CHAPTER 4

TECHNICAL DIVINATION AND MECHANICS OF SACRED SPACE

'Technical Divination' and 'Technologies of Divination'

When it came to ascertaining the will of the gods, ancient Greek worshippers were spoiled for choice of technique. The worshipper could gaze into a mirror, a lamp, or a bowl, cast dice and match the throw to a pre-inscribed list of oracular responses, or pose a question and draw lots for the answer. At times, they received divine answers through manifestations of the natural world; at other times, the divine was mediated through an inspired human being, either an ordinary individual via dreams or through the figure of a prophet(ess).[1]

This is by no means an exhaustive list, and already in antiquity there was a desire to sift through these techniques and to categorise them. Plato, then Cicero, divided the heterogeneous divinatory methods available to the ancient worshipper into two separate groups: the 'enthusiastic' and the 'technical'.[2] The former worked through the possession of a human by a supernatural power, the latter through the interpretation of signs. Plato in his *Phaedrus* distinguishes linguistically between divinely inspired prophecy (*mantikē*) and human interpretation of augurs (*oiōnistikē*); Cicero tells us that two kinds of divination existed, one dependent on art (*ars*), the other on nature (*natura*). Both authors profess their own views on which category was more likely to provide direct access to the gods, but we should beware of taking these overtly intellectualised and elite statements as representative of broader religious attitudes. The enthusiastic–technical divide as it is presented in

[1] Bouché-Leclercq's four volumes on ancient divination (1879–82) long ago recognised the plurality of divinatory methods available to the ancient worshipper.

[2] Pl. *Phdr.* 244d; Cic. *Div.* 1.6.11–12; 1.18.34; 2.11.26–7; 2.100. Arthur Stanley Pease's commentary on Cicero's *De divinatione* (1920/3) is indispensable both for understanding the text and for its discussion of ancient divination more broadly.

the ancient sources, coupled with Protestant approaches to theology, did, however, encourage modern scholars, for a time at least, to privilege the enthusiastic. Further influenced no doubt by Herodotus' *Histories*, the divination of Delphi's Pythia was seen as the method par excellence Greek worshippers used for divine advice and approbation.[3]

Even at Delphi, however, there are clear (if exceptional) cases where sortition was used alongside enthusiastic prophecy.[4] Dodona – the other sanctuary mentioned by Plato as the quintessential place for enthusiastic *manteia* – also had a system of lots using lead tablets for divinatory enquiry, as recent work has shown.[5] A truly accurate picture of divination at Dodona should also include mantic interpretations of the unique soundscape of the oracular site in the combination of the rustle of the sacred oak, singing of doves, and ringing of bronze.[6] A similar case for the pluralism of operators, techniques and organising principles could be made for divination at Claros and Didyma.[7] Large, institutionalised oracular sites including Delphi, Dodona, Claros, and Didyma existed alongside 'independent' diviners known as *manteis* and *chrēsmologoi*. Recent research into these figures, and the array of techniques that they employed, has helped to recalibrate the picture of ancient divination, leading to the general acceptance that both institutionalised oracles and their independent counterparts offered an array of techniques to access the divine.[8] Any strict delineation between technical and enthusiastic methods of divination, then, becomes fuzzy outside of the testimonia of Plato and Cicero.[9]

[3] Parke and Wormell 1956 followed by Fontenrose 1978 are seminal and still irreplaceable volumes on the operations, questions, and responses at Delphi. Subsequently see also on Delphi and its oracle from a range of angles: Amandry 1950; Burkert 1985, 115–17; Parker 1985; Morgan 1990; Maurizio 1995; Bowden 2005; Scott 2014; Kindt 2016.

[4] It was, for a rather long time, held that a system of binary lots was used at Delphi but Lisa Maurizio 2019 has recently reviewed the evidence and concludes, convincingly, that the Pythia did not *regularly* use lots at Delphi.

[5] Pl. *Phdr.* 244a–b. Lhôte 2006; Eidinow 2007, 2013; Dakaris, Vokotopoulou, and Christides 2013; Parker 2015, 2016. The use of lots at Dodona was hitherto attested only in a story told by Cicero from Callisthenes: *Div.* 1.34.76, 2.32.69 = FGrH 124 F 22 (a) and (b) 111.

[6] Cook 1902; Bosman 2016; Harissis 2017; Chapinal-Heras 2021, 101–33; Angliker 2021.

[7] Greaves 2012; Lampinen 2013.

[8] Bowden 2003; Dillery 2005; Flower 2008; Johnston 2008, 109–43.

[9] See especially Flower 2008, 84–91.

Nevertheless, the terminology, if redefined, proves useful for the task at hand. All ancient divinatory techniques were perceived to involve cooperation between gods and mortals, yet some forms undeniably relied more on human input than others. While the ancient category of 'technical' divination relates to the teachable skill of decoding signs, I take the liberty of misappropriating the term and refer to 'technical divination' and 'technologies of divination' to stress the human application of *technē* to construct and validate divinatory methods. Indeed, in an expanded sense, all communication relies on *technē* since language and voice are also *technai*. The focus of this section, then, is on the intensification of technicity in human–divine communications, rather than the introduction of a completely alien concept. I pull out examples from the subset of techniques of divination that relied on and, at times, specifically revelled in humanly fashioned technologies by which to access divine knowledge, and which thus served to manifest divine presence. In this, I redirect attention away from the questions and answers of ancient divinatory contexts (issues that are already well covered in scholarship, as we shall see) to the objects, techniques, and technical knowledge that were involved. I wish to interrogate what the human hand's intervention in constructing access to divine knowledge meant, both theologically and in terms of religious experience.

