CLASSICS STRIKES BACK: THOMAS EVANS AND HIS *MATHEMATOGONIA*

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Thomas Saunders Evans' Greek poem *Mathematogonia. The mythological birth of the nymph Mathesis* (1839) is one of the outstanding products of the British compositional tradition. The article begins with a brief account of Evans and of the historical context of the poem, which also belongs to the history of mathematics in Britain, and in particular, its teaching in nineteenth-century Cambridge. This is followed by a preliminary note on *Mathematogonia*; a reproduction of the text of the poem, with Evans' original preface and notes; an English translation; notes detailing Evans' sources and borrowings from Tragic texts; and an appendix listing the changes he made after its first publication. The aim is to show what Evans wrote, and to explain what prompted him to do so.

Introduction

The original text of *Mathematogonia* was published anonymously as a slim booklet (pp. ii + 8) in 1839 by W. P. Grant of Trinity Street, Cambridge, one of several local firms who were at once bookseller, printers, publishers and stationers. The firm's output, which ran from the mid-1820s to the mid-1850s, included works geared to the Mathematical Tripos, which was for most of the period the only honours degree examination in Cambridge. For example, Grant published several mathematical textbooks and self-help manuals by J. M. F. Wright, a Trinity man who graduated in 1819 and brought out an autobiographical memoir in 1827.[1] Spoof texts were not confined to Classics in this period: the editor of the *Cambridge Mathematical Journal* (1837), the Scottish mathematician Duncan Farquharson Gregory, circulated in 1838 a 'Prospectus of the society for the translation of Cambridge mathematical books into intelligible English' (Cambridge University Library, Cam a.500.9. 22).

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1 Wright (1827). A modern edition with introduction and annotations has been published: Wright (2023).

Thomas Evans, scion of an old Welsh family, was born in 1816.[2] At 12 he was sent to Shrewsbury School, where Samuel Butler, headmaster since 1798, had acquired a substantial reputation both as a classical scholar and as a producer of scholars. Evans soon displayed a talent for Latin and Greek composition, which he employed not only for school tasks but also for accounts of leisure activities: a memoir by his son-in-law quotes from a tale of illegal fishing, capture and punishment written in Latin elegiacs.[3] In 1835 Evans entered St John's College, Cambridge, which had a long-standing and close connection with Shrewsbury School. He won several college prizes, and in 1838 the university's Porson Prize for a translation of Shakespeare into Greek verse.[4] A convivial man, Evans acquired a reputation for extempore composition. A friend with whom he was walking in the sun in the college grounds invited him back to his rooms to eat potted beef: he replied with a neat hexameter, 'suaue uorare bouem sed suauius apricari'.[5] Versifying came naturally to Evans. Edward Benson, Archbishop of Canterbury 1883–96 and earlier a colleague on the teaching staff at Rugby, recalled in 1891 that 'He was an enthusiast about language. Beautiful words were a feast to him, and "he thought in numbers for the numbers came"'.[6] The reference to 'numbers' might seem surprising, given Evans's mathematical failures, but here it refers to metrical verse.[7] The anecdote about Janet Kennedy quoted below suggests that he did indeed 'think in numbers'.

In January 1839 Evans failed to obtain honours in the University's only degree examination, the Senate House Examination. This was dominated by mathematics and was informally known as the Mathematical Tripos.[8] While elite schooling in Britain was dominated by Classics, which also held sway at Oxford, Cambridge had developed a very different path. In the eighteenth century, under the influence of Newton and his

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2   Stray (2004). At Shrewsbury and upon entry to Cambridge, he signed as plain Thomas Evans. When he gained his MA in 1845, he became Thomas Saunders Evans; his middle name is sometimes written, as it was probably pronounced, Sanders. Some of the Latin verses he handed in at Shrewsbury in 1834, however, are signed 'T. F. Evans'.

3   Waite (1893) iv.

4   Reprinted in Waite (1893) 16–19. The translation was from *King Henry V*, Act 4: *Translations which have obtained the Porson Prize in the University of Cambridge from the year 1817* (1871) 78–81. The Porson Prize was established in 1816 in memory of the celebrated Greek scholar Richard Porson (d.1808), and first awarded in 1817. It was won by Benjamin Kennedy of St John's College (later headmaster of Shrewsbury School 1836–66), in 1823 and 1826.

5   Waite (1893) vii, with other examples. The fifth-foot spondee nicely suggests the lengthy relaxation of sunbathing.

6   Waite (1893) xxiii: a reference to Pope's *Epistle to Dr Arbuthnot* (1735) 125:

> WHY did I write? What sin to me unknown
> Dipt me in ink, – my parents' or my own?
> As yet a child, nor yet a fool to fame,
> I lisped in numbers, for the numbers came.

The conceit goes back to Ov. *Tr.* 4.10.25–6: sponte sua carmen numeros veniebat ad aptos / et quod temptabam dicere versus erat: 'My poem of its own accord came into suitable metre, and what I was trying to say was in verse'.

7   The usage dates back to Spenser: *OED* s.v. 'number', IV.17a.

8   Two of Evans' elder brothers had been Wranglers (in the first class in the Mathematical Tripos): John (St John's 1823) was Third Wrangler in 1828, and then a first-class man in the Classical Tripos; George (Caius 1828) was Twenty-first Wrangler in 1832.

followers, an alliance between latitudinarian religion and natural philosophy had made the university the leading home of mathematical physics in the world (Gascoigne (1989)). In the nineteenth century, Classics was embedded in the curriculum of Cambridge colleges, but the university curriculum was dominated by mathematics, in preparation for the Senate House Examination (Warwick (2003)). Not until 1854 was the mathematical bar to Classics removed, a reform which took effect in 1857. One of the last undergraduates to go through the old system was Montagu Butler of Trinity College, Senior Classic in 1855 and later Master of the college from 1886 until his death in 1918. In January 1855 he sat the Mathematical Tripos and wrote to his mother about the tribulations he endured:[9]

> All Monday evening from 5 to about 12 I was hard at Mathematics, dreamed of them – a ghastly dream with real living geometrical figures, circles, sines, cosines and all sorts of things that you never heard of staring me visibly palpably in the face at 8 on Tuesday morn.

Butler was not the only undergraduate to suffer such dreams, a symptom of what was often called 'Tripos Fever' (Deslandes (2002)).

The Classical Tripos, which followed later in January, had been established in 1822 as a voluntary examination open only to those who had gained mathematical honours. Evans was one of many aspiring classical scholars whose lack of mathematical proficiency barred them from sitting for the classical examination. The Senate House Examination had for some time been growing more and more difficult; classicists aimed at scraping through at the bottom of the honours list, where the lowest-scoring candidate was known as the Wooden Spoon.[10] The Spoon of 1832 was Richard Shilleto, whose talent for impromptu Greek composition closely resembled Evans'.[11] Shilleto, however, stayed in Cambridge, where his marriage long prevented him from obtaining a fellowship and where he was obliged to make a living as a private tutor (coach) to support his large family (Butterfield (2021)).

The difficulties faced by classicists were informally recognised by mathematical examiners, who marked such candidates leniently to enable them to go through in the lowest (third) class of honours. This, however, was itself resented by some mathematicians; the resultant tensions reached a climax in 1841, when the examiners of the year marked down several aspiring classicists, causing a controversy that echoed in the national press (Stray (2022)). *Mathematogonia* was born of the frustration felt by many undergraduates; Evans was surely referring to himself when he wrote in a note on his text:

> The Author here indulges in extravagant spleen against Mathesis [...] Our poet, therefore, kindling with anger, [...] while he rioted in the consciousness of his

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9   Trinity College Library, BUTJM.3.1.285.

10   This paradoxical celebrity was as much part of the worship of ranking as that of the top of the first class, the Senior Wrangler, according to Stray (2012).

11   The two were compared by Waite (1893) vii.

own stupendous powers, would naturally outpour his wrath upon him who narrowed the just area of their display.[12]

Evans' poem was recognised by his contemporaries as an outstanding contribution to the compositional genre. His old headmaster Samuel Butler, now Bishop of Lichfield, sent a copy to Edward Maltby, Bishop of Durham, who had recently published a Greek *Gradus*, a guide to versification very popular in early nineteenth-century Britain (Maltby (1830)). The two men agreed that Evans' verses were 'decidedly the best [...] either of them had ever read', and Butler 'circulated them through the entire Bench of Bishops'.[13] His contributions to the Cambridge volume *Arundines Cami* (1841) and the Shrewsbury collection *Sabrinae corolla* (1850) were much admired by the Oxford Latinist Robinson Ellis, who wrote of them: 'They combine the utmost perfect literalness with the most perfect freedom, the utmost accuracy with the utmost grace, in a degree never surpassed and rarely equalled' (Whiting (1932) 157).

Benjamin Kennedy, another very talented Johnian composer in Latin and Greek, had succeeded Samuel Butler as headmaster of Shrewsbury in 1836. Kennedy himself had charge of the sixth form (a standard archimagisterial perk), but when Evans was appointed to the staff in 1841, he was allotted their composition work and also put in charge of the fifth form. The two men worked closely together and became firm friends. Both were soaked in the vocabulary and metre of Greek drama; at his first meeting with Kennedy's youngest child Janet Edith, Evans remarked that her full name was a trochaic dimeter catalectic.[14] In 1847 he moved to Rugby School, then perhaps the leading public school in Britain; its most famous headmaster, Thomas Arnold, had been succeeded on his death in 1842 by Archibald Tait, later Archbishop of Canterbury. Here Evans was again put in charge of the composition of the sixth form, and Tait's successor Edward Goulburn made him form-master of the Shell, the form just below the sixth.[15] Edward Benson, whose opinion of Evans was quoted above, was a colleague from 1852 to 1859.

In 1862 Evans was appointed to the chair of Greek and Classical Literature in the University of Durham; the post carried with it a canonry in Durham Cathedral.[16] For the rest of his life, he gave lectures both on Greek literature and on biblical texts, and spent much of his time in discussion of the latter with fellow-canons, including the aggressive

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12 Waite (1893) 37, note 9, line 125.

13 Waite (1893) viii.

14 This was remembered by his ex-pupil J. E. B. Mayor of St John's College, Professor of Latin at Cambridge 1872–1910, in his obituary: Mayor (1889). Mayor wrote that Evans was 'perfectly happy' at his discovery, and added, 'No man can have taken a more genuine interest in the article ΓΕ. If you went a walk with him, as I did sometimes at Rugby, those two letters would furnish food for reflexion for hours and hours' (p. 479).

15 The term originated at Westminster School, where this form was taught in the apsidal end of the schoolroom: see *OED* s.v. 'shell', n., II.15. A similar term for forms lower in the school was 'remove': *OED* s.v. 'remove', n., 6b.

16 We might compare the situation at Christ Church, Oxford, a unique hybrid of cathedral and college, where one could be both professor and canon. Between 1849 and 1889, the Regius Greek chair at Cambridge had its income augmented by attachment to a canonry at Ely.

high churchman Henry Phillpotts, Bishop of Exeter.[17] He contributed to The Speaker's commentary a commentary on the First Epistle to the Corinthians which was much admired.[18] Evans was asked to join the company set up to revise the New Testament (1870–85), but was obliged to refuse because he was a member of the Northern Convocation of the Church of England, which refused to participate in the revision because of the opposition of its head, William Thomson, Archbishop of York.[19]

Evans' poem is the product of the turbulent history of Cambridge mathematics in the 1830s, but it also belongs to another history, that of the fusion of mathematics and poetry. Another example of this genre is Coleridge's poem 'Mathematical problem', written in 1791, when he was in his final year at Christ's Hospital. This was claimed by him to be the first in a series of poems turning the whole of Euclid's *Elements* into verse.[20] Its subject is Euclid's first proposition, on the construction of an equilateral triangle; Coleridge described it as having 'drawn the nymph Mathesis from the visionary caves of Abstracted Idea and caused her to unite with Harmony'.[21] The poem begins:

> On a given finite Line
> Which must no way incline;
> To describe an equi-
> Lateral Tri
> A N G LE.
> Now A B
> Be the given line
> Which must no way incline.

The poem was first published in 1834, during Evans' final year at Shrewsbury. Coleridge's reference to 'the nymph Mathesis' may have influenced Evans, who is also likely to have known 'The loves of the triangles', a clever satire on Erasmus Darwin's 1791 poem 'The botanic garden', which was published in The Anti-Jacobin (Canning and Frere (1798)). From Darwin and Coleridge, a line can be traced through *Mathematogonia* to Edwin Abbott's 1884 satirical novella *Flatland*.[22]

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17 After his first meeting with Phillpotts, Evans commented that 'He is very highly read, very acute, very accomplished. And he really has an excellent appreciation of the Aorist': Waite (1893) xxiv. Phillpotts had been created Bishop of Exeter in 1830, but was then given a canonry at Durham which he retained until his death in 1869.

18 Waite (1893) xxxiii–xxxvi. The Speaker's commentary was published by John Murray in 12 volumes, 1871–88. This was the informal title of Cook (1871–88).

19 Cadwallader (2018). The Anglican Church was administratively divided into two Convocations, Northern (York) and Southern (Canterbury).

