JOURNAL FOR TRANSCULTURAL PRESENCES &
DIACHRONIC IDENTITIES FROM ANTIQUITY TO DATE

THERSITES

7/2018

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thersites JOURNAL FOR TRANSCULTURAL PRESENCES & DIACHRONIC IDENTITIES FROM ANTIQUITY TO DATE

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Sailing with the Gods: serious games in an ancient sea, in: thersites 7 (2018), 107-153.

KEYWORDS

Video games, insularity, connectivity, Aegean studies

ABSTRACT

Maritime safety in the ancient Greek world was created through symbols and social practice as well as the science of seafaring. The human connections forged through ritual, myth and image enabled communication and granted authority to the civic institutions that offered legal and economic benefits. A gaming application offers a route to modelling the triangulation of seascapes, civic institutions, and narratives through which people and goods moved around the ancient Mediterranean. The game was inspired by the promise of maritime safety given to initiates into the mystery cult of the Great Gods of Samothrace, where grants of *proxenia* and *theoria* represent the civic counterparts of mystic promises and tales of supernatural intervention. The flexibility that characterizes ancient *proxenia* recommends the framework of a game; the bridge between imagination and strategic outcomes that characterizes serious games maps onto the ancient realities of the maritime success enabled through ritual force and civic institutions.

1. Serious games and practical mysteries[1]

THIS article offers a first report on the design, creation and implementation of a game based on an ancient cult and its ritual promises. The mystery cult of the Great Gods of Samothrace offered its initiates safety in travel at sea; the island's proxenia decrees constituted a civic counterpart to those mystic promises. The safety thus created relied on human decisions to refrain from piracy, communicate and collaborate in real space and time, but was articulated through mythic accounts of supernatural interventions to still the storms and provide good winds for those who had undergone initiation. The abundance of votives, stories and inscriptions associated with the rites suggest a high degree of credibility in the ancient world regarding its validity. The question of its effectiveness, however, has not figured into scholarly investigations of the rites: we know much of the structures which could be used to guarantee success, and can hypothesize their effectiveness, but we lack any accounts of individuals making the choices that assured this outcome.

A gaming application offers the potential to model how that effectiveness could be achieved. *Sailing with the Gods,* now in version 4.4, is an ongoing project to develop a game that generates agency-rich data as modern players make choices within a humanized ancient sea. That sea needs to simulate both the geospatial range of Samothrace's influence and the cultural texture of its Hellenistic context. The value of the data the game may generate for the historical investigation of the rites is directly proportional to the aptness of the game's algorithms as well as the quality of the historical information used in its creation. Within ludology, the project falls in the

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[1] The latest iteration of *Sailing with the Gods* is available at https://scholarblogs.emory.edu/samothraciannetworks/the-game/

This game would be impossible without the time, creativity and energy of every member of the team. Lead Programmer and Simulation Designer, Robert Bryant, University of Pennsylvania; Digital Projects Specialist, Joanna Mundy, Emory University; Leigh Cole Furrh and Alex Jester, Research Assistants; Craig Brasco, Visual Interface Collaborator, Kennesaw State University; Philip Kiernan, Outreach and Consultant, Kennesaw State University. Emory's Center for Digital Scholarship has generously hosted the game and the network and GIS analysis of Samothrace's cult http://digitalscholarship.emory.edu/; special thanks are due as well to Sara Palmer, Digital Text Specialist at Emory ECDS, and Michael Page, Geographer in Emory's Department of Environmental Sciences.

category of serious games, which investigate historical patterns including markets, military action, and infectious diseases. These games reveal strategic patterns of human interaction that exceed what New Institutional Economics, military history, or our extant knowledge of microbial entities alone reveal. Natural caveats arise from the fact that games are necessarily simplified. As designed environments, they are as much a reflection of the programmer's subjectivity as Thucydides is a subjective account of the Peloponnesian war. A Gestalt approach to games, however, embraces a historiographic truth: complete reality is as elusive, in even the most visually elaborate games, as complete historical data sets are for historians of any era. An embrace of the partiality of our data, and the use of a restricted series of possibilities, should resonate with scholars of the ancient world, whose critical eyes are trained to the analysis of sources that are partial, prejudicial, and contradictory. A gaming perspective lies at a significant distance, however, from the focus on the canon that characterizes classical scholarship. The Samothracian rites, for which the oath of secrecy compounds the investigative challenges of incomplete ancient sources, offers a particularly rich case study for the heuristic potential of gaming vis-à-vis the historical issue which the mysteries also promised to solve.