The very definition of divination, and the role it played in ancient Greek culture and society, has been much debated by scholars.[10] While traditionally divination is described as a quest to ascertain the future (in most cases to quell anxiety), some scholars have highlighted the ways that divinatory practice can conversely be used to make sense of and justify occurrences in the present and even the past. Divination has been seen as a public act concerned with community and politics, or as an intimate act of self-knowledge. In almost all instances, studies on

[10] See useful reviews of literature on ancient divination in Johnston and Struck 2005; Johnston 2008; Struck 2016. Notable recent contributions include: on oracles Eidinow 2007; on oracle stories Kindt 2016; on divination and experience Beerden 2013; Kajava 2013; Motte and Pirenne-Delforge 2013; Rosenberger 2013; Driediger-Murphy and Eidinow 2019.

ancient divination focus on the questions posed, answers received, and the interpretative moment – 'making sense' of the divine response either from a sociopolitical or a religious perspective. I turn instead to the act of divination itself and, above all, to the processes, techniques, and environments involved. I interrogate the humanly constructed, divinely authenticated channels which allowed human questions to secure divine answers. Divination redirects information – and usually information that is perceived to solve problems – between the everyday, human world and the supernatural world. The insertion of specialised *technē* into the process of bridging the worlds to begin with is a way to bring divine knowledge into the realm of human knowledge and human control. Rather than defining divination as about the future, or about making sense of the past, or as a means to solve human anxieties – all of which put the emphasis on the divine answers – I intentionally draw attention to the techniques and technical knowledge in place to achieve contact with the divine and to make the supernatural manifest. In other words, standing in opposition to an unsought epiphany, divination may be described as a quest for epiphany through humanly manufactured techniques and media.

Understanding divination as a quest for epiphany is perhaps easiest when we think of the possessed Pythia at Delphi, or of Amphiaraos appearing in a dream to tell the Athenians what to do with Oropos.[11] It is less obvious in cases where divination is undertaken according to processes of randomisation and rationalisation through *objects*, as in the case of astragalomancy (casting dice) or catoptromancy (prophecy through mirror reflections), for example. Analysis of these methods of 'technical divinations' as quests for epiphany allows us to ask what role the objects have in mediating with the divine sphere, and with making the divine present. This brings us once more to an understanding of the potential of objects to be social actors and to have agency and, in this context, a particular kind of agency which allows the object – the knucklebone, the bronze – not to *be* the divine (as in the case of the cult statue), but to shape the human–divine interaction by

[11] For the latter see Hyp. *Eux*. On oracle stories as epiphanic tales, see Kindt 2018.

acting as a mediator between two worlds. I will argue, perhaps counter-intuitively, that human intervention in 'technical divination' increased the authenticity of the divine encounter by setting up effective channels for transmission of divine *sēmata* that boosted the clarity of the 'signal' and lessened the impact of interfering 'noise'.

Shaping the Dice: Astragalomancy and Mathematical Probability

Both regularly shaped six-sided dice (*kyboi*) and irregularly shaped four-sided knucklebones (*astragaloi*) were used in divinatory contexts all over the ancient Greek and Roman worlds.[12] In their natural state, *astragaloi* were unevenly shaped rectangular prisms with two rounded ends, meaning that they only ever had four sides on which to land: two of these sides were narrow, and two were broad. One of the narrow sides was concave, the other convex, and the same was true of the broad sides. Finds of *astragaloi* in their natural state are plentiful in the archaeological record, as are those which have been pierced, flattened, embellished, inscribed, or replicated and monumentalised in other materials such as bronze or ivory. Humans clearly took an interest in these objects beyond their existence as sacrificial waste and sought to invest them with a different ontological status through various interventions. Crucially for this discussion, manipulating the mathematical potential – both combinatorial and probabilistic – of *astragaloi* was one such intervention.

It is not entirely clear how astragalomancy worked and there is a great chance in any case that practice varied over time and place. In general terms, different rolls of *astragaloi* corresponded to answers which were delivered either by pre-inscribed inscription, or possibly by a pronunciation given in the moment.[13] A well-studied case of the former comes to us through a unique

[12] Larson 1995; Graf 2005; Greaves 2012; Swift 2017, 124–46, 206–11; Carè 2019, 2024. For their use in gaming see Amandry 1984, 376; Gilmour 1997, 171–3; Kurke 1999; Kidd 2020.

[13] A very brief description is offered by Paus. 7.25.10. See discussions of possible practice in Graf 2005; Greaves 2012. In a wonderful discussion on ancient counting tokens and

series of inscriptions recording a set of prescribed answers at an Anatolian site of astragalomancy.[14] We will return to this site in a moment, but for now it suffices to note that in his analysis, Fritz Graf focuses on how the act of rolling the dice or *astragaloi* makes *randomising* integral to the divinatory moment. I will instead place emphasis on the (complementary) act of *regularising* the shape of *astragaloi* prior to the roll in order to see what this might tell us about objects, gods, and technical knowledge.