20 The poem is reprinted in Mays (2001) 33–8.

21 Coleridge to his brother George, 31 March 1791: Griggs (1956) 5–9. Its original title was 'Prospectus and specimen of a translation of Euclid in a series of Pindaric odes'; it thus belonged to the Pindaric tradition referred to below.

22 For Coleridge and the tradition, see Wiegand (2013), and for the tradition itself, Brown (2013, 2020). Abbott was Senior Classic in 1861. His Flatland: a romance of many dimensions (Abbott (1884)) was published under the pseudonym 'A. Square', hinting at the two-dimensional world in which the novella is set, where men are polygons and women are lines, in contrast to the one-dimensional Lineland and the three-dimensional

Evans' poem belongs to a specific institutional history, that of Georgian and Victorian Cambridge. His career, however, forms part of a larger history, that of the alliance of Classics and religion in the nineteenth history. This alliance became increasingly unstable as the influence of historicism and German scholarship grew from the 1820s. Its institutional support also weakened, as the foundation of the secular London University in 1826 made it possible to conceive of a mode of scholarship which was not tied to Anglican belief (Stray (1998) 120). The University of Durham, where Evans ended his career, was founded in 1832, and like King's College London (founded in 1829) formed part of an Anglican response to London University, often called 'the godless college in Gower Street', which in 1836 became University College London. As professor of Greek and Canon of Durham Cathedral, Evans belonged to this reassertion of the alliance of classical scholarship and Anglican faith.

Spaceland (cf. Stewart (2008)). The opening up of mathematical visions by the emergence of non-Euclidian geometry is discussed by Richards (1988); it might be seen as analogous to the influence of historicism on classical scholarship and Anglican belief (Conybeare and Goldhill (2021)).

The poem: preliminary

The title *Mathematogonia* has as its ultimate model Hesiod's *Theogony*. The sub-title names the nymph Mathesis (Μάθησις, 'act of learning'). There is no evidence in Greek mythology of a nymph of that name; the closest parallel for such an abstraction personified and deified is Mnemosyne, 'Memory', who Hesiod at *Theogony* 52–4 states was mother of the nine Muses.

Evans in the second paragraph of his Preface playfully suggests that the poem dates from the age of Ptolemy Philadelphus of Egypt (about 300 BC), who was the patron of Euclid in Alexandria. Evans continues with 'To this conjecture we are invited by the general tenor of [the poem's] language'. That is misleading: despite touches of Euclidean mathematics and vocabulary, its ambience and language are throughout those of fifth-century Greek tragedy – in particular of Aeschylus, and especially his *Prometheus bound* (see our Appraisal of Evans' poem, which follows its Greek text and English translation below). Also, ancient didactic poetry, beginning with Hesiod, employed almost always dactylic hexameters; but the spoken verse of Tragedy was the iambic trimeter.

This was the favoured medium in which schoolboy verse-composers learned their skills and which dominated students' Greek compositions at the universities and those of their teachers, and of poetasters afterwards. The conventions of the art encouraged Evans to borrow *verbatim* from, or to adapt or echo, Tragedy and its language. In this imitative accomplishment, he was typical of the Cambridge or Oxford graduate of his time, a 'scholar' in Victorian eyes. Clearly Evans had read most if not all of surviving Tragedy; there were specialist works available to help him in composition: dictionaries and lexica dedicated to Aeschylus, Sophocles and Euripides which began appearing from the 1780s in Germany and in the early nineteenth century in Britain. While Aeschylus was the principal source of Evans' 'borrowing', Euripides is well represented in his poem, Sophocles less so. More is said about the practice and popularity of verse-composition in the Appraisal. Editing Greek tragedies and imitating them in composition became as popular in the first half of the nineteenth century as composing Pindaric odes had been in the eighteenth – Coleridge's schoolboy poem, discussed at the end of our Introduction, belongs to the end of the tradition.

Evans' original version was published in 1839, at a time when tension between the proponents of Classics and mathematics was reaching a breaking point. The university's change of rules removed the mathematical bar on Classics in 1854; it may be inferred that Evans extended his poem from 124 to 154 lines at some point before that year. Expansions of the text were chiefly between the lines now numbered 88–104 and 107–23 in Waite's 1893 reprint; in the latter expansion, he introduced as programmatic matter the prophecy of mathematics' growth into the fiercely competitive Tripos examination. Textual differences between the 1839 version and that of 1893 are given in the Appendix.

ΜΑΘΗΜΑΤΟΓΟΝΙΑ.

THE MYTHOLOGICAL BIRTH OF THE NYMPH MATHESIS.

Preface

Where the following curious fragment of antiquity was discovered, the Editor is anxious to conceal; because, about the same spot other curious fragments may still be lurking. For great is the glory of restoring old manuscripts: and the more solitary we are in our fortunate researches, the more exceeding is the lustre of our fame.

The poem itself was probably written in the reign of Ptolemy Philadelphus, the royal patron of Lycophron and Euclid. To this conjecture we are invited by the general tenor of its language, while the mention of the Parabola and the Ellipse clouds the horizon of that brilliant hypothesis. For although Apollonius of Pamphylia did about that period compose many treatises upon Conic Sections, yet doubtless he invented neither the Ellipse nor the Parabola. The introduction, therefore, of these beautiful but mysterious curves, is an anachronism indeed, but an anachronism of the highest order: for Euripides assigns a premature date to inventions which existed *before*, our author to discoveries that were made *after* the age in which he lived. Bold and aspiring, in the extravagance and inebriety of his genius, dashing into the waters of futurity,

'He pass'd the flaming bounds of time and space.'

ΜΑΘΗΜΑΤΟΓΟΝΙΑ.

$$\begin{aligned}
&\text{ΛΟΓΟΣ τίς ἐστιν, ὥς ποτ' ἀνθρώπων γένει} \\
&\text{ἐλθὼν δι' ὀργῆς Ζεύς, ὅσ' ἐξημάρτανον,} \\
&\text{ἔχρηζεν αὐτοὺς ἀντιτίσασθαι δίκην.} \\
&\text{ἀλλ' ἠπόρει γὰρ ζημίαν, οἵα ποτὲ} \\
&\text{κακοῖσιν ἔργοις προστεθεῖσ' ἀντιρρέποι.} \quad\quad 5 \\
&\text{τέλος δὲ νεύσας τοῖς θεοῖς σιγὴν ἔχειν,} \\
&\text{"ἀκούσατ', ὦ θεοί, φησί, τὸν βραχὺν λόγον·} \\
&\text{θνητούς, ἃ δυσσεβοῦσι, τιμωρήσομαι.} \\
&\text{Ἥφαιστε, σοὶ δ' οὖν χρέος ἐπιστέλλω τόδε,} \\
&\text{εὐθὺς πρὸς Αἴτνην βὰς Ἐρινύων μέτα,} \quad\quad 10 \\
&\text{δειναὶ γὰρ εὑρεῖν, ἐκπόνει πόρον μέγαν} \\
&\text{κακῶν, ὁποῖον μηδέπω κάτοισθ' ἰδών."} \\
&\text{καὶ ταῦθ' ἅμ' ἠγόρευε, χὠ τέκτων πυρὸς} \\
&\text{χωλὸν πόδ' εἷλκε, δρᾶν παρεσκευασμένος.} \\
&\text{καὶ δὴ παρῆσαν χθόνιον ἐς κατώρυχα} \quad\quad 15 \\
&\text{γραιαὶ παλαιαὶ παῖδες, ὅ τε μουνῶψ στρατός,} \\
&\text{οἱ μὲν πονοῦντες, αἱ δὲ μηχανώμεναι.} \\
&\text{οἱ γὰρ Κύκλωπες ὠλένας πεδαρσίους}
\end{aligned}$$

μετὰ ῥυθμοῦ ’κούφιζον· ἀντέκλαζε δὲ
μυδροκτυποῦσι βαρύβρομος κοίλη πέτρα·   20
ἱδρὼς δ’ ἀνῄει χρωτί· θνητῶν γὰρ κακὰ
ἔσπευδον· ἦν δὲ πειστέον Διὸς λόγοις.
ἐν τῷδ’ ἀύπνοις ῥιπίδων φυσήμασιν
ἤγειρεν ἠρέθιζεν ἄσβεστον φλόγα
Ἥφαιστος· εἶτα, παρθένων σεμνῶν ἅμα   25
ταυροκτονουσῶν Ζηνὶ μηχανορράφῳ,
ῥαιστῆρ’ ἐπάρας καλλίνικον, ἐν μιᾷ
πληγῇ Τρίγωνον αὐτόχειρ ἐκαίνισε,[1]
γοργόν τι μηχάνημ’· ἐθάμβησαν δ’ ὁμοῦ
οἱ δημιουργοὶ πάντες οἱ πελώριοι·   30
νόμον δ’ ἐπευφήμησαν ὁμόφωνον κόραι
τρισσαὶ τριμόρφῳ τρίποδι τρικαράνῳ δάκει·
μαθὼν δ’ ἑαυτοῦ τριπλάσιον βλαστὸν τέρας
Τυφὼς πρὸς ὀργὴν στόματος Αἰτναίου διὰ
πυρὸς βέλη μετάρσι’ ἐξηκόντισε.   35
καὶ πᾶσα μὲν χθὼν μυχόθεν ἐσαλεύθη, πυλαὶ δ’
Ἅιδου ’κτύπησαν, ἀλαλαγήν θ’ ἧκαν νεκροὶ
τὸν λυμεῶνα τὸν νέον πεφευγότες.
ἐκ γὰρ Τριγώνου, θεομυσοῦς γεννήτορος,
σμερδνόν τι θρέμμ’ ἔβλαστε Τετραγώνου βία,   40
καὶ Πεντέγωνον προπάτορος μείζων βλάβη,
καὶ πάνθ’ ἃ πλευροῖς γωνίαις θ’ ἁβρύνεται
πολλαῖσιν· οὐ μὴν πάντα γ’ εἶχ’ ὁμόπτερον
φύσιν· τὸ μὲν γὰρ ἦν ἰσοσκελές, τὸ δ’ οὔ·
τὸ δ’ αὖ διαμπὰξ στερεόν,[2] ἄλλο δ’ ἐπίπεδον.   45
    τοὐνθένδε μέντοι, πῆμα πήματος πλέον,
χαλκεὺς ὁ δεινὸς αἱμύλῃ πλάσσει χερὶ
κύκλων περιβολὰς διαμέτροις σταθμώμενος·
κανόνας[3] θ’ ὅσοι τρέχουσιν ἀλλήλους πάρα
ἀλγοῦντες, οὐ γὰρ μὴ ξυνάψουσιν γάμους.   50
καὶ πρός γε τούτοις διπτύχους γραμμὰς λαβὼν
ἴσας τίθησιν, ἄλλοτ’ ἐκτείνει σοφῶς
τὴν ὑστέραν τῆς πρόσθεν εἰς ὑπερβολήν,
μυριάσι μορφῶν ἀδαπάνως τέρπων κέαρ.
ἀφροὺς δὲ φυσῶντ’ Εὐμενίδες οἴστροις πέριξ   55

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1 Construe, ‘forged a new and strange thing called a Triangle’.
2 Plato, *Theaet*. c. 14, ed. Bekker.
3 Euclid’s idea of parallel lines. Vide Lib. I Def. 35.

ἔχριον, ὠρόθυνον· οὐδ' εὕδειν παρῆν·
ἐπεὶ μόλις μὲν κεῖνος, ἐξέφυσε δὲ
γραμμήν[4] τιν' ἀξύμβλητον, ἣν ἐς αἰθέρα
φιλεῖ γράφειν ἰαλτὸς ἐκ χειρῶν λίθος,
εἶτ', ἐμμανὴς πνοαῖσι δηναιῶν κορῶν,   60
ἄστρων περιφορὰν πολύπλανον διώρισε,
κύκλον[5] μὲν οὔ, κύκλου δὲ φιλτάτην κάσιν.
κἄτευξεν ἄλλα, κἄτι τῶνδ' αἰσχίονα,
μαιμῶν θεὸς βροτοῖσι θριγκῶσαι κακά·
παρῆκε δ' οὐδὲν ἀτελές· ἀλλ' εὖ μὲν τὸ πᾶν   65
ἔργον κατερρίνησεν· εὖ δ' ἐνήρμοσε
πλευροῖς τε πλευρὰ γωνίαις τε γωνίας
γόμφοις ἐφηλῶν δυσλύτως ἀραρόσιν.

