

NERO'S EXPERIMENTS WITH THE WATER-ORGAN*

ABSTRACT

This article examines a pair of anecdotes in the works of Suetonius and Cassius Dio, describing Nero's passionate late-career interest in the instrument known as the hydraulis or water-organ. The first half of the article contextualizes the water-organ episode in light of both the history of the instrument's reputation and the wider characterization of Nero in the literary sources. The rest of the article uses the episode to shed light on Nero's self-representation as princeps, focussing on the significance of the water-organ as both a musical instrument and a technological marvel. On the one hand, the organ's popularity with Roman audiences of the Early Imperial period made it a politically strategic choice for a music-loving emperor with strong populist leanings. On the other hand, the association of the organ with the intellectual world of Hellenistic Alexandria appealed to a certain group of Roman elites (including Nero himself), who shared a keen interest in technological innovation and technical knowledge more broadly. In the end, however, Nero's experiments with the water-organ were cleverly trivialized by hostile writers and redeployed as an illustration of the emperor's most appalling vices.

Keywords: Nero; historiography; music; technology; *technē*; *paideia*; Alexandria

I. SETTING THE SCENE

Nero was at Naples, happily engrossed in his vocal exercises, when he learned of the revolt of Julius Vindex, the governor of Gallia Lugdunensis, in March A.D. 68.¹ At first, Suetonius reports, the emperor remained ostensibly unmoved by the news, uninterested even; indeed, for eight whole days, he simply ignored the crisis, secluding himself in the local gymnasium. But his demeanour changed drastically when he received a proclamation from Vindex heaping scorn on his family name and disparaging his ability as a lyre-player.² This was, for Nero, an insult too grievous to bear. He hurried back to Rome in a fit of frenzy and summoned a meeting of the imperial council in his newly built palace, the Domus Aurea.³ The councillors nervously assembled in anticipation of a formal briefing. But, as it turned out, the emperor was in no mood to talk politics (Suet. *Ner.* 41.2):

ac ne tunc quidem aut senatu aut populo coram appellato quosdam e primoribus uiris domum euocauit transactaque raptim consultatione reliquam diei partem per organa hydraulica noui et ignoti generis circumduxit,⁴ ostendensque singula, de ratione et difficultate cuiusque disserens, iam se etiam prolaturum omnia in theatrum affirmauit, si per Vindicem liceat.

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¹ The following narrative is based on Suet. *Ner.* 40.4–41.2.

² Suet. *Ner.* 41.1; cf. Philostr. *VA* 5.10.2.

³ K. Bradley, *Suetonius' Life of Nero: An Historical Commentary* (Brussels, 1978), 253: 'The last few days in March appear to be the most reasonable time for the date of this event.'

⁴ Cf. *OLD* s.v. *circumdūcō*, 3a; *TLL* 3.1135.27–8 (Probst) takes *circumdūxit* with *diei partem* (*circumducere* = *consumere*).

Not even then did he convene a public meeting of the Senate or the people, but called a few of the leading men to his palace and, after holding a brief conference, spent the rest of the day guiding them through some water-organs, of a new and unknown kind, showing them off one by one and lecturing on the workings and difficulty of each; he even promised that he would exhibit them all in the theatre—with Vindex's permission.

The epitomator of Cassius Dio preserves a different account of the same episode (Cass. Dio 63.26.4–5):

νύκτωρ ποτὲ τοὺς πρώτους τῶν βουλευτῶν καὶ τῶν ἰππέων ἐξαπίνης σπουδῇ, ὡς καὶ περὶ τῶν παρόντων τι κοινώσων σφίσι, μεταπέμψας “ἐξεύρηκα” ἔφη “πῶς ἢ ὕδραυλις” (αὐτὸ γὰρ τὸ ῥηθὲν γραφῆσεται) “καὶ μείζον καὶ ἐμμελέστερον φθέγγεται.” τοιαῦτα μὲν καὶ τότε ἔπαιζεν.

One night he suddenly summoned the foremost senators and equestrians as a matter of urgency, as if to make some communication to them regarding the present situation, and then said to them (I quote his exact words): ‘I have discovered a way by which the water-organ will produce louder and more tuneful music.’ Such were the games he played even at that time.

As the days and weeks wore on, Nero's obsession with the organ showed little sign of wavering. It would be only a matter of time, Nero thought, until the renegade Vindex and his Gallic insurgents would be forced into submission. A great celebration was called for, and who better to preside over the festivities than the emperor himself?

sub exitu quidem uitae palam uouerat, si sibi incolumis status permansisset, proditulum se partae uictoriae ludis etiam hydraulam et choraulam et utricularium ac nouissimo die histrionem saltaturumque Vergili Turnum. (Suet. *Ner.* 54)

Near the end of his life, indeed, he had publicly made a vow that, if his power remained intact, he would perform at his victory games as an organist, a pipe-player and a bagpipe-player, and that on the last day he would appear as an actor and dance ‘Virgil's Turnus’.

Much to Suetonius' relief, Nero's victory games proved to be nothing more than a flight of fancy. Within a few months of Vindex's revolt, the emperor was dead, and his memory consigned to infamy by the Senate.

Such, in short, is the surviving ancient testimony for Nero's association with the water-organ: two brief accounts of a curious incident in the Domus Aurea and an allusion to victory games which never took place. Whether Tacitus made mention of Nero's organ-playing in the relevant section of his *Annals* we do not know, since the extant narrative breaks off in the middle of A.D. 66. Here, as ever, the loss of a potentially corroborating source is regrettable. Dio's account is preserved only in the Byzantine epitome of Xiphilinus, compiled during the eleventh century. Although Xiphilinus is generally considered a reliable transmitter of Dio's text, we cannot discount the possibility that he condensed or reworked his source material in some way.⁵ More importantly, there is considerable doubt surrounding the historicity of the ancient narratives. As scholars have noted, Nero's demonstration of the *organa hydraulica* bears an uncanny resemblance to an episode from the reign of Caligula, in which the crazed emperor summons an audience of consular advisers to his palace in the middle of the night, appears unannounced adorned in full actor's costume, and performs a lively

⁵ See C. Mallan, ‘The style, method, and programme of Xiphilinus’ *Epitome* of Cassius Dio’s *Roman History*’, *GRBS* 53 (2013), 610–44.

musical number before disappearing again.⁶ There are obvious problems, therefore, in taking the story of the water-organ at face value. Indeed, according to Keith Bradley, the story is 'no more than a literary representation' of Nero's mania for the performing arts, with little basis in historical reality.⁷ It is telling that, in the copious modern scholarship on the Neronian Principate, the emperor's association with the organ has received only passing comment.⁸

Yet the evidence is worth a closer look. Even if we reject the idea that Nero's *organa hydraulica* were a mindless distraction from civil war, and even if we refuse to believe that he contemplated games to celebrate Vindex's defeat, it would be naive to regard his cultivation of the organ (and of other wind instruments) as a malicious fiction devised *ex nihilo* by his detractors in the wake of his ignominious demise. Significantly, the Suetonian depiction of Nero as an avid lover of the pipes is corroborated by the Greek orator Dio Chrysostom, whose teenage years coincided with the turbulent final period of Nero's reign. In his discourse *On the Philosopher*, delivered in the aftermath of Nero's death, Dio makes a negative example of the deceased *princeps* (τῶν νῦν βασιλέων τις 'a certain monarch of recent times') by criticizing his insatiable appetite for artistic and athletic pursuits (Dio Chrys. *Or.* 71.9):

... κηρύττειν καὶ ᾄδειν πρὸς κιθάραν καὶ τραγωδεῖν καὶ παλαίειν καὶ παγκρατιάζειν. φασὶ δὲ καὶ γράφειν καὶ πλάττειν ἰκανὸν αὐτὸν εἶναι καὶ αὐλεῖν τῷ τε στόματι καὶ ταῖς μασχάλαις ὁμοῦν ὑποβάλλοντα, ὅπως διαπεφευγὼς ἢ τὸ αἰσχρὸν τὸ τῆς Ἀθηνᾶς, οὐκ οὖν ὑπῆρχε σοφός;

... he acted as herald, sang songs to the lyre, performed tragedies, wrestled and participated in the pancration. What's more, they say that he could paint, sculpt, and play the pipes, both with his mouth [that is, in conventional fashion] and by tucking a bag beneath his armpits with a view to avoiding the reproach of Athena. Was he not, then, a wise man?⁹

Although Dio purports to be basing this characterization on rumour rather than on fact, we have reason to believe that he was drawing on a set of beliefs about Nero that were prevalent during the emperor's own lifetime. As Suetonius points out, Nero had taken steps 'towards the end of his life' (*sub exitu ... uitae*) to ensure that his ambitions as a pipe-player were common knowledge; indeed, he had vowed 'publicly' (*palam*) to perform on a variety of wind instruments, including the double-pipes (*choraulam*), the bagpipes (*utricularium*) and the water-organ (*hydraulam*). Of course, I do not mean to suggest therefore that the ancient sources are free from distortion or bias. But the possibility that Nero's interest in wind instruments was grounded in historical

⁶ Suet. *Calig.* 54; Cass. Dio 59.5.5; J. Perrot, *The Organ from its Invention in the Hellenistic Period to the end of the Thirteenth Century* (London, 1971), 49; E. Champlin, *Nero* (London and Cambridge, Mass., 2003), 292 n. 101. Cf. also Dio's account of Domitian's nocturnal banquet: Cass. Dio 67.9.

