and intricate’ (*perplexa & intricata*),<sup>45</sup> but for Dee (who considered himself to be possessed of a *mens adepta*), this *magisterium* had a clear meaning, and that meaning was an alchemical one.<sup>46</sup> In the margin beside this passage he writes ‘Composite earth. Quintessence’ (*Terra composita. Q[uinta] Ess[enti]a*). But Trithemius’s ‘one thing’ promised more than alchemical discoveries. ‘Without understanding of this middle, end and beginning through numbers, grades and orders,’ Trithemius continues,

the Magus would not be able to give power to his images without wickedness, nor would the Alchemist be able to imitate nature or compel spirits, nor would the seer be able to predict future things, nor would anyone who is curious be able to grasp the reason of experiments.<sup>47</sup>

The pervasive use of the Pythagorean tetraktys in Dee’s *Monas Hieroglyphica*, and its emphasis on the central role of ‘celestial moisture’ (specifically the *liquor* and *humor* of the sun and moon) in constituting the ‘terrestrial corporeity of all mortal things’, discoverable by ‘pyronomic analysis’ (*ANALYSIS PYRONOMICA*), or the alchemist’s fire, confirms that these passages on symbolic numbers were vital to Dee’s understanding of the alchemical process.<sup>48</sup> But this last passage also explains why the *Monas* claims that the hieroglyph will lead to knowledge of more than just alchemy. While some commentators have chosen to see Dee’s work as an example of ‘spiritual alchemy’, it might more accurately be understood as a form of Trithemian natural magic.<sup>49</sup>

<sup>44</sup>) Gohorry, *De usu et mysteriis*, sig. I ii recto: ‘Terra autem composita elementum est, & non est elementum per quam ternarius in binarium reducitur, quatuor ab vno gradibus distantem, mira continens, multiplex, corruptibilis, & tamen extra vnitatis circulum non vagatur. Huius cum ternario per binarium in vno secretum omnium magisterium est, & quaecunque humanitus inuenta mirabiliter existunt.’

<sup>45</sup>) Gohorry, *De usu et mysteriis*, sig. [I iiij] verso.

<sup>46</sup>) See Ruland, *Lexicon Alchemiae*, q.v. ‘Magisterium’.

<sup>47</sup>) Gohorry, *De usu et mysteriis*, sig. I ii verso: ‘Sine huius medij finis principij cognitione per numeros, gradus & ordines, nec magus imaginibus virtutem dare sine scelere potest, nec chimista naturam imitari, nec spiritus compellere. Homo nec futura praedicere vates, nec quisquam curiosus experimentorum capere rationem.’ Dee’s underlining.

<sup>48</sup>) See Theorem XIX, Dee, *Monas*, 18 verso, Josten, ‘A Translation’, 181.

<sup>49</sup>) On Dee as a spiritual alchemist, see, for example, Szőnyi, *John Dee’s Occultism*, 161–174

Dee's interest in the Brandenburg letter continues, and its significance for the *Monas Hieroglyphica* becomes more pointed. The following passage on the three principles of natural magic is glossed by Dee at the foot of the page on which it appears 'Monas. The one. From which, to which and by which' (*Monas. Vnu[m]. a quo. ad quod. per quod*):

There are three occult principles of knowledge in natural magic without a perfect notion of which no effect follows the operator. The first [principle] consisting 'ab uno', not from which but by which every virtue is produced: of which we have said [this] since it is pure and prime proceeding from the one and is neither composed nor does it change. To it, from the ternary and quaternary, that is, there is a progression to the monad, so that the denary may be fulfilled, by it there is a regression of number to one, at the same time an ascent with four, and a descent to the monad [my italics]<sup>50</sup>

The next passage is perhaps the most intriguing of all in connection with the alchemical nature of the *Monas Hieroglyphica*:

Now, the second principle is, separated from the first in order but not in dignity, which existing with one makes the ternary, [and] is that which works wonders by the binary. The one is in the one and is not one. It is composed of the quaternary. In which, purified by fire in the sun, it comes forth as pure water and returned to its greatest simplicity, will show the complement [...]. The quaternary, moreover, is the Pythagorean number, a supported number, [and], if it observes order and degree, purified. Occult and wonderful things can be performed in one to the binary in the ternary.<sup>51</sup>

(esp. 171–172). For a later use of Trithemian number symbolism in the context of magic and alchemy, see Philalethes, *Anima Magica Abscondita* (1650).

