From Egyptian barque oracles to Artificial Swarm Intelligence via the Ouija (or $wḏꜣ$?) board

Lloyd D. Graham

ABSTRACT

Ancient Egyptian barque oracles had a recent counterpart in the phenomenon of "table-turning", an occult process experienced in Nineteenth-Century Spiritualist séances. The séance table's small-scale successor, the Talking Board, ensured that oracular locomotion persisted throughout the Twentieth Century; its best-known embodiment – the Ouija board – remains popular even today. Scientific studies have helped to elucidate the behavioural drivers that govern table-turning and Ouija sessions; these reveal that good-faith groups are dominated by an auto-suggestive process known as the ideomotor response (IMR). Learnings from such studies suggest that a hierarchy of up to four drivers (two conscious and conditional, two unconscious and continuous) would have underpinned the significance-laden movements of Egyptian barque oracles. Such oracles constitute an early form of what is today called Artificial Swarm Intelligence (ASI); "human swarming" enables networks of individuals whose interactions are governed by real-time feedback loops to converge quickly on optimal solutions. The paper also examines the possibility that Ouija – the name bestowed in 1891 upon the "Egyptian luck-board" that went on to dominate the Talking Board market – might genuinely reflect an ancient Egyptian word with the approximate sense of "good luck", just as the board's pioneers claimed it did.

KEYWORDS

Barque oracle – Ouija board – behavioural drivers – ideomotor response – swarm intelligence

من مركب الوحى الإلهى المصرى القديم إلى ذكاء السرب الاصطناعي عبر لوحة الويجا أو ($wḏꜣ$؟)

لويد د. جراهام

الملخص

كان للعرافين المصريين القدماء نظير حديث في ظاهرة «تقليب الطاولة»، وهي عملية غامضة شهدتها جلسات تحضير الأرواح خلال القرن التاسع عشر. وقد كفلت، على نطاق صغير، «اللوحة الناطقة» التى خلفت مجلس الحوار، استمرار تنقل حركة الأرواح الوهمية طوال القرن العشرين؛ حيث لا تزال لوحة الويجا وهى أشهر تجسيد لها، تحظى بشعبية كبيرة حتى يومنا هذا. ساعدت الدراسات العلمية على توضيح الدوافع السلوكية التى تحكم تقليب الطاولة وجلسات الويجا؛ حيث تكشف أن المجموعات ذات النوايا الحسنة تهيمن عليها عملية الإيحاء الذاتى المعروفة باسم الاستجابة الحركية (IMR). كما تشير الدروس المستفادة من مثل هذه الدراسات إلى أن التسلسل الهرمى لما يصل إلى أربعة دوافع (اثنان واعيان ومشروطان، واثنان غير واعيان ومستمران) كان من شأنه أن يدعم الحركات المحملة بالأهمية للعرافين المصريين. تشكل مثل هذه النبوءات شكلاً مبكرًا لما يسمى اليوم بذكاء السرب الاصطناعى (ASI)، ويعمل «الحشد البشرى» على تمكين شبكات الأفراد الذين تحكم تفاعلاتهم ردود الفعل في الوقت الفعلي من التقارب بسرعة نحو الحلول المثلى. تبحث تلك الورقة أيضًا فى إمكانية أن تكون «الويجا» – الاسم الذى أُطلق عام 1891 على «لوحة الحظ المصرية» التى هيمنت على سوق لوحات التحدث – قد تعكس حقًا كلمة مصرية قديمة ذات معنى تقريبى لـ «الحظ السعيد»، تمامًا كما ادعى رواد المجلس أنها فعلًا تقوم بذلك.

الكلمات الدالة

مركب الوحى الإلهى – لوحة الويجا – الدوافع السلوكية – الاستجابة الحركية – ذكاء السرب

The mechanisms by which deities communicated their will to humans in ancient Egypt remain somewhat unclear, but a recurring motif is portentous movement – or lack thereof – on the part of a divine barque or palanquin[1] in the course of a procession (Černý 1962: 36; Kákosy 1982: 600; Mathieu 2021).[2] Oracles of this type were sought by all strata of society, ranging from kings to commoners, and the movements of divine barques in response to petitions or questions were relied upon to resolve all manner of uncertainties, disputes and dilemmas. Recent activity in the digital humanities has – via virtual reality – brought ancient Egyptian barque processions and oracular consultations to life and shed light on some of the underlying mechanical and ergonomic issues (Sullivan 2012a; Sullivan 2012b; Gillam – Jacobson 2015).[3] This paper seeks to extend these developments by considering the psychodynamic processes that are likely to have governed the operation and outcome of barque oracles. It does so by drawing upon current scientific knowledge about the psychology that underpins much more recent – yet fundamentally similar – processes, including insights gained in the last decade from the world of artificial intelligence.[4]

The theoretical justification for using recently acquired psychosocial data to understand an ancient Egyptian phenomenon is that, in both cases, the protagonists are anatomically modern humans with equivalent brains; accordingly, such individuals are likely to experience a similar set of behavioural drivers in analogous social situations (Petit 2019: 5–54). Anthropologically, this situates the study within the structuralism of Claude Lévi-Strauss (Becker – Wheater 2017). More particularly, its niche sits on the periphery of the field known as Psychology of Religion (which focuses on individuality in a person's religious thoughts and actions) and fully within the one known as Cognitive Science of Religion (CSR, which focuses on general patterns of religious belief and practice in groups and populations). In CSR – as in the present study – human cognitive faculties are assumed not to have changed meaningfully throughout the historical period, non-conscious cognitive processes are viewed as having a major influence upon religious ideas and practices, and there is an emphasis on the cross-cultural recurrence of certain concepts and behaviours (Barrett 2007: 768–769; Barrett 2013; Xygalatas 2020).

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1   Subsequently in this paper, the term "barque" is used as a catch-all which includes the litters, palanquins and other portable shrines that were used to carry a cult image.

2   The last of these references presents a recent and thorough bibliography of the literature on ancient Egyptian oracles.

3   The latter reference documents a virtual reality reconstruction of a Late Period barque oracle of Horus, seemingly aimed at young museum visitors, which has been developed by PublicVR, Boston: http://publicvr.info/html/pro_oracle.html (accessed on 30th July 2022). A video of a representative visitor experience may be seen at http://publicvr.info/egypt/oracle/longvid.html (accessed on 30th July 2022).

4   The study uses the methodologies of rational inference and comparative analysis (Ormerod 2010; Collier 1993) in the spirit of Guy Stroumsa (2018: 8–10), who addressed the questions "'Why compare?' 'What is gained from comparison?'" by stating that "the more focused (read: limited) one's own field of expertise becomes, the greater the need to see the work being done in – to compare with – other fields", adding that "like all intellectual moves, comparison is most valuable when it is not obvious."

BARQUE ORACLES IN ANCIENT EGYPT

Early Egyptian oracles (*bi3.yt*; Posener 1963; Römer 1994: 142–153; Kruchten 1997: 60–61; Gillen 2005; TLA: lemma no. 54480), which pertain mainly to royal and state affairs in the pre--Amarna phase of the Eighteenth Dynasty,[5] seem to have involved unusual diversions from the barque's normal route or halts which took observers by surprise; in certain well-known cases, the barque sought out and stopped before the god's chosen heir to the throne.[6] In matters of great importance, such as royal succession, we may be fairly confident that the priests carrying the barque had been instructed in advance as to how to proceed and whom they should seek.[7]

From the Ramesside era onward, there are records of barque oracles (*ph ntr*);[8] which involve non-royal petitioners (Ockinga 1989: 11–13, Documents 8–13; Traunecker 1997); these relate to religious and administrative appointments (Černý 1962: 40; Cabrol 2001: 733; Römer 1994: 479–486; Fukaya 2012a: 196–202; Gutierrez Jaskiewicz 2018: 105–110, 184–185), legal disputes (Černý 1962: 40–42; Černý – Gardiner 1957: 15 and pl. LIIA, 2 *recto*; McDowell 1990: 114–135; Fukaya 2012a: 191–196; Römer 1994: 290–301, 475–477, 487–497), private dilemmas (Moore 2013: 4918), and so on.[9] Elite clients would have had access to processions of the main city gods, while peasants and workmen would probably have resorted to more local deities (Moore 2013: 4918; Černý 1962: 40–43), such as village-specific embodiments of Amun or community representations of deified kings.[10] In either case, the oracular procedure was likely to be similar and would have taken place during a halt in the procession (Blackman 1926: 185; Traunecker 1997: 37; Gutierrez Jaskiewicz 2018: 240). For choices between persons, some candidates probably stood in silent prayer (Traunecker 2001: 95) while others petitioned the god orally (Moore 2013: 4918; Černý 1962: 43; Gutierrez Jaskiewicz 2018: 41, 127);[11] either way, it seems that the barque – typically borne above shoulder-height by a group of eight or more *w⁽b*-priests[12] – would draw toward

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5   For suggestions of even earlier processional oracles, see Römer (1987: 31) and Gutierrez Jaskiewicz (2018: 80–84).

6   *E.g.* Hatshepsut and Thutmose III (Kákosy 1982: 602; Römer 1987; Ockinga 1989: 6–7 [Document 1, lines 6–7; Document 2, lines 1–13]).

7   The cadre of porter-priests is commonly referred to by the feminine collective term *t3 f3y.t*, "the carrying personnel" (Blackman 1926: 182, footnote 3). For other terminology, see Quack (1994: 135, footnote 23).

8   "To approach/reach the god"; although this was the usual term for processional oracles during the Ramesside and Third Intermediate Periods, it also encompassed other forms of divine consultation (Gutierrez Jaskiewicz 2018: 70–71). Other terms could be used, too (Römer 1994: 135–157; Gutierrez Jaskiewicz 2018: 56–72).

9   For a sense of the range of questions posed to the oracle, see the lists in Černý (1962: 46), Ockinga (1989: 13, Document 13), Römer (1994: 515–519) and Gutierrez Jaskiewicz (2018: 122–124). In addition, it is likely that royal succession continued to be made (or, at a minimum, endorsed) by oracle until the end of the New Kingdom (Jansen-Winkeln 1999), with the selection of at least Horemheb seeming to involve the movements of a processional barque (Gardiner 1953: 15, inscription lines 14–15).

10   See Blackman (1925: 253) for local forms of Amun, and Blackman (1926) for the deified Amenhotep I. Non-festival processions of local gods, such as the deified Amenhotep I at Deir el-Medina, may also have occurred solely for the purpose of providing oracles (McDowell 1990: 112–114).

11   For example, in the Stela of Merimaat (Cairo JE 91927), described by Fukaya (2012a: 194).

12   For Amenhotep I at Deir el-Medina, eight (McDowell 1990: 109) or six to eight bearers (Sweeney 2008: 154). A painting in the tomb of Amenmose (TT19) (Černý 1962: 42, fig. 9) shows just four bearers (for Amenhotep of the Forecourt) but the image is interpreted by McDowell (1990: 112)

and/or stop opposite the favoured individual.[13] The deity would often confirm its choice by "nodding" (*ḥnn*) at the appropriate person,[14] presumably via an up-and-down inclination of the portable shrine; where this was a divine boat, such rocking would have made the god's head at its prow appear to nod (Römer 2003). In contrast to a forward movement of the barque (*nˁi m-ḥr=f*), which indicated assent, a lack of movement[15] or – more emphatically – a backward motion (*nˁi n-ḥꜣ=f*) signalled a refusal (Černý 1962: 44–45; Ray 1981: 180; Kruchten 1997: 62; McDowell 1990: 109, 257).[16] If names, persons or other options were presented sequentially, we may expect that negative or positive responses occurred at the appropriate moments (Kruchten 1997: 59; Moore 2013: 4918; Gutierrez Jaskiewicz 2018: 129–130, 167).[17] Scholars have speculated that, apart from positive indications such as the barque approaching, turning or nodding, and negative ones such as it recoiling, other emotions may have been expressed by

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as representing eight, while other representations of barques (Černý 1962: 37, fig. 8) show twelve (upper scene, for Horemheb) and twenty-four (lower scene, for Amun-Re). The Stela of Paser from Abydos (Cairo JE 43649) shows eight bearers for Ahmose's oracular barque, which Iskander – Goelet (2021: 125, fig. 2.22) consider a modest number. An animation created by Digital Karnak (2008) – which is accompanied by an explanatory document (Sullivan 2012a) that anticipates and draws upon the more complete description by Sullivan (2012b) – proposes three barque sizes for Karnak, as follows. Eighteenth Dynasty before Thutmose III: Version A (4.5 x 0.9 x 2.7 m, two poles, 12 bearers) and Version B (4.5 x 1.3 x 2.7 m, three poles, 18 bearers); Eighteenth Dynasty after Thutmose III and Nineteenth Dynasty, for the barque of Amun-Re (based on a relief in the Hypostyle Hall): Version C (4.5 x 2.2 x 3.0 m, five poles, 30 bearers). In the late Nineteenth Dynasty, the barque of Amun-Re seems to have been enlarged even further (5.5 x 2.2 x 3.0 m, five poles, 40 bearers) (Sullivan 2012b: 30). However, small- to medium-sized barques seem to have been the norm across both dynasties, with the vessels of Khonsu and Mut remaining similar to the Version A/B designs (Sullivan 2012b: 33).

13 Or, in the case of indictments, the guilty person(s). For example, with the oracle of Djehutymes: "Now the great god stopped [*smn*] at the scribes, agents, and officers, who did evil acts in the city, his town. The great god condemned (*ḥr*) scribes, agents, and officers for the evil acts that they had done" (Fukaya 2012a: 195). The latter sentence is discussed further in note 30.

14 There are many such instances (Faulkner 1962: 159; Ockinga 1989: 11 [Document 8, line 12], 12 [Document 10]; Römer 1994: 236–237; Kruchten 1997: 62; Gutierrez Jaskiewicz 2018: 43, 126–127, 207; Ibrahim 2012: 8; Iskander – Goelet 2021: 126). Examples in ostraca and papyri from Deir el-Medina are listed by Sweeney (2008: 154, footnote 4).

15 In the Stela of Paser (Cairo JE 43649), line 4, the deified Ahmose I gives a negative response by failing to move: *iw pꜣ nṯr ḥr smn.t*, "the god stopped / stood still" (Černý 1962: 43; McDowell 1990: 109, footnote 15; Römer 1994: 238; Ibrahim 2012: 5, 8 of online PDF).

16 The last reference is for Ostracon Geneva 12550, *recto* 8–9. Examples in other ostraca from Deir el-Medina are listed by Sweeney (2008: 154, footnote 5).