⁷ Bradley (n. 3), 254.

⁸ See e.g. M.T. Griffin, *Nero. The End of a Dynasty* (London, 1984), 164; Champlin (n. 6), 2 and 80; E. Fantham, 'The performing prince', in E. Buckley and M.T. Dinter (edd.), *A Companion to the Neronian Age* (Chichester, 2013), 17–28, at 20; M. Leigh, 'Nero the performer', in S. Bartsch, K. Freudenburg and C. Littlewood (edd.), *The Cambridge Companion to the Age of Nero* (Cambridge, 2017), 21–33, at 26; J.F. Drinkwater, *Nero: Emperor and Court* (Cambridge, 2019), 123; V. Schulz, *Deconstructing Imperial Representation: Tacitus, Cassius Dio, and Suetonius on Nero and Domitian* (Leiden and Boston, 2019), 197, 227, 234.

⁹ For the date of this oration, see C.P. Jones, *The Roman World of Dio Chrysostom* (Cambridge, Mass. and London, 1978), 133. For Nero's interest in painting and sculpting, cf. Tac. *Ann.* 13.3; Suet. *Ner.* 52.

reality, and not simply a product of literary representation, is one which ought to be taken seriously.

This article examines Nero's association with the water-organ from two perspectives. The first section seeks to explain the role of the water-organ episode in the deconstruction of Nero's memory. My concern here will be in exploring how Suetonius and Cassius Dio use the organ to encapsulate a set of negative Neronian traits—in particular, his excessive devotion to leisure (*otium*), his simultaneous pursuit of multiple *artes*, his immaturity and his lack of political insight. Crucial to the interpretation of this episode, I will argue, is the fact that the *hydraulis* was not simply a musical instrument but also a marvel of technological engineering, invented by a man with strong ties to the intellectual milieu of Hellenistic Alexandria. By casting Nero as a kind of technical expert, endowed with an intimate knowledge of the mechanics of organs, Suetonius and Dio further undermine his credibility as a ruler. In the second part of the article, I shift the focus away from later accounts of Nero to reconstructing Nero's own self-representation. The promotion of the water-organ, I argue, constituted a serious intellectual and cultural move, which aimed to resonate with a broad cross-section of Roman society. More than just a performance artist, Nero imagined himself as an *artifex* in the fullest sense—a champion of *paideia* in all its forms—and, in doing so, he sought to appeal to the scientific and technological inclinations of contemporary Roman elites, as well as to the musical proclivities of Roman spectators who delighted in the organ's booming and mellifluous tones. In the end, his reign came to a premature end, and his experiments with the water-organ were cleverly trivialized by a hostile tradition which framed the whole enterprise as a lesson in (inadvertent) Neronian self-abasement.

II. DECONSTRUCTING NERO'S ORGANS: HISTORY, TRADITION AND REPRESENTATION

The invention of the water-organ was attributed in antiquity to an engineer named Ctesibius, a barber's son from Alexandria who lived during the mid third century B.C.¹⁰ Ctesibius achieved lasting fame as a pioneer in the field of hydraulics. He was credited with the discovery of the piston-pump and the water-clock, among various other *hydraulicae machinae*.¹¹ But the organ was arguably his most enduring creation of all, starting a trend in the manufacture of keyboard instruments that would shape the history of western music for over two millennia.¹² The product of human ingenuity rather than divine intervention, the water-organ was clearly distinguished from the lyre

¹⁰ Vitruvius, *De arch.* 9.8.2; Athanasius, *Deipn.* 4.174b. For a summary of the main arguments surrounding Ctesibius' date, see A.G. Drachmann, *Ktesibios, Philon and Heron: A Study in Ancient Pneumatics* (Copenhagen, 1948), 1–3. Comprehensive studies of the *hydraulis* have been undertaken by Perrot (n. 6) and M. Markovits, *Die Orgel im Altertum* (Leiden and Boston, 2003); see further M.L. West, *Ancient Greek Music* (Oxford, 1992), 114–18; L. Beschi, 'L'organo idraulico (*hydraulis*): una invenzione ellenistica dal grande futuro', in M.C. Martinelli, F. Pelosi and C. Pernigotti (edd.), *La Musa dimenticata: Aspetti dell'esperienza musicale greca in età ellenistica* (Pisa, 2009), 247–66; D. Creese, 'Erogenous organs: the metamorphosis of Polyphemus' *Syrinx* in Ovid, *Metamorphoses* 13.784', *CQ* 59 (2009), 562–77, especially 569–71.

¹¹ Vitruvius, *De arch.* 9.8.4; Pliny, *HN* 7.125.

¹² See P. Williams, *A New History of the Organ from the Greeks to the Present Day* (Bloomington, 1980); P. Williams, *The Organ in Western Culture, 750–1250* (Cambridge, 1993); P. Dessì, *L'organo tardoantico: storie di sovranità e diplomazia* (Padua, 2008).

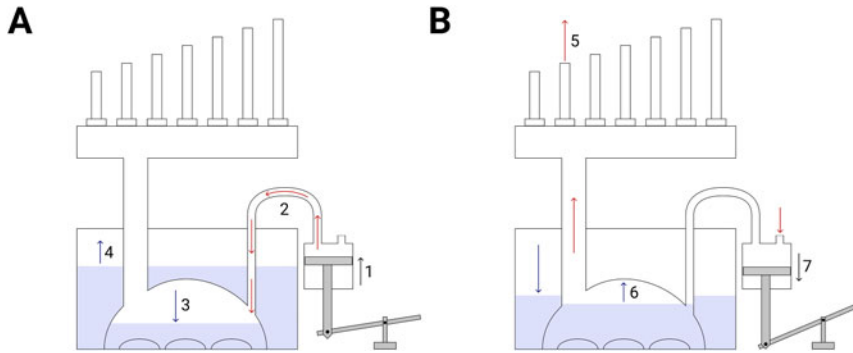


FIGURE 1: Diagram illustrating the mechanism of the *hydraulis* (source: author)

(*cithara*) and the double-pipes (Gk. *auloi*, Lat. *tibiae*), the instruments which underpinned the Graeco-Roman musical experience, in that it lacked a foundation in the mythological tradition. Its cultural cachet derived principally from the fact that it was a man-made invention, designed to astonish as well as to entertain.

The *hydraulis* worked by harnessing the compressed air inside a cistern filled partially with water (Fig. 1).¹³ Two cylindrical pistons on either side, worked by levers, pumped air into a hollow chamber inside the cistern, called a *pnigeus* (A1–2). The incoming air displaced water into the cistern through apertures at the base of the *pnigeus* (A3), driving the water level in the cistern upwards and thereby maintaining the high air pressure within the chamber (A4). When a key was depressed, a spring mechanism allowed the compressed air from the *pnigeus* to escape freely through the pipe, producing a musical sound (B5). As air escaped the pipe, the pressure in the *pnigeus* dropped, allowing water to re-enter (B6). The constant operation of the pistons was therefore necessary to ensure that the organ was primed for playing (B7).