<sup>50)</sup> Gohorry, *De usu et mysteriis*, sig. I iij recto: 'Tria autem sunt in magia naturali principia occulta scientiae, citra quorum notitiam perfectam, nullus operantem sequitur effectus. Primo ab vno consistens, non à quo, sed per quod omnis virtus producitur: de quo diximus, quia purum & primum ab vno procedens non componitur nec mutatur. Ad ipsum à ternario & quaternario, id est monadem progressus est, vt denarius compleatur, per ipsum est numeri regressus ad vnum, simul ascensus cum quatuor, & descensus ad monadem.'

<sup>51)</sup> Gohorry, *De usu et mysteriis*, sig. I iij verso: 'Principium vero secundum ordinem non dignitatem separatum à primo, quod cum vno existens facit ternarium, est quod operatur mira per binarium. In vno est vnum, & non est vnum est. In quaternario componitur. In quo purificatum per ignem, in sole [sol symbol] aqua pura egreditur, & ipsum ad summam simplicitatem reuersum complementum ministrabit. Naturalis omnis circumfert sibi vnita circulum repraesentat immensus ordo. In infinitum virtus ens super omnia purificata & simplex minor omnibus quaternario super gradum composita. Quaternarius autem numerus Pythagoricus, numerus suffultus, si ordinem & gradum obseruat, purificatus. In vno ad binarium in ternario mira & occulta operari potest.' Cf. Trithemius, *De Septem*

In this process, Trithemius says, the ternary is the ‘ineffable middle-point of all knowledge of the mystical art’.<sup>52</sup> That the ‘occult and wonderful things’ to be performed by one, two and three include alchemical transmutation can be seen from Dee’s gloss in the margin where we find the symbol for gold (a circle with a point in the middle), with a 4 beneath it; this is followed by the symbol of mercury with a horizontal line above it and the number 2 beneath it, then there is another mercury symbol with a square above it, and the number 3 beneath it, and finally the *Monas hieroglyph* itself with the number 1 beneath it. In this sequence gold seems to represent the quaternary, one form of mercury (common mercury perhaps) the binary, another form of mercury (the mercury of the philosophers?) the ternary, and the monas (fittingly), unity. One can also read into this sequence a geometrical progression from point, to line, to surface, to solidity (the point at the centre of the symbol for gold, the line and square above the mercury symbols, followed by the ‘solid’ Monas symbol). This is very much in keeping with Dee’s shifting of registers in the *Monas Hieroglyphica* between the geometrical and the arithmetical.

In his letter to Cecil in 1562/3, Dee had told his patron that he had discovered men and books who could help him with his interests in the mystical sciences of number, weight and measure. It is clear from his annotations to the copy of Gohorry’s work which he bought in Antwerp, that Trithemius was one of the influential books in question.

The Trithemian quaternary and ternary enter the theorems of the *Monas Hieroglyphica* at an early stage—in theorem VI where he discusses the ‘sun and moon resting upon a rectilinear cross’<sup>53</sup>—and it remains an implicit feature of the analyses of the symbol which follow. Beginning in his letter to Emperor Maximilian II, Dee emphasises the ‘mystical symmetries’ (*mysticas*

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*Secvndeis* (1567), 94–95: ‘Principium verò secundum ordine non tamen dignitate separatum à primo, quod vnum existens facit ternarium, quod est operatur miranda per binarium in vno, est enim vnum & non est vnum, est simplex & in quaternario componitur, quo purificato per ignem in sole aquia [sic] pura egraditur, & ipsum ad suam simplicitatem reuersum complementum operanti monstrabit occultorum. Hic centrum est magicæ naturalis, cuius circumferentia sibi vnita circulum repræsentat immensus ordo in infinitum. virtus eius super omnia purificata et simplex minor omnibus quaternario super gradu composita. Quaternarius autem Pythagoricus numerus ternario suffultus, si ordinem gradumque obseruat purificatus purus in vno ad binariu[m] in ternario mira[n]da & occulta naturæ operari potest.’