17 This occurred with the oracle appointing Nebwenenef as High Priest of Amun. Ramesses II relates: "I brought up to him (Amun) all the (names of) the courtiers and the leaders of the army, similarly the (names of the) priests of the gods of his house, those who were before him, but he was not satisfied with one of them, except when I spoke your name to him" (Kitchen 1980: 283.11–13; Ockinga 1989: 10, Document 7; Černý 1962: 43). Similarly, on the Stela of Paser (Cairo JE 43649), "Pesiur [= Paser] said: 'This field belongs to Tjay [...] and the children of Ḥay'. The god stopped. He said again to the god: 'It belongs to the wēˁeb Pesiur, son of Mes'. Then the god approved exceedingly before the wēˁebs" (Černý 1962: 43). Ostracon Ashmolean 4 describes a sequential reading of possible thieves' names before the oracle of Amenhotep at Deir el-Medina (Sweeney 2008: 159), and an identical process is recorded by P. BM 10335 (Blackman 1925: 251, *recto* 4). Presumably the god's feedback could be solicited in response to the sequential statements in any account that was read aloud slowly before the oracle (Sweeney 2008: 163).

the barque sinking down (respect, salutation) or shaking violently (wrath) (Černý 1962: 45; McDowell 1990: 109; Moore 2013: 4918).

Another common way of presenting a dilemma to the god was to have the opposing claims written on separate documents which the scribe could then have held or placed – in a well separated manner – before the deity; the barque could then have twisted either right or left (fig. 1a), and perhaps nodded, to indicate the god's endorsement of one of the two competing options (Černý 1962: 45; Ryholt 1993; Kruchten 1997: 57, 59, 62; Quack 1997: 84; Fukaya 2012a: 195; Gutierrez Jaskiewicz 2018: 43–48, 159, 180–181).[18] By such actions, the deity was said to "take" (ꜣi, iꜣ) one of the two choices on offer (Kákosy 1982: 600; Kruchten 1997: 62; Gutierrez Jaskiewicz 2018: 57). Alternatively, if the documents were presented sequentially, negative and positive responses could have been given at the appropriate times (fig. 1b). In either case, the statement represented by each document was probably spoken aloud (Gutierrez Jaskiewicz 2018: 153), so that the porter-priests were aware of the options being presented to the oracle;[19] failing that, the choice would have been nothing more than a lottery.[20] The latter may have been the case in later periods with queries of a highly personal and somewhat embarrassing nature, such as enquiries as to which woman a man should marry.[21]

In the most minimal scenario – whether selecting a person, spoken name, verbal statement or written document – oracular sessions could have been arranged so that the barque was not actually required to turn (*i.e.* rotate horizontally) or even to nod (*i.e.* rotate vertically); it could have conveyed the god's decision merely by staying still, advancing or retreating along a single axis (fig. 1b) (Černý 1962: 44–45; Kruchten 1997: 62). However, changes of compass orientation by the barque formed an important part of early royal oracles. For example, the movements of the barque of Amun that announced Hatshepsut's kingship are recorded thus: "After this, one [*i.e.* Amun] turned northwards, not knowing what he would do [...] Thereupon the majesty of the Lord of All turned his face to the east and gave a very great oracle" (Ockinga 1989: 7, Document 2).[22] Likewise, an oracle of Amun for Amenhotep III seems to have involved a sequential – and highly symbolic – rotation of the barque to face south, north, west and then east (Ockinga 1989: 8, Document 3; Römer 2003: 286). While (as noted earlier) important royal

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18 For example, in P. Brooklyn 16.205, column 2, 5–6, we read that the falcon-god "Heman of Hefat [...] said to the two written claims: Right is Ikeni!" and (in respect of a different dispute) in column 3, 8–9 "They made two written claims and they placed them before Khonsu-in-Thebes and he said: Right is Ikeni!" (Parker 1962: 50–51).

19 Ryholt (1993: 195, including footnote 27) suggests that the two competing petitions were drawn up in the presence of the god in his barque, in which case the porter-priests would presumably have known which verdict was represented by which document.

20 Traunecker (1997: 44) seems to believe that the oracle *was* in fact a lottery; see also Gutierrez Jaskiewicz (2018: 130–131).

21 In any case, these tended to be settled by temple-based "ticket oracles" rather than by processional oracles (von Lieven 2016: 19–20).

22 Chapelle Rouge, south side, block 35 (Lacau – Chevrier 1977: 98, inscription lines 7–10; 101; Römer 2003: 285). If Lacau – Chevrier (1977: 103, note *s*) are correct in their interpretation of *sḥd*, whereby "turned his face" in the quoted translation would literally read "lowered his face" (Lacau – Chevrier 1977: 101), then the oracular movement would also have involved a vertical rotation (*i.e.* inclination) of the barque. However, the glyphs for *sḥd* – which come from the parallel text at Deir el-Bahari – do not include any of the "inversion" determinatives expected for this meaning, and the word's counterpart in the Chapelle Rouge text, while mostly lost, seems to have been a different verb of movement.

oracles were most likely choreographed in advance, these examples do show that rotations of the barque were part of the oracular movement repertoire from the outset.

Another consideration is the terminology used to describe the solicitation of non-royal barque oracles. In lines 2–3 of Ostracon Gardiner 103, which translate as "he made two writings, and he placed them before the god himself" (Ockinga 1989: 12, Document 11; Willems 2014: 305, 310), the latter phrase is specified by *iw=f (ḥr) wȝḥ=w m-bȝḥ pȝ nṯr ḏs=f* (Kitchen 1983: 571.11), using the specific verb *wȝḥ* ("to set down, to lay down") and compound preposition *m-bȝḥ* ("in front of, in the presence of"; Faulkner 1962: 53, 77–78; Ockinga 2012: 19, 151). The same is true elsewhere (*e.g.* P. Brooklyn 16.205, column 3, 8; Parker 1962: 51 and Pl. 18).[23] This concrete expression really does suggest that the two options were physically deposited in front of the god,[24] with a turning of his barque being the obvious way to indicate the deity's choice (fig. 1a).[25] The brief markings found on the reverse sides of some oracular ostraca could indicate that they were deposited face downward before the oracle (Weiss 2009; von Lieven 2016: 19; Gutierrez Jaskiewicz 2018: 125).[26]

Irrespective of how the verdict was delivered, important oracular outcomes were witnessed and recorded (McDowell 1990: 108; Moore 2013: 4919; Gutierrez Jaskiewicz 2018: 184). In some cases, the names of the porter-priests were recorded instead of – or in addition to – those of witnesses, no doubt as a defence against any future misrepresentation of what had actually transpired (Černý 1962: 44; Sweeney 2008: 155).

Although the outcomes of many oracles were probably influenced by careful religious and/or juridical deliberations conducted well in advance of the procession (Kákosy 1982: 601; McDowell 1990: 138; Kessler 2011), it is unlikely that the porter-priests were expressly told what answer to give. For example, oracles concerning disputed ownership of real estate at Deir el-Medina were usually preceded by extensive inquiries at the magistrates' court (*ḳnb.t*), whereupon "a general opinion of the rights and wrongs of the case probably emerged", and it seems that the oracle was trusted to reflect this.[27] The outcomes of other oracles would have been less formal and more spontaneous (*e.g.* Ostracon Cairo 25555; McDowell 1990: 138–139). However, the behavioural drivers contributing to the various significance-laden movements of the barque in oracular situations were elided by Egyptian scribes and largely remain unexplored by modern scholars.[28] Alexandra von Lieven hints at the complexities of such collective decisions; citing the oracle of Nebwenenef as "a clear warning against always seeing priest

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23 See also P. BM 10417, *verso* 3–5 (Blackman 1926: 184–185, Pl. 39) for "I place you in front of Amenhotep at every procession of his", which relates to requests laid before the oracle for the safe keeping of a person.

24 A more ambiguous expression, such as *iw=f ḥr rḏi.t=w n pȝ nṯr* ("he gave/placed/put them to the god"), would have admitted a much wider range of interpretations, including the possibility that the petitions were just read aloud sequentially.

25 The less elegant and more time-consuming possibility that the documents were placed sequentially, and one of the two affirmed by a nodding or forward movement of the barque (Blackman 1926: 181), cannot be excluded. However, it begs the question of why the documents needed to be deposited at all, rather than simply being read aloud one after the other.

26 Some marks seem to relate to the statement's content, while others may have signalled the identity of the oracle-seeker. Yet other marks may have recorded the god's decision.

27 Quotation from McDowell (1990: 114–135, 138), which reiterates sentiments expressed on her p. 132.

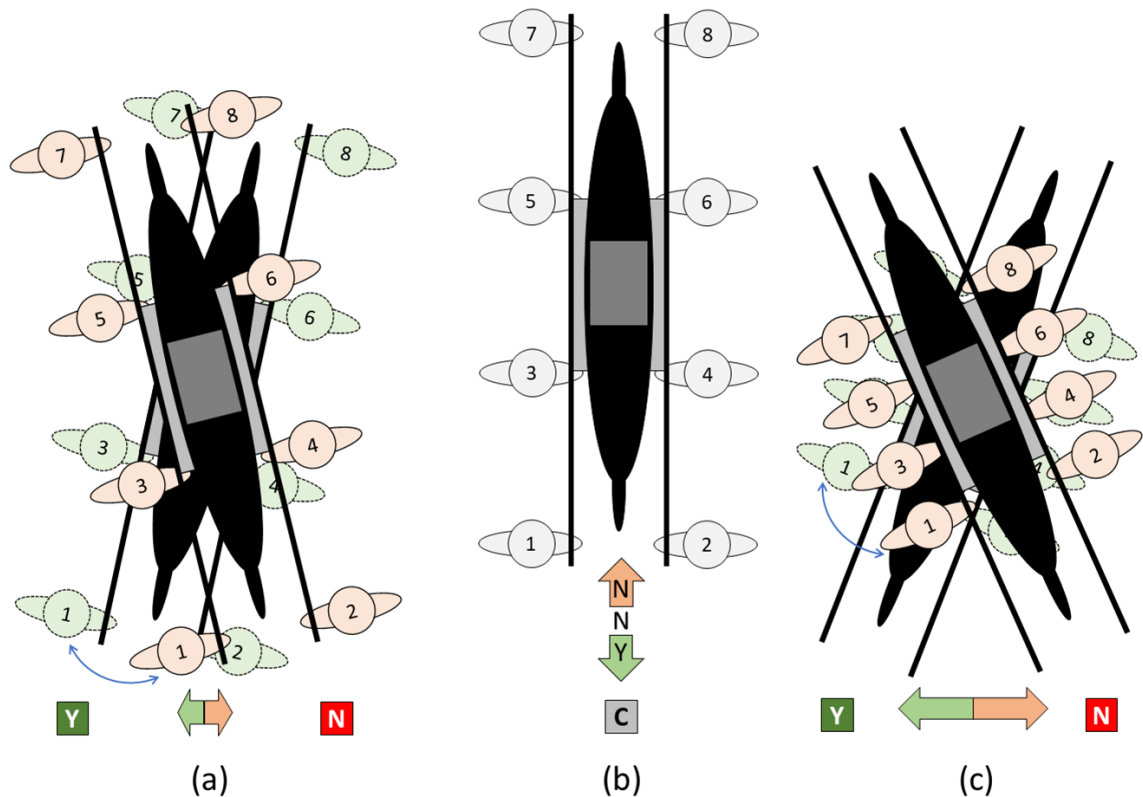28 For an overview of the behavioural driver model, see Petit (2019: 5–54).

Fig. 1   Aerial view of movements by which a barque carried by eight porter-priests might indicate an oracular verdict: (a) Two opposing choices (Y for Yes, green box; N for No, red box) are placed concurrently to the left and right, respectively, of the barque's prow; the verdict is indicated by the barque turning anticlockwise (green porters with dashed outlines) or clockwise (red porters with solid outlines), respectively. (b) Particular options (exemplified here by C, one Choice, grey box) are presented sequentially in front of the barque's prow; for each, a rejection is indicated by the barque remaining stationary (lower N) or retreating (upper N in red arrow), while approval is indicated by it moving forward (Y in green arrow). (c) As for panel (a), but with a compaction of the carrying crew towards the centre of the barque; this permits a much greater deflection of the barque for the same degree of movement by the porter-priests. The curved blue double-headed arrow, which is the same size as in panel (a), shows that the displacement of porter-priest number 1 is actually less than in panel (a), even though the barque's rotation is much greater (horizontal block arrows); the same is true for all of the other priests (drawing by Lloyd Graham)

deceit at work in [barque] oracles", she adds: "Presumably, group psychological phenomena were at work here that were not subject to the wilful control and manipulation of those in-volved, as is still the case in religious contexts today."[29] In Claude Traunecker's understanding of the process: "When the deity approved, the priestly bearers of the festival barque would

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29   In the original: "Dies sollte eine deutliche Warnung davor sein, beim Orakelwesen stets Priesterbetrug am Werke zu sehen. Vermutlich waren hier in der Regel gruppenpsychologische Phänomene am Werke, die nicht der willentlichen Kontrolle und Manipulation der Beteiligten unterlagen, wie sie auch heute noch in religiösen Zusammenhängen vorkommen" (von Lieven 2016: 22).

feel themselves overwhelmed by its weight,[30] or they would feel the barque turning toward one of the written propositions that had been presented to the deity" (Traunecker 2001: 95). In J.D. Ray's opinion, "some form of auto-suggestion is far more probable" than fraud (Ray 1981: 180–181). Likewise, Andrea McDowell sees deliberate manipulation of barque oracles as a rarity, since the porter-priests were all members of the local community and "an oracle known to be a charade would have been useless". She follows Ray in nominating "some sort of auto-suggestion" by which the barque-bearers "had a feeling about the rights and wrongs of the matter, and expecting or believing that the god would push them in a certain direction, actually felt him do so" (McDowell 1990: 110–111).

Oracles did not disappear with the transition to modernity; indeed, the concept of a device which can provide information that is otherwise difficult or impossible to access – known to computability theorists as an oracle machine[31] – is now formalised within information and computational complexity theory (Burgin 2017). While many Egyptologists would probably think that no practical counterparts to the barque oracle survive in the modern world,[32] the truth is that devices for delivering oracular locomotion persist in Western society even now, albeit in much diminished form. It seems to me that the study of these latter-day processes may be able to shed some light on the mechanisms underpinning their ancient antecedents. As mentioned in the Introduction, the theoretical justification for this assertion is that, in both cases, the protagonists would have had equivalent (*i.e.* anatomically modern) brains and should therefore have experienced a similar set of behavioural drivers in analogous social situations (Petit 2019: 5–54).