     οὕτως, ὅσ' ἐστὶ πημονῶν βλαστήματα
σπείρας, ἔπειτα δῆτ' ἀνεψύχθη πόνων   70
Ἥφαιστος· εἱστήκει δ' ἐπ' ἐξειργασμένοις,
κἀπεῖχεν ὄμμα πολύκερων ἐς μηχανὴν
σιγῇ· τέλος δὲ περιχαρὴς θαῦμ' εἰσορῶν
ὠρχεῖτο, τὸν μὲν χωλὸν εἱλίσσων πόδα
δινῶν τ' ἀέρδην θατέρου δ' ὀχούμενος   75
ἐπ' ὀρθὸς ὀρθοῦ, τοῖς μονοφθάλμοις γέλων,
πολύστονον δὲ κληδόν' ἁρμόζων ἅμα
Μαθήματ', ἢν γὰρ ξύμμετρος παθήμασιν,
ἔρρηξεν αὐδήν· "δαίμονες δειναὶ βροτῶν
λώβαις διώκειν ὑστεροφθόροις, ἐπεὶ   80
κακῶν ἕκατι κἀγένεσθε, κλῦτέ μου·
ἴδεσθε τήνδε μηχανὴν ἀμήχανον
θνητοῖς πόνων τε πόρον ἄπορον· ἴτ' ἔγκοτοι,
ἴτ' ὠκύποινοι, καὶ περιστιχίζετε
ἄπειρον ἀμφίβληστρον ἀνθρώποις τάδε,   85
ῥίψατε, διάδοτε, σπείρατ' ἐς πᾶσαν χθόνα,
κακῶν γὰρ ἔσται κλαυμάτων ἀρχηγενῆ."
αἱ δ' οὖν ταχύποδες ἀπτέροις ποτήμασιν
ᾖσσον, προσελθοῦσαι δὲ Παλλάδος πόλιν[6]
χώρας μετέσχον, γῇ μὲν οὐκ ἀκαρπίαν   90
φλογμοῖς φέρουσαι, δενδροπήμονα βλάβην,
ἀστοῖς δ' ἀπεύκτους προσβολὰς μαθημάτων,

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4   The Parabola.
5   Kepler has observed in his second law that Planets move in Ellipses.
6   The residence of Plato.

κρείσσω νόσον λειχῆνος, αὐονὴν φρεσίν.
κἀνθένδε ῥίμφ' Αἰγαῖον αἱ κυνώπιδες
ὑπερθοροῦσαι πέλαγος ἐξίκοντο γῆν   95
τρίγωνον, ἔνθα ποταμὸς Αἰγύπτου[7] βοτὴρ
πηγῶν ἄπαππος εἰς ἅλ' ἑπτάρους φθίνει,
ᾗ πόλλ' ἀριθμοῦ θυμοβόρα σοφίσματα
στάζουσιν· εἶτ' ἔσκηψαν ἄψορροι πάλιν
ἐκεῖσ' ὅθεν τὸ πρῶτον ὡρμήσαντο δή·   100
νῦν δ' εἰς τρίγωνον πατρίδα[8] γῆν κατήγαγον
Ἡφαιστότευκτον μηχανήν, βροτῶν ἅλας.
ἐνθένδε πρὸς βορεάδας ἔσπευδον πνοὰς
μόγις τε πόντου στενὸν ὑπερβᾶσαι πόρον
ἵκοντο καλλιδόνακα πηλώδη ῥοὴν   105
Κάμον καμοῦσαι ποταμὸν οὐ ψευδώνυμον.
καί τις τάδ' εἶπε μία κορῶν – "ἅλις γέ τοι,
ἅλις πλανῶν· στήσωμεν ἐς πεδία τάδε
πομπὸν τόδ' ἄχθος, τοῖς μὲν οἰκητῆρσι γῆς
ἔριδας φύτευσον φρενομανεῖς τε θηγάνας,   110
ἡμῖν δὲ πλοῦτον αἱματορρόφου χλιδῆς.
ἔσται γάρ, ἔσται τῇδ' ὑπερφυῶς μέγας
ἀγών· ἐρεβόθεν δ' ἐμμανὴς τάδ' ἐννέπω.
στρατὸν δέδορκα διὰ τριῶν τεταγμένον
σπαρτὸν τριγώνων ἔριδος ἐξ ἀγωνίου,   115
ἐπεὶ βροτοῖς τοῖς ἐνθάδ' ἀνθήσει χρόνῳ
Ἄρης ἄχαλκος ἀσπίδων ἐμφύλιος
ἄνδρες θ' ἁμιλλητῆρες ἀσιδήρους χέρας
πτεροῖσι χηνείοισιν ἐξηρτυμένοι
ἵασι σῖγα διὰ μάχης μαθημάτων,   120
παθήμαθ' οἳ' οἴσοντες αὐτὸ σημανεῖ."
αἱ μὲν τοιαῦτα κοὐκ ἄκραντ' ἐθέσπισαν,
Κάμου δὲ λίμναις γειτονοῦσ' οἰκεῖ πάλαι
ἡ παντομισής, ἡ νόσου πλέα τέχνη.
ὦ Ζεῦ, τί λέξω; πότερά νιν προσεννέπω[9]   125

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7   Alexandria was the scene of many discoveries in Mathematics, cf. Aesch. Fragm. δεινοὶ πλέκειν τοι μηχανὰς Αἰγύπτιοι.

8   At Syracuse flourished, B.C. 200, the renowned practical mathematician Archimedes.

9   The Author here indulges in extravagant spleen against Mathesis, imaged under various shapes. If, as we have ventured to suppose, he resided at the court of Ptolemy Philadelphus, this virulent attack upon so sage a goddess may have sprung from a desire to gratify some secret animosity against Euclid, who was a worshipper of that divinity. That great mathematician, having been tutor to Ptolemy, would probably reign paramount in his favour. Our poet, therefore, kindling with anger, would regard Euclid as an insurmountable barrier between himself and the scope of his ambition: and, while he rioted in the consciousness of his own

ναυαγίοις ἀνθοῦσαν ἀλίμενον χθόνα,
ἢ καὶ δόλον βλέπουσαν ἐξ ὑφασμάτων
Ἄτην ἄπληστον αἵματος; σπόγγον μὲν οὖν
ψυχὰς βροτῶν ῥοφοῦντα μυριόστομον,
ἀνδρῶν ἀπαιόλημα κἂν σοφός τις ᾖ,   130
πάμφθαρτον Ἅιδην, Σφίγγα δευτέραν τινά,
ἢ δυστόπαστα συμβαλεῖν αἰνίγματα
φύουσα θνητοῖς ξυγγενῆ σπείρει βλάβην.
φεῦ τῆς ἀνοίας, ὅστις ὢν ἐφήμερος[10]
ἔπειτα δεινῇ τῇδε πρόσκειται τέχνῃ·   135
λόγοισι μὲν γὰρ χρηστὸν ἐκτείνει βίον,
ἔργῳ δ’ ὁ τλήμων τήκεται λύπῃ μακρᾷ
οὔπω μαθὼν κύκλωμα τετράγωνον κτίσαι.[11]
πῶς δ’ οὔ τι μεῖζον ἢ κατ’ ἄνθρωπον φρονεῖ
ὅστις κάθηται πύργον εὐαγῆ λαβὼν   140
καὶ χαλκοτεύκτων οὐρανὸν δι’ ὀργάνων
σκοπεῖ, πεποιθὼς νυκτιφρουρήτῳ θράσει;
ὦ πάννυχοι λαμπτῆρες, οὐκ ἄρ’ ἴστε που
ὅσσοις βροτησίοισιν ὀφθέντες τορῶς,
ἢ πῶς δι’ ὀργῆς οὔποτ’, ἐσκοτωμένοι   145
ἀκτῖνας, ἤδη μηχανὰς ἐρρήξατε
βροτῶν; βροτοῖς γὰρ οὐράνια θέμις σκοπεῖν;
τούτων γενοίμην οὐ μεριμνητής ποτ’ ἂν
ἔγωγ’· ἐμοὶ μέν, αἰθέρος μεσόμφαλα
ἔχει βέβαιος εἴτ’ ἀνιδρύτοις ἀεὶ   150
χειμάζεται δρόμοισιν ἡλίου κύκλος,
ὅμοιον· εἰ γὰρ εὐτραφῆ θερμὴν φλόγα
φίλως ἰάπτει γῆς φερέσβιον γάνος,
ἅλις· τὰ δ’ ἄλλα, θνητὸς ὤν, χαίρειν ἐῶ.

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stupendous powers, would naturally outpour his wrath upon him who narrowed the just area of their display; for he would wisely think with the illustrious Bacon, ‘Non novit quispiam, quantum in virtute profecerit, nisi *honores* ei campum praebeant *apertum.*’ (Bacon, *De augmentis scientiarum*).

10   MS. ἔφη Ὅμηρος. We here insert the opinion of a learned correspondent, as a standard of excellence in note-building to all commentators: ‘Proponenti ἐφήμερος non assentior; ingeniosius id, quam tutius; legendum cum MS. ἔφη Ὅμηρος: nam textui insistendum semper, repugnante etiam tum sensu, tum metro.’

11   This is a real bane of Mathematics, namely, a restless hankering – an insatiate appetite after squaring the circle. It is, in fact, a canker of the mind – a spreading disease, under the workings of which some are said to have gone mad, others to have died: nor did the renowned Hobbes himself escape its contagion, for a modern Latin stanza-maker has observed,

ad astra tollam laudibus Hobbium,
Thucydidem qui reddidit Anglice, et
rotunda quadravit? quid Hobbi
clarius ingenio? quid Hobbi
virtute? cedat Roma Britanniae.

Translation

THERE IS A STORY that Zeus once became angry with the human race for all its faults and wanted to exact punishment upon it; but he was at a loss what kind of penalty should be imposed to balance its ill deeds. (5) At last he nodded to the gods to keep silent and said, 'Hear this short speech, you gods: I am going to take revenge on mortal men for their acts of irreverence. Hephaestus, I charge you therefore with this duty: you are to go at once to Etna with the Erinyes (10) – for they are clever inventors – and work out a great means of misery, of a kind you know you have never yet seen'. He was still making this address when the master-craftsman of fire began dragging his lame leg along, already prepared to act. And there at the earth's deep-dug pit were present (15) the ancient women, age-old but children, and the army of the single-eyed, these toiling, those devising means. The Cyclopes were lifting their arms in rhythm high into the air; the hollow cave echoed with heavy thunder to their smiting of the hot iron. (20) Sweat rose on their skin, for they were eagerly creating miseries for mankind; and the word of Zeus had to be obeyed. Meanwhile Hephaestus roused and chafed unquenchable flame with the sleepless gusting of fans; then, while the awesome maidens (25) sacrificed a bull to Zeus the deviser of schemes, he raised his hammer triumphantly and in one blow from his own hands forged Triangle, a strange new and terrible device. All those gigantic craftsmen marvelled together, (30) and the three maidens raised a strain in unison to celebrate the monstrous thing of threefold form, three feet, three heads. When Typhos learned of a portent born three times as great as himself, in rage he shot off bolts of fire high into the air through Etna's mouth. (35) The whole land was rocked violently from its depths; the gates of Hades boomed; the dead cried out in rejoicing to have escaped this new tormentor. For out of Triangle, a parent polluting the gods, was sprung a fearful creature, mighty Square, (40) and Pentagon, a bane greater than its forefather, and all the things which luxuriate in many sides and angles – not that they all had similar nature, for one had equal sides, another not, while one was solid all through, and another flat. (45)

Then, however – cruelty worse than cruel – the clever smith with his cunning hands moulds the circumferences of circles, measuring them by diameters, and all those straight lines which run alongside each other, hurt because they are not to join in marriage. (50) In addition, he takes double lines and sometimes makes them equal, sometimes cleverly extends the second beyond the first, delighting his heart with myriad shapes at no cost. The Eumenides round him pricked and harried him, goading him on as he slavered foam; (55) but there was to be no sleep. After Hephaestus with difficulty had produced the inscrutable line which a stone cast by hand into the air likes to draw, then, maddened by the breath of the age-old maidens, (60) he defined the wandering orbit of the stars, not as a circle, but a circle's dearest sister. He wrought other things too, and more shameful still than those, a god raging with eagerness to put on mortal men a coping of evil misery. He let nothing go unfinished; he perfected his whole work well, (65) matching sides to sides and angles to angles, nailing them home with rivets hard to undo once fitted.

So, after sowing all the shoots of torment, Hephaestus refreshed himself from his labours. (70) He stood over his achievements, and held his eye on a device with many horns, in silence. At last, observing the marvel in extreme joy, he began to dance, turning and twisting his lame leg high in the air, and keeping himself (75) straight upright on the other straight leg, bringing mirth to the single-eyed ones; and at the same time he applied a name boding much lamentation, Mathematics, for it rhymed with 'pathematics'. His voice burst out: 'You powers dreaded for pursuing mankind with later ruin that maims, (80) since you were indeed born to cause misery, hear me! See this device for mortal men no device can counter, and means of pain no means can counter! Go full of spite, go swift in retribution and surround men with these mathematics as an inescapable net (85) – throw them, spread them all round, scatter them over the whole earth, for they will be the first cause of tears of misery'. And so they, swift-footed in wingless flight, sped away; they came to Pallas' city and took a share in the land, bringing not unfruitfulness to the country (90) with their flames, ruin blighting trees, but assaults from mathematics abominable to the citizens, a plague stronger than canker, withering the mind. And from there the dog-faced ones leapt lightly over the Aegean Sea and came (95) to the triangular land, where the river that sustains Egypt, fathered by no springs, dies away in seven streams into the sea; there they let drip many soul-devouring ingenuities with number. Then they shot back again to where they first set out; (100) now they carried back to its triangular fatherland the device Hephaestus had wrought, for mortal men's confusion. From there they pressed on against northerly winds and after crossing the narrow sea-strait with difficulty, they came wearily to the Cam, a muddy stream with fine reeds, (105) a river not falsely named. And a certain one of the maidens said, 'Enough, for sure! Enough wandering! Let us set this burden we escort in these plains, to grow rivalries for the land's inhabitants that whet minds to madness, (110) but for us a wealth of blood to gulp down luxuriously. For there shall be – shall be *here* – an exceedingly great contest; from Erebos in mad frenzy I declare this. I see a host of triangles marshalled in threes, sown from rivalry in competition, (115) since for mankind here shall flower in time civil War without bronze shields; and men contestants, their swordless hands equipped with goose feathers, will go silently into battle with mathematics, (120) to endure "pathematics" of a kind the outcome itself will show'. Such were the women's prophecies, and not unfulfilled; and as neighbour to Cam's waters this utterly loathed, this plague-filled art has long been living.