Little is known about the early history of the *hydraulis*. The instrument is first attested in an honorific decree from Delphi, dating from around 90 B.C. The inscription records the achievements of a Cretan organ-player (ὄδραυλος) named Antipatros, who had been invited specially by the Delphic archons to participate in a two-day festival and was subsequently rewarded for his performance with various honours, including a bronze statue.¹⁴ We do not know how or when the Romans first encountered

¹³ Our knowledge of the technical workings of the *hydraulis* derives mainly from the writings of Hero (*Pneum.* 1.42) and Vitruvius (10.8.3–6), as well as from the remains of two water-organs excavated during the twentieth century, the first from Aquincum (modern Budapest) and the second from Dion in northern Greece. On the Aquincum organ, see W. Hyde, 'The recent discovery of an inscribed water-organ at Budapest', *TAPhA* 69 (1938), 392–411; M. Kaba, *Die römische Orgel von Aquincum (3. Jahrhundert)* (Budapest, 1976). On the Dion organ, see Markovits (n. 10), 97–8; Beschi (n. 10), 256–7; C. Stroux, 'Appendice: caractéristiques musicales dell'*hydraulis* di Dion', in M.C. Martinelli, F. Pelosi and C. Pernigotti (edd.), *La Musa dimenticata: Aspetti dell'esperienza musicale greca in età ellenistica* (Pisa, 2009), 267–9. Fragments belonging to a third water-organ, unearthed at Aventicum (modern Avenches), are discussed by F. Jakob, M. Leuthard, A.C. Voute and A. Hochuli-Gysel, *Die römische Orgel aus Avenches/Aventicum* (Avenches, 2000).

¹⁴ *Syll.*³ 737 = *Choix Delphes* 192. There is an erasure in lines 8–9 of the text; Dittenberger, ad loc., restores the name of the games (i.e. Pythian) and the total prize money: τῶι ἁγῶν[ι τῶν Πυθίων δραχμαῖς χιλίας καὶ πεντακοσίας καὶ] εἰκόνι χαλκῆα. The inscription states that additional honours were conferred on a certain Cryton, the brother of Antipatros (lines 13–14), as well as on a group of attendants (line 20), who may have assisted Antipatros in the operation of the instrument:



FIGURE 2: Medallion depicting an organist and a trumpet-player (*cornicen*) on an amphitheatre mosaic from the Roman villa at Nennig, Germany; third century A.D. (photo: Wikimedia Commons)

Ctesibius' invention. They certainly knew of the existence of the *hydraulis* by the middle of the first century B.C., since Cicero alludes to the instrument in his *Tusculan Disputations* (as discussed below).¹⁵ By the time of Nero, at any rate, the organ was familiar to audiences in Rome for its role in accompanying public spectacles of various kinds. In a scene from Petronius' so-called *Cena Trimalchionis*, the sight of a slave carving meat is likened to 'a gladiator in a chariot fighting to the accompaniment of a water-organ' (*essedarium hydraule cantante pugnare*), while in the anonymous poem *Aetna*, usually dated to the 60s or 70s A.D., the *hydraulis* is described as a 'vessel' which 'with its water-worked song makes music in large theatres' (*carmineque irriguo*

see A. Chaniotis, 'A few things Hellenistic audiences appreciated in musical performances', in M.C. Martinelli, F. Pelosi and C. Pernigotti (edd.), *La Musa dimenticata: Aspetti dell'esperienza musicale greca in età ellenistica* (Pisa, 2009), 75–97, at 88.

¹⁵ Cic. *Tusc.* 3.43. Perrot (n. 6), 45–6 speculates that Cicero might have encountered the *hydraulis* at some point during his travels in Greece between 79 and 77 B.C., but there is no direct evidence to support this claim.

magnis cortina theatris ... canit).¹⁶ It is also around the middle of the first century A.D. that the *hydraulis* begins to appear in Roman art. Of the forty or so artistic representations of the instrument which survive, the majority are associated either with gladiatorial spectacles or with performances in the theatre or the circus. In several cases, the *hydraulis* is represented as part of a larger instrumental ensemble, including brass-players (*tubicines/cornicines*) and pipe-players (*tibicines*).¹⁷

What was it about Nero's affinity with the organ that so scandalized the likes of Suetonius and Cassius Dio? Certainly, as Bradley notes, the theme of 'Kunstlermanie' figures prominently in both narratives. One cannot read the passages without being reminded of Nero's notorious exploits on the stage, first as *citharoedus* and later as *tragoedus*—from his public debut at Naples in A.D. 64 to his star turn at the Neronia of 65 to his prize-winning tour of Greece in 66–7. Suetonius makes the theatrical connection explicit by listing the *hydraulis* among the various instruments which Nero vowed to play at his *ludi uictoriae* in 68. Here, as elsewhere, the implication is that the emperor was devoting his time to frivolous pleasures when he should have been attending to important matters of state, not the least of which was how to deal with the mounting political opposition to his rule. Both Suetonius and Dio take pains to stress the severity of the situation in which Nero found himself at this critical point in his reign (*ac ne tunc quidem; καὶ τότε*). Suetonius portrays Nero in typically cavalier fashion, hastily concluding his official business (*transactaque raptim consultatione*) in order to spend the remainder of the day waxing lyrical about his new organs (*reliquam diei partem ... circumduxit*). Dio, by contrast, sets the whole scene at night-time (*νύκτωρ*). Without warning (*ἔξ᾽απίνῃς*), the leading members of the imperial council receive an urgent message summoning them to a crisis meeting in the palace. Nero begins speaking, the first word of his speech, *ἔξεύρηκα* ('I have discovered'), promising the revelation of newly acquired intelligence about Vindex's conspiracy. Yet, in an instant, the tension turns to bathos: there is no mention of Vindex at all; only the revelation of a new and improved *hydraulis*. Dio's narrative plays out as a kind of surreal nightmare, the nocturnal ambience creating the illusion of a topsy-turvy world—a distinctly Neronian world—in which business is conducted under cover of darkness, and work serves merely as a pretext for leisure.

Modern commentators have tended not to detect signs of radical intent in Nero's decision to take up the organ. For example, Edward Champlin, noting the 'progression'

¹⁶ Petron. *Sat.* 36; *Aetna* vv. 296–7. On the date of the *Aetna*, see F.R.D. Goodyear, 'The *Aetna*: thoughts, antecedents, and style', *ANRW* 2.32.1 (1984), 344–63, at 353.

¹⁷ Unfortunately, none of the extant iconography can be securely dated to the period before or during Nero's reign. A tiny engraved gem from the British Museum shows an organ-player accompanied by two assistants who operate the pistons (GR 1859.3–1.112; BM Cat Gems 1051). Markovits (n. 10), 39 dates it to the first century B.C., but does not say on what grounds, while Perrot dates it to the third century A.D. on the opinion of 'experts at the British Museum' (Perrot [n. 6], 84–5 with Plate VIII, no. 2). The *hydraulis* is also represented in two terracotta figurines from Tarsus and Alexandria, variously dated between the first centuries B.C. and A.D. (Perrot [n. 6], 77–8 with Plate V; 99–100 with Plate XVI, no. 1; Markovits [n. 10], 739, Taf. 5 and 6). Also noteworthy is a small graffito of an organ from a *taberna* in Pozzuoli, found alongside a larger graffito of a gladiator's trident; it is usually dated to the mid first century A.D. (M. Guarducci, 'Iscrizioni greche e latine in una taberna a Pozzuoli', in *Acta of the Fifth International Congress of Greek and Latin Epigraphy*, Cambridge, 1967 [Oxford, 1971], 219–23, with Plate 23a; M. Langner, *Antike Graffitizeichnungen: Motive, Gestaltung und Bedeutung* [Weisbaden, 2001], Taf. 153, nos. 952, 2362–3; not mentioned by Perrot [n. 6] or Markovits [n. 10]); this dating is disputed by Creese (n. 10), 571 n. 41.

of Nero's performances 'from private and amateur to public and professional', claims that 'the step from citharody to tragedy was a natural one'; it was natural, too, that 'a tyrant of artistic bent' should develop an interest in wind instruments later on in life.¹⁸ There are, to be sure, many musicians today who are lauded for their ability to perform proficiently on more than one instrument. This was not the case in antiquity, however. For a performer to apply himself to several different musical pursuits at the same time was highly unusual. Indeed, it flew in the face of the established convention that musicians should specialize in one instrument, and one instrument alone.¹⁹ It was certainly not unheard of for citharodes to switch to accompanying the pipes, but this was apparently taken as an admission of failure, since the *cithara* was deemed the more difficult instrument (Cic. *Mur.* 29): 'they say of Greek musicians that aulodes are those who are incapable of becoming citharodes' (*aiunt in Graecis artificibus eos auloedos esse qui citharoedi fieri non potuerint*).²⁰ Nero's brand of multi-instrumentalism was, as far as we can tell, the first of its kind, and in the eyes of conservative elites it represented a radical departure from the cultural norm.²¹ Revealingly, Martial thought it degrading for an esteemed *tibicen* such as Canus to desire to play the bagpipes, presumably on the grounds that such a lowly instrument was unbecoming for a serious concert musician (*et concupiscat esse Canus ascaules?*).²² What, then, could be less worthy of an aspiring *artifex* than to proclaim himself publicly as an expert citharode, piper, bag-piper and organist all at the same time, not to mention the many other activities which he was supposed to have engaged in?