TABLE-TURNING AND THE OUIJA BOARD

American and European Spiritualist séances of the mid-Nineteenth Century purported to communicate with spirits, usually those of the dead.[33] Such meetings often involved "table-

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30 So also Černý (1962: 44). In the oracle of Djehutymes (see note 13 above), Kruchten (1986: 76–77, 294 [text A, 12]; 1997: 62) interprets *ꜥḥꜥ.n pꜣy nṯr ꜥꜣ ḥr nꜣ sš.w…* as a haplography for *ꜥḥꜥ.n pꜣy nṯr ꜥꜣ ḥr n nꜣ sš.w…* meaning that the god "fell" before and because of the miscreants, indicating a sudden increase in the perceived weight of the barque as it passed them. This reading is opposed by Jansen--Winkeln (1990: 244) and others, who take it that the god "brought down" the miscreants (*ꜥḥꜥ.n pꜣ nṯr ꜥꜣ (ḥr) ḥr nꜣ sš.w;* Römer 1994: 246). Overall, it seems more likely that the god overthrew the miscreants (Naville 1883: 4, line 10; Jansen-Winkeln 1990: 244; Römer 1994: 246; Fukaya 2012a: 195), but it remains possible that he fell down himself because of a perceived increase in the weight of the barque (Kruchten 1986: 76–77, 294; Kruchten 1997: 63). A possible parallel for the latter option occurred in modern Egypt "where the body of a *sheikh* carried for burial began to weigh so heavily on the bier that the bearers could not proceed any further" (Černý 1962: 44).

31 This is typically envisaged as a Turing machine connected to an oracular "black box" (Burgin 2017: 65–69).

32 Public processions where the statue of a saint is paraded on festival days remain common in the Roman Catholic church, especially in southern Europe and Latin America. Festival processions of Hindu deities are also well known (von Lieven 2016: 18). However, in neither case is there an oracular component to the movement of the portable shrine or float.

33 In their attempts to communicate with the dead – often the recently deceased relatives of participants – these séances parallel the ancient Egyptian practice of writing letters to deceased family members in order to solicit their intervention and assistance (Baines 1987: 86–88).

-turning", a process in which participants in a darkened room sat around a table with their hands upon it and awaited its movements (Association for the Scientific Study of Anomalous Phenomena n.d.).[34] The alphabet would slowly be recited aloud and the table would tilt, rotate, rise or tap the floor as certain letters were voiced, thereby spelling out words and sentences – ostensibly communications from one or more spirits (Museum of Talking Boards n.d.a). Yes/No questions could also be posed verbally and answered by movements of the table (Anonymous Editorial 1853). The outcomes from these processes were governed by a hierarchy of behavioural drivers which ranged from (1) deliberate duplicity or fraud, (2) conscious action by biased participants, (3) unconscious action by sincere participants, and (4) random or accidental movements. The last category might seem unimportant, but a modest amount of "input noise" may be useful in that it can boost weak signals above the detection threshold, a process known as stochastic resonance (Moss *et al*. 2004; Zhou 2013).

Actions in the first category (driver 1) were typically motivated by a desire for notoriety and/or money; "Fraud was often involved, with mediums using magic tricks to convince the gullible that they had made contact with the spirits" (Schwarcz 2019).[35] The second category (driver 2) acknowledges the emotive reality that the spirits being interrogated or enquired about at séances were often the deceased relatives or friends of some of the sitters (Carrington 1907: 255, 312, 314, 411), participants who – for personal reasons – would probably have sought to guide the session toward or away from particular answers.[36] Such interventions would necessarily have been subtle. The third category (driver 3) is the most interesting one, since it involves the summing of individual inputs to give expression to the collective unconscious or "hive mind" of the group; the phenomenon is so powerful that many intelligent participants and observers became convinced that communication had truly been established with the spirit world (Godfrey 1853; Shenefelt 2011: 158; Evans 2017; British Library n.d.). However, Michel-Eugène Chevreul correctly understood that the supposedly paranormal movement of the table was actually due to involuntary and unconscious muscular actions performed by those touching it (Chevreul 1854: 168–186, 214–225; Shenefelt 2011: 158), and Michael Faraday devised an apparatus which helped to confirm the phenomenon (Faraday 1859: 382–391). Named by William Carpenter some 170 years ago (Carpenter 1852), the effect continues to be known to psychologists today as the ideomotor response (IMR) (Stock – Stock 2004).

The diminutive successor to the Spiritualist's table was the "Talking Board", a wooden board inscribed with numbers, letters and Yes/No stations, which was equipped with a movable indicator called a planchette (Museum of Talking Boards n.d.a). The planchette, touched lightly by two or more persons, would glide along the surface of the board to spell out the words which form the message. The best-known Talking Board is of course the Ouija board

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34 The parallels between table-turning and the Egyptian barque oracle have largely escaped scholarly attention. To the best of my knowledge, the sole exception is a one-sentence footnote in Traunecker (1997: 44, footnote 35), discovered when the writing of this paper was well advanced: "On ne peut s'empêcher de penser aux phénomènes des consultations spirites à l'aide des tables dites tournantes, dus à une sorte d'autosuggestion collective." ("One cannot help but think of the phenomena of spiritist consultations using so-called turning tables, due to a kind of collective autosuggestion.")

35 For detailed examples of some of the tricks used, see Carrington (1907: 73–76).

36 Inputs from sincere Spiritualist believers who felt commanded or inspired by a spirit to *knowingly* cause a movement would arguably fall into this second category of driver.

(Deslippe 2015; Campbell 2016); Ouija sessions were very popular as parlour games for the first half of the Twentieth Century (Museum of Talking Boards n.d.a), and many versions of the board are still manufactured and sold today (Museum of Talking Boards n.d.b). Multi--user sessions with a Ouija board are governed by exactly the same hierarchy of behavioural drivers as table-turning séances, with IMR the key driver in good-faith groups (Shenefelt 2011: 157–159; Gauchou *et al.* 2012: 976; Deslippe 2015: 185). Neurology professor Terence Hines observes that "in both cases, the illusion that the object (table or planchette) is moving under its own control is often extremely powerful and sufficient to convince many people that spirits are truly at work" (Hines 2003: 47).

The profound contribution of IMR to the Ouija process has been revealed by tests which show that blindfolded participants spell far more incoherent messages than participants who can see the board (Radford 2013; Romano 2018). IMR is characterised by a diminished sense of agency and a dissociative state of mind related to that achieved in hypnosis (Andersen *et al.* 2019; Hines 2003: 47; Cleveland *et al.* 2020). Accordingly, IMR may have real value in that it could allow participants to express knowledge not available to their conscious minds; in sham--pair experiments where only the test subject was actually moving the planchette, the accuracy of their guessed answers to Yes/No questions was rated "at chance for volitional report (50%),[37] but significantly higher for Ouija response (65%)" ($p < 0.001$)[38] (Gauchou *et al.* 2012: 976, 979, including fig. 2). The inadvertent communication of non-verbal cues from the experimenter/ questioner to the Ouija test subject – the so-called "experimenter effect" – is another factor that could have contributed to the positive outcome.[39] In genuine pair experiments, one player typically dominates (unwittingly) over the other in driving the board's response; dominant players tend to return high "need for power" scores in Personal Values assessments (Wise 1977: 150–153, 155). Lastly, a recent study has revealed that paired players cooperate (unknowingly) to build upon whatever initial letters may have been chosen in a way that usually ensures the completion of a meaningful word (Andersen *et al.* 2019: 585, fig. 3, 586–587).

Nevertheless, a proportion of Ouija letter sequences will either make no sense or suggest unpalatable answers. As with other IMR-driven processes, "successes are noted and 'failures' ignored. By trying and discarding 'wrong' answers, the facilitator can eventually hit upon the 'correct' one" (Dillon 1993: 285; Museum of Talking Boards n.d.c; Zusne – Jones 2014: 183). Interestingly, a related process seems to have obtained with Egyptian oracles,[40] since there are reports of the same dispute being submitted to oracular judgement more than once (Gut-

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37 Via clicked Yes/No responses to a computer questionnaire (Gauchou *et al.* 2012: 977–978).

38 A probability of $p < 0.001$ indicates that result has very high statistical significance, *i.e.* is extremely unlikely to have arisen by chance.

39 As suggested by Moga – Dienes (2022: 312), for whom an experiment in which subjects knowingly operated a pendulum solo – again, in order to test the ability of IMR to express unconscious knowledge – was unsuccessful.

40 For example, Ostracon Gardiner 4 "suggests that the oracle could be re-petitioned if the defendant was unsatisfied with its first answer" (McDowell 1990: 183). The loser in an oracular decision could also question the god himself, but Ostracon Gardiner 4 and P. BM 10335 suggest that the original decision was usually upheld (McDowell 1990: 140–141). For related practices in other cultures, see Eidinow (2019), Driediger-Murphy (2019) and Maurizio (2019: 128–129) for Greco-Roman examples, and Maurizio (2019: 125–129) for accounts from modern Africa.

ierrez Jaskiewicz 2018: 130).[41] As already noted, on Ostracon Gardiner 103 we read:[42] "He made two documents and placed them before the god himself" (Černý – Gardiner 1957: 15, pl. LIIA, 2 *recto*; McDowell 1990: 254–256); then, after the first decision is recorded, the text continues with: "Documents were presented a second time" (O. Gardiner 103, *recto* 2–3, 5; Allam 1973: 169–170; Ockinga 1989: 12, Document 11).[43] While repeat enquiries seem to have been permitted, the process was undoubtedly much less standardised than the one that governs modern legal appeals to higher courts (McDowell 1990: 134–135, 183–186). Nevertheless, we know that some cases were tried sequentially by a number of different oracles. In one trial for theft, recorded in P. BM 10335 (Twentieth Dynasty), a field worker named Patjauemdiamun was first indicted by Amun *pꜣ ḥn.ti*, had his conviction upheld by Amun *tꜣ šni.t*, and – upon appeal – was brought before Amun *bw-ḳnn*, before ultimately being required to confess his guilt in a further appearance before Amun *pꜣ ḥn.ti* (Blackman 1925; Černý 1962: 40–41; Fukaya 2012a: 193; von Lieven 2016: 23; Moore 2013: 4918; McDowell 1990: 137–138; Traunecker 1997: 41–42). The process began at the Opet Festival and ended during Khoiak, indicating that it extended over two months (Blackman 1925: 250–251, including footnotes 3, 12). By the Third Intermediate Period, serial consultations – exemplified by the appeals of Henuttawy C at Karnak – could span several years (Winand 2003: 620; Gutierrez Jaskiewicz 2018: 155, 158).

BACK TO THE BARQUE

From our insights into the psychodynamics of table-turning and Ouija sessions, we may reasonably suppose that a similar hierarchy of influences would have governed the outcome of a non-royal oracle obtained during an ancient Egyptian barque procession, irrespective of whether the deity's selection was indicated by the barque failing to move, retreating, approaching and stopping, nodding, or turning. The behavioural drivers would have ranged from (1) a collective "fixing" or "rigging" of the outcome in response to a priestly conspiracy or bribe from a wealthy petitioner; (2) conscious gravitation on the part of some of the barque-bearers – all of them members of the local community – toward the candidate or litigant whom they preferred or believed; (3) unconscious actions by porter-priests acting under IMR, with controlling personalities initiating responses that the collective could

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41 As well as the circumstances considered in the previous note, confirmation of a satisfactory decision could be sought by repeating the question with different wording (McDowell 1990: 140). The video showcasing PublicVR's virtual reality reconstruction of a Late Period barque oracle (see note 3) shows the same dilemma being subjected to three consecutive judgements by the Horus barque ("The Egyptian Oracle", 16:00–18:00 minutes). A dispute that had received an oracular resolution could also reappear at a later date before an administrative tribunal (Ostracon BM 5624; Blackman 1926: 181); see also Römer (1994: 287–288).

42 For an extensive modern bibliography, see Willems (2014: 305, footnote 2).

43 Literally: "(It) was done on two separate occasions of casting notes" (Willems 2014: 310, footnote 19); similarly McDowell (1990: 255, footnote *a*). The verb interpreted as "casting" is *ḫꜣꜥ*, "to throw, to dispatch (messages), to abandon (property)" (Kitchen 1983: 571.13; Faulkner 1962: 183), which here seems to mean that the documents were dispatched to or relinquished at the oracle (Faulkner 1962: 183–184; TLA: lemma no. 113560; Römer 1994: 238); the latter option would be consistent with their deposition before the barque (Moore 2013: 4918). Pentaweret, seemingly the disputant who had been rejected by the first oracle, refused to look at the options for – or perhaps the outcome of – the second one (McDowell 1990: 256).

then endorse; and (4) background fluctuations, such as stumbling, weight-shifting and muscle fatigue/cramp/spasm among the porter-priests, which could potentiate the system by stochastic resonance.

As mentioned earlier, activities in the first category (driver 1) were probably uncommon because divine oracles were generally perceived to be reliable. Sameh Iskander and Ogden Goelet, citing the Stela of Paser (Cairo JE 43649; Ibrahim 2012), suggest that oracular decisions may generally have favoured the person who requested the oracle (Iskander – Goelet 2021: 126),[44] but – even if true – this need not equate to endemic injustice; in a deeply religious society, a person who chose to bring their suit before the omniscient scrutiny of a god was perhaps more likely to be in the right (Römer 1994: 520–523; Gutierrez Jaskiewicz 2018: 194–195). Modern Western courts, too, begin their legal deliberations from a non-neutral position, since the defendant is presumed innocent until proven guilty. While Jean-Marie Kruchten is concerned that the w^cb-priests "were able to manipulate the Theban oracle in their best interests",[45] the opinion of Lászlo Kákosy is that oracles were probably less open to bribery than the civil courts (Kákosy 1982: 601).[46] Andrea McDowell notes that, despite the wealth of oracular data obtained from the site, "Deir el-Medina itself furnishes no examples of oracle-riggers caught in the act" (McDowell 1990: 111). Alexandra von Lieven mentions how, in the "Elephantine scandal", the w^cb-priest Penanuqet was convicted of having conspired to influence an oracle of Khnum (P. Turin 1887, 1 *recto*, 12–13), thereby confirming that the corruption of an oracular outcome was not tolerated (von Lieven 2016: 22).