O Zeus, what am I to say? Am I to address it (125) as a land flowering with shipwrecks, one without harbour, or as Ruin looking guilefully out from woven garments, insatiable for blood? A sponge, rather, with a million mouths, gulping down the souls of mankind, a twisting cheat of men however clever any one may be, (130) a Death destroying everything, some second Sphinx, one giving birth to riddles inscrutably hard for mortals to guess and sowing havoc among kin. Oh the folly of man, born to live for a day and then to devote himself to this terrible art! (135) It is said, the poor wretch is extending a good life; in fact, he wastes away in long misery when he never discovers how to make circle into square! How is it not greater than human arrogance in whoever occupies a

tower of wide prospect (140) and views the heavens by means of bronze instruments, confident in his bold night-long watching? You all-night luminaries, have you really no knowledge of being seen clearly by mortal eyes, or how is it that you have never darkened your beams in anger (145) and not already broken men's devices? Why, is it right for mortal men to view things in heaven? I would never ponder them myself. For me, whether the sun with his circle occupies the mid-navel of the upper air securely, or whether he is storm-battered on courses always unfixed, (150) it's all the same: for if he casts his warm and nourishing flame kindly, its brilliance bringing life to the earth, that is enough; all the rest, as a mortal man, I put away from me.

An appraisal of Evans' poem

Mathematogonia has the sub-title 'The mythological birth of the nymph Mathesis', but neither the word 'nymph' nor the name 'Mathesis' occurs in the poem – but 'Mathesis, imaged under various shapes' appears awkwardly at the start of Evans' n. 9. Evans may have put 'the nymph Mathesis' in his sub-title because he wanted to suggest his poem's affinity to Hesiod's accounts of the creation of gods, demi-gods and other anthropomorphic beings and powers in the *Theogony*. In his n. 9 he admits to 'extravagant spleen' against Mathesis when it would be more honestly directed against Euclid, 'an insurmountable barrier between himself and the scope of his ambitions' – by which Evans means what? – that he would otherwise have enjoyed mathematics, or that his real ambition remained the Honours in Classics which university regulations denied him?

In the poem, 'Mathematics' is not identified through an animate parent who gave it 'birth'; it is called *Mathemata* / Μαθήματα, with capital M in 78 but without it in 92 and 120; and it is the god Hephaestus himself who gives it this name as his μηχανή / μηχάνημα, the 'device' which Zeus has ordered him to make as a means to punish men's offences (2–5). It is also termed 'a great means of misery' πόρον μέγαν / κακῶν (11–12, cf. 64 'to put on mortal men a coping of evil misery', 87 κακά). The poem equates μαθήματα with rhyming παθήματα 'pathematics' in 78, cf. 120–1.

The 'device' is 'wrought' by Hephaestus (102); it has substance, consisting in geometrical shapes (29, 72, 82), and it is heavy enough to be a 'burden' when carried (109); we are not told from what these shapes are made. Thus Evans' 'mathematics' is 'solid geometry', and the first shape made, Triangle (28), serves both as physical challenge and intellectual torment. It is also the simplest shape, and it generates Tetragon (40) and Pentagon (41). Next come 'circles' (52); towards the poem's end inability to 'square the circle' is to waste men away (137–8). Then there are 'lines', some parallel and others single but of differing lengths (51–3). Lastly come the 'inscrutable line' (58), which Evans in his n. 4 says is the Parabola, and 'circle's dearest sister', which Evans in his n. 5 indirectly states is an Ellipse (62).

How best in the late 1830s, when Cambridge classicists were still thwarted of honours, to inveigh against the prime place of mathematics? Evans was awarded merely a 'pass' degree in 1839, the year he published his poem. It would be interesting to know whether its conception was Evans' alone, but what better way could there be to demonstrate an excellence different from that in mathematics, and to use as a vehicle for attacking a facility in the public art and face of 'scholarship', verse composition? How better than to style the advent and privilege of Mathematics as a Greek 'tragedy' for students, teachers and educated readers of Greek – an infliction 'from on high'? How better – and more appropriate – than to 'borrow' the myth of Prometheus who thieves from the gods 'number, supreme intellectual skill' to give to men (Aesch. *PV* 459 ἀριθμόν, ἔξοχον σοφισμάτων – although the word ἀριθμος appears in Evans' poem just once, at 98: πόλλ' ἀριθμοῦ θυμοβόρα σοφισματα, 'many soul-devouring ingenuities with number'); to transform 'number' into a 'means' (11) for the gods' exquisite retribution; and, in place of the thief Prometheus, to substitute Hephaestus the artificer, who fetters Prometheus to

a rock face for everlasting torment (*PV* 6, 19, 95 etc.)? Aeschylus' richly worded tragedy was there, its authenticity not yet questioned (one thinks of Byron's and Shelley's enthusiasm); for Evans it would be a metatheatrical gold mine.

There were two further factors. First, Evans, born in 1816, went to Shrewsbury School in the last few years of the headmaster Samuel Butler, editor of Aeschylus in an ambitious complete edition; Evans' poem shows his acquaintance with six of the seven complete plays, especially the *Oresteia* in its verbal grandeur and *Eumenides* with the prominence of the Erinyes and the *Prometheus* with Hephaestus. Second, verse composition was a principal element of the traditional syllabus of major schools and the two universities, Cambridge more strongly than Oxford. From their first years, schoolboys would be encouraged, indeed drilled, to show specimens of their skill; our Introduction describes the particular atmosphere at Shrewsbury in which Evans learned and later taught.

★ ★ ★

Evans styles his narrative largely as a tragic messenger's report of disaster; it is given immediacy by the inclusion of direct speech.

1–22 *in medias res*: very brief scene-setting with the assembled gods, enlivened by live words: 9–12 for Zeus' order to Hephaestus; he and the terrifying Erinyes together are to go beneath Etna (10) and 'to work out a great means of misery' to punish mankind (11–12); they will join the Cyclopes always noisily active there at their forge (16–21, cf. 29–30).

23–68: 'In one blow' Hephaestus creates Triangle (27–8), followed by the other geometric shapes (39–45), and draws lines, circular, curved or straight (46–62). The Erinyes praise the work (31–2), urging it forward (55–6); the monstrous Typhos joins in, with bolts of fire (33–5). Everything is riveted and perfected (65–8).

69–87: Dancing grotesquely in satisfaction, Hephaestus names his devices 'Mathematics' (78) and orders the Erinyes to distribute them throughout the mortal world (79–87) – live words for a second time.

88–124: The Erinyes go successively to Athens and then Egypt (to Alexandria, an intellectual capital, as Evans explains in his n. 7); then back to Sicily (to Syracuse, the home of the 'practical mathematician Archimedes', Evans again explains in n. 8); next on their northward path they cross the 'narrow sea-strait' to the river Cam – where the Erinyes themselves cry 'Enough!' (107) after leaving their 'burden' (109) to create suffering ever after in the (University's) written examinations; all is described in the poem's third and longest passage of direct speech (107–21).

125–54: The narrator then speaks *in propria persona*, but first repeats Hephaestus' and the Erinyes' pride in their destructive creation (125–33). Next, moving closer to personal assertion, he deplores the folly of those who pursue mathematics; then he invokes the stars themselves to destroy the bronze instruments through which mortal eyes wrongfully presume to observe the heavens (134–42). Last, he appeals to the sun, who warms all mortal existence, to preserve those like himself who wish to live without such things (143–54).

The poem's end simulates but at greater length the regretful, moral tone with which some Tragic messengers finish their speeches. For example, Eur. *Med.* 1224–30 damns the

folly of much false cleverness in argument about mortals' well-being and its constant changeability. Other concluding generalisations are made at e.g. Eur. *Bacch*. 1150–2, *Heracl*. 863–5, *Supp*. 726–30. Evans' final verses nevertheless become more and more his own angry voice for his contemporaries; his 'borrowings' or echoes from tragic language become fewer as his own cleverness in imitative composition takes him over. Evans' last thirty lines are distinctive in tone and a little … bitter? self-satisfied? snobby?

<div align="center">★ ★ ★</div>

This poem is not, of course, a miraculous survival from antiquity. If it were, it would require detailed scholarly analysis and bibliographic commentary; here, only so much is offered as seems useful to appraising Evans' purpose and success.

Evans writes with a mixture of deliberate coyness and playful ostentation in his *alias* as the discoverer of the poem: see the end of his Preface and, in his n. 9, his words that 'our poet […] rioted in the consciousness of his own stupendous powers' (the complete sentence has been quoted already in our Introduction). What were the powers in Evans' 'display' (another word from his n. 9)? On what premise did he and fellow composers work? Apparently, and in emulation, with two objectives: first, the pleasure of challenging readers to recognise and applaud their skill in borrowing from, echoing and imitating tragic poets; second, deftness in accommodating such elements. In our Notes which end this article, we list almost two hundred 'borrowings', similarities conscious or not, and echoes from tragedy in Evans' poem; his ability in using them so cleverly shows that his poem is far more than a mere patchwork; in its *genre* it is outstanding. Conversely, composers needed at the same time to demonstrate independent or 'original' composition in tragic style. The reward was esteem or acclaim among fellow poetasters and educated men, especially the clergy, and chances of preferment to 'positions of considerable emolument' (Gaisford's well-known phrase) as headmasters or deans or bishops – some of these became known as 'Greek play bishops' because of their ability in editing tragedy.[1] Evans would hope for his poem's success as a polemic fantasy or satire both amusing and serious; he could be sure, too, of congratulations on its accomplished composition from those to whom he gave copies. He was confident enough (and was probably also encouraged) to publish it at Cambridge as a booklet – but he did so anonymously. It was probably some years later that in lines 107–23 he made the lengthiest expansion of his original text of 1839; probably he hoped to encourage the discontent which grew among classicists throughout the 1840s; it is however not known whether he circulated the expanded version, or when he made the assertion reported by Waite ((1893) vii) that there was no saying in any language or dialect which could not be readily and accurately reproduced in Greek iambics; his poem gives a brief demonstration in describing the use of an astronomer's telescope (140–2).

Here are three passages showing how deftly Evans accommodated his borrowings (in bold type, marked with the sign = in our Notes) and close similarities (in italics, marked there with the sign ~):

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1   See Burns and Stray (2011).

"Ἥφαιστε, σοὶ δ' οὖν χρέος ἐπιστέλλω τόδε,
εὐθὺς πρὸς Αἴτνην βὰς Ἐρινύων μέτα,   10
δειναὶ γὰρ εὑρεῖν, ἐκπόνει πόρον μέγαν
κακῶν, ὁποῖον μηδέπω κάτοισθ' ἰδών."
καὶ ταῦθ' ἅμ' ἠγόρευε, χὠ τέκτων πυρὸς
χωλὸν πόδ' εἷλκε, **δρᾶν παρεσκευασμένος**.
καὶ δὴ παρῆσαν χθόνιον ἐς κατώρυχα   15
γραιαὶ παλαιαὶ παῖδες, ὅ τε μουνὼψ στρατός,

κἀνθένδε ῥίμφ' **Αἰγαῖον** αἱ κυνώπιδες
ὑπερθοροῦσαι **πέλαγος** ἐξίκοντο γῆν   95
τρίγωνον, ἔνθα ποταμὸς Αἰγύπτου βοτὴρ
πηγῶν ἄπαππος εἰς ἅλ' ἑπτάρους φθίνει,
ἣ πόλλ' ἀριθμοῦ θυμοβόρα σοφίσματα
στάζουσιν· **εἶτ' ἔσκηψαν ἄψορροι πάλιν**
ἐκεῖσ' ὅθεν τὸ πρῶτον ὡρμήσαντο δή·   100
νῦν δ' εἰς τρίγωνον πατρίδα γῆν κατήγαγον
Ἡφαιστότευκτον μηχανήν, βροτῶν ἄλας.