By seeking to subvert the normal rules of artistic performance, Nero displayed in the eyes of his critics not only a lack of dignity and political prudence but also a lack of maturity. An education in the different *artes* could be considered an appropriate grounding for a young *princeps*, but only in so far as it equipped him with skills that would enable him to exercise good judgement as a mature ruler.²³ Nero's problem was that he failed to outgrow his juvenile pursuits. On the contrary, he made them increasingly the focus of his energies. It is notable in this regard that Dio presents the water-organ episode as a particularly egregious example of Nero's taste for jokes,

¹⁸ Champlin (n. 6), 79–80.

¹⁹ A survey of the prosopographical entries in I.E. Stephanis, *ΔΙΟΝΥΣΙΑΚΟΙ ΤΕΧΝΙΤΑΙ* (Heraklion, 1988) and P. LeVen, *The Many-Headed Muse: Tradition and Innovation in Late Classical Greek Lyric Poetry* (Cambridge, 2014), 22–32 yields only a couple of possible exceptions. A fascinating inscription from Aquinum commemorates a female musician who apparently was proficient at both the *cithara* and the *hydraulis* (CIL 3.10501). However, the inscription suggests that the woman played the lyre in private for her husband's benefit (*uox ei grata fuit pulsabat pollice cordas*, line 3), in contrast with the organ, which she performed while being 'watched by the people' (*spectata in populo*, line 7). The depiction of women as skilful lyre-players is a common literary trope denoting education and domestic virtue: see E. Hemelrijk, *Matrona Docta: Educated Women in the Roman Elite from Cornelia to Julia Domna* (London and New York, 1999), 79–80.

²⁰ Aulodes were singers who accompanied *aulos*-players.

²¹ It could be argued, perhaps, that Nero adopted the pipes in an attempt to assimilate himself more closely with his patron god Apollo, with whom he positively compared himself as a singer (Suet. *Ner.* 53). A poem by Alcman (*PMG* fr. 51) represents Apollo as being proficient at both the lyre and the pipes, implying that mortal musicians ordinarily lacked such proficiency.

²² Mart. 10.3.8. Canus specialized as a *choraules* and rose to fame under Nero: cf. Suet. *Galb.* 12.3. On the bagpipes, see A. Baines, *Bagpipes* (Oxford, 1960), 64–6; West (n. 10), 107–9; J.C. Calvo-Sotelo, 'Around the origins of bagpipes: relevant hypotheses and evidences', *Greek and Roman Musical Studies* 3 (2015), 18–52.

²³ On Nero's musical education, cf. Tac. *Ann.* 13.3; Suet. *Ner.* 20, 52.

allowing this one example to speak for the rest (συχνὰ δὲ δὴ καὶ ἤθυρεν, ὧν ἐγὼ τὰ μὲν ἄλλα παραλείψω, ἐν δὲ εἶπω).²⁴ He then goes on to describe Nero's behaviour as a kind of παιδιὰ, 'childish play or amusement' (τοιαῦτα μὲν καὶ τότε ἔπαιζεν).²⁵ The implication is clear: Nero was more interested in playing around with his musical instruments than in the serious business of running the empire. Nor was he the only youthful emperor to display such a fault: Caligula, Commodus, Elagabalus and Severus Alexander are all censured for their devotion to music (Elagabalus and Severus are even supposed to have played the *organum*, perhaps in imitation of Nero himself).²⁶

In many ways, therefore, the water-organ episode reinforces the standard depiction of Nero in the literary sources as an obsessive, transgressive and immature narcissist who preferred the escapist world of show business to the grim reality of imperial politics. The realization that Nero the organist shares similar traits with Nero the citharode and Nero the actor should come as no great surprise of course. But there is, I think, a deeper meaning to be gleaned from this particular episode. After all, Suetonius and Dio *could* have presented the encounter in the Domus Aurea as yet another of Nero's interminable recitals, a sequel to the concert series in Greece. And yet, in neither version of the story is it stated simply that he wished to *play* the organ. The attraction of the instrument for Nero had as much to do with its practical mechanics as with its aesthetic qualities. Suetonius' Nero expends considerable energy on explaining the inner workings of the *organa hydraulica*, their *ratio* and *difficultas*, making a complex machine intelligible and accessible to its audience on an intellectual level: he 'describes' (*dissersens*) as well as 'shows' (*ostendensque*). Dio, similarly, has Nero deliver a direct speech in which he claims personal responsibility for improving the mechanical capabilities of the *hydraulis*. Indeed, Dio makes a point of telling the reader that he is quoting Nero verbatim: "ἐξεύρηκα" ἔφη "πῶς ἡ ὕδραυλις" (αὐτὸ γὰρ τὸ ῥήθην γραφήσεται) "καὶ μεῖζον καὶ ἐμμελέστερον φθέγγεται." It is this 'eureka' moment, so to speak, which forms the crux of the narrative.²⁷ To invent an organ that was 'louder and more musical' certainly required a level of artistic cultivation; but, no less importantly, it also demanded a specialized knowledge that could only be gained by mastering the principles of Ctesibian hydraulics. As recent scholarship has underlined, scientific discourse in Graeco-Roman antiquity was characterized by a strongly competitive ethos. Consequently, 'ancient experts ... tended to reach for self-assertive and ostentatiously innovative first-person personas' which bolstered their claims to

²⁴ Cass. Dio 63.26.4. For the use of (suppressed) catalogues as a feature of Dio's characterization of Nero, see Schulz (n. 8), 227–8.

²⁵ See E. Gowers, 'Persius and the decoction of Nero', in J. Elsner and J. Masters (edd.), *Reflections of Nero: Culture, History and Representation* (London, 1994), 131–50, at 136. Cf. Epictetus, *Encheiridion* 29.3, criticizing those who throw themselves 'like children' (ὡς τὰ παιδιὰ) from one activity to the next: 'they [i.e. children] play wrestlers, again gladiators, again they blow trumpets, and then act a play'.

²⁶ Caligula: Philo, *Leg.* 44, 79, 96; Suet. *Calig.* 11, 54.1; Cass. Dio 59.29; Aur. Vict. *Caes.* 3.12; cf. Philo, *Leg.* 42, describing his 'boyish' (μειρακιωδέστερον) enthusiasm for dancers and mimes. Commodus: *HA, Comm.* 1.8. Elagabalus: *HA, Heliogab.* 32.8. Severus Alexander: *HA, Alex. Sev.* 27.5, 27.9. Titus, too, is said to have acquired an aptitude for singing and playing the lyre as a boy (*in puero*), although he was apparently careful to adhere to proper standards of decorum once he reached maturity: Suet. *Tit.* 3.