Given the polysemantic nature of *astragaloi* ranging from (and switching between) weights to toys to objects involved in sacrifice, dedication, and prophecy, it is not always easy to determine whether finds of knucklebones at sanctuaries had a strictly mantic function. Aside from the Anatolian site where the epigraphic evidence provides unique assistance, Alan Greaves has made a good argument for the connection of the site of Branchidai-Didyma to astragalomantic practice during its Archaic existence.[15] Similarly, the Korykeion Cave near Delphi where around 23,000 *astragaloi* were recovered, of which around 4,000 bones had been modified in some way, is a site that lends itself well to possible conjectures of astragalomancy.[16]

Various components affect the mathematical probability of the rolls of ancient *astragaloi*. The first is, quite simply, their natural shape, which is determined by the animal from which they were sourced. *Astragaloi* were made from the bones of sheep, goats and pigs. The knucklebones of these animals naturally have more evenly spread rolls than the bones of cows, buffalos, asses, and horses.[17] The common use of sheep, goats, and pigs in sacrifice, and thus the availability of these knucklebones for repurposing, should be taken into account, yet it is striking that the bones of another common sacrificial animal, cows, are excluded. Their larger size may have been a contributing factor, but the uneven distribution of rolls of bovine *astragaloi* was possibly at stake too.

their cognitive and material significance, Netz 2002, 340–1 notes the 'double materiality' of the practice of astragalomancy, which relies both on the dice and on the tablet, and points out that this is reminiscent of the Western abacus.

[14] See Graf 2005, 61–2 with Maurizio 1995, 69–86 and Johnston 2001, 109–13 on the topic of randomising more generally in Greek divination.

[15] Greaves 2012. [16] Amandry 1984, 347 with the interpretation of Larson 1995.

[17] Greaves 2012, 183–7.

In this case, it seems that ancient Greek practitioners of astragalomancy were aware of the mathematical probability of the rolls and how to affect these. Even with the preselection of species, two sides of an unaltered *astragalos* are far more likely to appear than others. Though *astragaloi* could be modified in various ways, there are two interventions that specifically impacted the probabilities of the throws: shaving part of the bone, and filling in the concave portion, both of which essentially aim to flatten and even out the sides. Archaeological evidence shows that there was no standardised way to flatten ancient *astragaloi* and, indeed, the degrees of flattening vary incredibly in the material record.[18] We are left with a curious picture: the modifications to the *astragaloi* appear mathematically informed as they are effective in spreading the odds of the rolls more evenly than prior to intervention. At the same time, this never quite achieves the exact 25 per cent per side.[19]

The inscriptional evidence allows us to deduce that at the astragalomantic site in Anatolia, five *astragaloi* were rolled at once, and each of the fifty-six possible rolls would match up to a pre-formulated oracular answer. These same fifty-six oracles could also be consulted if three (six-sided) dice were rolled. The sophistication of the combinatorial knowledge that the Anatolian site exhibits is noteworthy.[20] When we add to this the manipulations of individual *astragaloi* for more consistent rolls, we see in the ancient practice of astragalomancy not just an erudite use of mathematical combinations, but also an interest in and manipulation of the frequency of the appearance of the individual faces which constitute these multi-dice combinations. Worshippers wanted to arrive close to equal probability for the rolls on each individual dice before these objects were deemed effective media for the transmission of divine will and subsequently placed into combinatorial sequence for interpretation. There is a real attempt here of regularising the randomising, of mathematically containing the uncontainable breadth that was the entirety of divine will.

[18] I am grateful to Barbara Carè for sharing with me her wealth of knowledge on *astragaloi* in the archaeological record.
[19] Greaves 2012, 186–7. [20] Compare Kidd 2020, 18.

Siegert's notion of cultural techniques, introduced earlier in the book, is again useful at this juncture.[21] If, as we have seen, claims like 'counting existed before numbers' are integral to the theoretical profile of cultural techniques, then we might like to think of the way that games of chance as a cultural technique preceded gambling.[22] Further, Siegert stresses that operations (e.g. counting or writing) always presuppose technical objects which are 'capable of performing – and to considerable extent, determining – these operations.'[23] This helps us to see how dice existed before probability and that the former are cultural techniques that perform and determine the media concepts subsequently generated. From the point of view of media theory, then, the regularising of knucklebones helps to set up an effective channel for transmission of divine *sēmata* that 'tunes' the clarity of the 'signal' without any interfering 'noise', as it were. It is a technological intervention that effectively effaces itself in the service of neutrality. From the point of view of the worshipper, regularising dice is a way for the human worshippers to increases the 'objectivity' of these media to communicate divine will. Tampering with the mathematical probability of *astragaloi* is a peculiar theological statement: being supreme as they were, why could the divine not simply affect the dice as needed despite the object's natural bias? Shaping the *astragaloi* is both an acknowledgement that divine–human communication remains imperfect, as it relies on constraints imposed by the human world, and an attempt to reduce the impact of these constraints. At the same time, the fact that the throws are still not equally distributed anticipates and justifies – mathematically and materially – the possibility of miscommunication or misinterpretation.[24] Lest this all sound too serious or intellectualised, we might like to remember that *alea* is a fundamental category of play too. Regularising is thus a way to uphold the illusion of parity in the interaction between the two parties, but the aleatoric element stands as a reminder of the