ὦ Ζεῦ, τί λέξω; πότερά νιν προσεννέπω   125
ναυαγίοις ἀνθοῦσαν **ἀλίμενον χθόνα**,
ἢ καὶ δόλον βλέπουσαν ἐξ ὑφασμάτων
Ἄτην ἄπληστον αἵματος; **σπόγγον** μὲν οὖν
ψυχὰς βροτῶν ῥοφοῦντα μυριόστομον,
ἀνδρῶν ἀπαιόλημα κἂν σοφός τις ᾖ,   130
πάμφθαρτον Ἅιδην, Σφίγγα δευτέραν τινά,
ἢ **δυστόπαστα** συμβαλεῖν **αἰνίγματα**
φύουσα θνητοῖς ξυγγενῆ σπείρει βλάβην.

In choosing Aeschylean characters as striking as the artificer Hephaestus of *PV* and the relentlessly punitive Erinyes of *Eum.*, and in reversing Prometheus' gift to men of 'number' into Zeus' retaliatory justice upon them, Evans deliberately gives a dominant Aeschylean and Promethean ambience to his poem. His descriptions of the grim Erinyes and their actions in 16, 31–2, 55–6 and throughout 79–122 are indebted to *Eum.*: the horrified priestess in the play's 48–54 and the disgusted Apollo in 179–97 – and in Evans 107–22 the creatures' final prediction recalls and contrasts with the prophetic scene in *Eum.* 916–1031 at Athens when they abandon their persecution of Orestes for communal beneficence.

Very evident in the poem are the Aeschylean weight and frequent sonority of its descriptive language, with many colourful compound adjectives, often brought densely together. The narrative consists mostly of long sentences, filling four or more verses, stretched to accommodate images single or combined, varied in detail. A few examples:

Hephaestus' constructions of his inventions throughout 17–68 come in long sentences like Prometheus' benefits to mankind in *PV* 447–53, 454–9, 478–84, 485–95. The cameo soon afterwards of his joyful dancing at 73–9 gives contrast before it is followed in 79–87 by his portentous and climactic order to the Erinyes to distribute his 'mathematics' to cause age-long misery. Successive long sentences 88–93, 94–102 and 103–6 describe the Erinyes' journeys in willing obedience, ending when one of them cries 'Enough!' – teasing the reader, for the whole intended misery has yet to culminate with a further long sentence, the conflict between the army of triangles and Tripos examinees at 114–21: μαθήματα are indeed παθήματα 120–1. When at 125 the narrator feigns inadequacy to continue his description, there follow two demonstratively challenging sentences which contain nine of the most elaborately confected verses in the poem (the third of the three passages given above). After 133, however, the sentences become shorter, except for 139–47, when they emphasise the transgression of natural law (139, 147); here Evans relies more on his own powers of composition. Relief from long sentences is given throughout the poem by interposing short, simple clauses: 19–22, three; 29–30, one; 43–5, three (they convey the variety of the shapes); 56, one; 65–6, two; 107–8, one; 112–13, two – this too is an Aeschylean habit.

One further link between Evans' poem and *PV* can be seen: mythical geography colours the course of Io and her supernatural flight from Argos to the Caucasus *PV* 673–82. There she encounters the fettered Prometheus, who predicts her onward journey to Egypt between 707 and 872 – and Egypt is the easternmost destination of Evans' Erinyes 96: compare too his brief evocation of the Nile 94–7 with that of Prometheus 811–14. Lastly, the swift travels of the unsparing Erinyes recall the speed and stages of Clytemnestra's beacons between Mt. Ida at Troy to Argos, Aesch. *Ag.* 281–311.

⋆ ⋆ ⋆

Lastly, a few aspects of language and style.

Assonance and alliteration are markedly Aeschylean modes. A few effective examples are at 32–4 with τρι- as first syllable (× 4); at 46 and 61 with the letter π (× 3); at 79–80 with the letter δ (× 3); at 83–4 and 88, both with π and τ. There is an extraordinary fivefold use of the diphthong αι within three words at 16 – but this is a 'borrowing' (see our Notes below). Imitative sound aids sense in e.g. 23–4, with the noise of vigorous fanning; and at 101 with the effort of a return journey.

Appositional phrases are used in 39, 76, 93 (× 2), 102. Asyndeton is common: of adjacent verbs at 24, 56, 86 (× 3), all at verse-beginning; of adjacent adjectives at 16 and 32 (× 3); of phrases at 30; in abrupt explanation at 8 and 114. Parenthesis helps vary pace at 9, 11, 50, 78. Figures of speech occasionally sharpen effect: chiasmus at 16–17; litotes with adjectives in negative ἀ- at 82–3, 96–7, 118, cf. οὐ at 62, 106, 122; polyptoton at 46 and 67. Touches of near-colloquial language colour speeches at 107–8 with ἅλις·, cf. 154; at 121 with αὐτὸ σημανεῖ; at 152 with ὅμοιον·; contrast solemn ἔσται γάρ, ἔσται at 112. There is one oddity: the normally 'active' adjective πόμπος is 'passive' at 109 (see our Notes below).

As to the iambic trimeter: the use of many compound words, adjectives especially, necessitated prosodic ingenuity and in particular many 'resolutions' of long syllables into

two short ones. Their total is surprisingly high, 52 in 154 trimeters (see the 'statistics' below). Some tragic rarities and licences occur: elision at verse-end after a postpositive, 36 δ(έ); this is a freedom apparently unique to Sophocles, e.g. OT 29, 785, 791; a prepositive at verse-end, 80–1 ἐπεί, cf. e.g. Aesch. *PV* 384–5 ἐπεί; this licence is occasional throughout tragedy, but *PV* has about twenty examples.

One element both of syntax and prosody is enjambment, syntactic coherence between a word at line-end with the first word in the following line, usually indicated by punctuation with a following colon or comma. There has long been inconclusive debate whether this device gives or can give emphasis to the enjambed word. There are over twenty examples in the poem, of which these are strongest in effect: 12 κακῶν·, 43 πολλαῖσιν·, 50 ἀλγοῦντες, 73 σιγῇ·, 74 ὠρχεῖτο, 78 Μαθήματ(α), 96 τρίγωνον, 99 στάζουσιν·, 113 ἀγών·, 147 βροτῶν;, 149 ἔγωγ(ε)·, 152 ὅμοιον·, 154 ἅλις·. This frequency of enjambment further shows how greatly Evans was influenced by *PV* – but how consciously? – for the figure occurs only ten times in Aeschylus' six other plays, but eighteen times in this one play.

Some underlying statistics
'Borrowings' and similarities
From the **Notes** below, the signs = and ∼ are here counted just once, whether they precede a single reference or more, and more than one author.

Instances of exact correspondence and deliberate borrowings, signed with = : 43, of which there are 24 for Aesch. (56%), 8 for Soph. (18%), 11 for Eur. (26%).

Instances of other close similarities, conscious or accidental, signed with ∼ : 89, of which there are 58 for Aesch. (65%), 5 for Soph. (6%), 26 for Eur. (30%).

Total of = 43 and ∼ 89: 132.

In Aesch. = *Ag.* 7, *Eum.* 8, *PV* 4, other plays (from 6 out of 7 complete plays) and fragments 5: 24.

∼ *Ag.* 19, *Eum.* 10, *PV* 12, other plays (from 7 out of 7 complete plays) and fragments 17: 58.

In total *Ag.* 26, *Eum.* 18, *PV* 16, other plays and book fragments 22, total 82 (62% of 132); Soph.13 (10% of 132), Eur. 37 (28% of 132).

There is only one span of verses where frequency of verbal 'borrowings' and similarities is matched by significant frequency of metrical 'resolutions': 90–130.

Metre: the iambic trimeters
Resolutions: 4 in the 1st foot, including 2 'substitute' anapaests not excused by housing metrically awkward proper names, 49, 110;

6 in the 2nd foot: all tribrachs
29 in the 3rd foot: 13 tribrachs, 16 dactyls
11 in the 4th foot: all tribrachs
2 in the 5th foot: both tribrachs, 45, 108
9 verses have 2 resolutions: 32, 36, 45, 48, 54, 61, 83, 86, 110.

In total, 52 in 154 verses, about 33%; one in every 3 lines, an average reached and exceeded only in Euripides' late plays (one wonders whether Evans was himself conscious of this un-Aeschylean feature). For Aeschylus the figure is about 7.5% (slightly lower in *PV*), for Sophocles a little less than 7%.

There are 2 verses with only 3 words, 26 and 119; this is a marked feature of Aeschylean style, not always in grand narrative descriptions, with 44 examples in the 7 plays, *Sept.* having most (13), and *PV* 9. Over 30 verses have only 4 words, about 1 in 5 of the poem's 154 lines; this frequency, too, is Aeschylean.

Notes

Evans' own preface and notes
Preface, second paragraph

Apollonius of Perga in Pamphylia, *c.* 262–190 BC; his *Conics* analysed ellipses, hyperbolas and parabolas.

Euripides' 'anachronism': we are unable to identify which passage(s) Evans had in mind, unless he meant the dramatist's tendency to anticipate fifth-century political and social issues in his mythic/heroic world.

The terminal quotation is in fact a misquotation from Thomas Gray's *The progress of poesy: a Pindaric ode* (1757): 'He pass'd the flaming bounds of place and time' (line 95). The passage refers to Milton's *Paradise lost*, in which Satan 'overleaped all bound / Of Hill or highest Wall' (4.181–2) as he entered Eden; it also evokes Lucretius, *De rerum natura* 1.73: 'flammantia moenia mundi'. In Milton's cosmology, Heaven was made of fire (the Empyrean), its boundaries consisting of flames that separated it from Chaos below.

Notes

n. 7   The reference is now Aesch. *fr.* 373.

n. 10   Composers sometimes simulated objections to their own wording, in the comments of non-existent critics. Evans commends the practice, but rightly rejects the proposed alternative here (disguised as the reading of the manuscripts) as 'more ingenious than safe'.

n. 11 The stanza-maker was Evans himself; the metre is Alcaic: 'I shall praise Hobbes to the stars, who translated Thucydides, and squared the circle. What is more brilliant than the genius of Hobbes? What is more brilliant than the excellence of Hobbes? Let Rome give way to Britain!'

Evans refers to circle-squaring both in his poem at lines 135–8 and in his 'Autobiography of a goose-quill' (Waite (1893) 29, 57–64). The mania for it was elegantly exposed and deflated in Augustus De Morgan's *A budget of paradoxes* (De Morgan (1872)); see Rice (2023).

Editors' notes on the poem. Lemmata are predominantly from the Greek; citings from the translation are enclosed in single raised quotes.

A Greek lemma followed by the sign = indicates an exact or very close correspondence with a word or wording in a Greek author, almost always a tragedian; it may be judged a deliberate borrowing by Evans. When followed by the sign ∼, a lemma indicates a close

similarity or looser resemblance which in many cases may yet be a conscious borrowing rather than accidental. 'Cf.' indicates other words or wording comparable in some way with those of Evans. Tragic references are to Aeschylus ed. West, Sophocles ed. Lloyd-Jones and Wilson, Euripides ed. Diggle; fragmentary texts are signalled with the abbreviation *fr.* To avoid confusion, lines from Evans' poem are sometimes cited as 'Evans 00'.

Sub-title 'The mythological birth of the nymph Mathesis': neither the word 'nymph' nor the name 'Mathesis' occurs in the Greek text: see the Appraisal above.

1 ΛΟΓΟΣ τίς ἐστιν, ὅς [. . .] = Soph. *Trach.* 1 Λόγος μέν ἐστ(ι) [. . .] 2 ὡς [. . .] Cf. Eur. *Hel.* 17–18 ἔστιν δὲ δὴ / λόγος τις ὡς [. . .]

2 δι' ὀργῆς: cf. 120 διὰ μάχης and n. below.

ὅσ' ἐξημάρτανον = Soph. *Phil.* 1224 (but 1st pers. sing. there). Cf. Aesch. *PV* 945 τὸν ἐξαμαρτόντ' εἰς θεούς.

3 ἔχρηζεν: the omission of *iota* subscript or adscript from the *eta* may be a slip, for texts printed in England before Evans' time have it, recognising the verbal infix -ιζ-, as in e.g. κλῄζω; conversely, modern orthography would remove *iota* from Evans' 14 δρᾶν and 77 κληδόν(α); see n. on the latter below.

ἀντιτίσασθαι δίκην ~ Eur. *Med.* 261 δίκην [. . .] ἀντιτίσασθαι.

5 ἀντιρρέποι: cf. Aesch. *Ag.* 574 ἀντιρρέπει, the verb's only occurrence in Tragedy.

6 νεύσας τοῖς θεοῖς: cf. Hom. *Il.* 1.528 νεῦσε Κρονίων, where Zeus' nod to all the gods indicates his inflexible undertaking to Achilles' mother the goddess Thetis that Achilles will win glory at Troy.

7 ἀκούσατ(ε) [. . .] τὸν βραχὺν λόγον: cf. Aesch. *Pers.* 213 ἀκούσῃ [. . .] μῦθον ἐν βραχεῖ λόγῳ.

8 ἃ δυσσεβοῦσι, τιμωρήσομαι ~ Eur. *Hipp.* 2 ἃ δ' εἰς ἔμ' ἡμάρτηκε, τιμωρήσομαι.