Moving our attention to driver 2, we should expect its relevance to be inversely proportional to the size of the community. In processions of village deities, some of the barque-carriers would at times have been friends or relatives of the candidates or disputants,[47] or may have been given inducements to favour one of them, but flagrant manipulation of an outcome would have been both obvious and unacceptable to the other priests carrying the barque (McDowell 1990: 110–111).[48] The Thirty-Seventh Maxim of the Instruction of Ani cautions members of the crowd, too, against partisan intervention in the barque's movements (von Lieven 2016: 22). The older of the two manuscripts to contain this section, P. Deir el-Medina I (later Nineteenth Dynasty), says: "Sacrifice to the god! [...] Do not bother him, when he appears, to approach his carrying-crew. Do not increase the deflection of the oracle that he has given."[49] The younger, P. Cairo CG 58042 (later Twenty-first Dynasty), reads: "Sacrifice to your god! [...] Do not bother

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44   The trope is also borne out by a suit, brought before the deified Teshnefer of Hawara, which concerned a suspected botch in the embalming of the plaintiff's husband (von Lieven 2016: 24).
45   In the original: "ils étaient en mesure de manipuler l'oracle thébain au mieux de leurs intérêts" (Kruchten 1997: 63).
46   At any rate, it is likely that oracles were at least popularly perceived to be less corrupt than the magistrates (Brunner 1982: 76). Corruption in Deir el-Medina is discussed by McDowell (1990: 115–117).
47   "The bearers were simply villagers" (McDowell 1990: 110).
48   The situation is analogous to that described earlier for the second driver in Spiritualist séances; detached impartiality could hardly be expected of a sitter when the session's messages related to the spirit of *their* deceased relative or friend, but the scope for deliberate intervention was limited.
49   In the original: "Opfere dem Gott! [...] Belästige ihn nicht, wenn er erschienen ist, Um dich seiner Trägermannschaft zu nähern. Vergrößere nicht die Beugung des Orakels, das er gegeben hat." (Quack 1994: 9, 134–137).

him when he appears! Do not approach him to carry him! Do not harm the oracles!"[50] Joachim Quack's interpretation of these lines is that: "it is recommended not to crowd too closely during processions with oracles. [...] Apparently, believers could get crowded during processions because everyone wanted to get as close as possible to the cult image. [...] It is clear that too much crowding can create confusion and ambiguity as to the actual response."[51]

Of the four drivers, numbers 3 and 4 remain to be discussed. Unlike the first two, which were under conscious control and only came into play in specific circumstances, these two are best envisaged as default drivers – ones which would have operated unconsciously during every processional halt where a decision was required. Borne aloft by many, the divine barque would have been in a dynamic equilibrium which was less stable – and thus more responsive – than either a séance table resting on the ground or a Ouija planchette resting on its board. In circumstances free of deliberate interference (drivers 1 and 2), we may envisage the barque's disposition as reflecting the sum of a network of fluctuating forces, both reinforcing and opposing in nature. Vertical forces would generally have been large, reinforcing and directed upward to support the weight of the barque on its carrying-poles; lateral ones would generally have been small and oppositional so that, when balanced, the barque remained aligned with the axis of the processional way. The dynamic and finely balanced nature of the force network meant that the barque was primed to respond to the slight involuntary movements of w^cb-priests acting under IMR. As with a compass needle, the long narrow shape of a divine boat would have meant that only a slight central torque was required to rotate its prow noticeably to the left or right, or up and down; for a palanquin or vertical shrine, the carrying-poles would similarly have served as long indicators whose termini would have made obvious even a slight twisting movement at the centre (fig. 1a).

A potential problem is that the presence of porter-priests level with (or beyond) the ends of the boat – as is typically seen in artistic depictions of barques in procession (*e.g.* Černý 1962: 37, fig. 8; Iskander – Goelet 2021: 125, fig. 2.22) – would have made lateral deflections harder to achieve (fig. 1a). One must wonder, therefore, if the carrying crew did not compact itself centrally during processional halts when oracles were to be given, the w^cb-priests shuffling closer together under the barque's centre of gravity to facilitate movements at its (now free) extremities (fig. 1c). Intermittent changes in the configurations of barque carrying crews for other practical purposes are postulated by Sullivan (2012b: 6–7, 10, 12), so there is no *a priori* reason why bearers might not routinely have shuffled towards the centre during oracular halts. This configuration is not seen in pictorial depictions, but would presumably have been eschewed by the rules of artistic decorum on the basis that it did not afford the clearest representation of the barque being carried by its crew of w^cb-priests (Robins 2008: 21). Of course, if the barque was merely required to advance or retreat along a single axis, as in the minimal-

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50 In the original: "Opfere deinem Gott! [...] Belästige ihn nicht, wenn er erschienen ist! Tritt nicht an ihn heran, um ihn zu tragen! Schädige die Orakel nicht!" (Quack 1994: 5–7, 108–109).

51 In the original: "In diesem Fall wird also empfohlen, sich bei Prozessionen mit Orakelerteilung nicht zu dicht heranzudrängen. [...] Offenbar ist es so, daß bei Prozessionen ein Gedränge der Gläubigen entstehen konnte, weil jeder möglichst nahe an das Kultbild herantreten wollte. [...] Es ist klar, daß ein zu großes Gedränge Wirrnis und Unklarheit hinsichtlich der tatsächlichen Antwort hervorrufen kann." (Quack 1994: 176).

ist scenario countenanced earlier (Černý 1962: 44–45) (fig. 1b),[52] then there would be no need for any compaction of the carrying crew. However, Ani's recently-mentioned injunction (in P. Cairo CG 58042) that spectators should not interfere with "the deflection of the oracle" is consistent with a lateral twisting or turning movement (fig. 1a, c) that could be modulated by spectators adjacent to the barque.[53]

A complementary way of considering the lateral turning motion of a barque is afforded by Archimedes' Law of the Lever. This dictates that, for any given rotation, the porter-priests furthest from the fulcrum (*i.e.* the central point about which the barque pivots) – priests 1, 2, 7 and 8 in fig. 1a – will need to apply the least force but will have to travel the most distance (fig. 1). In the oracular context, these two effects will tend to cancel each other because the amplification of input force gained by being near the ends of the carrying poles (advantage) is offset by the requirement for more conspicuous movement by the priests occupying those positions (disadvantage). If the carrying crew do compact during oracular halts (fig. 1c), then the position occupied by a particular priest becomes less important because all of the priests are close to the fulcrum. If the barque does not turn but simply moves back and forth (fig. 1b), then the Law of the Lever does not apply and all of the carrying positions are equivalent.

Let us return from physics to psychology. Our learnings from Ouija studies suggest that, within any given cadre of porter-priests, the first unconscious impulse toward meaningful movement by the barque would typically have come from an individual with a dominating personality.[54] This would immediately (and again, unwittingly) have been sensed and – if acceptable[55] – amplified and consolidated by the other bearers to ensure the delivery of an intelligible outcome.[56] Where a matter had already been assessed before the local magistrates, it is probably safe to say that an IMR initiative would only have been acceptable to the collective unconscious of the porter-priests if it reflected the community's sense of justice.[57] Other cases would have been more subjective, but – by a process analogous to the "experimenter effect" in Ouija studies – instinct and intuition would often have enabled the *wꜥb*-priests to know a petitioner's state of mind from his body language, vocal timbre, choice of words, *etc.*,

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52   We should include here the ungainly possibility of the barque moving sideways by the porter-priests shuffling laterally, *i.e.* orthogonal to the boat's long axis, which would have been another way to select between two well separated documents placed in front of the barque without needing to turn it.

53   The root of the Egyptian term used – *ḥꜣm* (Quack 1994: 136, line 5.6) – means "to bend", as in bending one's arm; it can also mean "to bow down" (Faulkner 1962: 184; TLA: lemma no. 114010). Accordingly, it could equally refer to a vertical deflection of the barque, such as the earlier-mentioned "nodding" movement (*hnn*), although it is more difficult to see how the crowd could modulate a vertical rotation. Occasional suggestions that a barque might have been placed on a pedestal to facilitate oracular consultation (Gutierrez Jaskiewicz 2018: 109, 159) are also easier to reconcile with a horizontal turning than a vertical nodding.

54   By "dominating" or "controlling" is meant a person who, in a modern-day Personal Values assessment, would have returned a high "need for power" score, as discussed in the previous section.

55   The limited extent to which dominant personalities can influence the group outcome is a topic reprised in the next section.

56   Similarly, the lack of a trigger impulse among the porter-priests would most likely have been consolidated into immobility on the part of the barque – another intelligible outcome.

57   As discussed earlier in respect of Deir el-Medina (McDowell 1990: 114–135, 138); similarly Allam (1994: 5) and Gutierrez Jaskiewicz (2018: 192–194).

and thus to appreciate his level of sincerity.[58] The diminished sense of personal agency – and therefore of individual responsibility – associated with IMR-driven group activities would have facilitated fair outcomes to socially awkward enquiries; like the oracle-seeker,[59] the porter-priests could hardly be held accountable for the decision of the god (Traunecker 1997: 44; Gutierrez Jaskiewicz 2018: 191).[60] Overall, the seemingly autonomous power of the "hive mind" powered by IMR – a "swarm intelligence" with the potential for hypnosis-like insights – would undoubtedly have convinced many stakeholders that the barque was truly communicating the decisions of a deity.[61] Indeed, to the extent that the "hive mind" expressed by IMR corresponds to Carl Jung's understanding of the collective unconscious, the oracle would genuinely have been accessing the abode of mythic and divine archetypes (Jung 1991).

SWARM INTELLIGENCE

"Swarm intelligence" refers to the collective behavior of decentralised, self-organised systems governed by simple interactional rules with real-time feedback loops; fully natural examples include beehives, ant colonies, fish schools and starling flocks ("murmurations"), while completely artificial ones include multirobot networks such as military drone swarms (Hambling 2021). Hybrid systems are also possible; in these, the inputs and outputs of organisms – in practice, always humans – are dynamically interlinked by computer algorithms that mimic the feedback loops of natural swarming. Fully artificial systems and human-computer hybrid systems are both classed as Artificial Swarm Intelligence (ASI) networks because the participating units are linked via an artificial "yoke"; however, only the former could qualify as true Artificial Intelligence (AI), since AI entails complete independence from human input. Large Language Models, such as the well-known ChatGPT,[62] are embodiments of true AI because they are fully autonomous in operation. To minimise the potential for confusion with true AI,

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58 Seven texts – drawn from Ostraca Berlin 10629, BM 5625, BM 5637, Gardiner 103 and Petrie 16, plus P. Boulaq X – strongly suggest "that the claimant argued his case as he would in court, giving all the relevant facts with specific details. [...] It would seem that at least sometimes the plaintiff would make a lengthy plea before the god which would then be 'officially' submitted to him by one of the authorities" (McDowell 1990: 139–140).

59 As with Ostracon Gardiner 4, in which it seems that the Deir el-Medina draughtsman "Ḳaḥa knew perfectly well who stole his shirts", but, being afraid to prosecute the well-connected suspect, instead "pretended ignorance and let Amenophis [*i.e.* the oracle of Amenhotep I] defend his interests for him" (McDowell 1990: 116).

60 As von Lieven (2016: 26) puts it: "There is no doubt that there was far less cause for social conflict when the god Amun convicted a worker of stealing than when his neighbours did." In the original: "Es bot zweifelsohne weit weniger Stoff für sozialen Konflikt, wenn der Gott Amun einen Arbeiter des Diebstahls überführte, als wenn es seine Nachbarn taten."

61 While clearly the oracle did not always get it right (Quack 2008), McDowell (1990: 111) suggests that occasional "failures of the oracle could be outweighed by a few spectacular successes which would live long in local memory." Similarly, Herodotus tells a story about king Amasis (of the Twenty-sixth Dynasty) which indicates that his pre-royal experience of incorrect judgements by particular oracles did not cause him to lose faith in the oracular process as a whole; rather, as king, Amasis simply favoured those gods whose oracles he knew to have provided correct judgements (*Hist.* II.174.1–2; Eidinow 2091: 55–56).

62 A product of OpenAI, San Francisco (https://openai.com/blog/chatgpt); see *e.g.* Roose (2023).

hybrid human-computer ASI is often referred to simply as "human swarming". In all swarming systems, a holistic intelligence – which exceeds the capability of most or all of the individual agents – manifests as an emergent global property (Bonabeau *et al.* 1999; Dorigo – Birattari 2007; Solé *et al.* 2016; Rosenberg *et al.*, 2016).

In a hybrid ASI network, the "yoke" that links participants and provides them with dynamic feedback would, at its simplest, be a physical indicator-object for whose movements the participants are jointly responsible, such as an Egyptian barque that is shouldered collectively by its cadre of porter-priests, or a Ouija planchette that is being touched by more than one member of a séance group. Accordingly, both the barque oracle and the Ouija séance are forerunners of modern hybrid ASI systems. Today's hybrid ASI networks consist of real-time cooperatives of humans whose interactions are governed by computational swarm algorithms (*i.e.* dynamic feedback loops) with the result that they quickly converge on optimal solutions to problems (Oxenham 2016; Rosenberg 2016; Rosenberg – Willcox 2019; Rosenberg 2021). For example, UNUM – introduced in 2015 – is an online human swarming platform which provides a moveable on-screen puck that clearly parallels both the Egyptian barque and the Ouija board planchette:[63]

"Each participant in the swarm [...] is provided a controllable graphical magnet that allows the user to freely apply force vectors on the puck in real time. [...] Through the collaborative control of the graphical puck, a real-time *physical negotiation* emerges among the members of the online swarm. This occurs because all of the participating users are able to push and pull on the puck at the same time, collectively exploring the decision-space and converging upon the most agreeable answers." (Rosenberg 2015: 658; italics present in the original text.)

To test the efficacy of UNUM, seven novice participants were asked to make predictions relating to public events in the near future.[64] Each time, the appropriate set of "answer stations" was displayed with equal spacing around the periphery of the screen and the station closest to the resting position of the puck – always achieved in less than 60 seconds – was taken to be the verdict.

"In all cases, the predictions made by swarms were substantially more accurate than the predictions made by the individuals who comprised each swarm. In fact, in all cases the predictions made by swarms out-performed even the highest performing individual in each group. The swarms also outperformed the average polling results across the full population of participants. This suggests that swarms offer a powerful alternative to the traditional pollbased methods of harnessing the wisdom of groups. [... Indeed,] a group of 7 novices, functioning as a social swarm, made predictions that surpassed industry experts. Although not conclusive, this result suggests that social swarming may provide a means of achieving expert-level insights from groups of non-experts." (Rosenberg 2015: 658–659)

The size of the UNUM test swarm and the non-expert status of its members is, of course, directly comparable to the eight-man cohort of *wꜥb*-priests that carried the typical Egyptian barque oracle. The swarm members were consciously manipulating the puck, a circumstance countenanced above for the barque oracle via drivers 1 and 2. However, the rapidity and non-

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63   The latter resemblance was admitted by UNUM's inventor, who said "We came up with a solution that reminds some people of a Ouija board; but of course, there are no spirits involved, just AI [Artificial Intelligence] algorithms based on the biological principles of swarm intelligence" (Rosenberg 2021).
64   Specifically, the outcomes of the then-current NFL playoffs, Golden Globes, and Academy Awards.