²⁷ On the importance of speeches in Dio's history, see J. Rich, 'Speech in Cassius Dio's *Roman History*, Books 1–35', in C. Burden-Strevens and M. Lindholmer (edd.), *Cassius Dio's Forgotten History of Early Rome* (Leiden, 2018), 217–84, especially 224.

intellectual authority.²⁸ Seen in this light, Nero's desire to reinvent the organ (ἔξεύρηκα) looks very much like a typical assertion of technical expertise, perhaps even evoking the memory of Archimedes, whose 'eureka' moment served as a paradigmatic model for scientific thinkers in the Roman empire.²⁹

In fact, it could be argued that, in depicting Nero as a knowledgeable authority on water-organs, Suetonius and Dio were mining a vein of conservative elite disdain towards professional 'inventors' or 'builders' of machines (variously identified in Latin as *mechanici*, *machinatores*, or simply *artifices*). In his *Life of Demetrius*, Plutarch criticizes kings who 'applied their love of *technē* to things that would afford useless pleasure or diversion' (οὐδ' εἰς διαγωγᾶς ἀχρήστους ἔτρεψε τὸ φιλότεχνον), such as 'playing the pipes, painting and metal-working' (αὐλοῦντες καὶ ζωγραφοῦντες καὶ τορεῦντες).³⁰ An example of one such king can be found in Polybius' *Histories*. In a passage discussing the behaviour of the Seleucid king Antiochus IV Epiphanes, Polybius states that Antiochus 'would often be seen wandering about in all parts of the city with two or three companions' and 'was especially to be found at the silversmiths' and goldsmiths' workshops, holding forth at length (εὐρησιλογῶν) and discussing technical matters (φιλοτεχνῶν) with the moulders and other craftsmen'.³¹ The criticism of technophile rulers such as Antiochus IV is suggestive of a broader elite prejudice against vulgar or 'banauistic' occupations. In one of his *Moral Epistles*, Seneca dismisses technological invention as the product not of 'wisdom' (*sapientia*) but of 'ingenuity' (*sagacitas*), a lower form of knowledge.³² Even the great Archimedes is said by Plutarch to have regarded his own mechanical inventions as 'ignoble and vulgar' (ἀγεννή καὶ βάνανσον).³³ Such passages may give us an insight into why Suetonius and Dio represent Nero in the manner that they do. To portray the emperor in the act of *playing* the organ would have been shocking enough. But to cast him in the guise of a humble *artifex*, guiding his audience through the intricacies of his craft, was something altogether more distinctive, and thus all the more powerful as an indictment of Nero's vices.³⁴

III. TECHNOLOGY, INNOVATION AND *PAIDEIA* IN NERONIAN ROME

The surge of scholarly interest in theatre and spectacle which occurred around the turn of the millennium (sometimes referred to as the 'performative turn') has revolutionized

²⁸ J. König, 'Introduction: self-assertion and its alternatives in ancient scientific and technical writing', in J. König and G. Woolf (edd.), *Authority and Expertise in Ancient Scientific Culture* (Cambridge, 2017), 1–26, especially 1–2.

²⁹ For the 'eureka' story, cf. Vit. *De arch.* 9.praef.10; M. Jaeger, *Archimedes in the Roman Imagination* (Ann Arbor, 2008), 17–31. The Archimedean resonance becomes stronger if we imagine that Nero was actually speaking in Greek, the standard language of technical discourse in antiquity: see C. Roby, *Technical Ekphrasis in Greek and Roman Science and Literature: The Written Machine between Alexandria and Rome* (Cambridge, 2016), 80–2. Interestingly, Tertullian (*De anim.* 14.4) claims that the *hydraulis* was the invention of Archimedes and not of Ctesibius.

³⁰ Plut. *Dem.* 20.1–2; cf. Plut. *Dion* 9.2; Diod. Sic. 20.92.1–5; S. Cuomo, *Technology and Culture in Greek and Roman Antiquity* (Cambridge, 2007), 73.

³¹ Polyb. 26.1.

³² Sen. *Ep.* 90.10–11.

³³ Plut. *Marc.* 17.3–4.

³⁴ Similarly, Philostratus (*VA* 4.42.1) conjures an image of a scantily clad Nero singing in a tavern and compares him to 'the most shameless of shop-keepers' (τῶν κατήλων οἱ ἀσελγέστατοι).

modern conceptions of the Neronian Principate.³⁵ The watershed moment came in 1994 with the publication of the volume *Reflections of Nero: Culture, History and Representation*, edited by Jaś Elsner and Jamie Masters. In her important contribution to that volume, Catharine Edwards transformed Nero from a mindless, stage-obsessed fanatic into a highly self-conscious political actor. By subordinating the role of emperor to that of theatrical artiste, Edwards argues, Nero effectively turned the notoriety of public performance on its head, distorting the boundary between appearance and reality and so 'show[ing] he could transcend the rules that ordered the rest of society'. In this way, Nero was able to harness the transgressive power of theatricality in order to 'find new discursive strategies for representing imperial power'.³⁶ Edwards's emphasis on the representational aspects of Neronian stagecraft (and statecraft) laid the groundwork for Champlin's provocatively revisionist monograph, published in 2003. Far from being a maniacal monster, Champlin's Nero comes across as a consummate showman, a 'very serious' performer endowed with a 'ferocious energy', 'passionate determination' and a 'fecund imagination'.³⁷ Above all, the young emperor is portrayed as an expert manipulator of his own self-image, successfully turning popular opinion in his favour by incorporating the language of mythology into his theatrical role-playing.

The modern rehabilitation of Nero has undoubtedly succeeded in facilitating a more nuanced understanding of the emperor and his era. Scholars have become increasingly sensitive to the distorting lens of the historical sources. Contemporary attitudes to Nero were by no means universally negative, and many of Nero's seemingly irrational or trivial actions can be better explained by paying closer attention to the audience(s) at whom such actions might have been targeted. For example, in his book *The Culture of Kitharōidia* (2010), Timothy Power demonstrates how Nero rendered 'the Hellenic language of *kitharōidia* legible and lovable to Romans' by translating a quintessentially Greek art form for a Roman setting.³⁸ Tacitus' derogatory assessment of Nero's supporters at the beginning of the *Histories*—'the plebs accustomed to the theatre and the circus' (*plebs circo ac theatris sueta*)—certainly provides some indication of his popularity as performer.³⁹ Other sources reinforce this impression.⁴⁰

Equally, we should not assume that all members of the elite were opposed to Nero's artistic pursuits. Columella, writing in the middle of the first century A.D., takes for granted the demand among members of his own class for high-quality teachers who specialized in music and dance.⁴¹ The young man praised for his skill at playing the

³⁵ The impact of the 'performative turn' on Neronian scholarship is discussed by M.T. Griffin, 'Nachwort: Nero from zero to hero', in E. Buckley and M.T. Dinter (edd.), *A Companion to the Neronian Age* (Chichester, 2013), 467–80, at 469–71; see also S. Bartsch, K. Freudenburg and C. Littlewood, 'Introduction: angles on an emperor', in eid. (edd.), *The Cambridge Companion to the Age of Nero* (Cambridge, 2017), 1–18, at 2–3.

³⁶ C. Edwards, 'Beware of imitations: theatre and the subversion of imperial identity', in J. Elsner and J. Masters (edd.), *Reflections of Nero: Culture, History and Representation* (London, 1994), 83–97.

³⁷ Champlin (n. 6), 82.

³⁸ T.C. Power, *The Culture of Kitharōidia* (Washington, DC, 2010), 101.

³⁹ Tac. *Hist.* 1.4.3.

⁴⁰ For the popularity of Nero's songs, cf. Suet. *Vit.* 11.2; Philostr. *V A* 4.39.1, 5.9.1. On the infamous 'false Neros', cf. Tac. *Hist.* 2.8; Cass. Dio 66.19.3; Suet. *Ner.* 57.2; also Dio Chrys. *Or.* 21.10; C.J. Tuplin, "'The False Neros' of the first century A.D.", in C. Deroux (ed.), *Studies in Latin Literature and Roman History* 5 (Brussels, 1989), 364–404; Champlin (n. 6), 1–35; C.W. Hedrick, '*Qualis artifex pereo*: the generation of Roman memories of Nero', in K. Galinsky (ed.), *Memory in Ancient Rome and Early Christianity* (Oxford, 2015), 145–66.