[21] See pages 15–16.
[22] Kidd 2020 looks at the intriguing issue of why mathematical probability did not develop until the sixteenth century despite gambling with dice being popular in antiquity. Our different foci and approaches mean that we diverge on a few issues.
[23] Siegert 2015, 11.
[24] Compare misinterpretation of the Pythia's enigmas on which see page 3n6.

indeterminacy of divine will which in other contexts might just be termed 'chance'.[25]

Two main conclusions can be drawn. First, this case study brings to the fore the counter-intuitive notion that human involvement does not *decrease* religiosity and chance but increases it. Second, the fact that *astragaloi* remain probabilistically uneven – and that they coexist with rather than being replaced by regular six-sided dice – can be explained theologically as manifesting the religious realities of Greek supernatural entities whose knowledge will always be difficult to apprehend perfectly in the human realm, but which comfortably uses technical (here, mathematical) knowledge and intervention to get as close to it as possible.[26] There is a lot of work still to be undertaken in the study of *astragaloi* in general, as well as their use in divinatory contexts specifically, but if what I suggest is correct, it helps us to understand the theological underpinnings of an otherwise obscure practice as derived from the technical modifications on religious objects involved in the ritual.

Divine Reflections: Catoptromancy and Architectural Epiphanies

Mirrors are another common, yet commonly misunderstood, medium of human–divine communication in ancient Greek religion. Not only were they frequent votive dedications, they were also used for divination and erected in sacred spaces to increase religious aura. Mirrors make a particularly interesting case study for the subject at hand because we are able to put the anecdotal evidence for the use of mirrors in religious contexts into conversation with technical texts on the science of reflection (catoptrics) to gain insight into the intended effect of reflection on the viewer.[27] In doing so, it becomes apparent that mirrors are theologically useful in ancient Greek religion neither for their ability to produce glare or iridescence, nor for their potential to reflect an image accurately, but, on the contrary, for their capacity

[25] On both *agōn* and *alea* relying on parity of conditions, see Caillois 1961, 74.
[26] On 'loading' six-sided dice to skew the outcome of a throw in the Roman context, see Swift 2017, 127–30.
[27] On the ancient mirror, see McCarty 1989; Balensiefen 1990; Frontisi-Ducroux and Vernant 1997; Bartsch 2006; Taylor 2008; Gerolemou and Diamantopoulou 2020.

to create optical illusion.[28] This was in part inherent within the materiality of the ancient mirror, where the lens made of slightly curved bronze resulted in reflections that were both less clear and less accurate than those of modern glass mirrors. The natural obscurity and distortion of the ancient mirror was, however, further manipulated to great effect through the application of catoptric knowledge, as ancient scientific manuals make clear. The various 'trick' mirrors described in these technical texts speak directly to instances where mirrors were used in ancient divinatory contexts, as well as to enhance the religiosity of the temple space. In both contexts – which are united if we see them as cases of sought and unsought epiphanies, respectively – it was the ontological gap between the real and reflected image that enabled the ancient Greek worshipper to connect with the ever-distinct realm of the supernatural.

Greek catoptric manuals are chiefly concerned with how a variety of visual experiences can be manufactured and manipulated according to the reflection of rays. The arrangement of three types of mirrors – plane, convex, and concave – are used to exploit the difference between the real image and its reflection in a number of creative ways including magnification, multiplication, and omission in the technical texts of Euclid, Pseudo-Hero, and Ptolemy, for example.[29] The Heronian author, in particular, gives insight into the catoptric 'programme', or the practical ways to use geometrical optics. He explains that reflection gave humans a way to observe what was not typically observable, whether this was a human body in unexpected form, something happening behind you, or what your neighbour was doing across the street.[30] In other words, catoptric knowledge allowed for the human production of the ontologically slippery thing that was reflection and, further, according to the vocabulary of the ancient text, this provoked

[28] I demonstrate this more fully using a comparative ethno-anthropological approach in Bur 2020.

[29] For example, Magnification: Ps.-Hero *Catoptr.* 15. Compare Euc. *Catoptr.* 5, which it closely follows. Distortion: Ps.-Hero *Catoptr.* 17. Compare Ptol. *Optics* 4.161; Anthem. *On Burning Mirrors* 5. Multiplication: Ps.-Hero *Catoptr.* 20, 23 (a version of Euc. *Catoptr.* 14). Omission: Ps.-Hero *Catoptr.* 10 (a model inspired from Euc. *Catoptr.* 4. Euc. *Catoptr.* 5 and 6 create the same effect off concave and convex surfaces).