-verbal nature of the UNUM process would preclude debate and downplay the opportunity for complex rational deliberation; this, together with the genuinely diminished personal agency imposed by the swarm algorithm and the fact that every participant's opinion was necessarily guesswork, would foster a similar cognitive environment to that of the Ouija board and the barque oracle – one dominated by "gut feeling" and intuition, albeit with more processual self-awareness than afforded by IMR (driver 3). Although we earlier accepted that $w^ɜb$-priests with controlling personalities would be inclined to initiate movements of the barque, we noted that they required the endorsement of the group to succeed; ASI researchers point out that the influence wielded by dominating individuals in swarms is greatly attenuated relative to the intimidational control that they would normally exert over verbal team-based negotiations (Shah *et al.* 2021).

Since 2015, work has continued on the UNUM platform, which is now known as Swarm AI.[65] The applications of ASI have diversified further; human swarming networks have been used to generate better business decisions (Metcalf *et al.* 2019), more reliable financial forecasts (Rosenberg *et al.* 2017; Schumann *et al.* 2019) and more accurate medical diagnoses than is traditionally possible (Rosenberg *et al.* 2018; Scudellari 2018; Shah *et al.* 2021). ASI has also been used to forecast the world's future famine hotspots (Rosenbaum 2021), and even to enable sports fans to triumph over the odds set by betting platforms (Rosenberg *et al.*, 2016; Oxenham 2016; Bayern 2018).

Contemporary echoes of the barque oracle do not need to be futuristic, though. In a modern instance which parallels the ancient Egyptian use of oracles to decide lawsuits (Lurje 1971: 97–125), the jury of a British court, which had been sequestered overnight in a hotel, was found to have used a Ouija board to arrive at its guilty verdicts in a 1994 double-murder trial (*R. v. Young (Stephen)* [1995] QB 324, 2 Cr App R 379, [1995] 2 WLR 430; Gans 2017; Dulaney – Carrick 2018). When this news became public, the convictions were quashed, and a retrial was ordered. The outcome, however, was the same as before (Independent 1994), suggesting that the Ouija board had merely facilitated a correct adjudication of the case.

It is possible that the Ouija board has one last unacknowledged feature in common with ancient Egypt, in this case a linguistic rather than a mechanistic one. The next section of the paper – the last one before summing up – will explore the possibility of an Egyptian connection in respect of the name given to the world's most popular oracular board game.

AN EGYPTIAN INSPIRATION FOR THE NAME OUIJA?

Various origins have been reported for the name "Ouija", which is of course pronounced /ˈwiːdʒə/, with a hard anglophone *j*. The current popular belief that the name is a combination of the French and German words for "yes" may be nothing more than a folk etymology (McRobbie 2013) – most likely a facile gloss promulgated by past individuals who sought to misrepresent themselves as the board's originator.[66] A more credible story behind the name

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65   A product of Unanimous AI (https://unanimous.ai/), San Francisco (Nesta 2022).

66   Schneck (2016: 129–130) attributes this etymology to William Fuld. Fuld may have peddled this origin story when he was competing with the Ouija Novelty Company (previously the Kennard Novelty Company) in the years before he acquired the rights to the Ouija name (Museum of Talking Boards: n.d.a).

was told by Charles Kennard, one of the two assignees on a U.S. Patent granted to Elijah Bond in 1891 for the first Ouija board, which the inventor designated as "an Ouija or Egyptian luck-board" (Patent specification US446054A; Bond 1891). The Museum of Talking Boards records the naming process as follows. "Kennard stated that he named the new board Ouija (pronounced wE-ja) after a session with Miss Peters, Elijah Bond's sister-in-law: 'I remarked that we had not yet settled upon a name, and as the board had helped us in other ways, we would ask it to propose one. It spelled out O-U-I-J-A. When I asked the meaning of the word it said 'Good Luck.'"" (Museum of Talking Boards n.d.a). From 1919, the Ouija board was mass produced by William Fuld, who repeated the story that the board had named itself. "We didn't know what to name it, so put the question up to the board and it spelled out O-U-I-J-A. We hadn't any idea what it meant and scratched a long time before we found any clue. Finally we discovered that it was a very close approximation of an Egyptian word which meant good luck" (Museum of Talking Boards n.d.a). Historians of the occult seem to regard this last claim as entirely spurious, one dismissing it with: "Of course, modern Egyptologists are quick to point out that no such word exists in the Egyptian language, as far as they know" (Cornelius 2005: 21). And yet the word *wḏꜣ* – pronounced exactly as Kennard had indicated[67] – means "to be hale, uninjured, prosperous" (Faulkner 1962: 74). It is well known from the pious formula which follows almost every mention of the king, *i.e.* ꜥnḫ(.w) wḏꜣ(.w) snb(.w), "may he live, prosper and be healthy". As an imperative, *wḏꜣ* – Prosper! – is as close to an invocation of "good luck" upon the addressee as one is likely to find in the Egyptian language.

Of course, it is most unlikely that Kennard, Fuld or Peters would have known of *wḏꜣ* in this exact form, but it is entirely possible that they had heard of the Oudjat or Wedjat,[68] the protective "Eye of Horus" amulet whose name is derived from the same root (Faulkner 1962: 75). The phonetic similarity is close enough that one might expect Oudjat/Wedjat to have enjoyed many nominations as the Egyptian inspiration for the name Ouija, but it has not. A targeted search revealed only one instance where the phonetic proximity of Wedjat and Ouija was even noticed. Robert Schneck, in a 2005 book of strange-but-true tales titled *The President's Vampire*, perceptively observed that "'Udjatti, 'Udjat' and 'Wedjat' all sound something like 'Ouija,' and the board is decorated with the 'Eyes of Heaven,' that is, the sun and moon".[69] But Schneck then used the fact that the moon on the Ouija board takes the form of an Islamic-style crescent--plus-star as grounds for reverting to his preferred etymology, which is that the board's name refers to the fabled Moroccan city of Oudja.

It is especially surprising that the Oudjat/Ouija nexus has attracted no attention because Helen Peters Nosworthy – Elijah Bond's sister-in-law – had apparently attended the crucial Ouija session wearing a locket which bore the name that then emerged from the board (Museum of Talking Boards n.d.a; Edwards 2018). In a 1920 issue of the New York *World Magazine*,

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67   U.S. Trademark No. 18,919 (1891) states that "The said trade-mark consists of the arbitrary or fanciful word 'Ouija,' pronounced 'We-Ja;'" the phonetic spelling was itself later protected in Trademark No. 142,200 (1921) (Murch 2007a). Of course, in the American context under discussion, initial letter in "We-Ja" (and in Wedjat, introduced shortly) will in both cases be the soft anglophone /w/ (voiced labial-velar approximant), not the Germanic /v/ (labiodental fricative consonant).

68   Variously rendered into European languages in the late Nineteenth / early Twentieth Centuries, *e.g.* in English, "Utcha-t" (Budge 1920 I: 193) or "Udjat" (Budge 1930: 141).

69   Currently in print as Schneck (2016), with quotation at Schneck (2016: 130).

Edgar Goodman wrote: "It is a fact that the ouija board, or similar device, was known even to the ancient Egyptians. [...] Kennard was afterward told that ouija was an Egyptian word meaning 'good luck.' However, it developed that the young lady [at the naming séance, *i.e.* Miss Peters] was wearing a locket on which the word Ouija was engraved."[70] Robert Murch, the current chairman of the Talking Board Historical Society, suggests that "Helen Peters was a well-read upper class woman. She likely read stories from English novelist Ouida.[71] We believe she might have been wearing a locket that had 'Ouida' on it, and it's possible that 'Ouija' was in her subconscious" (Edwards 2018). On the other hand, lockets are close relatives of charms and amulets, so an alternative possibility is that Miss Peters – "a strong medium" in the Spiritualist movement (McRobbie 2013), where ancient Egypt was much in vogue (Edwards 2018) – was wearing an amuletic pendant which invoked the protection of the Oudjat/Wedjat by including its name written in the Latin alphabet.[72] Alternatively, the later search for an exotic back-story for the board's name may have led Kennard or Fuld to connect it with the similar-sounding Egyptian good luck amulet, while stopping short of naming the referent explicitly. Whatever the truth,[73] the original trademark of the "Ouija or Egyptian luck-board" has Egyptianising features: its flowing lines are reminiscent of the Wedjat Eye design, while the ornamental scrolling ends in lotus-flower terminals (fig. 2).
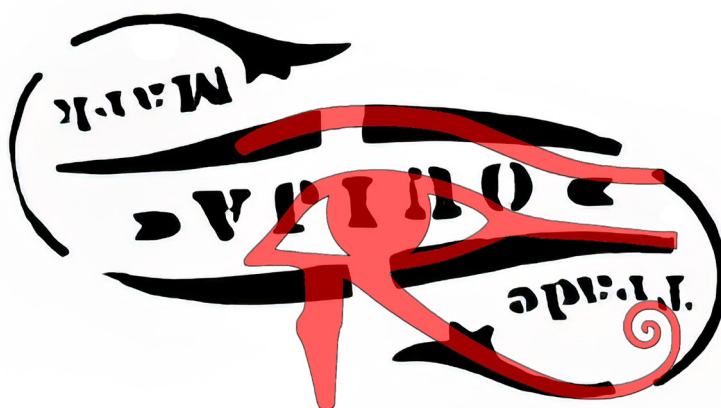

Fig. 2   Original Ouija board logo of the Kennard Novelty Company (*ca.* 1890, black), here inverted and superimposed with the "Eye of Horus" Oudjat/Wedjat template (red, transparent) (drawing by Lloyd Graham; logo image Public domain, via Wikimedia Commons, online at https://commons.wikimedia.org/wiki/File:Ouija_board_-_Kennard_Novelty_Company.png)

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70 See Murch (2007b). Repeated in the *Literary Digest* of 3 July, 1920 (Murch 2007c). The assertion in the initial sentence is, of course, untrue.

71 A pen-name of Maria Louise de la Ramée (Jones 2018: 109, footnote).

72 Much as many talismans in the Western magical tradition invoke the divine power of יהוה (Yahweh) via the Greek word "Tetragrammaton" (Waite 1997: 73, 220–223, 245, 277, 293, 319). Some recent accounts of the naming séance include differing details about the locket, often ones which would preclude what I am proposing here, but modern embellishments to a historical core are almost guaranteed in the case of this "popular tale from occult folklore" (Jones 2018: 109, footnote).

73 Perhaps Ouija was an unconscious compounding of Ouida with Oudjat/Wedjat; the Ouija board is known to provide such amalgams (Wise 1977: 148, 150).

If *wḏȝ* is in fact the origin of the Ouija name, then it is singularly well chosen. Apart from its already-discussed meaning of prosperity or good fortune, a change in determinative yields another *wḏȝ*, this time a verb of motion used to denote the carrying of a cult image in procession (Faulkner 1962: 75; TLA: lemma no. 52130) – the very process during which (as noted above) oracular decisions were typically given to petitioners. One sense of the near-homonym *wḏꜥ* is "to judge between options" (Faulkner 1962: 75; TLA: lemma no. 52360; Gutierrez Jaskiewicz 2018: 57), which is what the Ouija board frequently does. The board itself resembles a *wḏ*, *i.e.* a stela (Faulkner 1962: 74; TLA: lemma no. 51990) and it can be used to *wḏ*, *i.e.* to decree a destiny (Faulkner 1962: 73–74; TLA: lemma no. 51970).[74] If the name Ouija was indeed selected by the board interrogated by Kennard, Bond and Peters, then it is so uncannily apt that one might be forgiven for wondering (with tongue in cheek) whether the device was not in fact channelling Thoth himself.

DISCUSSION AND CONCLUSIONS

Despite a burgeoning literature on the Cognitive Science of Religion (CSR), in which ancient divination, augury and oneiromancy have received some attention (*e.g.* Driediger-Murphy – Eidinow 2019), few publications by CSR researchers have addressed ancient oracles *per se*.[75] The exceptions tend to focus on oracles in the Greco-Roman world,[76] and especially on the pronouncements of the Pythia at Delphi, who famously communicated the judgements of Apollo to enquirers for over a millennium (Harissis 2014; Bowden 2019; Maurizio 2019; Deeley 2019). Of consultations with this seer, Hugh Bowden writes: "Although there is still some scholarly disagreement, it is now generally accepted that the enquirers spoke directly to the priestess, who replied directly to them, and that her words were entirely comprehensible" (Bowden 2019: 441); it is likely, however, that those words often took the form of ambiguous verses (Maurizio 1995: 86; Chalupa 2014: 31–33). The Egyptian barque oracle differed from normative classical oracles – *i.e.* those of the Pythian and Sibylline kind – in that it was at heart a binary oracle whose outcome was indicated non-verbally (Gutierrez Jaskiewicz 2018: 200, 202).[77] Moreover,

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74 Fukaya (2012b: 80, 82) notes that "*wḏ* often appears in texts in oracular contexts" and "can be understood as 'oracle' or 'divine decree;'" similarly Römer (1994: 141–142, 523–527), Kruchten (1997: 55–56) and Gutierrez Jaskiewicz (2018: 53–54).

75 For example, the 448-page compendium titled *The Oxford Handbook of the Cognitive Science of Religion*, published a year ago by Oxford University Press, contains no index entry whatsoever for "Oracle".

76 The editors of one such volume, published in 2019, write that: "Comparative data from other ancient cultures (e.g. Jewish, Egyptian) would enrich the picture further, and we hope that this volume will inspire further work in all of these areas" (Driediger-Murphy – Eidinow 2019: 5). The ancient Near East did not have a strong native tradition of processional oracles (Millard 2000); nevertheless, see the cross-cultural comparison by Gillam (2014).

77 Even when multiple options were presented to the barque oracle (such as by reading a list of names) the god's response was binary because each option was met with either agreement or refusal, although the amplitude of any response could of course provide a qualitative overlay. For the Pythia, Lisa Maurizio (2019: 130) concludes that "her divinatory practice at Delphi would most likely not have been a procedure yielding a yes or a no answer." On one occasion, the Pythia was required to choose between two pre-formulated written options sealed within separate containers (Maurizio 2019: 121), but even then the decision seems to have been articulated verbally (Bowden 2019: 438–441). This constitutes an enduring point of difference from Egyptian barque oracles, even

communication of the oracular judgement was not the prerogative of one specially chosen and trained lifetime appointee who led a life of ritual seclusion, as at Delphi (Römer 1994: 155–156; Chalupa 2014: 41),[78] or of a solitary prophetess advanced in years and close to madness, as with the archetypal Sibyl (Irwin 1997: 366–370; Gruen 2016). Rather, the outcome was delegated to an assortment of w^cb-priests – low-ranking part-time assistants drawn (potentially on an *ad hoc* basis) from the local community (Doxey 2001: 68–69).