Sailing with the Gods is an ongoing project. Our first release came in 2016, and an alpha version 4.4 has just been completed in November 2018. Our team is small, and evolves with the availability of student volunteers from one semester to the rest. Core members are a Classicist (Sandra Blakely), a programmer (Robert Bryant), and a PhD candidate in Art History, serving as digital projects specialist with Emory's Center for Digital Scholarship (Joanna Mundy). While we are still far from generating the quantity of data that was the inspiration and first hope for the project, the process of research and creation has foregrounded issues of methodology and outcomes relevant for the larger issue of the use of games to investigate the ancient world. The methodology – how we move from our ancient data to a meaningful game design – constitutes the majority of the discussion in the pages which follow. Three historiographic outcomes have already become apparent, even as we continue to refine the game itself. The first is a shift in our thinking regarding the relationship between civic institutions and mystic promises, those social structures that bridged the visible and invisible worlds. The second is the potential to bring ludic frameworks to civic institutions. The specific case study within the Samothracian project is proxenia, long noted for its capacity to generate safety at sea through a

range of mechanisms, while falling short of the regularity and predictability of law. The ludic framework foregrounds the extent to which its effectiveness relies on its flexibility, and thus suggests the potential for a gaming perspective in further institutional studies. The third is the contextualization of Samothrace and its rites within the larger world of Hellenistic cities, normalizing a cult whose monuments were exceptional, but whose promise was realized through familiar civic structures. The use of a wide-spread, long lived narrative – the Argonautica – as the framework for the game further positions Samothrace within the larger cultural framework in which its promises operated. The game ultimately offers the potential to generate data to complement network analyses of the preserved epigraphic material.

These outcomes have emerged from our work in building a methodology for an effective game design, a task which began with the historical context itself. The article as follows consists, accordingly, of three sections: the historical context of the rites, the dynamics of *proxenia*, and the design of the game itself. Key factors from the rites' historical framework are the geospatial range of the promise, the commonality of the island's economic strategies, and the extent to which the ritual and the economic intersect. The extent to which the island's maritime and cross-cultural strategies are typical rather than an exception among Greek poleis offers the rationale for the use, within the game, of the same strategies for interaction from one port of call to another. The bridge between the cultural imaginary and economic realities on the island suggests a meaningful analogy between the rituals and serious games. The second portion of the paper turns from the symbolic vocabulary assembled on the island to the practical civic mechanisms through which the promises could be realized – the *proxenia*, combined with *theoria*, which set up the social networks along which communication and cooperation could flow. This section concludes with an argument analogous to that which concludes the introduction to the physical realities of the cult: the productivity of considering *proxenia* as a game, drawing on critical frameworks of Huizinga, Caillois, Bateson and McGonigal. The third portion of the paper details our methodology for translating these historical realities and into an interactive video game, our principles of data collection, and prospects for the project to bridge historiography with serious games, network analysis, and the anthropology of gaming communities.

2. Context, cult, and promise: Samothrace and the Mediterranean sea lanes

Three aspects of ancient Samothrace – the Cartesian extent of its promise, its participation in paradigmatic Greek strategies for ecological success, and its integration of economic reality into ritual practice – bear directly on the challenge of programming a game capable of modeling its outcomes. The landscape relevant to Samothrace' promise reaches far beyond the island itself to include the sea lanes along which the cult's affiliates moved, which extended from Rome to the Black Sea to Alexandria. The time frame stretches from archaic and early classical through the fourth century and the waning of Roman imperium. This daunting scale has been much enabled by movements within Mediterranean historiography that began with Braudel's critique of *histoire événementielle*, and continued with Horden and Purcell's *The Corrupting Sea* (2000).[2] These have produced a model of geographic fragmentation and unpredictability in annual agricultural yields. The human response to this is connectivity, moving goods and ensuring relationships of cooperation among partners operating at a geospatial distance. That transportation is overwhelmingly maritime. Ships harnessed the 'free' power source of the wind, but created human vulnerability to and reliance on meteorological realities, including the seasonal patterns of wind and current, unpredictable storms, and the gusts generated by mountainous shorelines.[3] While so broad a sweep of space and time has a place in historiography, it presents significant challenges in designing a game that can engage the player at aesthetic and imaginative levels, and so raises the stakes for incorporating narratives at a more human scale.