[30] Ps.-Hero *Catoptr.* 2.5–11 with Ps.-Hero *Catoptr.* 17 and 22. On the authorship of this text, see Bur 2020, 111n29.

wonder.[31] Given such an understanding of reflection, it comes as little surprise that mirrors were harnessed in ancient religious contexts. We have touched on this tangentially already in the context of catoptric epiphany in Dionysiac mystery cult and now turn our attention to evidence for the uses of reflection in Greek religion more broadly.[32]

The practice of mirror divination in ancient Greece is attested in a variety of sources from the lampooning of catoptromancy using a well-oiled shield in Aristophanes, to the serious sanctuary description of a mirror suspended over water in Pausanias, to the unease of Iamblichus and Clement of Alexandria regarding the mirror's ability to access divine truth.[33] Exactly how ancient Greek catoptromantic rituals were undertaken, or according to what paradigm the mantic message in the reflection was decoded, is not clear, likely due to the fact that there was no real consistency. Fortunately for us, however, this does not impede an understanding of why reflection was theologically compelling. Alongside the use of mirrors in the context of specific divinatory (and mystery) rituals, reflections were also a generally effective way to manufacture or enhance divine presence within sacred space thanks to their capacity for creating an ontological 'other'. Plenty of the mirror arrangements described in Pseudo-Hero could have been used for this purpose but two are remarkably persuasive given complementary anecdotes elsewhere. The first is a mirror termed a 'multi-view' (*polytheoron* or *multividum*) which comprised two bronze, rectangular, plane mirrors connected along one side with a hinge.[34] From this fairly simple catoptric arrangement, a mirror of exciting visual potential ensued which, the author explains, could animate unexpected iconographic forms from a three-headed Zeus to dancing victories, to Athena being born from the brow of Zeus, and

[31] Ps.-Hero *Catoptr*. 2.4. 'We see too that the topic of catoptrics is also worthy of study – for it possesses a certain wonderful observation' (*videntes autem et katoptricum negotium esse dignum studio – habet enim quandam* ***admirabilem speculationem***).

[32] See page 75.

[33] Ar. *Ach*. 1128–31 with schol. Ar. *Ach*. 1128a and Suda K 867; Paus. 7.21.11–13 with Luc. *Ver. Hist*. 1.26; Iambl. *Myst*. 2.10.93–4; Clem. Al. *Strom*. 7.3.13; Clem. Al. *Protr*. 2.18.1. On ancient catoptromancy see Delatte 1932; Addey 2007.

[34] Ps.-Hero *Catoptr*. 18.1–2 with Schmidt 1976, 412 on lacunae. Compare Anthem. *On Burning Mirrors* 5–7 for a similar mirror.

distorted bulls' heads. A similar use of mirrors for the projection of distorted images in a temple in Smyrna is preserved in Pliny.[35]

The second example of common ground between technical and religious content is the description by Pseudo-Hero of a mirror which was constructed 'so that everyone who approaches will see neither himself nor someone else, but only whatever image (*imaginem*) someone has chosen in advance'.[36] We can extract from this a clear expectation on behalf of the individual to see themselves reflected when they approach a reflective surface, and thus a sense of cognitive dissonance when this is subverted. According to an often-cited description by Pausanias, it appears that exactly this kind of mirror was erected in the Temple to Despoina at Lykosoura.[37] There, the worshipper saw not themselves reflected, but images (*agalmata*) of the gods and thrones instead. Without wanting to press the language too hard, one does wonder whether the *imago* of the medieval Latin was originally Greek *agalma*, which would further help in contextualising the Heronian mirror and thus strengthen its association with a religious context. In any case, the argument that I would like to make is that beyond relating mirrors to Greek religion in non-specific terms, as is often done in scholarship, we can perhaps be more nuanced in describing the place that optical tricks facilitated by mirrors as embodiments of catoptric knowledge held in ancient religion. This in turn allows us to talk about elements such as distortion, visual illusion, and paradox as part of the lived experience of ancient Greek religion, and especially of epiphany.

Properly situating mirrors and catoptric knowledge within ancient Greek divination and epiphany also speaks to and extends scholarly explorations on the interior of temples. There is an obvious point for comparison with the use of water or oil at the foot of cult statues, for example, known to have been used in the temples of Athena Parthenos and Zeus at Olympia, as well as in the temple to Asklepios at Epidauros. Scholars have noted that such use of reflections would 'enhance the religious atmosphere'

[35] Plin. *HN* 33.129.
[36] Ps.-Hero *Catoptr.* 24. Euc. *Catoptr.* 1 and Anthem. *On Burning Mirrors* 4 are based on the same geometrical problem. Compare Jones 1987, 8–11.
[37] Paus. 8.37.7; Platt 2011, 222–3.

(*vel sim.*) of the temple, but the problem with these sorts of statements is that, though they may well be right, they are intuitive and as such rest on modern preconceptions of what is theologically enchanting.[38] My focus on mirrors uses catoptric manuals to sidestep this methodologically dangerous formulation in order to better understand what was religiously compelling about reflections from an emic point of view. The answer from these technical texts is the capacity of catoptrics to play with the gap between the real and the reflected, and thus to play with ontology.