In terms of the CSR-related field known as cultural evolutionary theory, the upsurge in the prevalence of barque oracles during the New Kingdom can be seen as an "adaptive trait in Egyptian culture" – one whose "functions included political cooperation, social cohesion, community mediation, and the promotion of prosocial behaviours" (Gutierrez Jaskiewicz 2018: 6, 84–86, 185–196, 236–242, 246). Perhaps for these reasons, the phenomenon did not remain unique to Egypt and its cultural sphere. In Roman Syria of the Second Century AD, Lucian mentions an oracle of Apollo which communicated the god's decisions by a process very similar to an Egyptian barque oracle (*De Syria Dea* § 36; Černý 1962: 45), and the Fifth Century Roman author Macrobius attributes similar properties to the oracle of Jupiter Heliopolitanus at Baalbek in Lebanon (*Saturnalia* 1. 23. 13; Lendering 2013). Greco-Roman cognates such as these were probably inspired by Egyptian antecedents (Irwin 1997: 349–351);[79] Macrobius himself suggests as much for Baalbek (*Saturnalia* 1. 23. 10).

In this paper, mechanistic insights into the operation of ancient Egyptian barque oracles were obtained by analysing the process in terms of behavioural drivers (Petit 2019), while also being mindful of the constraints imposed by physics. With regard to the latter, the Law of the Lever indicates that bearer positions are not strictly equivalent in situations where the barque indicates its response by turning, although the advantages and disadvantages associated with any given position oppose (and probably cancel) one another. Positional effects can be minimised by compacting the crew towards the centre of the barque; this configuration is optimal in all respects because it affords maximal deflection of the barque for the least movement by the priests. If the barque only moves forwards and backwards, then all bearer positions are equivalent and compaction has no effect.

The behavioural drivers governing most ancient Egyptian barque oracles were probably similar to those at work in Spiritualist table-turning séances and Ouija-board sessions. If so, a hierarchy of four drivers would need to be considered in order to account for the significance-

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if verdicts given by the latter were often recorded in the form of "statements by the god" (Gutierrez Jaskiewicz 2018: 132–133).

78 In the heyday of the Delphic oracle, up to three such priestesses could serve concurrently as the Pythia; however, these – two alternates and one reserve – would always act independently rather than as a group (Parke 1943: 22; Chalupa 2014: 41). Even if – as Plutarch says – the Pythia was untrained at the time of her election, she would no doubt have received training after her appointment; it is more likely, however, that appointees had already undergone a lengthy apprenticeship (Chalupa 2014: 41, 46–47).

79 A genuinely independent process with a related mechanism has been described for Nineteenth Century West Africa; James Frazer (1919: 323) writes that: "Among some tribes of Sierra Leone the delicate task of detecting the murderer used to be laid upon the corpse. Being stretched on a bier and hoisted on to the heads of six young people, it was strictly questioned as to the cause of its death, and gave its answers either by impelling its bearers forward, which signified 'Yes,' or by lurching to the side, which signified 'No.'"

-laden movements of Egyptian barque oracles. Those drivers would be: (1) a deliberate prede-termining of the outcome in response to a suitable incentive; (2) conscious preferences of the porter-priests in favour of a particular candidate or litigant; (3) unconscious actions by porter--priests acting under an auto-suggestive process known as the ideomotor response (IMR), with controlling personalities initiating responses that their peers could either amplify or ignore; and (4) background fluctuations, which could potentiate the system by stochastic resonance.

The first two drivers are conscious and conditional in nature, the second two unconscious and continuous. Outside of important royal oracles, whose outcomes would no doubt have been determined in advance, driver 1 (prior agreement) does not often seem to have been operative, and especially not as a manifestation of corruption or fraud. Driver 2 (bias) would have been more important in smaller communities, where the carrying crew were more likely to know the petitioners, but the manipulation could not have been blatant. If good-faith table-turning and Ouija sessions are indeed appropriate models, then we would expect driver 3 (IMR) to have been the major contributor to most oracular outcomes. Driver 4 (random stimuli) would have been ubiquitous but effectively impartial.

Some intercultural and interdisciplinary observations are warranted in respect of driver 3. Since IMR is characterised by dissociative and hypnosis-like states of mind (Andersen et al. 2019; Hines 2003: 47; Cleveland et al. 2020), both of which are highly relevant to oracular communication (Chalupa 2014: 39–40, 42–47; Deeley 2019: 234–240, 247), the barque oracle shares with the Delphic one the expectation that an altered state of consciousness would contribute to the outcome (Maurizio 1995; Chalupa 2014; Harissis 2014; Deeley 2019). In psychiatric terminology, members of the w^cb-priest cohort could be considered as experiencing a mild form of lucid possession characterised by passivity phenomena – episodes in which thoughts or bodily movements that would normally be accompanied by a sense of control and ownership are experienced as originating from outside the self (Deeley 2019: 230–231). Although – as already noted – the porter-priests were not ritual specialists, this would pose no problem (Deeley 2019: 244).

Like its Delphic counterpart, the outcome of the Egyptian barque oracle was believed to be directly inspired by a personified deity. CSR can provide up to three further insights into this aspect. First, the attribution of the barque's oracular outcomes to divine will rather than to random chance is underpinned by the cognitive system responsible for detecting intentional agency, the so-called Hypersensitive Agency Detection Device, HADD (Barrett 2007: 773). Second, attributing oracular outcomes to the will of a god affords an agentive causal explanation that could have reduced the anxiety of community members and enhanced their general sense of control, security and well-being (Gutierrez Jaskiewicz 2018: 185–196; Watson--Jones – Legare 2022: 136). Third, participants and spectators may have enjoyed what Émile Durkheim termed "collective effervescence", an immersive feeling of belonging and assimilation produced by collaborative ritual action. One can extrapolate from data obtained during a Spanish fire-walking ritual (Xygalatas *et al.* 2011; Xygalatas 2020: 458–459) to suggest that, for the Egyptian porter-priests, such bonding would primarily have been mediated by their coordinated movement, whereas for spectators – unless they too could move in unison with the barque – it would mainly have been mediated by empathetic projection (Xygalatas *et al.* 2011: 735). One participant in a Ptolemaic-era oracular procession of Amenope of Djeme left a record of just such a sense of euphoria and divine inspiration (Gutierrez Jaskiewicz 2018: 209–210).

The behavioural driver model that has been applied in this paper to ancient Egyptian barque oracles was gleaned largely from scientific studies of Ouija-board séances. Interestingly, the pioneers of the "Egyptian luck-board" used in such sessions asserted that its name reflected an ancient Egyptian word with the approximate sense of "good luck". While the claim has never been taken seriously, the paper engaged in a digression which shows that it might in fact have some veracity.

Despite the fact that a newly-developed ChatGPT-like Artificial Intelligence (AI) suite has been named *Pythia* (Biderman *et al.* 2023), normative classical oracles – including the Delphic one honoured by this name – have almost nothing in common with modern embodiments of AI. In contrast, ancient Egyptian barque oracles genuinely do have successors in the AI world; in modern terminology, they constitute the earliest known instances of a particular category of AI called Artificial Swarm Intelligence (ASI), and specifically are examples of the hybrid ASI sub-type called "human swarming". This form of ASI enables networks of individuals whose interactions are governed by real-time feedback loops to converge quickly on optimal solutions, so Egyptian barque oracles were likely to be both fast and fair – an ingenious method of rapidly acquiring expert-level communal decisions from groups of ordinary citizens. It is only as part of the current computing revolution that ASI processes have begun to be understood in detail and the potential of the technology appreciated. Applications in finance, business, medicine, national defence and global resource management are already emerging from ASI research and proving their worth. However, only a select few will realise that these cutting-edge developments in networked human intelligence are in fact the digital heirs of the ancient Egyptian barque oracle.

BIBLIOGRAPHY

ALLAM, SCHAFIK
1973   *Hieratische Ostraka und Papyri aus der Ramessidenzeit* I, Tübingen: Selbstverlag.
1994   "Observations sur les oracles", in: Berger, Catherine – Clerc, Gisele – Grimal, Nicolas-Christophe (eds.). *Hommages à Jean Leclant* IV, Cairo: Institut Français d'Archéologie Orientale [Bibliothèque d'Étude 106], pp. 1–8.

ANDERSEN, MARC – NIELBO, KRISTOFFER L. – SCHJOEDT, UFFE – PFEIFFER, THIES – ROEPSTORFF, ANDREAS – SØRENSEN, JESPER
2019   "Predictive minds in Ouija board sessions", Phenomenology and the Cognitive Sciences 18, pp. 577–588.

ANONYMOUS EDITORIAL
1853   "Table-Turning and Spirit-Rapping", Journal of Psychological Medicine and Mental Pathology 6/24, pp. 601–604.

ASSOCIATION FOR THE SCIENTIFIC STUDY OF ANOMALOUS PHENOMENA
(n.d.)   "Table-tilting – a practical guide" (http://www.assap.ac.uk/newsite/articles/Table%20tilting.html. Accessed on 16th January 2023.).

BAINES, JOHN
1987   "Practical Religion and Piety", Journal of Egyptian Archaeology 73, pp. 79–98.

Barrett, Justin L.
2007   "Cognitive Science of Religion: What Is It and Why Is It?", Religion Compass 1/6, pp. 768–786.
2013   "Cognitive Science of Religion", in: Runehov, Anne L.C. – Oviedo, Lluis (eds.). *Encyclopedia of Sciences and Religions*, Dordrecht: Springer, pp. 409–412.

Bayern, Macy
2018   "How AI systems beat Vegas oddsmakers in sports forecasting accuracy", TechRepublic, 4th September (https://www.techrepublic.com/article/how-ai-systems-beat-vegas-oddsmakers-in-sports-forecasting-accuracy/. Accessed on 16th January 2023.).

Becker, Jeffrey A. – Wheater, Kitty
2017   *An Analysis of Claude Levi-Strauss's Structural Anthropology*, London: Macat-Routledge.

Biderman, Stella – Schoelkopf, Hailey – Anthony, Quentin – Bradley, Herbie – O'Brien, Kyle – Hallahan, Eric – Khan, Mohammad A. – Purohit, Shivanshu – Prashanth, Usvsn S. – Raff, Edward – Skowron, Aviya – Sutawika, Lintang – Van der Wal, Oskar
2023   "*Pythia*: A Suite for Analyzing Large Language Models Across Training and Scaling", ICML 2023 (Proceedings of the 40th International Conference on Machine Learning, 23–29 July, Honolulu, Hawaii), San Francisco: EleutherAI. PMLR 202, pp. 1–34 (https://arxiv.org/pdf/2304.01373.pdf. Accessed on 25th June 2023.).

Blackman, Aylward M.
1925   "Oracles in Ancient Egypt", Journal of Egyptian Archaeology 11/3–4, pp. 249–255.
1926   "Oracles in Ancient Egypt II", Journal of Egyptian Archaeology 12/3–4, pp. 176–185.

Bonabeau, Eric – Dorigo, Marco – Theraulaz, Guy
1999   *Swarm Intelligence: From Natural to Artificial Systems*, New York: Oxford University Press.

Bond, E.J.
1891   "Toy or Game", Patent specification US446054A (https://patents.google.com/patent/US446054. Accessed on 16th January 2023.).

Bowden, Hugh
2019   "Believing in Oracles", in: Petersen, Anders K. *et al.* (ed.). *Evolution, Cognition, and the History of Religion: A New Synthesis*, Leiden: Brill [Supplements to Method & Theory in the Study of Religion 13], pp. 435–446.

British Library
(n.d.)   "Table Moving, its causes and phenomena", BL Collection Items (explanatory entry for a *ca.* 1853 pamphlet of the same title) (https://www.bl.uk/collection-items/table-moving-its-causes-and-phenomena. Accessed on 16th January 2023.).

Brunner, Hellmut
1982   "Die religiöse Antwort auf die Korruption in Ägypten", in: Schuller, Wolfgang (ed.). *Korruption im Altertum (Konstanzer Symposium Oktober 1979)*, Munich – Vienna: R. Oldenbourg, pp. 71–92.

Budge, E. Wallis
1920   *An Egyptian Hieroglyphic Dictionary* I–II, London: John Murray.
1930   *Amulets and Superstitions*, Oxford: Oxford University Press.

BURGIN, MARK
2017   "Inaccessible Information and the Mathematical Theory of Oracles", in: Burgin, Mark – Hofkirchner, Wolfgang (eds.). *Information Studies and the Quest for Transdisciplinarity: Unity through Diversity*, New Jersey: World Scientific [World Scientific Series in Information Studies 9], pp. 59–114.

CABROL, AGNÈS
2001   *Les voies processionnelles de Thèbes*, Leuven: Peeters [Orientalia Lovaniensia Analecta 97].

CAMPBELL, JOSIANNE L.
2016   "Ouija", in: Fee, Christopher R. – Webb, Jeffrey B. (eds.). *American Myths, Legends, and Tall Tales: An Encyclopedia of American Folklore I–III*, Santa Barbara: ABC-Clio, pp. 740–743.

CARPENTER, WILLIAM B.
1852   "On the Influence of Suggestion in Modifying and directing Muscular Movement, independently of Volition", Lecture of 12th March 1852 to the Royal Institution; published in 1854 in *Notices of the Proceedings at the Meetings of the Members of the Royal Institution of Great Britain* I, 1851–1854, London: Royal Institution, pp. 147–153.

CARRINGTON, HEREWARD
1907   *The Physical Phenomena of Spiritualism: Fraudulent and Genuine*, Boston: Herbert B. Turner & Co.

ČERNÝ, JAROSLAV
1962   "Egyptian Oracles", in: Parker, Richard A. (ed.). *A Saite Oracle Papyrus from Thebes in the Brooklyn Museum (Papyrus Brooklyn 47.218.3)*, Providence: Brown University Press, pp. 35–48.

ČERNÝ, JAROSLAV – GARDINER, ALAN H.
1957   *Hieratic Ostraca* I, Oxford: Griffith Institute.

CHALUPA, ALEŠ
2014   "Pythiai and Inspired Divination in the Delphic Oracle: Can Cognitive Science Provide Us with an Access to 'Dead Minds'?", Journal of Cognitive Historiography 1/1, pp. 24–51.

CHEVREUL, MICHEL-EUGÈNE
1854   *De la Baguette Divinatoire, du Pendule Dit Explorateur et des Tables Tournantes*, Paris: Mallet-Bachelier.

CLEVELAND, JONATHAN M. – REUTHER, BRYAN T. – GOLD, STEVEN N.
2020   "The varied relationship between hypnosis and dissociative phenomena: Implications for traumatology", American Journal of Clinical Hypnosis 63/2, pp. 139–149.