⁴¹ Columella, *Rust.* 1.praef.3.

lyre in the anonymous panegyric known as the *Laus Pisonis* is probably the same Piso who conspired against Nero in A.D. 65.⁴² Even allowing for poetic licence, the idealization of a Roman *nobilis* as an accomplished citharode speaks to a society which valued the acquisition of musical skills as part of a well-rounded aristocratic education. At the *Ludi Maximi* of A.D. 59, according to Cassius Dio, senators and equestrians performed in a variety of productions, including some who played the pipes and sang to the lyre (ἠύλησάν τινες αὐτῶν ... καὶ ἐκίθαρόδησαν), just as Nero himself would do.⁴³ They could not have taken part in such performances without the appropriate training; and, as Champlin points out, 'there was no overt coercion of the upper classes to participate'.⁴⁴

The idea that Nero actively sought to elevate the status of the water-organ in the latter part of his reign therefore need not be dismissed as fictitious or far-fetched. The *hydraulis* was, after all, a highly popular instrument associated with mass public spectacles. It is surely no coincidence that Suetonius refers to Nero's intention to appear in public as an organist in a section of the *Life* dealing with the emperor's *popularitas*, his courting of popular approval.⁴⁵ Judging from Cicero's remarks in the *Tusculan Disputations*, the organ was also an instrument which appealed to the rarefied tastes of Roman elites. Cicero finds fault with those of an Epicurean disposition who, in seeking to mitigate feelings of pain or suffering, preferred to listen to the sound of a *hydraulis* than to a dialogue of Plato.⁴⁶ The pleasure derived from listening to the water-organ, Cicero implies, was similar to that derived from eating a fine fish (*accipenserem*), looking at a diverse array of flowers (*florida et uaria*), or smelling a fragrant bouquet (*fasciculum*). In each case, it seems, sensory overload was the desired aim. Perhaps, then, by presenting himself as an ardent supporter of the *hydraulis*, Nero was seeking to capitalize on the instrument's mass appeal in the face of the mounting political opposition to his rule. For an emperor who styled himself as both a supreme aesthete and a patron of the *plebs*, the *hydraulis* represented a potentially useful means of bridging the gap between private (elite) luxury and public (popular) leisure.⁴⁷

There is also the question of technological innovation to consider. If the organ was already popular with audiences in Rome, why introduce a new type (or types)? Why fixate on the organ's *ratio* and *difficultas*? The relationship between emperors and technology is a topic that remains to be fully explored by historians of imperial Rome. It goes without saying, of course, that technology played a vital role in enabling the construction of roads, bridges, aqueducts, canals and other engineering projects undertaken at the behest of, and with the resources of, the emperor. In most cases, this role is simply taken for granted by our sources: technology was a necessary means to an end but seldom the focus of direct imperial oversight. Technical treatises

⁴² *Laus Pisonis* 32, 166–72; cf. Tac. *Ann.* 15.65, on Piso's tragic acting.

⁴³ Cass. Dio 62.17.3.

⁴⁴ Champlin (n. 6), 70.

⁴⁵ Suet. *Ner.* 53.1 (*maxime autem popularitate efferebatur*).

⁴⁶ Cic. *Tusc.* 3.43.

⁴⁷ The appearance of a *hydraulis* on the reverse of a fourth-century contorniate medallion, coupled with an image of Nero on the obverse, may suggest that Nero was remembered for playing the *hydraulis* in later times. However, this idea could be challenged on the grounds that the *hydraulis* also features on other contorniates of the period alongside portraits of Trajan and Caracalla on the obverse: see Perrot (n. 6), 90–1 with plate IX, nos. 1–2; Markovits (n. 10), Taf. 26a; A. Alföldi and E. Alföldi, *Die Kontorniat-Medaillons* (Berlin and New York, 1990), 2.223–4 with additional tables.

are frequently addressed to emperors, in the expectation (or hope) that the recipient would be willing and able to engage seriously with their contents.⁴⁸ Trajan, in Book 10 of Pliny's *Letters*, evinces a concern for the progress of ongoing construction projects in the province of Bithynia-Pontus.⁴⁹ Only rarely, however, does the evidence afford specific insights into the attitude of individual emperors towards technological innovation.

Two notable exceptions are worth singling out. First, Suetonius tells the story of an unnamed *mechanicus* who approached Emperor Vespasian with an invention that allowed heavy columns to be transported up the Capitoline hill at low cost. Although the engineer was rewarded handsomely for his invention, Vespasian refused to make use of it, 'declaring that he must be allowed to feed the common people' (*praefatus sineret se plebiculam pascere*).⁵⁰ The second example relates to the supposed discovery of 'unbreakable' glass. The craftsman responsible was granted an audience with the emperor (identified in some sources as Tiberius). However, instead of rewarding the craftsman for his ingenuity, the emperor had him beheaded, out of fear that the discovery, if made public, would drive down the cost of gold and other precious metals.⁵¹ For Moses Finley, these anecdotes bore witness to the ancients' antipathy towards technological innovation, which resulted in its long-term stagnation.⁵² More likely, the stories are apocryphal; as Kevin Greene explains, they illustrate the particular character traits of the two emperors concerned: Vespasianic *prudentia*, in the case of the column transportation system, and Tiberian *saeuitia*, in the case of the 'unbreakable' glass.⁵³ Nevertheless, it remains the case that in both passages the emergence of novel technologies is presented in strikingly cynical terms. Far from promoting the technologies as a boon to society, the emperors in question suppress them out of a desire not to disrupt the status quo.

Nero's attitude to the water-organ could not be more different. His eagerness to exhibit the *hydraulis* in public, to lay bare its complex machinery and fine-tune its design (at least in Dio's version), speaks to an enthusiasm for technological innovation that finds few parallels, if any, in the tradition of Roman imperial biography.⁵⁴ In fact, the organ episode can be compared with a number of other literary anecdotes attesting to

⁴⁸ Vitruvius, *De arch.* 1.praef.1–3; Frontinus, *Aq.* 1.1; Aelian, *Tactica praef.*1–7 (C.A. Matthew, *The Tactics of Aelian* [Barnsley, 2012], 2–3); Apollodorus, *Poliorketika* 137.1–138.17 (D. Whitehead, *Apollodorus Mechanicus: Siege-Matters (Πολιορκητικά)* [Stuttgart, 2010]); Arr. *Tact.* 32.3, 44.2–3 (E.L. Wheeler, 'The occasion of Arrian's *Tactica*', *GRBS* 19 [1978], 351–65); *De rebus bellicis*, preface (R.I. Ireland, *Anonymi auctoris De rebus bellicis* [Leipzig, 1984]); cf. Cass. Dio 69.4.1–5 for Hadrian's interest in innovative architectural designs.

⁴⁹ Plin. *Ep.* 10.24, 10.40, 10.42, 10.62, 10.91, 10.99.

⁵⁰ Suet. *Vesp.* 18. The meaning of Vespasian's statement is not entirely clear, but it probably relates to the idea that casual labourers should continue to receive wages for public works: see P.A. Brunt, 'Free labour and public works at Rome', *JRS* 70 (1980), 81–100, at 81–3.

⁵¹ Petron. *Sat.* 51; Plin. *HN* 36.195; Cass. Dio 57.21.6. Revealingly, Pliny concludes his account by mentioning a new type of glass that was 'discovered' (*reperta*) during Nero's reign. Rather than prohibiting its circulation as Tiberius had done with the 'unbreakable' glass, he permitted it to be sold on the market but for an exorbitantly high price.

⁵² M.I. Finley, 'Technical innovation and economic progress in the ancient world', *The Economic History Review* 18 (1965), 29–45, at 40–3.

⁵³ K. Greene, 'Technological innovation and economic progress in the ancient world: M.I. Finley re-considered', *The Economic History Review* 53 (2000), 29–59, at 46–50.

⁵⁴ H.M. Hine, 'Rome, the cosmos, and the emperor in Seneca's *Natural Questions*', *JRS* 96 (2006), 42–72, at 66 cites the water-organ episode as evidence that 'the emperor [Nero] was a serious sponsor of technological progress'. Similarly, Drinkwater (n. 8), 123 infers from the episode that Nero possessed a 'liking for gadgets', but does not pursue this idea further.