Further productive comparisons may also be drawn from thinking about how catoptrically induced epiphany worked with other architectural elements that capitalised on visual manipulation, such as so-called epiphany windows in Hellenistic temples.[39] Christiana Williamson has recently explored the way that Greek temple doors functioned as portals of epiphany especially via visual access to the cult image.[40] Williamson's analysis considers both main temple doors as well as curious door-like apertures in a number of temple pediments, notably in Asia Minor, which can be explained if considered as spaces for epiphanies and their re-enactments. Epiphany windows speak quite directly to staged epiphanies looking both back to the *deus ex machina* of Part I, and forward to the discussion of Lucian's *Alexander* in Part III. Somewhere like the Hellenistic Temple to Apollo at Didyma is a unique case which inverts many of the expected features of religious architectural *technē* to great theological effect.[41] In many ways it is the exception that helps to prove the rule. Archaeological remains from the site reveal a colossal 14-metre-high door which, instead of giving an epiphanic glimpse of the cult statue within, took worshippers into a *pronaos* where their physical and visual trajectory was then unexpectedly thwarted by a 1.46-metre-high wall above which was a large rectangular 'window' 5.63 metres in height. Entrance to the inside of the temple was instead through steep, claustrophobic, vaulted

[38] The use of oil or water pools in front of cult statues could also have the very mundane purpose of keeping the ivory moist enough not to crack.
[39] Miles 1998–9, 21–3; 2016, 363. Generally on temple interiors compare Tanner 2006, 46–8.
[40] Williamson 2018.
[41] Parke 1986; Williamson 2018, 327–32 with further bibliography.

tunnels which stood on either side of the *pronaos* and which allowed only one person abreast. The temple's architecture also subverted expectations of light and dark where instead of progressing from brightness towards a darkened *cella*, the peristyle of the Didymaion was densely colonnaded while the innermost court was open-air, containing an oracular spring and sacred laurel grove. Thinking through the lens of lived religious experience, of how the worshipper would have navigated the space, and how the space would have navigated the worshipper, we get a nice sense of how the *technē* of architecture at the Temple to Apollo at Didyma was consciously manipulated to speak to theological realities concerning access to the divine. At this site, access to Apollo and his mantic advice was anything but direct and straightforward: openings ended up being dead ends and less-than-monumental spaces in fact led to light and epiphany. A theological analysis of Greek temple architecture helps to enrich the picture of technically enhancing divine presence.[42] It allows us to situate the mechanical miracle within a range of technical strategies used to manifest the gods in ancient Greek religion, rather than to dismiss the phenomenon as an outlier.

Trophonios, Tunnels, and Underground Temple Architecture

Staying with the use of technical knowledge to increase the religiosity of sacred settings, but coming back to the specific context of divination from which we have strayed, we turn now to the oracle to Trophonios at Lebadeia in Boeotia, and to its construction of a unique, artificial divinatory setting. Consulting Trophonios was an overtly manufactured experience where human *technē* was essential to achieving a connection with the divine, creating a particular(ly Greek) religious experience and containing particular(ly Greek) theological presuppositions.

The oracle is known to have been in use as early as the sixth century BCE. Herodotus records instances when it was consulted,

[42] Juan De Lara has just completed a fascinating dissertation on the use of light to create sacred aura in Greek temples (2023).

including by Croesus in his famous 'testing' of the oracles.[43] Pausanias mentions that the oracle gave a pronouncement about the battle of Leuctra of 371 BCE, and it appears that Celsus was also urging visitors to go there at a similar date to Pausanias' own visit to the site.[44] This well-known religious site of Panhellenic importance evidently had a long life. The curious method of divination practised at the site has not come down to us in descriptions earlier than the second century CE, yet the terrifying nature of a Trophonian consultation was familiar enough to a fifth-century BCE Attic audience for it to be the source of a joke in Aristophanes' *Clouds*.[45] Moreover, though it is now lost to us, we know that a pupil of Aristotle's wrote a two-book treatise entirely dedicated to the descent to the Trophonion.[46] Four extant accounts are of particular interest because they are extensive in their treatment of the oracle and its descent: Pausanias 39.9.5–14, Plutarch's *On the Sign of Socrates* 589F–592E, Philostratus *VA* 8.19–20, and Maximus of Tyre 14.2. All of these are much later than the bulk of the evidence we have used up to this point in the book which, on the one hand, fits with this chapter's mission of extending the historical span of the case studies covered, and, on the other hand, points to the enduring problem of trying to understand Greek religion through the lens of much later texts.

Albert Schachter and Pierre Bonnechère – two of the leading scholars on Trophonios – agree that there were undoubtedly changes in almost every area of the oracle over time.[47] All the same, one of the main contentions of Bonnechère's monograph is that there is a large amount of continuity from our Classical sources through to the Roman sources in regards to the oracle's relation to myth, the nature of the consultation, and the manner of revelation. Leaning foremost on Pausanias' detailed eyewitness account, and supplementing where necessary, we are able to reconstruct more or less how a consultation at the Oracle of Trophonios would have proceeded.

[43] Hdt 1.46; compare 8.134. Note Crahay 1956, 195, who observes that the oracles supposedly tested by Croesus are those that were important at the time of Herodotus, not Croesus.
[44] Paus. 4.32.5–6; Origen *Cels* 7.35. [45] Ar. *Nub*. 508. [46] Ath. 13.594 and 14.641.
[47] Schachter 1994; Bonnechère 2003.