COLLIER, DAVID
1993   "The Comparative Method", in: Finifter, Ada W. (ed.). *Political Science: The State of the Discipline* II, Washington DC: American Political Science Association, pp. 105–119.

CORNELIUS, J. EDWARD
2005   *Aleister Crowley and the Ouija Board*, Port Towsend: Feral House.

DEELEY, QUINTON
2019   "The Pythia at Delphi: A Cognitive Reconstruction of Oracular Possession", in: Driediger-Murphy, Lindsay G. – Eidinow, Esther (eds.). *Ancient Divination and Experience*, Oxford: Oxford University Press, pp. 226–252.

Deslippe, Philip
2015   "Ouija Board", in: Cardin, Matt (ed.). *Ghosts, Spirits, and Psychics: The Paranormal from Alchemy to Zombies*, Santa Barbara: ABC-Clio, pp. 184–186.

Digital Karnak
2008   "Bark Movement", Los Angeles: University of California (http://wayback.archive-it.org/7877/20160-919172019; http://dlib.etc.ucla.edu/projects/Karnak/experience/BarkMovement/1. Accessed on 16th January 2023.).

Dillon, Kathleen M.
1993   "Facilitated Communication, Autism, and Ouija", Skeptical Inquirer 17/Spring, pp. 281–287 (https://cdn.centerforinquiry.org/wp-content/uploads/sites/29/1993/04/22165148/p65.pdf. Accessed on 16th January 2023.).

Dorigo, Marco – Birattari, Mauro
2007   "Swarm intelligence", Scholarpedia 2/9, item 1462 (https://doi.org/10.4249/scholarpedia.1462. Accessed on 16th January 2023.).

Doxey, Denise M.
2001   "Priesthood", in: Redford, Donald B. (ed.). *The Oxford Encyclopedia of Ancient Egypt*, Oxford: Oxford University Press, pp. 68–73.

Driediger-Murphy, Lindsay G.
2019   "Unsuccessful Sacrifice in Roman State Divination", in: Driediger-Murphy, Lindsay G. – Eidinow, Esther (eds.). *Ancient Divination and Experience*, Oxford: Oxford University Press, pp. 178–199.

Driediger-Murphy, Lindsay G. – Eidinow, Esther
2019   "Introduction", in: Driediger-Murphy, Lindsay G. – Eidinow, Esther (eds.). *Ancient Divination and Experience*, Oxford: Oxford University Press, pp. 1–14.

Dulaney, Michael – Carrick, Damien
2018   "'Who killed you?' The jurors who used a Ouija board to find a murderer guilty", Australian Broadcasting Corporation, News, 8th May (https://www.abc.net.au/news/2018-05-08/ouija-board-juror-misbehaviour-murder-trials/9734868. Accessed on 16th January 2023.).

Edwards, Phil
2018   "What 'Ouija' actually means, and how the game has changed", Vox, 17th September (https://www.vox.com/2015/6/11/8765053/ouija-board-meaning-name. Accessed on 16th January 2023.).

Eidinow, Esther
2019   "Testing the Oracle? On the Experience of (Multiple) Oracular Consultations", in: Driediger-Murphy, Lindsay G. – Eidinow, Esther (eds.). *Ancient Divination and Experience*, Oxford: Oxford University Press, pp. 44–67.

Evans, Sophie
2017   "Table-Turning: a Victorian fad", Royal Irish Academy Library blog, 24th October (https://www.ria.ie/news/library-library-blog/table-turning-victorian-fad. Accessed on 16th January 2023.).

Faraday, Michael
1859   *Experimental Researches in Chemistry and Physics*, London: Richard Taylor – William Francis.

FAULKNER, RAYMOND O.
1962   *A Concsie Dictionary of Middle Egyptian*, Oxford: Griffith Institute.

FRAZER, JAMES G.
1919   *Folk-lore in the Old Testament: Studies in Comparative Religion, Legend and Law* III, London: Macmillan.

FUKAYA, MASASHI
2012a   "Oracular Sessions and the Installations of Priests and Officials at the Opet Festival", Orient 47, pp. 191–211.
2012b   "Re-examination of the Egyptian Oracle", Miscellanea Philosophica [Tsukuba] 30, pp. 88–75.

GANS, JEREMY
2017   *The Ouija Board Jurors: Mystery, Mischief and Misery in the Jury System*, Sherfield on Loddon: Waterside Press.

GARDINER, ALAN
1953   "The Coronation of King Ḥaremḥab", Journal of Egyptian Archaeology 39, pp. 13–31.

GAUCHOU, HÉLÈNE L. – RENSINK, RONALD A. – FELS, SIDNEY
2012   "Expression of nonconscious knowledge via ideomotor actions", Consciousness and Cognition 21, pp. 976–982.

GILLAM, ROBYN
2014   "The Ancient Egyptian Processional Oracle: A Cross-cultural Analysis", 65th Annual Meeting of the American Research Center in Egypt, 4–6th April, Portland; Abstract booklet (San Antonio: ARCE US), pp. 40–41 (https://arce.org/wp-content/uploads/files-imported/documents/2014.pdf. Accessed on 28th June 2023.).

GILLAM, ROBYN – JACOBSON, JEFFREY (EDS.)
2015   *The Egyptian Oracle Project: Ancient Ceremony in Augmented Reality*, London: Bloomsbury Academic.

GILLEN, TODD J.
2005   "The Historical Inscription on Queen Hatshepsut's *Chapelle Rouge*. Part 1: *bỉꜣ.yt* ("wonder") and the Divine Oracle", Bulletin of the Australian Centre for Egyptology 16, pp. 7–14.

GODFREY, NATHANIEL S.
1853   *Table-Turning, the Devil's Modern Masterpiece*, London: Seeleys.

GRUEN, ERICH S.
2016   "Sibylline Oracles", in: *The Oxford Classical Dictionary* (https://doi.org/10.1093/acrefore/97801-99381135.013.8134. Accessed on 2nd July 2023.).

GUTIÉRREZ JASKIEWICZ, MARÍA A.
2018   *Approaching the God: Processional Oracles in Egypt during the Pharaonic and Graeco-Roman Periods*, New Haven: Yale University (unpublished PhD thesis; https://www.proquest.com/docview/2089949282/1D8A365568224764PQ/1. Accessed on 27 June 2023.).

Hambling, David
2021   "What are Drone Swarms and Why Does Every Military Suddenly Want One?", Forbes, 1st March
        (https://www.forbes.com/sites/davidhambling/2021/03/01/what-are-drone-swarms-and-why-does-
        everyone-suddenly-want-one/?sh=415c0160f68d. Accessed on 16th January 2023.).

Harissis, Haralampos V.
2014   "A Bittersweet Story: the true nature of the laurel of the Oracle of Delphi", Perspectives in Biology
        and Medicine 57/ 3, pp. 351–360.

Hines, Terence
2003   Pseudoscience and the Paranormal, Amherst: Prometheus Books.

Ibrahim, Abdel W.A.S.
2012   "Observations on Paser Stela no. 43649 in the Egyptian Museum, Cairo", Abgadiyat 7/1, pp. 15–24
        (https://abgad.journals.ekb.eg/article_58183_554674a204c1b0b7f60c7a582158e7f4.pdf, in Arabic.
        Accessed on 16th January 2023.).

Independent, The
1994   "Couple's murderer jailed in 'Ouija board' retrial", The Independent, 17th December (https://www.in-
        dependent.co.uk/news/uk/couple-s-murderer-jailed-in-ouija-board-retrial-1389824.html. Accessed
        on 16th January 2023.).

Irwin, Lee
1997   "Words of the God: Ancient Oracle Traditions of the Mediterranean World", Alexandria: Journal of
        Western Cosmological Traditions 4, pp. 343–377.

Iskander, Sameh – Goelet, Ogden
2021   The Temple of Ramesses II in Abydos III: Architectural and Inscriptional Features, Atlanta: Lockwood Press.

Jansen-Winkeln, Karl
1990   "Review: Le grand texte oraculaire de Djehoutymose, intendant du domaine d'Amon sous le pontificat de
        Pinedjem II. By Jean-Marie Kruchten. Monographies Reine Elisabeth, 5. 280 x 220 mm. Pp. viii + 400,
        pls. 5, 1 folding pl. Bruxelles, Fondation Egyptologique Reine Elisabeth, 1986. Price BF 2,200." Journal
        of Egyptian Archaeology 76, pp. 242–244.
1999   "Die Wahl des Königs durch Orakel in der 20. Dynastie", Bulletin de la Société d'Égyptologie de Genève
        23, pp. 51–61.

Jones, Paul A.
2018   Around the World in 80 Words: A journey through the English Language, Chicago: University of Chicago
        Press.

Jung, Carl G.
1991   The Archetypes and the Collective Unconscious (translated by Hull, R.F.C.), London: Taylor & Francis.

Kákosy, László
1982   "Orakel", in: Helck, Wolfgang – Westendorf, Wolfhart (eds.). Lexikon der Ägyptologie IV, Wiesbaden:
        Harrassowitz, columns 600–606.

KESSLER, DIETER
2011   "Bemerkungen zur Tempel- und Gottesgerichtsbarkeit im Neuen Reich", in: Hawass, Zahi A. – Daoud,
        Khaled A. – Hussein, Ramadan B. (eds.). *Scribe of Justice: Egyptological Studies in honour of Shafik Allam*,
        Cairo: Ministry of State for Antiquities [Cahier N° 42], pp. 249–263.

KITCHEN, KENNETH A.
1980   *Ramesside Inscriptions* III, Oxford: Blackwell.
1983   *Ramesside Inscriptions* V, Oxford: Blackwell.

KRUCHTEN, JEAN-MARIE
1986   *Le grand texte oraculaire de Djéhoutymose, intendant du domaine d'Amon sous le pontificat de Pinedjem II*,
        Brussels: Fondation Égyptologique Reine Elisabeth [Monographies Reine Elisabeth 5].
1997   "La Terminologie de la Consultation de l'Oracle de l'Amon Thébain à la Troisième Période Intermédi-
        aire", in: Heintz, Jean-Georges (ed.). *Oracles et Prophéties dans l'Antiquité: Actes du Colloque de Strasbourg,
        15–17 juin 1995*, Paris: De Boccard, pp. 55–64.

LACAU, PIERRE – CHEVRIER, HENRI
1977   *Une Chapelle d'Hatshepsout à Karnak* I, Cairo: Service des Antiquités de l'Égypte – IFAO.

LENDERING, JONA
2013   "Jupiter Heliopolitanus", Livius.org: Articles on Ancient History (https://www.livius.org/articles/
        religion/jupiter-heliopolitanus/. Version of 8th June 2019, accessed on 2nd July 2023.).

LURJE, ISIDOR M.
1971   *Studien zum Altägyptischen Recht des 16. bis 10 Jahrhunderts vor Unserer Zeitrechnung*, Weimar: Hermann
        Böhlaus Nachfolger [Forschungen zum Römischen Recht 30].

MATHIEU, BERNARD
2021   "Procédures oraculaires dans l'Égypte ancienne: Indications bibliographiques", Université Paul
        Valéry, Montpellier (https://www.academia.edu/43656433/. Accessed on 16th January 2023.).

MAURIZIO, LISA
1995   "Anthropology and Spirit Possession: A Reconsideration of the Pythia's Role at Delphi", Journal of
        Hellenic Studies 115, pp. 69–86.
2019   "A Reconsideration of the Pythia's Use of Lots: Constraints and Chance in Delphic Divination", in:
        Driediger-Murphy, Lindsay G. – Eidinow, Esther (eds.). *Ancient Divination and Experience*, Oxford:
        Oxford University Press, pp. 111–133.

McDOWELL, A. G.
1990   *Jurisdiction in the Workmen's Community of Deir el-Medîna*, Leiden: Nederlands Institut voor het Nabije
        Oosten [Egyptologische Uitgaven 5].

McROBBIE, LINDA R.
2013   "The Strange and Mysterious History of the Ouija Board", Smithsonian Magazine, 27th October
        (https://www.smithsonianmag.com/history/the-strange-and-mysterious-history-of-the-ouija-
        board-5860627/. Accessed on 16th January 2023.).

Metcalf, Lynn – Askay, David A. – Rosenberg, Louis B.
2019   "Keeping Humans in the Loop: Pooling Knowledge through Artificial Swarm Intelligence to Improve Business Decision Making", California Management Review 61/4, pp. 84–109 (https://digitalcommons. calpoly.edu/cgi/viewcontent.cgi?article=1105&context=it_fac. Accessed on 16th January 2023.).

Millard, Alan R.
2000   "Prophecies and oracles", in: Bienkowski, Piotr – Millard, Alan (eds.). *Dictionary of the Ancient Near East*, Philadelphia: University of Pennsylvania Press, pp. 235.

Moga, Gyorgy – Zoltan Dienes
2022   "Expressing unconscious general knowledge using Chevreul's pendulum", American Journal of Clinical Hypnosis 64/4, pp. 306–315.

Moore, Teresa
2013   "Oracles, Pharaonic Egypt", in: Bagnall, Roger S. – Brodersen, Kai – Champion, Craige B. – Erskine, Andrew – Huebner, Sabine R. (eds.). *The Encyclopedia of Ancient History* IX, Chichester: Wiley-Blackwell, pp. 4917–4919.

Moss, Frank – Ward, Lawrence M. – Sannita, Walter G.
2004   "Stochastic resonance and sensory information processing: a tutorial and review of application", Clinical Neurophysiology 115/2, pp. 267–281.

Murch, Robert
2007a   "Patents and Trademarks", William Fuld: The Story of America's Most Unique Inventor (https://www. williamfuld.com/ouija_patentsandtrademarks_williamfuld.html. Accessed on 16th January 2023.).
2007b   "Pedigree of The Witch Board", William Fuld: The Story of America's Most Unique Inventor, Ouija-Related Articles (https://www.williamfuld.com/ouija_articles_05231920a.html. Accessed on 16th January 2023.).
2007c   "Ouija, Ouija, Who's Got the Ouija?", William Fuld: The Story of America's Most Unique Inventor, Ouija-Related Articles (https://www.williamfuld.com/ouija_articles_07031920.html. Accessed on 16th January 2023.).

Museum of Talking Boards
(n.d.)a "History of the Talking Board" (https://www.museumoftalkingboards.com/history.html. Accessed on 16th January 2023.).
(n.d.)b "List of Currently Manufactured Talking Boards" (https://www.museumoftalkingboards.com/new. html. Accessed on 16th January 2023.).
(n.d.)c "Directions On How To Use the Ouija Board" (https://www.museumoftalkingboards.com/new.html. Accessed on 16th January 2023.).