Nero's scientific curiosity more broadly: for example, his novel method of watching gladiatorial fights through the reflection of an emerald;⁵⁵ or his expedition to discover the source of the Nile, documented by Seneca, Pliny and Cassius Dio;⁵⁶ or his (albeit unsuccessful) attempt to measure the depth of the Alcyonian Lake, by which route Dionysus had descended into the underworld;⁵⁷ or his plan to dig a canal through the isthmus at Corinth (also unsuccessful);⁵⁸ or the so-called *decoctio Neronis*, Nero's trademark drink made by boiling water and then rapidly cooling it in ice.⁵⁹ Collectively, these examples highlight a peculiarly Neronian fascination with artificial technologies and construction projects which appear to defy the laws of nature. In my view, a strong case could be made for adding the water-organ to this list of nature-defying creations. Seneca, Nero's tutor and long-time confidant, alludes to the *hydraulis* in his *Natural Questions* as an instrument which 'by water pressure emits a sound louder than that which can be produced by the human voice' (*aquarum pressura maiorem sonitum formant quam qui ore reddi potest*), likening it on this basis to the horn (*cornu*) and the trumpet (*tuba*).⁶⁰ Dio's suggestion that Nero attempted to make the organ 'louder and more musical' (μεῖζον καὶ ἔμμελέστερον) thus accords well with its reputation as a device with supernaturally loud properties, especially when one considers the unnatural lengths Nero went to in order to enhance the sonority of his own voice.⁶¹

Again, in assessing Nero's technophilia, we should be wary of placing too much confidence in the anti-Neronian sources. Attitudes towards technology expressed within the moralizing genres of historiography and biography are not necessarily representative of the attitudes of Roman society as a whole. As modern scholarship has emphasized, the existence of competing ethical discourses among the Roman aristocracy allowed for the articulation of conflicting value judgements about technology and technical knowledge more broadly.⁶² Seneca, for all his aversion to technological innovation, still deemed the water-organ sufficiently noteworthy to warrant mention in a discussion of the effects of air pressure. Pliny the Elder, meanwhile, goes so far as to place the invention of *organa hydraulica* by Ctesibius on a par with the laying out of the city of Alexandria by the architect Dinochares.⁶³ Most significantly, the mechanical

⁵⁵ Plin. *HN* 37.64; see D. Woods, 'Pliny, Nero, and the "emerald" (*NH* 37,64)', *Arctos* 40 (2006), 189–96.

⁵⁶ Sen. *QNat.* 6.8.3; Plin. *HN* 6.181; Cass. Dio 63.8.1–2.

⁵⁷ Paus. 2.37.5.

⁵⁸ Suet. *Ner.* 19.2; Cass. Dio 62.16; Philostr. *VA* 4.24.

⁵⁹ Plin. *HN* 31.40; Mart. 2.85.1, 14.116, 14.117; Juv. 5.50; Suet. *Ner.* 27.2, 48.3; Cass. Dio 63.28.5. One might add to this list of examples the massive lake which Nero constructed in the Domus Aurea (Suet. *Ner.* 31.1); his vast pool extending from Misenum to Lake Avernus (Tac. *Ann.* 15.42; Suet. *Ner.* 31.3; cf. Stat. *Silu.* 4.3.7–8); and the collapsible boat which he used to drown Agrippina, supposedly inspired by a mechanical stage prop exhibited in the theatre (Tac. *Ann.* 14.3; Suet. *Ner.* 34.2; Cass. Dio 61.12.2).

⁶⁰ Sen. *QNat.* 2.6.5. The loudness of the *hydraulis* is also suggested by an inscription from Rhodes, dating from the third century A.D., which refers to an organ-player belonging to the cult of Dionysus whose role was to 'wake up the god' (τῷ ὑδραύλῃ τῷ ἐπεγείροντι [τὸν θεόν]: *REG* 17 (1904), 203 no. 1b, lines 23–4; *I.Ephesos* 1601a provides further evidence of the use of organs in noisy Dionysiac ritual).

⁶¹ Cf. Suet. *Ner.* 20.1; Plin. *HN* 19.108, 34.166.

⁶² See A. Wilson, 'Machines, power and the ancient economy', *JRS* 92 (2002), 1–32, especially 4–5. For the concept of conflicting ethical discourses in Julio-Claudian Rome, see M.B. Roller, *Constructing Autocracy: Aristocrats and Emperors in Julio-Claudian Rome* (Princeton and Oxford, 2001).

⁶³ Plin. *HN* 7.125.

workings of the *hydraulis* piqued the interest of two prominent technical writers of the first century, Vitruvius and Hero of Alexandria. Vitruvius singles out the organ's 'sophisticated design' (*exquisita ratio*) and ingenious 'complexity' (*subtilitatis; subtiliter*); it was, for this reason, an *obscura res*, something difficult for the layperson to understand.⁶⁴ Similarly, Hero of Alexandria, writing in the time of Nero, provides a close examination of the *hydraulis* in his treatise *Pneumatika*, presenting it as an example of a mechanical device which created a 'wondrous effect' (ἐκπληκτικὸν τινα θαυμασμόν) by harnessing the power of the elements.⁶⁵ Paul Keyser has suggested that Hero's *hydraulis* may have served as the model or prototype for Nero's *organa hydraulica*, on the grounds that Hero likely had contacts with high-profile intellectuals in Rome.⁶⁶ Though this idea remains purely speculative, the evidence clearly confirms the existence of a circle of educated elites in first-century Rome who sought to acquire and disseminate technical knowledge of Ctesibius' invention.⁶⁷ By presenting himself as a well-informed and highly engaged connoisseur of water-organs, endowed with the expert knowledge of a Vitruvius or a Hero, Nero demonstrated that he possessed a superior *paideia*, a kind of technocratic authority, which his subjects ought to emulate.

Moreover, Nero's efforts to promote technological innovation, and the model of *paideia* it represented, could be seen as a deliberate attempt to rival the achievements of the Hellenistic kings in this area. It is surely no coincidence that Nero chose to exhibit his new organs in the opulent surroundings of the Domus Aurea, a complex which was almost certainly inspired by the Ptolemaic royal palace at Alexandria.⁶⁸ The traits of *polymathia* and *philotechnia* were associated particularly with members of the Ptolemaic dynasty. The invention of the *hydraulis* by Ctesibius would not have been possible were it not for the patronage of the early rulers of this dynasty, who provided the scholars of the Alexandrian Museum with much-needed resources and publicity.⁶⁹

⁶⁴ Vitr. *De arch.* 10.8.3–6.

⁶⁵ Hero, *Pneum.* 1.42; cf. *Pneum.* 1.*proem.*15–20. For Hero's date, see O. Neugebauer, *Über eine Methode zur Distanzbestimmung Alexandria-Rom bei Heron* (Copenhagen, 1938), 22; Drachmann (n. 10), 74–7; N. Sidoli, 'Heron of Alexandria's date', *Centaurus* 53 (2011), 55–61. On the significance of 'wonder-making' in Hero, see K. Tybjerg, 'Wonder-making and philosophical wonder in Hero of Alexandria', *Studies in History and Philosophy of Science* 34 (2003), 443–66.

⁶⁶ P. Keyser, 'Suetonius Nero 41.2 and the date of Heron *mechanicus* of Alexandria', *CPh* 83 (1988), 218–20.

⁶⁷ J.M. May, 'Seneca's neighbour, the organ tuner', *CQ* 37 (1988), 240–3 interprets a phrase in Sen. *Ep.* 56.4 (*qui ad Metam Sudantem tabulas experitur et tibias*) as an oblique reference to 'a tuner, builder, or repairer of the *hydraulus*' [*sic*], rejecting the conventional reading *tubulas* [i.e. small pipes] in favour of the variant *tabulas* (which, in his view, represent 'the boards of *hydraulis*'); cf. Vitr. *De arch.* 10.8.3). May proceeds to speculate further that 'Seneca had, in fact, been one of the *primores uiri* who accompanied Nero on guided tours of his favourite water organs'. Such speculation is unhelpful: Seneca retired from the political scene in 62 and was put to death in 65, whereas Nero's association with the instrument is not mentioned until 68.

⁶⁸ See J.-L. Voisin, 'Exoriente sole. À propos de la Domus Aurea', in *L'Urbs: Espace urbain et histoire (Ier siècle av. J.C.–IIIe ap. J.C.)* (Rome, 1985), 509–43; D. Hemsoll, 'The architecture of Nero's Golden House', in M. Henig (ed.), *Architecture and Architectural Sculpture in the Roman Empire* (Oxford, 1990), 10–36; Y. Perrin, 'D'Alexandre à Néron: le motif de la tente d'apparat – La salle 29 de la Domus Aurea', in J.M. Croisille (ed.), *Neronia IV: Alejandro Magno, modelo de los emperadores romanos: actes du IVe Colloque international de la SIEN* (Brussels, 1990), 211–29. On Nero's Egyptomania generally, see M. Cesaretti, *Nerone e l'Egitto: messaggio politico e continuità culturale* (Bologna, 1989), 53–65; S. Mratschek, 'Nero the imperial misfit: philhellenism in a rich man's world', in E. Buckley and M.T. Dinter (edd.), *A Companion to the Neronian Age* (Chichester, 2013), 45–62, especially 46–7.