In its ecological strategies for success Samothrace exemplifies the Mediterranean norm, combining limited local resources, a reliance on connectivity, and the uses of ritual, narrative and image to create a humanized seascape amenable to human need. Situated in the northeast corner of the Thracian sea, it lies at the intersection of two seas, two continents, and the Greek and Thracian worlds. Most of the island consists of Mount Phengari or Saos, which at 1644 meters is the tallest peak of the Aegean after Euboea and Crete, looming up dramatically from the fault line which divides the

[2] Braudel (1949); Horden and Purcell (2000).

[3] Morton (2001).

European from the Turkish and Aegean plates.[4] The mountain exemplifies the combination of mythopoiesis and practicality. Visible from some 100 miles away, it provided a natural landmark to steer by, and its abundant rivers offered the water critical for successful voyages. Its multiple names reflect this serviceability for men at sea. It was known as Mount Leukosia, 'white one', suggesting the clouds that, clustering about its height, would augment its natural visibility; it was also Phengari, 'moon' or 'glowing one', offering poetic hyperboles of height and gleaming moonlight.[5] It bore as well the name 'Saos', behind which was the story of a brave Samothracian, Saon, who saved his people from drowning. Long ago, when the waters of the Hellespont burst the barrier that separated them from the Aegean sea, a sudden flood covered up the island's low-lying fields. Saon led his people up the slopes of the mountain, which was renamed for his heroism – a name which would resonate with the Greek adjective for 'saved.'[6] The historical analogue to the flood in question took place ca. 5000 BC, and established the pattern of currents which flow from the Black Sea into the Aegean.[7] One of these, the 'Samothraki anticyclone', pulls ships exiting the Hellespont into a clockwise gyre around the island, significantly increasing its use as a port of call, and its participation in the port-to-port networks connecting the Greeks in Thrace and Asia Minor.[8]

The island is not small (180 km^2), but its agricultural potential is limited. Its surface is a steep network of water and riverside flora and fauna, and its only exports in antiquity were a flaky black stone, possibly identifiable as jet, and horned onions.[9] Its penury was a *topos* in Classical literature, and exemplifies Braudel's model of the natural poverty of Mediterranean islands. Samothracians turned to two typical Mediterranean strategies oriented away from the island: trade routes, and mainland bases.[10] Samothrace intersects with two of six trade routes with deep historical roots, shaped as early as the final Neolithic: the first runs along the coast of Thrace, through

4 Pavlides et al. (2005).

5 Marangou and Della Casa (2008); Hemberg (1950), 103.

6 Diodorus Siculus 5.47.3; Larson (2001) 178.

7 Morton (2001), 5-8; Papageorgiou (2008); Maran (2007).

8 Lykousis et al. (2002).

9 Lewis (1958) 9-11.

10 Constantokopoulou 2007: 238-9; Isaac 1986: 125-158; Tiverios (2008) 107-118.

the Bosporus and into the Black Sea.[11] Braudel wrote that this route lasted well into the historical period, drawing Milesians, Athenians, and Italians alike.[12] A second route centers on Lemnos as a stepping stone for open sea crossings between the northeast and southwest Aegean. G 2-3 ware, a fine Aeolian ceramic often found in ritual contexts, indexes the continuing connectivity between the northeastern Aegean islands and Troy into the iron age, a connectivity which would benefit the incoming Greeks.[13]

Collaboration with those Thracians was key in the strategy of the Samothracian Greeks, and translates into a symbolic presence in the rites. The settlers established a *peraia* soon after their arrival; inscriptions declare the land the property of the Great Gods of Samothrace.[14] The cities on the *peraia* were reasonably successful, though they operated at an order of magnitude beneath the great centers of Abdera, Ainos and Thasos,[15] and Casson deemed the Samothracians the pioneers of Odryssian trade.[16] Ironmaking practices show continuing Thracian control of the craft, highlighting the reliance on collaboration between Greeks and the indigenous groups.[17] Hellenistic inscriptions index the ongoing importance of these holdings for Samothracian success.[18] This economic reality translates into the use of the autochthonous language in the rites. Diodorus Siculus wrote that it was used even in his own time (5.47.3); inscribed ceramics from the island and from the temple of Apollo at Mesembria/ Zone on the Samothracian *peraia* corroborate the use of Greek letters to write in the Thracian language.[19] The abundance of *bothroi* and unworked stones as objects of ritual celebration have been interpreted as Thracian ritual types, which lasted through the imperial period. Graham has noted that while the mysteries on Lemnos