In preparation for their descent, the worshipper[48] stays a number of days in a sacred lodging, abstaining from hot baths, but indulging in meat from the multitude of sacrifices made to Trophonios, his children, Apollo, Cronus, Zeus, Hera, and Demeter. An initial act of divination is undertaken through inspection of entrails to ensure that the worshipper will be well received by Trophonios. This must then be reconfirmed by the sacrifice of a ram. Once these preliminaries have been undertaken, the worshipper is taken at night (sources are unanimous on this point) by two *hermai* (thirteen-year-old, citizen boys) to the river to be anointed and washed. There, the worshipper drinks from two fountains (one of *Lēthē* 'Forgetfulness' and the other of *Mnēmosunē* 'Memory'), prays to a cult statue supposedly made by Daedalus, and subsequently heads to the oracle itself, described at length by Pausanias, and to which we shall return shortly. Within the sacred enclosure is an artificially constructed chasm. The worshipper is brought a ladder in order to be able to descend into this cave. They must then lie down, holding barley cakes in their hands as gifts to the god, and are pulled feet first into the depths. In this inner sanctum (*adyton*) they experience the divinatory moment revealed by either sight or hearing – sources agree on the fact that the worshipper is the direct medium of divine knowledge. They come back out of the Trophonion feet first and after the ascent are taken by the priests to recall all that they learned below, specifically termed *thaumasia* in Plutarch's version. The inquirer is seriously emotionally inhibited after the experience, but a few more days in the initial lodging and the power to laugh returns to them. The whole experience is sealed with an obligatory dedication of a tablet recording what the enquirer learned.

Scholars have largely abandoned the original interpretation of the descent into the Trophonion as an incubatory experience as there is no evidence that dreams were involved.[49] Instead, owing to the traumatic nature of the event according to the sources, it has been seen as closer to an initiatory ritual with an oracular element. Quite a lot has been made in scholarship of the preparatory rituals (particularly as they link to sensory deprivation and a heightened state of anxiety inducing

[48] To date there is no direct or indirect evidence for a woman consulting the god.
[49] Clark 1968; Bonnechère 2003a, 2003b; Ustinova 2009, 90–6. Note Ogden 2001, 80–5, however, who still sees the Trophonion as incubatory.

an altered state of consciousness), the notion of descent as a re-enacted *katabasis*, and the suppression of laughter at the end, but not much has been made, theologically speaking, of the construction of the oracle as an artificial chamber of religious experience.

By virtue of features of landscape or topography, natural sites can carry and propagate an innate sense of religious aura. Delphi's spectacular location is an obvious example, or Didyma's mythic status as a place of paradigmatic wilderness.[50] Caves too, even when not particularly remarkable or unique, are always thought of as sacred, at least to the nymphs.[51] The description of the location of Trophonios' oracle, however, is overtly manufactured and this is what leads to its sense of the numinous. Pausanias' description is weighed down by specific dimensions, details of construction, materials used, and their colour. Even the size of the enclosure is described in relation to the technical – 'about that of the smallest threshing-floor' – further associating this sacred site to manual activities and to the human taming of nature.[52] Later too the cave is described not by assimilation to a natural grotto, but as being *kribanos*, 'in the shape of a bread oven'.[53] This cave is overtly not natural (*ouk automaton*) but made with *technē* and *harmonia* after the most accurate masonry.[54] This is perhaps extra fitting for a god who himself was trained in architectural *technē*: Trophonios and his brother, Agamedes, are said from very early on in the mythic tradition to have built parts of Apollo's first temple in Delphi, for example.[55] Innately bound up with Trophonios' mythological tradition is the idea that without artificial *technē*, there would be no access to the gods. The Trophonion is fashioned so that the worshipper needs a ladder – a man-made, purpose-specific mechanism – to descend and have this divine encounter. This was not, in fact, about replicating nature, but about creating a religiously compelling environment and manufacturing a religious epiphany which enabled the worshipper to become the vessel for divine knowledge as part of this religious experience.

[50] In general see Scully 1962. On the latter specifically see Graf 1993.
[51] On caves see Ustinova 2009. On the Vari Cave and the interaction between physical space, sounds produced in the cave, reliefs, and the *technē* of music, see Laferrière 2019.
[52] Paus. 9.39.9. [53] Paus. 9.39.10. [54] Paus. 9.39.9–10. [55] *hHom* 3.295–7.

The exact method by which the worshipper is pulled through the chamber is controversial, but ancient authors agree that the worshipper was reclining. If we are to believe Pausanias – and, incidentally, the scholia to Aristophanes' *Clouds* – about the feeling of being pulled through as if being sucked into a vortex, it is possible that the person descending was lying down on a platform on tracks which got pulled feet-first into the abyss. If this is the case, it is difficult not to see this rolling platform as a sort of *ekkyklēma*, particularly fitting given the theatricality of the whole manufactured divine encounter. The Trophonion has been constructed as an artificial 'set' and since costuming made for more authentic role-playing, we should not be surprised to find that detail of the worshipper's attire is something on which all our sources also dwell. The *katabasis*, apart from being a re-enactment into the underground chamber which Trophonios was mythically conceived to inhabit after being swallowed by the earth, can also be read as an intentional inversion of the *deus ex machina*. Instead of the god descending upon the human realm to orchestrate affairs, the person descending is going to the god (Trophonios is explicitly referred to as a *theos*, and not as a hero)[56] thanks to the machine, in order to experience a direct encounter with the divine which will in turn help to orchestrate affairs back in the human realm.