Naville, Édouard
1883   *Inscription Historique de Pinodjem III, Grand Prêtre d'Ammon à Thèbes*, Paris: Maisonneuve.

Nesta
2022   "Swarm AI: Connecting hybrid human–machine groups to make decisions together in real time", National Endowment for Science, Technology and the Arts (Nesta, UK) (https://www.nesta.org.uk/ feature/ai-and-collective-intelligence-case-studies/swarm-ai/. Accessed on 16th January 2023.).

OCKINGA, BOYO

1989   A"Oracles in Pharaonic Egypt", in: *Ancient History Teachers' Conference, Macquarie University, 26–28 May, 1989: Conference Papers,* Sydney: Macquarie University Continuing Education Program, pp. 5–14.

2012   *A Concise Grammar of Middle Egyptian,* Darmstadt/Mainz: Philipp von Zabern.

ORMEROD, RICHARD J.

2010   "Rational inference: deductive, inductive and probabilistic thinking", Journal of the Operational Research Society 61, pp. 1207–1223.

OXENHAM, SIMON

2016   "Why bees could be the secret to superhuman intelligence", British Broadcasting Corporation, Future, 15th December (https://www.bbc.com/future/article/20161215-why-bees-could-be-the-secret-to-superhuman-intelligence. Accessed on 16th January 2023.).

PARKE, H. W.

1943   "The Days for Consulting the Delphic Oracle", Classical Quarterly 37/1–2, pp. 19–22.

PARKER, RICHARD A. (ED.)

1962   *A Saite Oracle Papyrus from Thebes in the Brooklyn Museum (Papyrus Brooklyn 47.218.3),* Providence: Brown University Press.

PETIT, VINCENT

2019   *The Behavioural Drivers Model: A Conceptual Framework for Social and Behaviour Change Programming,* Amman: UNICEF (https://www.unicef.org/mena/media/5586/file/The_Behavioural_Drivers_Model_0.pdf%20.pdf. Accessed on 16th January 2023.).

POSENER, GEORGES

1963   "Aménémopé 21, 13 et *bꜣꜣ.t* au sens d"oracle'", Zeitschrift für Ägyptische Sprache und Altertumskunde 90, pp. 98–102.

QUACK, JOACHIM F.

1994   *Die Lehren des Ani: Ein neuägyptischer Weisheitstext in seinem kulturellen Umfeld,* Freiburg – Göttingen: Universitätsverlag – Vandenhoeck & Ruprecht [Orbis Biblicus et Orientalis 141].

1997   "Eine neue Deutung von pBerlin 8525", Göttinger Miszellen 159, pp. 83–84.

2008   "Henuttawis machtlose Unschuld: Zur Deutung von LRL 37", in: Gallois, Christine –Grandet, Pierre – Pantalacci, Laure (eds.). *Mélanges offerts à François Neveu par ses amis, élèves et collègues à l'occasion de son soixante-quinzième anniversaire,* Cairo: Institut Français d'Archéologie Orientale [Bibliothèque d'Étude 145], pp. 259–263.

RADFORD, BENJAMIN

2013   "Ouija Board: Demystifying the 'Mystifying Oracle'", LiveScience, 11th December (https://www.livescience.com/41859-ouija-board.html. Accessed on 16th January 2023).

RAY, J. D.

1981   "Ancient Egypt", in: Loewe, Michael – Blacker, Carmen (eds.). *Divination and Oracles,* London: Allen & Unwin, pp. 174–190.

ROBINS, GAY

2008   *The Art of Ancient Egypt,* Cambridge MA: Harvard University Press.

Romano, Aja
2018   "How Ouija boards work. (Hint: It's not ghosts)", Vox, 6th September (https://www.vox.com/2016/10/29/13301590/how-ouija-boards-work-debunked-ideomotor-effect. Accessed on 16th January 2023.).

Römer, Malte
1987   "Ist der Text auf den Blöcken 222/35/184 der Chapelle Rouge ein Zeugnis für eine neue 'Dimension erfahrbarer Gottesnähe' (Assmann)?", Göttinger Miszellen 99, pp. 31–34.
1994   *Gottes- und Priesterherrschaft in Ägypten am Ende des Neuen Reiches: Ein religionsgeschichtliches Phänomen und seine sozialen Grundlagen*, Wiesbaden: Harrassowitz [Ägypten und Altes Testament 21].
2003   "Das 'Gesicht' des Orakelgottes", Studien zur Altägyptischen Kultur 31, pp. 283–288.

Roose, Kevin
2023   "How Does ChatGPT Really Work? Learning how a 'large language model' operates", The New York Times, 28th March (https://www.nytimes.com/2023/03/28/technology/ai-chatbots-chatgpt-bing-bard-llm.html. Accessed on 30th March 2023.).

Rosenbaum, Joe
2021   "Leading Humanitarian Organizations use Swarm AI to Forecast Food Insecurity in Global Hotspots", Cision PRWeb, 11th February (https://www.prweb.com/releases/leading-humanitarian-organizations-use-swarm-ai-to-forecast-food-insecurity-in-global-hotspots-884101472.html. Accessed on 16th January 2023.).

Rosenberg, Louis
2015   "Human Swarms, a real-time method for collective intelligence", ECAL 2015 (13th European Conference on Artificial Life, 20–24th July, York), Cambridge, MA: MIT Press Direct, pp. 658–659 (https://direct.mit.edu/isal/proceedings-pdf/ecal2015/27/658/1903863/978-0-262-33027-5-ch117.pdf. Accessed on 16th January 2023.).
2016   "Artificial Swarm Intelligence, a human-in-the-loop approach to A.I.", AAAI'16 (Proceedings of the Thirtieth AAAI Conference on Artificial Intelligence, 12–17th February, Phoenix), New York: Association for Computing Machinery, pp. 4381–4382 (https://dl.acm.org/doi/10.5555/3016387.3016604. Accessed on 16th January 2023.).
2021   "Swarm intelligence: AI inspired by honeybees can help us make better decisions", Big Think, 13th October (https://bigthink.com/the-future/swarm-intelligence-ai-honeybees/. (Accessed on 16th January 2023.).

Rosenberg, Louis – Baltaxe, David – Pescetelli, Niccolo
2016   "Crowds vs Swarms, a Comparison of Intelligence", SHBI 2016 (Swarm/Human Blended Intelligence Workshop, 21st–23rd October, Cleveland), New York: Institute of Electrical and Electronics Engineers, pp. 1–4 (https://doi.org/10.1109/SHBI.2016.7780278. Accessed on 29h July 2023.).

Rosenberg, Louis – Pescetelli, Niccolo – Willcox, Guy
2017   "Artificial Swarm Intelligence amplifies accuracy when predicting financial markets", IEEE 8th Annual UEMCON (Ubiquitous Computing, Electronics and Mobile Communication Conference, 19–21st October, New York), New York: Institute of Electrical and Electronics Engineers, pp. 58–62 (https://doi.org/10.1109/UEMCON.2017.8248984. Accessed on 16th January 2023.).

Rosenberg, Louis – Lungren, Matthew – Halabi, Safwan – Willcox, Gregg – Baltaxe, David – Lyons, Mimi

2018   "Artificial Swarm Intelligence employed to Amplify Diagnostic Accuracy in Radiology", IEEE 9th Annual IEMCON (Information Technology, Electronics and Mobile Communication Conference, 1st–3rd November, Vancouver), New York: Institute of Electrical and Electronics Engineers, pp. 1186–1191 (https://doi.org/10.1109/IEMCON.2018.8614883. Accessed on 16th January 2023).

Rosenberg, Louis – Willcox, Gregg

2019   "Artificial Swarm Intelligence", in: Bi, Yaxin – Bhatia, Rahul – Kapoor, Supriya (eds.). *Intelligent Systems and Applications* [IntelliSys 2019, vol. 1], Cham: Springer [Advances in Intelligent Systems and Computing 1037], pp. 1054–1070 (https://doi.org/10.1007/978-3-030-29516-5_79. Accessed on 16th January 2023).

Ryholt, Kim

1993   "A Pair of Oracle Petitions Addressed to Horus-of-the-Camp", Journal of Egyptian Archaeology 79, pp. 189–198.

Schneck, Robert D.

2016   *The Bye Bye Man: And Other Strange-but-True Tales*, New York: Tarcher Perigee.

Schumann, Hans – Willcox, Gregg – Rosenberg, Louis – Pescetelli, Niccolo

2019   "'Human Swarming' Amplifies Accuracy and ROI when Forecasting Financial Markets", 2019 IEEE HCC (International Conference on Humanized Computing and Communication, 25–27th September, Laguna Hills), New York: Institute of Electrical and Electronics Engineers, pp. 77–82 (https://doi.org/10.1109/HCC46620.2019.00019. Accessed on 16th January 2023.).

Schwarcz, Joe

2019   "The Right Chemistry: Turning the tables on the table turners", Montreal Gazette, 7th June (https://montrealgazette.com/opinion/columnists/the-right-chemistry-turning-the-tables-on-the-table-turners. Accessed on 16th January 2023.).

Scudellari, Megan

2018   "AI-Human 'Hive Mind' Diagnoses Pneumonia", IEEE Spectrum, 13th September (https://spectrum.ieee.org/ai-human-hive-mind-diagnoses-pneumonia. Accessed on 16th January 2023).

Shah, Rutwik – Astuto, Bruno – Gleason, Tyler – Fletcher, Will – Banaga, Justin – Sweetwood, Kevin – Ye, Allen – Patel, Rina – McGill, Kevin – Link, Thomas – Crane, Jason – Pedoia Valentina – Majumdar, Sharmila

2021   "Utilizing a digital swarm intelligence platform to improve consensus among radiologists and exploring its applications", arXiv:2107.07341, Ithaca: Cornell University (DOI:10.48550/arXiv.2107.07341. Accessed on 16th January 2023.).

Shenefelt, Philip D.

2011   "Ideomotor Signaling: From Divining Spiritual Messages to Discerning Subconscious Answers During Hypnosis and Hypnoanalysis, A Historical Perspective", American Journal of Clinical Hypnosis 53/3, pp. 157–167.

Solé, Ricard – Amor, Daniel R. – Duran-Nebreda, Salva – Conde-Pueyo, Núria – Carbonell--Ballestero, Max – Montañez, Raúl

2016   "Synthetic collective intelligence", Biosystems 148, pp. 47–61.

STOCK, ARMIN – STOCK, CLAUDIA
2004   "A short history of ideo-motor action", Psychological Research 68/2–3, pp. 176–188.

STROUMSA, GUY G.
2018   "Introduction: In Search of a New Paradigm", in: Stroumsa, Guy G. (ed.). *Comparative Studies in the Humanities*, Jerusalem: The Israel Academy of Sciences and Humanities, pp. 7–13.

SULLIVAN, ELAINE A.
2012a   "The Size and Movement of the Ritual Barks at the Temple of Karnak" (http://wayback.archive-it.org/7877/20160919172017/http:/dlib.etc.ucla.edu/projects/Karnak/assets/media/resources/Bark-Movement/guide.pdf. Accessed on 16th January 2023.).
2012b   "Visualising the size and movement of the portable festival barks at Karnak temple", British Museum Studies in Ancient Egypt and Sudan 19, pp. 1–37.

SWEENEY, DEBORAH
2008   "Gender and Oracular Practice in Deir el-Medîna", Zeitschrift für Ägyptische Sprache und Altertumskunde 135/1–2, pp. 154–164.

TRAUNECKER, CLAUDE
1997   "L'Appel au Divin: La Crainte des Dieux et les Serments de Temple", in: Heintz, Jean-Georges (ed.). *Oracles et Prophéties dans l'Antiquité: Actes du Colloque de Strasbourg, 15–17 juin 1995*, Paris: de Boccard, pp. 35–54.
2001   *The Gods of Egypt* (translated by David Lorton), Ithaca: Cornell University Press.

VON LIEVEN, ALEXANDRA
2016   "Das Orakelwesen im Alten Ägypten", Mythos 10, pp. 17–30.

WAITE, ARTHUR E.
1997   *The Book of Ceremonial Magic*, Secaucus: Citadel Press – Carol Publishing [a reprint of Waite's 1910 original, with a Foreword by John C. Wilson].

WATSON-JONES, RACHEL E. – LEGARE, CRISTINE H.
2022   "Explaining and Solving Practical Problems Supernaturally", in: Barrett, Justin L. (ed.). *The Oxford Handbook of the Cognitive Science of Religion*, Oxford: Oxford University Press, pp. 133–144.

WEISS, LARA
2009   "Markings on oracle ostraca from Deir el Medina: Conflicting interpretations", in: Haring, B.J.J. – Kaper, Olaf E. (eds.). *Pictograms or Pseudo Script? Non-Textual Identity Marks in Practical Use in Ancient Egypt and Elsewhere*, Leiden – Leuven: NINO – Peeters [Egyptologische Uitgaven 25], pp. 221–230.

WILLEMS, HARCO
2014   "O. Gardiner 103: One of a Pair of Legal Statements?", in: Haring, B.J.J. – Kaper, Olaf E. – Walsem, René van (eds.). *The Workman's Progress: Studies in the Village of Deir el-Medina and Other Documents from Western Thebes in Honour of Rob Demarée*, Leiden – Leuven: NINO – Peeters [Egyptologische Uitgaven 28], pp. 305–311.

WINAND, JEAN
2003   "Les décrets oraculaires pris en l'honneur d'Henouttaouy et de Maâtkarê (X[e] et VIIe pylônes)", Cahiers de Karnak 11/2, pp. 603–707.

Wise, James A.

1977   "The Psychology of the Ouija Board", in: Jungermann, Helmut – de Zeeuw, Gerard (eds.). *Decision Making and Change in Human Affairs*, Dordrecht: D. Reidel, pp. 141–157.

Xygalatas, Dimitris

2011   "Quantifying collective effervescence: Heart-rate dynamics at a fire-walking ritual", Communicative & Integrative Biology 4/6, pp. 735–738.

2020   "Cognitive Science of Religion", in: Leeming, David A. (ed.). *Encyclopedia of Psychology and Religion*, Cham: Springer, pp. 457–461.

Zhou, Tianshou

2013   "Stochastic Resonance", in: Dubitzky, Werner – Wolkenhauer, Olaf – Cho, Kwang-Hyun – Yokota, Hiroki (eds.). *Encyclopedia of Systems Biology*, New York: Springer, pp. 2004–2009.

Zusne, Leonard – Jones, Warren H.

2014   *Anomalistic Psychology: A Study of Magical Thinking*, New York: Psychology Press.

Internet Resources

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Thesaurus Linguae Aegyptiae (https://thesaurus-linguae-aegyptiae.de/search)

Lloyd D. Graham
Independent scholar; lloyd.graham@cantab.net