11 Matsas (1995); Papageorgiou (2009).

12 Braudel (1949/1972) 75; Archibald (2013).

13 Ilieva (2006).

14 Graham (2002); Reger (2004) 769-72; McCredie (1968) 220-21; *IG* XII (8), p. 40, nr. 1-2; Cole (1984) 148 n. 15.

15 Archibald (2010); Rubinstein (2009); Psoma (2008); Zahrnt (2008).

16 Markov (1980); Isaac (1986) 126; Casson (1926) 92-93.

17 Skinner (2012) 83-89; Kostoglou (2010); Ilieva (2007); Matsas (2007).

18 Funke (1999); Constantokopoulou (2007) 238.

19 Matsas (2007) 388-390 and n. 11; Brixhe (2006); Graham (2002) 244-47.

were increasingly Atticized over time, the signature of Thracian identity increased in strength as the Samothracian rites moved through time.[20]

Maritime connectivity figures as powerfully in the symbolic vocabulary of the rites as do the encounters across ethnic lines. The site brings together Greek ritual practices aimed at maritime salvation, narrative responses to those hopes, and the visual vocabularies that materialize hope, thanks and triumph at sea. From the 2nd century BCE onward, visitors to the sanctuary saw the famous Nike, wings spread wide to catch the wind that presses her garments to her form, looming over the site from the prow of a ship. The ship is sculpted with sufficient detail to recommend identification as a Rhodian *trihemiola*.[21] A very different ship occupied the Neorion, positioned on the sanctuary's west hill. The building is one of only three extant examples of its type: such structures render the seagoing vessel an object of exchange between men and gods, and affirm divine intervention in the physical world of the sea and the human attempts to cross it.[22] Material expressions of such interventions were not limited to the exceptionally wealthy. Diogenes Laertius describes the terracotta *pinakes*, thanking the gods for salvation, which crowded the site; these are small enough to carry in the hand, and cheap enough to be accessible to ordinary sailors, soldiers and travelers. Diogenes of Sinope observed cynically that there would be more of them if the gods were better at their jobs.[23] None of these have survived on Samothrace. Latin poetry preserves multiple references to their use, and archaic examples from Corinth depict not the disasters to be averted, but mythic heroes and their successes at sea.[24] These become metonymic for the success of the sailors themselves, inscribing their voyages onto those of the Argonauts and Odysseus.[25]

Literary sources from Classical Athens through the Roman imperial period attest a lively awareness of the cult's promises, and the ritual categories through which it assured safe travel. Herodotus suggests a role for the ithyphallic and the dwarfish in the divine iconography of the rites, whose gods

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20 Graham (2002).

21 Knell (1997).

22 Wescoat (2005).

23 Diogenes Laertius 6.2.59; cf. Cicero, *de Natura Deorum* 3.37.89, who ascribes the comment to Diagoras.

24 Harrison (1987) 48; Horace *Carmina* 1.5.13-16; Juvenal 12.27-28.

25 Geagan (1970); Palmieri (2009).

he identifies as Kabeiroi and compares to the apotropaic figurines used on Phoenician ships.[26] Aristophanes invites Samothracian initiates to engage the gods in a curse to trip up Tumult and impede his journey.[27] Theophrastus' Superstitious Man sees a pirate in every rock formation and a storm on every horizon, and fervently hopes that every soul on board is an initiate.[28] Hellenistic epigrams commemorate the humble votives left on the island – a sailor's lock of hair, a salt cellar.[29] Material analogies for these have been proposed in fishhooks, terracotta models and votive shells found at the site.[30] And accounts of the Argonauts offer narratives of how the promises could be fulfilled. Caught in a storm, the Argonauts begged Orpheus, who alone among them had been initiated, to pray to the Samothracian gods. The wind died down in response to his prayer, and two stars appeared above the heads of the Dioskouroi, saving them from danger and elevating the divine twins to their status as saviors at sea.[31] Orpheus prays to the Samothracian gods a second time during a storm on the Pontic sea: the winds die down, the sea god Glaukos appears and accompanies the ship for 48 hours, prophesying the immortality of Herakles and the honors that would be given to the deified Dioskouroi.[32] Diodorus Siculus 4.49.8 reported that the Argonauts left bowls there, which could be seen even in his own day. Odysseus' salvation from drowning is attributed to Samothracian powers: the sash the sea nymph Leukothea gives him is deemed a token of the rites, and is used by Agamemnon to quell a tumult in the Greek camp at Troy.[33] Analogous *periammata* may lie behind the tradition of magnetized

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26 Nielson (2002); Blakely (forthcoming).