What does the descent to Trophonios' oracle tell us about the way that the cosmos was thought to have functioned? The transit between realms of divine knowledge and human knowledge is achieved through the application of humanly engineered *mēchanai*. The gods in general, and Trophonios in this specific instance, were considered ontologically distinct from humans, which is why Trophonios' prophecies only come through a confronting experience of altered consciousness. The worshipper becomes, according to Maximus of Tyre, a prophetic enunciator to others. But the worshipper's role as divinatory medium was enabled by a manufactured religious experience. They are guaranteed to be an authenticated medium of divine knowledge because they have gone through a process arranged and overseen by human technical

[56] Paus. 9.39.12.

knowledge. At the same time, the divine realm was evidently considered to be geographically accessible – the worshipper is confronted not with a prophet, but with Trophonios himself – and mechanical knowledge, mechanical skill, were imperative in bridging this gap.

Artificial subterranean religious experiences were not exclusive to Trophonios. At Claros, for example, there also existed an oracular cave (*specus*) of some sort as well as a labyrinth structure in its foundations.[57] There too the combination of drinking from a spring and descending into a cave provoked mantic inspiration in the human visitor. Herodotus records for us the puzzling tale of Salmoxis – possibly a god, possibly a man – who uses subterranean architecture to stage his resurrection.[58] Archaeologically, the prominent *tholos* (or *thymelē*) structure at Epidauros provides another example of an underground labyrinth used to shape religious experience in some way, possibly by enhancing acoustics integral to ritual performance, according to one interpretation.[59] Excavations from the site of ancient Corinth reveal a fifth-century temple nestled close to a spring which has an underground tunnel connected to it, big enough for a man to crawl through. Access to the tunnel, which ran under the shrine, was possible thanks to a hidden door camouflaged as a metope.[60] The temple appears to have had a dual priesthood to Dionysus and Apollo,[61] and it has been suggested that the structural peculiarities of this small Corinthian temple can be accounted for if we understand them as mechanisms built to allow not for prophecy, but for the manufacture of the Dionysian miracles of producing wine spontaneously from the earth, or turning water to wine.[62] Such quintessential Dionysian feats – richly attested in ancient literature, as discussed in relation to the *Bacchae* in Part I – would have reliably invoked the presence of Dionysus in the temple space.[63] The orchestra floor of

[57] Tac. *Ann*. 2.54 with, most recently, Gunderson 2021. [58] Hdt. 4.95–6.
[59] See Schultz, Wickkiser, Hinge et al. 2017. Compare Schultz and Wickkiser 2010.
[60] Carpenter 1933, 57–61; Mee and Spawforth 2001, 154.
[61] G. Elderkin 1941, 125–37. [62] Bonner 1929, 368–75.
[63] Note too a system that delivers clean water from an underground cistern at the Jerusalem Temple. Though built for the purposes of purification, Aristeas' description is full of the vocabulary of wonder; see *Letter of Aristeas* 89–91.

the fifth-century theatre in the sanctuary of Apollo at Cyrene had various incisions in the rock floor of its orchestra. One is a large pit (1.70 × 0.81 m) which, it has been suggested, was probably used for staging apparitions from underground.[64]

Far from being at odds with the religious, techniques and technical knowledge were in fact necessary to a functioning cosmological order which included both divine and mortal bodies, and divine and mortal knowledge. While nature and the divine is a well-rehearsed theme in scholarship on ancient religion, it appears that there is more to be done to interrogate the relation between the artificial and the divine. Religious technologies not only allow and organise access to the transcendental, but their use tells intriguing tales about what the ancient gods were thought to be able to do, and the use to which mechanical epistemology was put in antiquity. The very fact that humanly manufactured objects (as opposed simply to the natural world) were vehicles for divine knowledge is part of the theological underpinnings of ancient Greek religion and deserves to be better acknowledged in scholarship on ancient Greek divination. That this is constantly being navigated in different ways – by regularising the shape of knucklebones, fashioning optical illusions, creating artificial spaces for divine encounter, for example – reveals the manifold ways in which technical epistemologies were integral to divine communication. It shows the ways that ancient religious media were constantly and self-consciously being 'tuned' to improve the signal that they transmitted. This is important because when we turn, in Part III, to the Roman reception of the phenomenon of technologically manufacturing religious aura, it must be seen against this backdrop. 'Rational' scientific knowledge was not deemed counterproductive for divine–human relations in ancient Greek religion but, on the contrary, helpfully supported 'technical' divinatory practices and mechanical epiphany in a host of ways.

[64] Stucchi 1975, 36; Ensoli 2010, Csapo-Wilson 2020, 800 (IV G); 124–5 with figures 9 and 10.