9 Ἥφαιστε, σοὶ δ' οὖν χρέος ἐπιστέλλω τόδε ~ Aesch. *PV* 3 Ἥφαιστε, σοὶ δὲ χρὴ μέλειν ἐπιστολάς, Zeus' order to fetter Prometheus.

11 δειναὶ γὰρ εὑρεῖν [. . .] πόρον = Aesch. *PV* 59 δεινὸς γὰρ εὑρεῖν [. . .] πόρον (Hephaestus); cf. Aesch. *Eum.* 82 μηχανὰς εὑρήσομεν (the Erinyes themselves).

ἐκπόνει πόρον ~ Aesch. *Supp.* 367 ἐκπονεῖν ἄκη.

πόρον μέγαν ~ Aesch. *PV* 111 μέγας πόρος.

11–12 πόρον [. . .] / κακῶν ~ Eur. *Alc.* 213 πόρος κακῶν.

12 ὁποῖον μηδέπω ~ Aesch. *Pers.* 760 οἷον μηδέπω of a great feat; κάτοισθ' ἰδών cf. Soph. *Phil.* 256 πῶς γὰρ κάτοιδ' ὅν γ' εἶδον οὐδέπω;

13 καὶ ταῦθ' ἅμ' ἠγόρευε = Eur. *El.* 788, *Phoen.* 1177, *Bacch.* 1082.

τέκτων πυρός ~ Eur. *Alc.* 5 τέκτονας πυρός.

14 δρᾶν παρασκευασμένος = Aesch. *Supp.* 440 -ους.

16 γραιαὶ παλαιαὶ παῖδες = Aesch. *Eum.* 68–9 κόραι / γραιαί, παλαιαὶ παῖδες.

ὅ τε μουνῶψ στρατός = Aesch. *PV* 804 τόν τε μουνῶπα στρατόν, but there of the mythical Arimaspians.

18 Doric πεδάρσιος three times in Aesch. *PV*, once in *Cho.* – but in 35 below Evans has Attic μετάρσι(ος).

19–20 ἀντέκλαζε [. . .] / [. . .] πέτρα ~ Eur. *Andr.* 1145 πέτραισιν ἀντέκλαγξ(ε).

20 μυδροκτυποῦσι ~ Aesch. *PV* 366 μυδροκτυπεῖ, there of Hephaestus himself.

κοίλη πέτρα ~ Aesch. *Eum.* 22–3 πέτρα / κοίλ, cf. Eur. *Ion* 31 κοίλης πέτρας, Soph. *Phil.* 1081 κοίλας πέτρας, all three of Delphi.

βαρύβρομος only in lyric in Tragedy.

21 ἱδρὼς δ' ἀνήει χρωτί = Soph. *Trach.* 767, the effect of the burning shirt of Nessus.

θνητῶν γὰρ κακά cf. Aesch. *PV* 107 θνητοῖς γὰρ γέρα.

21–2 κακά / ἔσπευδον ~ Eur. *Hel.* 1629 σπεύδεις κακά, *Phoen.* 582 δυὸ κακὼ σπεύδεις.

22 πειστέον Διὸς λόγοις ~ Eur. *Hipp.* 1182 πειστέον πατρὸς λόγοις, cf. Aesch. *PV* 40 ἀνηκουστεῖν [. . .] τῶν πατρὸς λόγων.

23–4 ῥιπίδων φυσήμασιν / [. . .] ἠρέθιζεν cf. Ar. *Ach.* 668–9 φέψαλος [. . .] / ἐρεθίζομενος [. . .] ῥιπίδι. As to φύσημα: only of breath, but cf. φυσητήρ 'bellows' in later Greek.

24 ἤγειρεν ἠρέθιζεν: cf. Evans 56 ἔχριον, ὠρόθυνον and, differently, 86 ῥίψατε, διάδοτε, σπείρατ(ε): juxtaposed finite verbs or participles of identical tense are a Tragic mannerism e.g. Aesch. *Pers.* 426 ἔπαιον ἐρράχιζον, Eur. *El.* 843 ἤσπαιρεν ἠλέλιζε.

26 ταυροκτονουσῶν ~ Aesch. *Sept.* 276 ταυροκτονοῦντες. The Erinyes follow human practice in sacrificing a bull (and beneath Etna!) at a very significant occasion e.g. *Sept.* 43 (ταυροσφαγοῦντες), Soph. *Trach.* 760.

μηχανορράφος e.g. Soph. *OT* 387, Eur. *Andr.* 447.

The verse has only three words, like 119 (see the Statistics section at the end of the Appraisal).

27 ῥαιστῆρ(α) ~ Aesch. *PV* 56 ῥαιστῆρι θεῖνε, Hephaestus told to fetter Prometheus.

καλλίνικον 'triumphant(ly)': used of a victorious weapon e.g. Eur. *HF*, 49, 570.

27–8 ἐν μιᾷ / πληγῇ = Aesch. *Pers.* 251.

29 ἐθάμβησαν δ(έ) ~ Eur. *Ion* 1205 ἐθάμβησεν δέ.

δ' ὁμοῦ at verse-end = Aesch. *Pers.* 426.

31 νόμον δ' ἐπευφήμησαν ὁμόφωνον ~ Aesch. *fr.* 350.4 παιὰν' ἐπευφήμησεν (cited by Pl. *Resp.* 386b), cf. Eur. *IT* 1403–4 ἐπευφήμησαν [. . .] / παιᾶνα, Aesch. *Ag.* 158 ὁμόφωνον (αἴλινον).

32 With four successive words beginning τρι-, and another in 33, Evans uses alliteration to emphasise heavily the significance of 'three' in his poem, after naming Τρίγωνον ('Triangle') in 28. The Erinyes are handily 'three', like other potent figures of myth such as the Phorcides and Gorgons, Aesch. *PV* 795–8; and the number is significant in cultic or symbolic actions. A further emphasis on 'three' when triangles 'go to war', Evans 114–15.

33–4 Τυφώς: banished beneath Etna for trying to dethrone Zeus; associated with Hephaestus in causing its fiery eruptions at Aesch. *PV* 351–72.

τέρας: Typhos is termed δάϊον τέρας in *PV* 352.

πρὸς ὀργήν (i.e. ὀργήν: see Appendix on the text) = Soph. *El.* 369, 628, Ar. *Ran.* 844 etc.

35 πυρὸς βέλη ~ Aesch. *PV* 917 πύρπνουν βέλος.

ἐξηκόντισε: a Euripidean verb, *Supp.* 446, *HF* 1149, *IT* 362, *Bacch.* 665.

36 πᾶσα μὲν χθών = Eur. *Hipp.* 1215.

μυχόθεν is Aeschylean but outside dialogue trimeters, *Ag.* 96, *Cho.* 35.

χθὼν [..]. ἐσαλεύθη ~ Aesch. *PV* 1081 χθὼν σεσάλευται.

36–7 πυλαὶ […] / Ἄιδου ~ Aesch. *Ag.* 1291 Ἄιδου πυλάς, cf. Eur. *Alc.* 126, *Hipp.* 56–7.

37 ἀλαλαγήν […] ἧκαν ~ Eur. *Med.* 1176–7 ἧκεν ὀλολυγῆς μέγαν / κωκυτόν.

39 θεομυσοῦς ~ Aesch. *Eum.* 40 θεομυσῆ (the parricide Orestes); not attested elsewhere.

40 σμερδνόν ~ Aesch. *PV* 355 σμερδνῇσι γαμφηλῇσι; but a Homeric word.

Τετραγώνου βία: an 'Epic' periphrasis used in Tragedy e.g. Aesch. *Sept.* 641 Πολυνείκους βία, *Sept.* 577, Eur. *Phoen.* 56.

τὸ τετράγωνον Pl. *Resp.* 510d.

41 Πεντέγωνον: the second -ε- is apparently a slip, for the only attested form of this compound is πεντάγωνος e.g. Arist. *fr.* 310 Rose. Compounds in πεντε- are older formations, but πεντέλιθα 'five-stones' appears at Ar. *fr.* 383.

προπάτορος ~ Eur. *Or.* 1441 Πέλοπος προπάτορος; the word first at Pind. *Nem.* 4.89, and not Aeschylean.

μείζων βλάβη = Soph. *El.* 784 (Electra); cf. Soph. *fr.* 86.2.

42 ἁβρύνεται = Aesch. *Ag.* 1205 ἁβρύνεται γὰρ πᾶς τις εὖ πράσσων πλέον; a rare verb, twice in Aesch., once in Soph., not in Eur.

43 ὁμόπτερον 'similar' ~ Aesch. *Cho.* 174 ὁμόπτερος (a lock of hair).

44–5 ἰσοσκελές, στερεόν, ἐπίπεδον: terms attested first in Plato: ἰσοσκ. *Ti.* 54a, στερ. *Tht.* 184b (cited by Evans in his n. 2), ἐπιπ. together with στ. *Philb.* 51e, cf. *Ti.* 32ab.

45 διαμπάξ ~ Aesch. *PV* 65 (through a torso), *Supp.* 945 (a driven rivet), Eur. *Bacch.* 994 (a pierced gullet).

46 τοὐνθένδε μέντοι = Eur. *Med.* 1167, *Hipp.* 1185.

πῆμα πήματος πλέον = Eur. *Hec.* 1168.

48 διαμέτροις 'diameters'; 'hypotenuses' of triangles in Pl. *Ti.* 54d, of other shapes *Meno* 85b.

49 κανόνας 'straight lines': κανών a builder's tautened horizontal cord e.g. Eur. *HF*, 945 or pendant plumb-line e.g. *Tro.* 6.

Evans' reference in his n. 3 to Euclid is clearer as 'see Book 1, Definition 35'.

51 καὶ πρός γε τούτοις ~ Aesch. *Sept.* 265, *PV* 622.

53 τὴν ὑστέραν τῆς πρόσθεν εἰς ὑπερβολήν ~ Eur. *Hipp.* 939 ὁ δ' ὕστερος τοῦ πρόσθεν εἰς ὑπερβολήν.

54 ἀδαπάνως τέρπων κέαρ ~ Eur. *Or.* 1176 ἀδαπάνως τέρψαι φρένα.

55–6 οἴστροις […] / ἔχριον ~ Aesch. *PV* 566 χρίει τις […] οἶστρος, 880 οἴστρου δ' ἄρδις χρίει ζάπυρος.

ὀροθύνω: an Epic verb, but in the passive Aesch. *PV* 202.

57 μόλις μὲν κεῖνος, ἐξέφυσε δὲ ~ Eur. *Phoen.* 1421 μόλις μέν, ἐξέτεινε δ(έ), cf. Soph. *Ant.* 1105 μόλις μέν, καρδίας ἐξίσταμαι.

58 γραμμήν 'line', explained by Evans in his n. 4 as the Parabola.

ἀξύμβλητον 'inscrutable': this is the meaning most likely intended by Evans here and in 132 δυστόπαστ(α), cf. Soph. *Trach.* 694 ἀξύμβλητον ἀνθρώπῳ μαθεῖν. Heath (1908) gives the technical definition 'non-secant'.

59 ἰαλτός cf. Aesch. *Cho.* 22 and *PV* 659 of persons sent speedily. The verb is rare e.g. Eur. fr. 1048 τόξ' ἰάλλων.

60 ἐμμανὴς πνοαῖσι ~ Eur. *Bacch.* 1094 θεοῦ πνοαῖσιν ἐμμανεῖς. The Erinyes madden their victims (Evans 113; see n. below).

δηναιῶν κορῶν ~ Aesch. *PV* 794 δηναιαὶ κόραι, but there of the mythical Phorcides; see also the note to line 16 above.

61 περιφοράν 'orbit' cf. Ar. *Nub.* 171–2 τῆς σελήνης […] / […] τὰς περιφοράς.

62 κύκλου […] κάσιν ~ Aesch. *Ag.* 494–5 κάσις / πηλοῦ ξύνουρος διψία κόνις, *Sept.* 494 λιγνὺν μέλαιναν, αἰόλην πυρὸς κάσιν.

Evans' contemporary Bishop Charles Ellicott proposed a correction in this verse which he rejected, to alter it to οὐ κύκλος, ἀλλὰ φιλτάτη κύκλου κάσις. Waite (1893) 1 has: 'to which Evans with a smile said, "If an ellipse had been as different from a circle as a square is, the Bishop's remark might hold water, but inasmuch as it is 'μόνον οὐ κύκλος', and not a circle, I think my line is correct"'.

63 κᾆτι τῶνδ' αἰσχίονα ~ Soph. *Ant.* 64 κᾆτι τῶνδ' ἀλγίονα.

64 μαιμῶν ~ Aesch. *Supp.* 895 of an aggressive snake, but the word is Homeric.

θριγκῶσαι κακά ~ Aesch. *Ag.* 1283 ἄτας […] θριγκώσων, Eur. *Hec.* 1280 δῶμα θριγκῶσαι κακοῖς.

66 κατερρίνησεν 'perfected', lit. 'filed down, polished', cf. Aesch. *Supp.* 747 βραχίον' εὖ κατερρινημένους 'men with arms well-toned', Ar. *Ran.* 747 κατερρινημένον τι λέγειν 'say something polished'.