<sup>52</sup> Gohorry, *De usu et mysteriis*, sig. [I iiij] recto ‘omnis scientiæ artis mysticæ ineffabile medicentrum [...]’.

<sup>53</sup> Dee, *Monas*, 12 verso, Josten, ‘A Translation’, 157.



... *symmetrias*) contained in his hieroglyph,<sup>54</sup> and its links to ‘inexplicable and celestial harmonies’ (*Inexplicabiles, Caelestesque ... HARMONIAS*).<sup>55</sup> The underlying principle of this harmony is the Pythagorean tetraktys as expounded by Trithemius—grounding what Dee calls the ‘denarian proportion’ (*DENARIA .... Proportio*) of his symbol.<sup>56</sup> That part of the mysteries promised by the symbol are alchemical can be seen most clearly in Theorem X, where he says ‘THE SUN AND THE MOON OF THE MONAD DESIRE THEIR ELEMENTS, IN WHICH THE DENARIAN PROPORTION WILL BE STRONG, TO BE SEPARATED, AND THAT THIS BE DONE WITH THE AID OF FIRE.’<sup>57</sup> This ‘Denary proportion’, as well as deriving its significance from being the sum and ‘completion’ of the tetraktys, is also deduced by Dee from his ‘cabalistic anatomy’ of the cross, whose ‘quinary virtue’ he finds by seeing the cross as composites of the Roman numerals L, X and V.<sup>58</sup> This ‘new discipline of the true hieroglyphic proportions’ (*verarum ... Commensurationum Hieroglyphicarum ... Disciplina noua*)<sup>59</sup> culminates in the final pages of the book in a series of *schemata* which relate explicitly to the Pythagorean tetkratys and its use as an alchemical key. Dee promises to show his reader in these *schemata*:

How much Authority, therefore, there is in our Numbers (as we promised) when elements are to be weighed, when measures of time are to be determined, [and] finally when the power and virtue of things have to be expressed in certain degrees.<sup>60</sup>

Dee’s mystical science of number, weight and measure here seems to relate explicitly to alchemy, where the metallic (and other) elements of the work are weighed, the times for parts of the process are allocated, and the degrees of heat applied to the alchemical vessels are to be calculated. This can be clearly seen

<sup>54</sup> Dee, *Monas*, 3 verso, Josten, ‘A Translation’, 121. Cf. Dee, *Monas*, 25 recto (‘nostris Mysticis SYMMETRIAS’), Josten, ‘A Translation’, 207. Cf. Theorem XXIII: ‘Symmetrias, iam, in nostrae MONADIS constructione Hiieroglyphica, à nobis obseruatas’. In Dee’s copy of Pomponius Gauricus’s *De sculptura* (1542), now Cambridge Library M\*.5.49 (D), inscribed ‘Joannes Dee 1550 Lovanij’, there are a number of annotations on ‘Symmetria’.

<sup>55</sup> Dee, *Monas*, 6 recto, Josten, ‘A Translation’, 131.

<sup>56</sup> Dee, *Monas*, 13 verso, Josten, ‘A Translation’, 161.

<sup>57</sup> Dee, *Monas*, 13 verso, Josten, ‘A Translation’, 161.

<sup>58</sup> Dee, *Monas*, 15 verso–17 recto, Josten, ‘A Translation’, 169–175.

<sup>59</sup> Dee, *Monas*, 25 recto, Josten, ‘A Translation’, 207 (translation slightly altered). It is worth noting that *commensus* is a Vitruvian equivalent for the Greek *symmetria* (see, e.g., Vitruvius, *De architectura*, I.3 and III.1).