⁶⁹ See P.M. Fraser, *Ptolemaic Alexandria* (Oxford, 1972), 1.305–35; A. Erskine, 'Culture and power in Ptolemaic Egypt: the Museum and Library of Alexandria', *G&R* 42 (1995), 38–48;

Philo of Byzantium, a Greek writer on mechanics who was active in Alexandria a few decades after Ctesibius, observed that the *technitai* in that city benefitted greatly from the endorsement of kings who were ‘ambitious and lovers of *technē*’ (φιλοδόξων καὶ φιλοτέχνων).⁷⁰ Even the tyrannical Ptolemy VIII Euergetes (182–116 B.C.), who reportedly did so much to undermine the reputation of the Museum, was said to have ‘filled the islands and cities with grammarians, philosophers, mathematicians, musicians, painters, athletic trainers and numerous other *technitai*’, thereby sparking ‘a fresh revival of all types of *paideia*’ (ἀνανέωσις πάλιν παιδείας ἀπάσης).⁷¹ This emphasis on a holistic conception of *paideia* is indicative of the ‘totalizing tendency’ of Hellenistic scholarship more broadly, and represents a striking departure from earlier Athenian notions of *paideia*, which stressed the importance of specialization (Plato, revealingly, criticizes *polymathia* as being ‘a danger to children’).⁷² For Suetonius and Dio, schooled in the Platonic tradition, it was easy to cast Nero’s intellectual pursuits in a negative light; indeed, Dio takes pains to present Nero as the antithesis of a *pepaideumenos*, turning his back on the traditional *paideia* that had been instilled in him as a young boy by his mother Agrippina and his pedagogue Seneca.⁷³ But there seems little doubt that the spirit of Hellenistic *philotechnia* was alive and well in Neronian Rome.

A closer look at the water-organ episode can therefore shed new light on the role of technology, and of *paideia* more broadly, in the cultural politics of the Neronian Principate. As serious as Nero’s theatrical and athletic ambitions undoubtedly were, it is important to recognize that the range of *artes* with which he was associated went far beyond the stage or the circus. Through his various technological and scientific endeavours, Nero made *paideia* a central pillar of his Principate. He sought to create a new monopoly of knowledge, founded upon the institutions and aspirations of the Ptolemaic dynasty but focussed through the prism of Roman imperial power. The organ contributed to this project in more ways than one. With its complex hydraulic mechanism, it represented the epitome of technological refinement. More than just a musical instrument, the *hydraulis* was a marvel of human engineering, whose secrets could only be disclosed by a select group of learned scholars (of whom Nero claimed to be one). Reinvention turned the *hydraulis* into a *miraculum*, something *noui et ignoti generis*, a collectible, a symbol of the emperor’s control over both the epistemic and the physical resources of Rome’s empire. The *hydraulis* was also accessible to the *populus Romanus* at large. As contemporary evidence makes clear, audiences at the games relished its distinctly resonant and tuneful sound—qualities which Nero evidently

M.J.T. Lewis, ‘The Hellenistic period’, in Ö. Wikander (ed.), *Handbook of Ancient Water Technology* (Leiden, 2000), 631–48; M. Berrey, *Hellenistic Science at Court* (Berlin, 2017); R. Strootman, *The Birdcage of the Muses: Patronage of the Arts and Sciences at the Ptolemaic Imperial Court, 305–222 B.C.E.* (Leuven, 2017); F. Schirone, ‘Enlightened kings or pragmatic rulers? Ptolemaic patronage of scholarship and sciences in context’, in P.R. Bosman (ed.), *Intellectual and Empire in Greco-Roman Antiquity* (New York and London, 2019), 1–29. For scientists and other intellectuals in the court of Nero, see Drinkwater (n. 8), 119–27.

⁷⁰ Ph. Bel. 50.3.

⁷¹ Ath. *Deipn.* 4.184c.

⁷² Pl. *Leg.* 811a–b (κίνδυνόν φημι εἶναι φέρουσαν τοῖς παισὶν τὴν πολυμαθίαν); cf. Pl. *Phdr.* 275a2–b1; Heraclitus, DK 22 B 40; Xen. *Cyr.* 8.2.5; Y.L. Too, *The Idea of Ancient Literary Criticism* (Oxford, 1998), 123–4.

⁷³ Cass. Dio 61[60].32.3; on this theme, see B. Jones, ‘Cassius Dio – *pepaideumenos* and politician on kingship’, in C.H. Lange and J.M. Madsen (edd.), *Cassius Dio: Greek Intellectual and Roman Politician* (Leiden and Boston, 2016), 297–315, at 310.

wished to enhance. Inevitably, however, Nero did not manage to persuade everyone. To those of a more conservative disposition, the emperor's *philotechnia* looked like an assault on the very foundations of Roman culture. It was this conservative view that won out after Nero's death and posthumous damnation. Disavowed by surviving elites and redeployed as a moral paradigm, the organ came to symbolize the worst excesses of the Neronian regime.

IV. CONCLUSIONS

The water-organ features prominently in the story of Nero's final days in power as narrated by Suetonius and Cassius Dio. For these writers, the showcasing of the *hydraulis* in the Domus Aurea, which coincided with a period of mounting political tension in Rome, presented a stark illustration of the emperor's moral vices, his pretensions and his delusions, his tyrannical whims and desires. On the one hand, the episode bears witness to Nero's fanatical obsession with all things musical. Blurring the boundaries between reality and fantasy, tension and bathos, it strikes a chord with many other ancient depictions of Neronian theatricality. By branding himself as an aficionado of the organ—and, by extension, as an aspiring multi-instrumentalist—Nero showed that he was willing to transgress the normal rules of musicianship. In doing so, he appeared to demonstrate a shocking disregard for the duties of the imperial office, born out of an inane and selfish devotion to *otium*. On the other hand, we can see in the image of the emperor-organist the channelling of negative Roman attitudes towards technology. For Nero's detractors, it was bad enough that the emperor saw fit to put the organs on display in the first place; worse still was the fact that he was able to talk about them in such elaborate detail, thereby placing himself on a par with the class of professional *artifices* who traded in precisely this kind of technical expertise.

Ultimately, the historicity of the water-organ episode must remain controversial. And yet, with closer scrutiny of the evidence, it is possible to reconstruct a plausible picture of why the 'historical' Nero might have cultivated an image of himself as a collector and connoisseur of water-organs. Recent scholarship on the Neronian Principate has focussed on recovering the subtle and complex ways in which the emperor represented himself as 'artist', 'musician' and 'performer'. The problem with this (otherwise valuable) approach, however, is that it presupposes an artificial divide between the 'arts' and the 'sciences' that is fundamentally anachronistic in an ancient context. The Greek word τέχνη, and its Roman equivalent *ars*, encompassed an extremely wide range of intellectual and practical disciplines, including not only music, dance and poetry but also philosophy, mathematics, rhetoric, painting, sculpting and much more.⁷⁴ Likewise, the term *artifex* (τεχνίτης in Greek), though often associated with musical or theatrical performers, referred strictly to anyone who practised a skilled craft, including *mechanici* and *machinatores*.⁷⁵ In this sense, 'music' and 'technology' were not regarded as discrete branches of learning but rather as part of the broad spectrum of *artes* (or *disciplinae*) which collectively comprised the epistemic system of *paideia*. The origins of this intellectual worldview were Hellenistic—or, more

⁷⁴ Cuomo (n. 30), 1; König (n. 28), 3–4.

⁷⁵ Cf. *TLL* 2.696.65–77 (Klotz).

specifically, Alexandrian. But it was a worldview shared by many elites in Rome, as demonstrated by writers such as Vitruvius and Seneca, whose works are imbued with a deep knowledge of technical subjects (including both hydraulic engineering and music theory). Crucially, in the case of the water-organ, the elite appetite for technological ingenuity went hand in hand with a popular appetite for novel types of public entertainment. These twin factors made the *hydraulis* a potentially effective means of configuring and consolidating imperial power.

Sadly, for Nero, the end came too soon. Vindex's rebellion was eventually thwarted (that satisfaction at least was afforded to the emperor), but the unrest in Gaul set in motion a chain of events that, within the space of just a few months, would bring about the total annihilation of the Julio-Claudian dynasty. Nero never had the opportunity to perform on the organ in public, as he so desperately desired.

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