68 γόμφοις ἐφηλῶν δυσλύτως ἀραρόσιν ~ Aesch. *Supp.* 944–5 ἐφήλωται […] / γόμφος […] ὡς μένειν ἀραρότως.

70 ἀνεψύχθη πόνων ~ Eur. *Hel.* 1094 ἀνάψυξον πόνων.

71 εἱστήκει δ' ἐπ' ἐξειργασμένοις = Aesch. *Ag.* 1379 ἕστηκα […] ἐπ' ἐξειργασμένοις (Clytemnestra by Agamemnon's corpse).

72 πολύκερων […] μηχανὴν ~ Aesch. *Ag.* 1127 μελαγκέρῳ […] μηχανήματι, usually taken to mean 'black clothing held up on outstretched arms' in which Clytemnestra will entangle Agamemnon. With 'device of many horns', however, Evans may suggest also inescapable impalement; the word πολύκερως occurs only at Soph. *Aj.* 55 describing the slaughter of cattle 'with many horns'. See nn. on ἀμφίβληστρον 85 and 127 below.

73–4 περιχαρὴς ([…] / ὠρχεῖτο) ~ Soph. *Aj.* 697 περιχαρὴς (δ' ἀνεπτάμαν).

74 εἱλίσσων πόδα ~ Eur. *Or.* 171 ἀνὰ πόδα σὸν εἱλίξεις, *Tro.* 332–3 πόδα σὸν / ἕλισσε.

75 ἀέρδην ~ Aesch. *Ag.* 234 (Iphigenia lifted above the altar).

76 ἐπ' ὀρθὸς ὀρθοῦ: cf. Aesch. *PV* 921 ἐπ' αὐτὸς αὐτῷ.

μονοφθάλμοις: a prose word. For the description 'one-eyed', see n. on 16 above.

77 πολύστονον […] κληδόν(α): *nomen omen*; see n. on 106 below.

Printing of the noun with subscript *iota* was still current in Evans's day; philologists have since rejected it, despite the word's sharing the root κλη- with the verb κλῄζω (there, -ιζ- is a verbal infix; see n. on 3 above).

78 Μαθήματ(α) […] παθήμασιν: this jingling predication was proverbial; cf. Evans 120–1 μαθημάτων / παθήμαθ'. These longer words occur first at Hdt. 1.207.1 τὰ δέ μοι

παθήματα ἐόντα ἀχάριτα μαθήματα γέγονε; the shorter μάθος πάθος is a theme of the *Oresteia*, first at *Ag.* 177.

79 ἔρρηξεν αὐδήν = Eur. *Supp.* 710 ἔρρηξε δ' αὐδήν.

80 διώκειν of the Erinyes Aesch. *Eum.* 226.

λώβαις [. . .] ὑστεροφθόροις ~ Soph. *Ant.* 1074 λωβητῆρες ὑστεροφθόροι.

81 κακῶν ἕκατι κἀγένεσθε = Aesch. *Eum.* 71 κακῶν ἕκατι κἀγένοντο.

82–3 (μηχανὴν ἀμήχανον [. . .] / [. . .]) πόρον ἄπορον = Eur. *IT* 897 (text uncertain), cf. Aesch. *PV* 59 ἐξ ἀμηχάνων πόρον.

83 ἔγκοτοι = Aesch. *Cho.* 924, 1054 also of the Erinyes.

84 ὠκύποινοι ~ Aesch. *Sept.* 744 (παρβασίαν) ὠκύποινον.

84–5 περιστιχίζετε / ἄπειρον ἀμφίβληστρον ~ Aesch. *Ag.* 1382–3 ἄπειρον ἀμφίβληστρον [. . .] / περιστοχίζω (West: περιστιχίζω one ms.): Clytemnestra traps Agamemon in his clothing; see nn. on 72 above, 127 below.

86 διάδοτε cf. Eur. *Or.* 1268 κόρας διάδοτε 'Keep your eyes everywhere!'

87 κλαυμάτων ἀρχηγενῆ = Aesch. *Ag.* 1628.

88 ἀπτέροις ποτήμασιν = Aesch. *Eum.* 250, where the noun is a *hapax*.

89 προσελθοῦσαι δὲ Παλλάδος πόλιν ~ Aesch. *Eum.* 79 μολὼν δὲ Παλλάδος ποτὶ πόλιν.

90 χώρας μετέσχον = Aesch. *Eum.* 869 χώρας μετασχεῖν, also of the Erinyes in Attica.

ἀκαρπίαν = Aesch. *Eum.* 801 similarly, cf. 941 ἄκαρπος.

91 φλογμοῖς ~ Aesch. *Eum.* 940.

δενδροπήμονα = Aesch. *Eum.* 938, also olive trees.

92 ἀπεύκτους προσβολὰς μαθημάτων ~ Aesch. *Ag.* 638 ἄπευκτα πήματα; *Cho.* 283 προσβολὰν Ἐρινύων.

93 λειχῆνος ~ Aesch. *Eum.* 785.

αὐονὴν ~ Aesch. *Eum.* 333 = 346.

94 κυνώπιδες ~ Eur. *El.* 1252, *Or.* 260.

The prosody of short final vowel (here -ε) before initial ῥ- elsewhere only Aesch. *PV* 713 and 992 (both -α), an observation we owe to James Diggle.

94–5 Αἰγαῖον [. . .] / [. . .] πέλαγος = Aesch. *Ag.* 659, Soph. *Aj.* 461.

ὑπερθοροῦσαι ~ Aesch. *Ag.* 297, 827.

95-6 γῆν / τρίγωνον ~ Aesch. *PV* 813–14 τὴν τρίγωνον εἰς χθόνα; cf. n. on 101 below.

96 ποταμὸς Αἰγύπτου βοτὴρ cf. Aesch. *Pers.* 33–4 πολυθρέμμων / Νεῖλος.

Egypt's Alexandria was to suffer from Mathematics no less than Athens.

97 πηγῶν ~ Aesch. *Pers.* 311 πηγαῖς τε Νείλου [. . .] Αἰγυπτίου.

ἄπαππος ~ Aesch. *Ag.* 311 φάος [. . .] οὐκ ἄπαππον [. . .] πυρός. The source of the Nile's never-failing flow was an object of speculation in antiquity (Hdt. 2.28.1); it was still uncertainly identified in Evans' own day.

ἑπτάρους ~ Aesch. *fr.* 300.2 (more correctly spelled with -ρρ-).

98 ἀριθμοῦ [. . .] σοφίσματα ~ Aesch. *PV* 459 ἀριθμόν, ἔξοχον σοφισμάτων, one of Prometheus' gifts to men.

θυμοβόρα ~ Aesch. *Ag.* 103 θυμοβόρον φρενὶ λύπην.

99 στάζουσιν ~ Aesch. *Cho.* 1058 ἐξ ὀμμάτων στάζουσι νᾶμα δυσφιλές, also the Erinyes.

εἶτ' ἔσκηψαν = Aesch. *Ag.* 308 εἶτ' ἔσκηψεν.

ἄψορροι πάλιν = Soph. *El.* 53 ἄψορρον πάλιν, cf. *OT* 430–1 πάλιν / ἄψορρος.

101 τρίγωνον πατρίδα γῆν: Sicily (note Evans' n. 8), in Tragedy named Σικελία e.g. Eur. *Phoen.* 21; the island had an earlier name Τρινακρία 'three-pointed (land)', Thuc. 6.2.2.

102 Ἡφαιστότευκτον ~ Aesch. *fr.* 69.2 (δέπας); cf. Evans 141 χαλκοτεύκτων.

βροτῶν ἄλας ~ Aesch. *Ag.* 195 βροτῶν ἄλαι, cf. Eur. *Med.* 1285 ἄλαις 'wanderings' of the god-maddened Ino, in both places connoting mental disorder no less than physical. Evans 110 has φρενομανεῖς [...] θηγάνας 'whetting minds to madness'.

103 πρὸς βορεάδας [...] πνοάς ~ Aesch. *fr.* 195.2 βορεάδας [...] πρὸς πνοάς.

104 πόντου στενὸν [...] πόρον: the English Channel.

105 καλλιδόνακα ~ Eur. *Hel.* 493.

106 ποταμὸν οὐ ψευδώνυμον = Aesch. *PV* 717 (the river Ὑβριστήν); cf. Evans 77 πολύστονον [...] κληδόν(α). In Κάμον καμοῦσαι 'wearily to the Cam', the pun is like other not infrequent plays upon names and their associated tragedies (*nomen omen*). They are sometimes spelled out e.g. Aesch. *Sept.* 670–1 ἦ δῆτ' ἂν εἴη πανδίκως ψευδώνυμος / Δίκη (Eteocles fearing defeat by Polynices), *Ag.* 681–90 (Ἑλέναν, as 'destroyer', ἑλ-), Eur. *Phoen.* 1494 ὦ Πολύνεικες, ἔφυς ἄρ' ἐπώνυμος ('Great Feuder', also Aesch. *Sept.* 829–31), Eur. *Bacch.* 367 Πενθεὺς δ' ὅπως μὴ πένθος εἰσοίσει δόμοις, *Tro.* 989–90 Ἀφροδίτη [...] ἀφροσύνης.

107 καί τις τάδ' εἶπε = Eur. *Andr.* 1104 καί τις τόδ' εἶπε(ν), *HF* 951, *Hel.* 1589.

107–8 ἅλις· ~ Soph. *Aj.* 1402, Eur. *fr.* 791, *Hel.* 1581 ἅλις μοι·; Soph. *fr.* 792a ἅλις δὲ παίδων; Eur. *Alc.* 334 μύθων; *Hel.* 143. This curt exasperation verges on colloquial idiom; it is not attested for Aeschylus. See also n. on 150–2 below.

109 πομπὸν τόδ' ἄχθος: we owe to James Diggle the observation that 'πομπός is always escorting, never escorted – a (probably unique) slip by Evans?'. The related adj. πόμπιμος, however, has a passive meaning 'sent, conveyed' at Soph. *Trach.* 872 δῶρον Ἡρακλεῖ τὸ πόμπιμον and Eur. *Hipp.* 578 πομπίμα φάτις δωμάτων 'report of the house that is (to be) sent'.

110 φρενομανεῖς ~ Aesch. *Ag.* 1140.

θηγάνας ~ Aesch. *Eum.* 859 αἱματηρὰς θηγάνας.

111 πλοῦτον [...] χλιδῆς ~ Aesch. *Ag.* 1383 πλοῦτον εἵματος κακόν.

αἱματορρόφου cf. Aesch. *Eum.* 264–5 ἀπὸ ζῶντος ῥοφεῖν / ἔρυθρον ἐκ μελέων πελανόν.

112 ἔσται γάρ, ἔσται = ἔσται τάδ', ἔσται Eur. *Alc.* 328, ἔσται τάδε *Ion* 413, 425 and often; a solemn formula. Cf. Eur. *Or.* 257 αὗται γάρ, αὗται.

ὑπερφυῶς: this everyday use of the adverb is not attested in Tragedy.

112–13 μέγας / ἀγών ~ Eur. *Hipp.* 496, *Hec.* 229, *Hel.* 1090 and often; Thuc. 2.89.10 in direct speech.

113 ἐρεβόθεν = Eur. *Or.* 177.

ἐννέπω in a solemn pronouncement ~ Aesch. *Ag.* 247; προυννέπω *Eum.* 98 and 852.

ἐμμανὴς: the Erinyes themselves are 'maddened' Aesch. *Eum.* 860; they madden their victims e.g. Aesch. *Cho.* 1048–58 (of Orestes); Evans in 60 has them madden Hephaestus, too, amid his extreme inventions. Here they take on the 'mad' or frenzied visionary

possession of prophetic women, such as Cassandra e.g. Aesch. *Ag.* 1064 μαίνεται and Virgil's Sibyl *Aen.* 3.443 *insanem vatem.* See also n. on 122 below.

114 στρατὸν δέδορκα διὰ τριῶν τεταγμένον, cf. Eur. *Supp.* 653 ὁρῶ δὲ φῦλα τρία τριῶν στρατευμάτων.

114–15 στρατὸν [...] / σπαρτόν: an allusion to the dragon's teeth sown at Thebes by Ares which later sprang from the ground as an army, the Σπαρτοί, Aesch. *Sept.* 412, 474 and e.g. Eur. *HF* 5.

116–17 ἀνθήσει [...] / Ἄρης ~ Aesch. *Pers.* 820 ὕβρις, *Cho.* 1009 πάθος; see also n. on 126 below.

117 Ἄρης [...] ἐμφύλιος = Aesch. *Eum.* 862–3.

   ἄχαλκος ἀσπίδων = Soph. *OT* 191.

118 ἁμιλλητῆρες ~ Soph. *Ant.* 1065.

   ἀσιδήρους χέρας ~ Eur. *Bacch.* 736 χειρὸς ἀσιδήρου μέτα.

119 πτεροῖσι χηνείοισιν ἐξηρτυμένοι ~ Aesch. *PV* 711 ἑκηβόλοις τόξοισιν ἐξηρτυμένοι.