27 Faraone (2005).

28 Theophrastus *Charakteres* 252; Dimitrova (2008) 122-125, no. 49.

29 Lucillius, Epigram 15, *Anth. Pal.* 6.164; Callimachus Epigram 47, *Anth. Pal.* 6.301; Diodorus Epigrammaticus *Anthology* VI.245 records the plea of sailor to the Boiotian Kabeiroi for help when his mast has broken in a Karpathian storm, suggesting an extension to the mainland of the island's characteristic promise.

30 Lehmann (1998) 37; Lehmann (1952).

31 Dionysius Skytobrachion, *BNJ* 32 F 14; Diodorus Siculus 4.43.

32 Dionysius Skytobrachion, *BNJ* 32 F 14; Diodorus Siculus 4.48.5.

33 Literary evidence for the promise: Aristophanes *Pax* 276-86 and scholia *ad loc*; Cicero *de Natura Deorum* 3.37.89; Diogenes Laertius 6.2.59; Theophrastus *Charakteres* 252; Kallimachos, *Anth Pal.* 6.301; Athenaeus *Deipnosophistae* 10.421d; Lewis 1958: 102-11; Hemberg (1950) 101.

iron rings as the token of Samothracian initiation – a tradition first legible in Lucretius, but remembered into the sixth century CE.[34]

Two implications for the gamification of Samothrace emerge from these historical patterns. While modern visitors have characterized the island as isolated and set apart, ancient Samothrace benefited from long-established sea lanes, perennial currents, a landmark peak, and the abundant water supplies which were critical for sailing vessels. These position the island in the patterns of connectivity that typified Greek ecological strategies from one end of the Aegean to the other. The ubiquity of these strategies encourages a Gestalt approach to game design, which limits the number of variables in order to yield the most significant outcomes. Players in the game encounter analogous modalities of local myths and social mechanisms in every city at which they arrive: the core strategy of the game, to level up by moving from port to port, does not alter from one site to another. A second pattern, the translation from lived reality into the symbolic realm of toponyms and ritual practice, recommends an analogy between the project of the game and the object of our investigation. The heuristic value of serious games lies in the relevance of action within the game for problems in the real world. The repeated inscription of economic realities into the symbolism of the rites suggests a fundamental commonality between the mysteries themselves and the game by which we seek to model their impact.[35]

3. From imaginarium to practicality: *theoria*, *proxenia*, and maritime success

The civic institutions of Samothrace offer a connection to maritime safety which, unlike the visual, ritual and mythic vocabulary of the rites, supports quantitative analysis in Cartesian spaces. While heroic narratives from Odysseus to the Argonauts reflect the authority and persuasiveness of the rites, these institutions were the mechanisms for forging Greek cities from the Classical through the Hellenistic period into collaborative networks. Inscriptions on the island record the names of nearly 1000 individuals who invested time, capital, and travel in order to come for initiations, to witness

34 Blakely (2012).

35 On the intersection between ritual and gaming, Bainbridge (2013); Leibovitz (2013); Campbell and Grieve (2014).

festivals, and to receive the benefits of *proxenia*.[36] The same experience may be reflected in inscriptions far from Samothrace, in Koptos, Fasilar, Apameia Kibotos, and Rhodes, through which the dedicator thanked Samothracian gods for saving his life at sea.[37] Both expressions position the initiate in the same category as Orpheus able to calm the sea, Odysseus saved by Leukothea's veil, and the nervous hopes of Theophrastus' Superstitious Man.