<sup>60</sup> Dee, *Monas*, 26 recto, Josten, ‘A Translation’, 211 (translation slightly altered).

in what is effectively the ‘Groundplatt’ (or summative schema) of the *Monas Hieroglyphica* immediately following the Pythagorean and ‘artificial’ quaternaries, where the ‘mysteries’ of virtue, weights and times are displayed, showing the structural importance of the quaternarian-denarian proportions of the tetraktys to the alchemical work.<sup>61</sup>

To conclude, I would like to re-emphasise that the influence of Trithemius on Dee’s conception of the *Monas Hieroglyphica* runs deeper than the provision of a Pythagorean ‘calculus’ for assigning proportions in alchemy. Dee clearly saw the ‘mysteries’ of the Monas symbol as concerning a great deal more than its alchemical applications. While the ‘analyses of natural philosophy’ (*Physicae ANALYSEOS*) were a far from negligible part of his project, we need also to be aware of the significance of some of his other claims. Not only does he claim that the hieroglyph contained in his work will be ‘the rebuilders and restorer of all astronomy’, and establish a ‘sacred art of writing,’<sup>62</sup> but he also claims to be creating a superior form of cabala, and to be providing a technique for the construction of ‘geogamic’ talismans or *gamaaea*.<sup>63</sup> Dee had, after all, told Maximilian in his dedicatory epistle that the *Monas* was a treatise on ‘adeptship’ (*De ADEPTIVO*),<sup>64</sup> and we can see from a cursory glance at the hieroglyphic figure of the ‘tree of rarity’ (ARBOR RARITATIS) in that epistle that denarian proportions and the role of earth and water are as important to Dee’s conception of the ‘choice’ (OPTIO) between the earthly path (culminating in the power of the tyrant) or the celestial (watery) path of the spiritual *pneumatikos* (culminating in the power of the *Adeptiuus*) as they are to his understanding of alchemy. Dee’s universe was indeed like ‘a lyre tuned by some excellent artificer’<sup>65</sup> and he believed that its ‘ineffable’ harmonies could be

<sup>61</sup> Dee, *Monas*, 26 verso, Josten, ‘A Translation’, 213. Dee uses the term ‘Groundplatt’ to describe the summative schema of his ‘Praeface’ to Billingsley’s Euclid.

<sup>62</sup> Dee, *Monas*, 4 recto, Josten, ‘A Translation’, 123.

<sup>63</sup> Dee, *Monas*, 7 recto, Josten, ‘A Translation’, 135. It should be noted that in Theorem XXIII (Dee, *Monas*, 23 verso–25 recto, Josten, ‘A Translation’, 201–207) with its instruction to ‘mechanics’ (*Mechanici*) on the construction of the Monas symbol ‘on rings or seals’ (in *Annulis, Sigillisue*) Dee seems to be conceiving of his hieroglyph as a *gamaaea*. On the ‘geogamic’ (‘earth-marrying’) nature of this talisman, see Dee’s derivation of *gamaaea* from the Greek της γαιης αίαν (Dee, *Monas*, 7 recto, Josten, ‘A Translation’, 135) and the ‘geogamic figures’ at the end of Theorem XII (Dee, *Monas*, 14 recto, Josten, ‘A Translation’, 163). Dee may have been thinking of Pico’s assertion that ‘To operate magic is nothing other than to marry the world’ (*Magicam operari non est aliud quam maritare mundum*). See Farmer, *Syncretism in the West*, 498–499.

<sup>64</sup> Dee, *Monas*, 7 verso, Josten, ‘A Translation’, 137.

<sup>65</sup> PA, 126–127.

understood by the ‘peculiar and mystical division and proportion’ (*peculiarem Mysticamque ... partitionem, & rationem*) of its parts, as revealed in his *Monas Hieroglyphica*.<sup>66</sup>

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<sup>66</sup> Dee, *Monas*, 25 verso, Josten, ‘A Translation’, 209.

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