   Goose feathers: quill pens for the Tripos examination, conducted silently (σῖγα Evans 120) as opposed to the archaic *viva voce.*

   The line has only three words: 26 above and n.

120 διὰ μάχης ~ Eur. *HF* 220, *Hel.* 978, *IA* 1392, 1414–15; cf. Evans 2 δι' ὀργῆς and n. above.

121 αὐτὸ σημανεῖ = Eur. *Phoen.* 623; cf. *Bacch.* 976 τἄλλα δ' αὐτὸ σημανεῖ.

122 ἄκραντ' ἐθέσπισαν ~ Eur. fr. 62g.1 ἄκραντα [...] θεσπίζειν. Cf. Aesch. *Ag.* 249 τέχναι δὲ Κάλχαντος οὐκ ἄκραντοι, which Evans no doubt had in mind when he here links mathematical skills to those of seers and diviners. The pragmatic Calchas enjoyed a reputation for infallibility, while Cassandra (n. on 113 above) was never wrong but also never believed.

123 λιμναῖς γειτονοῦσ(α) ~ Aesch. *Pers.* 311 πηγαῖς τε Νείλου γειτονῶν.

124 παντομισής ~ Aesch. *Eum.* 644 ὦ παντομισῆ κνώδαλα, Apollo abusing the Erinyes.

125–54 Evans' 'borrowings' in these lines become fewer: see the Appraisal.

125 ὦ Ζεῦ, τί λέξω; πότερα = Eur. *Hec.* 488, cf. *Cyc.* 375, Soph. *OC* 310: a dramatist's hyperbole to vivify a particular moment; cf. especially Aesch. *Cho.* 997–9 τί νιν προσειπὼν ἂν τύχοιμ' ἂν εὐστομῶν; / ἄγρευμα θηρός, ἢ νεκροῦ ποδένδυτον / δροίτης κατασκήνωμα;

   Evans' reference to Bacon in his n. 9 may be updated to 'De dignitate et augmentis scientiarum', VI 3.12 vii: Spedding, Ellis, Heath (1857) 691. Evans slightly misquoted Bacon, who wrote 'in virtutis cursu'.

126 ναυαγίοις ἀνθοῦσαν ~ Aesch. *Ag.* 659–60 ἀνθοῦν πέλαγος [...] νεκροῖς / [...] ναυτικοῖς τ' [...] ἐρειπίοις.

   ἀλίμενον χθόνα = Aesch. *Supp.* 768.

127 βλέπουσαν ἐξ ὑφασμάτων ~ Aesch. *Ag.* 1178–9 ἐκ καλυμμάτων δεδορκώς. In preferring ὑφασμάτων here to the metrically equivalent καλυμμάτων, Evans wishes to allude to *Ag.* 1492–3, where Cassandra imagines Agamemnon dying ἀράχνης ἐν ὑφάσματι τῷδε 'in this spider's web', namely the clothing in which Clytemnestra trapped him, the ἀμφίβληστρον 'net' of *Ag.* 1382: see n. on lines 84–85 above.

128 (Ἄτην) ἄπληστον αἵματος ~ Aesch. *Eum.* 976 ἄπληστον κακῶν […] στάσιν; cf. Hdt. 1.212.2 Ἄπληστε αἵματος Κῦρε.

128–9 σπόγγον = Aesch. *Ag.* 1329 σπόγγος (βολαῖς ὑγρώσσων σπόγγος ὤλεσεν γραφήν).

σπόγγον μὲν οὖν / ψυχὰς βροτῶν ῥοφοῦντα ~ Aesch. *Cho.* 999–1000 δίκτυον μὲν οὖν / ἀρκύν τ' ἂν εἴποις.

129 ῥοφοῦντα: see n. on 111 above.

μυριόστομον: a coinage by Evans.

130 ἀνδρῶν ἀπαιόλημα ~ Aesch. *Cho.* 1002 ξένων ἀπαιόλημα.

κἂν σοφός τις ᾖ ~ Eur. *fr.* 362.17 κἂν ᾖ σόφος τις, HF 237, *fr.* 715.2 κἂν βραδύς τις ᾖ, *Hipp.* 424 κἂν θρασύσπλαγχνός τις ᾖ, *Phoen.* 777 κἂν φίλων τις ᾖ.

131 πάμφθαρτον (Ἀΐδην) ~ Aesch. *Cho.* 296 παμφθάρτῳ μόρῳ.

(Σφίγγα) δευτέραν τινά ~ Aesch. *Ag.* 870 (Γηρυὼν) ὁ δεύτερος.

Evans anticipates the complaint of John Seeley (1867) 163 about Tripos examinations: 'Cambridge is like a country invaded by the Sphinx. To survive the monster's conundrums has become an absorbing occupation'.

132 δυστόπαστα […] αἰνίγματα = Eur. *Supp.* 138 δυστόπαστ' αἰνίγματα.

134 φεῦ τῆς ἀνοίας = Soph. *El.* 920.

136 ἐκτείνει βίον = Eur. *Supp.* 1109 ἐκτείνειν βίον.

138 κύκλωμα τετράγωνον κτίσαι: Evans' n. 11 does not trace this alchemist's dream, squaring the circle, back beyond Hobbes, but he was probably aware of Arist., *Soph. el.* 171b16 τετραγωνίζειν τὸν κύκλον.

139 μεῖζον ἢ κατ' ἄνθρωπον φρονεῖ ~ Aesch. *Pers.* 820 ὡς οὐχ ὑπέρφευ θνητὸν ὄντα χρὴ φρονεῖν, *Sept.* 425 οὐ κατ' ἄνθρωπον φρονεῖ, Soph. *OC* 598 μεῖζον ἢ κατ' ἄνθρωπον (νοσεῖς).

140 πυργὸν εὐαγῆ λαβὼν = Eur. *Supp.* 652.

141 χαλκοτεύκτων: elsewhere only Eur. *IT* 99, of κλῆθρ(α).

142 νυκτιφρουρήτῳ θράσει = Aesch. *PV* 861.

143 πάννυχοι λαμπτῆρες ~ Aesch. *Ag.* 22 λαμπτήρ, νυκτὸς ἡμερήσιον φάος.

148 μεριμνητής ~ Eur. *Med.* 1226 μεριμνητὰς λόγους.

149 μεσόμφαλα: picturing the sun as central in the heaven just as the Greeks pictured Apollo's holy site and oracle at Delphi as the 'mid-navel' of the earth e.g. Aesch. *Sept.* 747, *Cho.* 1036, Soph. *OT* 480–1, Eur. *Ion* 462.

150–1 ἀνιδρύτοις ἀεὶ / […] δρόμοισιν ~ Eur. *IT* 971 δρόμοις ἀνιδρύτοις.

150–2 εἴτ' […] / […] / ὅμοιον· ~ Aesch. *Ag.* 1403–4 εἴτε […] / ὅμοιον·, Eur. *Supp.* 1069 ὅμοια·, *Hec.* 398. These and similar one-word elliptical expressions – such as ἅλις· Evans 107 (and n. at 107–8, above), ἄμεινον· Eur. *fr.* 752k.21 and οὐδέν· *Med.* 64 – are generally regarded as colloquial.

154 τὰ δ' ἄλλα […] χαίρειν ἐῶ ~ Aesch. *Ag.* 36 τὰ δ' ἄλλα σιγῶ, Eur. *El.* 400 (μουσικὴν) χαίρειν ἐῶ, cf. Pl. *Phd.* 100d τὰ μὲν ἄλλα χαίρειν ἐῶ. The expression χαίρειν λέγω or κελεύω is frequent in Euripides e.g. *Hipp.* 113.

Addenda

We are grateful to the Editor and Press for accommodating these further Notes, which we owe to the generous collaboration of Gregory Hutchinson.

7–8 ἀκούσατ' ὦ θεοί: cf. Hom. *Iliad* 8.5 κέκλυτέ μευ, πάντες τε θεοὶ πᾶσαί τε θέαιναι.

θνητούς . . . τιμωρήσομαι: cf. Ovid, *Met.* 1.187–8 *nunc mihi . . . / perdendum est mortale genus* Jupiter addressing all the gods.

17–18 ὠλένας πεδαρσίους / μετὰ ῥυθμοῦ 'κούφιζον, the Cyclopes: cf. Call. *H.* 3.59 ῥαιστῆρας ἀειράμενοι ὑπὲρ ὤμων and Verg. *Aen.* 8. 452–3 *bracchia tollunt / in numerum*.

19–20 ἀντέκλαζε / μυδροκυποῦσι, again the Cyclopes: cf. Callim. *Hymn* 3.54–8: 55 ἄκμονος ἠχήσαντος, 56 αὖε γὰρ Αἴτνη.

36 μυχόθεν ἐσαλεύθη: the consecutive short syllables are perhaps expressive of busy hammering.

37–8 ἀλαλαγήν θ' ἧκαν νεκροὶ / [...] πεφευγότες: cf. perhaps *Verg. Aen.* 8.246 *trepident immisso lumine Manes*.

74–6 (Ἥφαιστος) ὠρχεῖτο [...] / [...] / τοῖς μονοφθάλμοις γέλων: cf. Hom. *Il.*1.599–600 ἄσβεστος δ' ἄρ' ἐνῶρτο γέλως μακάρεσσι θεοῖσιν, / ὡς ἴδον Ἥφαιστον [...] ποιπνύοντα.

106 Κάμον: the Cam becomes Camus at Milton, *Lycidas* 103–7.

107–8 ἅλις in anaphora at Soph. *OT* 685, Eur. *Supp.* 1147–8.

On the poem as a whole: Gregory Hutchinson writes: 'The play between mathematics and poetry connects intriguingly with ancient play between them, as in the poems ascribed to Archimedes SH 201 and Eratosthenes fr. 35 Powell, and with the modern discussion of the ancient relationship in R. Netz, *Ludic proof: Greek mathematics and the Alexandrian aesthetic* (Cambridge, 2009), cf. id., *A new history of Greek mathematics* (Cambridge, 2022), 125–7, 149–50'.

Appendix

Differences between the Greek texts of 1893 and 1839

33 βλαστὸν participle 'born'
replacing infinitive φῦναι 'had been born'

50 ἀλγοῦντες, οὐ γὰρ μὴ ξυνάψουσιν γάμους 'hurt because they are not to join in marriage'
replacing   λύπη, γάμους γὰρ οὐ ξυνάψουσίν ποτε
              'in pain, because they will never join in marriage'

57 κεῖνος, punctuating after this word

73 σιγῇ· τέλος [...] 76 [...] γέλων
replacing   73 (σιγῇ·) τέλος δὲ περιχαρὴς ὠρχήσατο,
              74 σκιρτῶν ἑλιγδήν, φιλόχορος δινῶν πόδα
              '(in silence.) At last he began to dance in an extreme of joy, cavorting and
twisting about, feet whirling in delighted dancing'.

79 ἔρρηξεν αὐδήν· 'δαίμονες [...] 83 [...] ἴτ' ἔγκοτοι'

replacing	77 ἔρρηξεν αὐδήν· ὦ θεαὶ φθισίμβροτοι,
	78 ταύτης γάρ ἐστε τῆς τέχνης μεταίτιαι,
	79 δρακοντόμαλλοι Νυκτὸς αἰανῆς τέκνα,

'(his voice burst out,) O you goddesses who destroy men – because you share responsibility for this art – snake-locked, children of everlasting Night, [...]'

87 κακῶν '(tears) of woe'

replacing	83 καινῶν 'unprecedented (tears)'

88 αἱ δ' οὖν ταχύποδες [...] 104 [...] ὑπερβᾶσαι πόρον

replacing	84 αἱ δ' εὐθὺς ἐξήκριζον εὐρὺν αἰθέρα
	85 πτεροῖσι κλαγγαίνουσιν, οἷ πανύστατον
	86 Νεῖλος πλατύρρους θανάσιμον μέλπει γόον.
	87 κἀνθένδ' Ἀθηνῶν πρὸς θεόδμητον πόλιν
	88 ἔσπευδον· εἶτ' ἔσκηψαν, εἶτ' ἐσήγαγον
	89 εἰς καλλίκαρπον Σικελίαν Μαθήματα.
	90 ὅθεν περῶσαι στενοπόρου φλοῖσβον σάλου

'At once they skimmed the wide heaven with noisy wings, to where the broad-flowing Nile sings its last and dying lament. From there they hurried to Athens' god-built city. Then they shot away, then they brought Mathematics to Sicily and its beautiful crops, from where they crossed the roaring surges of a narrow channel [...]'

107 καί τις τάδ' εἶπε [...] 123 [...] γειτονοῦσ' οἰκεῖ πάλαι

replacing	93 καὶ τοῖσδε ῥείθροις γειτονοῦσ' οἰκεῖ πάλαι
	'and as neighbour to these streams [...] has long been living'

Surprisingly, 1893 does not correct 1839's rough breathing on **34** ὀργὴν; but ὀργῆς with smooth breathing stands in 2 (1839 = 1893) and in 145 (1893) = 115 (1839).

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