Within the game, *proxenia* is the basis of the algorithms which offer a heuristic quantification of the relative benefits of human network affiliation in different ports around the Mediterranean. This choice was based on several factors. Of the various institutions attested on Samothrace's inscriptions, *proxenia* has clearest direct historical relevance for maritime safety; it has generous attestation beyond the island, and so helps us position Samothrace in a sea of networks beyond those of its own creation. It is frequently associated, on the island, with *theoria*, and so indexes the complexity of the institutions through which cities bound themselves simultaneously to each other and to the gods. Its record provides us with the names of historical cities and individuals, so that we are able to tie maritime benefits, in the game, to people with life histories and narratives that engage the player. A closer look at the nature of the island's *proxenia*, moreover, establishes the bases of the argument for its gamification.

Samothrace is especially rich in inscriptions recording grants of *theoria* and *proxenia*. *Theoroi* came to the island to observe its festival, as representatives from their home cities along the Asia Minor coast, the Hellespont, the Black Sea, and islands in the Aegean and Thracian seas. Plutarch calls the festival a "*panegyris*"; it was not the context for initiations, nor is there evidence, in the preserved details, of ritual actions specific to maritime safety.[38] The festivals were, however, a framework for ensuring the flow of information and collaboration among individuals from widely scattered geographic regions. Even relatively small *panegyreis* represented a temporally limited, spatially specific, recurring opportunity for face to face meetings,

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36 Dimitrova (2008).

37 Skarlatidou (1993); Koptos, *OGIS* I, no. 69, Cole (1984) 168; Sterrett (1888) 169, no. 277; Apameia Kibotos, *CIG* no. 3961, Cole (1984) 167; Ramsay (1897) 1.2, no. 289; Rhodes, *SEG* 33 644. For Romans on Samothrace, see Wescoat (2013).

38 Plutarch *Lucullus* 13.2; Cole (1984) 39, 48 and n. 408.

and thus a powerful practical economic benefit in a fragmented Mediterranean.[39] These were the opportunity to declare honors, perform orations and dramas, and read histories, in the presence of the most connected individuals of city states around the Mediterranean.[40]

The Samothracian festivals were also the occasions for adding *proxenia* to *theoria*. *Proxenia* was a frequent response to the structural difficulties that arose from the political fragmentation of the Mediterranean from the Classical through the Hellenistic period. This fragmentation put individuals operating outside their own communities at legal and practical disadvantage. [41] *Proxenia* grants were given by an entire city to individual non-citizens, in recognition of past service to the city and anticipation of service to come. *Proxenoi* would attend to the interests of citizens from the granting city when abroad, providing hospitality, accommodation, access to legal and administrative structures, as well as knowledge of local conditions, networks of friends, and their personal prestige. The *proxenos*, in return, received from the granting city a range of benefits ordinarily enjoyed by citizens; specifically, maritime were the benefits of sailing freely in and out of the granting city's port (*eisploun* /*ekploun*) freedom from taxes (*ateleia*), access to city councils, and freedom from seizure (*asylia*). In contrast to the scholarly tradition that seeks an evolution of proxenia over time, from archaic guest friendship to an eventually meaningless title, Mack has identified a '*proxenos* paradigm' made up of enduring, stereotypical characteristics. Key among these is an eager goodwill on the part of the recipient toward the city. The *proxenos* is to be '*prothumos'*, full of an enthusiasm goes beyond rational and economic calculation and highlights the strong levels of motivation provided by the honor embedded in the etymology. That honor positions the recipient in the type of aristocratic Homeric hero, even while enabling practical economic benefits in the Hellenistic world of cities. Gauthier notes that *proxenia* adds to the nexus of interstate relations on

39 Dimitrova (2008) 9-21, 74, 248-53; Lehmann (1969) 11; Hemberg (1950) 108; Vian (1974) 19: Fraser (1960) 89-91; Habicht (1994); Perlman (2000) 133-46; Marconi (2010); Kowalzig (2007); Rutherford (2007a), (2013); De Ligt and de Neeve (1988).

40 Ma (2003); Michels (2013).

41 Mack 65, 130, 203-7; Archibald (2001); Gauthier (1985); Pritchett (1974), 129; Davies (1984).

which commerce relied; Burke observes that proxenia grants increase after the social war, coincident with a general increase in economic activity.[42]

The Samothracian grants reflect a focus on these maritime benefits: four *proxenia* grants found inside the city of Samothrace offer *ateleia*, *asylia*, *eisploun* and *ekploun*, without paying taxes or fees, in times of war, in times of peace, and in the pursuit of commercial exchange.[43] The benefits would be of long duration, as they are extended not only to an individual, but to his descendants.[44] Three of these inscriptions also reference 'the other *proxenoi*'; this suggests that these benefits extended as well to the individuals listed on 28 block grants which added *proxenia* to *theoria*.[45] The block grants themselves may reflect the granting city's landscapes of primary action, an advertisement of the reach of their influence.[46] Samothrace's grants recommend this model, as the bulk of its affiliated cities are positioned on the Asia Minor coast and in the Hellespont region.

Proxenia is both narrow in its explicit benefits, and flexible in its execution. Grants are limited in their geographic scope, offering benefits to recipients only within the territory of the granting city. They exhibit more flexibility in terms of recipients, extending benefits to descendants and representatives of the *proxenos*, including slaves and brothers who exercise joint control over family estates.[47] Five grants from 3rd century BC Kyme extend the tax benefits even further, including any individual who trades with the

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42 Mack (2015) 68, 71; Engen (2010) 207-211; Gauthier (1985) 134-137; Burke (1992); Runciman (1982); Zelnick-Abramovitz (2004).

43 Bresson (2016) 286-299. These may have been set up in the temple of Athena, as were inscriptions offering civic honors to traveling Rhodians (*IG* XII.8.153) and a Spartan general (*IG* XII.8.156). The inscriptions include *IG* XII.8.151 (Mesata in Aetolia and Oitaia), *IG* XII.8.152 (Kalchedon), *IG* XII.8.153 (Rhodes), *IG* XII.8.155 (Zone, on the Samothracian peraia), *IG* XII.8.157 (Gortyn in Crete), Fraser 1960: 6, Maroneia on the Samothracian peraia, and Rhoiteia (Salviat 1962: 270-274, no. 2). See Dunant and Pouilloux 1958: 18-20, no. 169, for a Samothracian proxeny decree found at Thasos. The dated inscription is *IG* XII(8) 151. In Odessos on the Black Sea, an inscription granting these benefits to that city's honorees was set up in their local temple of the Samothracian gods: *IGBR* I, no. 42 and Pl. 14; Cole (1984) 147 no. 13.

44 Rubinstein (2009) 136 n. 37.

45 Dimitrova (2008) 21-51; Fraser (1960) 62 believes that *proxenia* was eventually granted to all theoroi who came to the island.

46 Mack (2015) 104.

47 Rubinstein (2009) 136 n. 37.

recipient's family. This would constitute a significant competitive edge over other entrepreneurs, and factor in trading partners as yet unidentified. Even more expansive access to these benefits is suggested by the phrase 'the cities which the Athenians rule', which appears in a significant number of Athenian inscriptions detailing *proxenia*, honors, trading allowances and treaties.[48] A *proxenia* decree from the Doric temple at Pherai uses a similar phrase when extending grants of *proxenia*, *asylia* and *ateleia* to Praxiteles and Baukideus, their possession and their family 'also in as much land as the Pheraioi rule', and in a decree from Labraunda.[49] These are exceptional rather than typical decrees, but they show the flexibility of the institution. Further index of this flexibility are the block grants combining *proxenia* with *theoria* which appear in central Greece, Delphi, Epidaurus and Thera as well as Samothrace. These cities show the numbers of recipients fluctuating from year to year, suggesting that the grants responded to evolving inter-polis circumstances.[50]

The combination of *theoria* with *proxenia* highlights the extent to which the effectiveness of *proxenia* as a counter to maritime risk would emerge as much from enabling information flow - open ended, unpredictable, and prone to cascade-like effects - as from the benefits specifically named on the stones. The activation of the privileges of the *proxenos* relied on the mutual recognition of *proxenoi* and citizens. The importance of this recognition is underlined by dispensing *proxenia* in the city theater and at festival times, as well as the evidence of record keeping and dissemination of information.[51] There was significant variation in the execution and enforcement of such records from one polis to another. Gauthier emphasizes the importance of oral testimony; Velisarropoulos and Rubinstein notes the implication of this process for tax collectors in the agora and the harbor.[52] 'Guar-

48 Low (2005).

49 Cf. Crampa (1972) no. 40, who writes that this is 'a not entirely unproblematic award of proxeny and related honors' by Mausolus 'to the Knossians'; Graninger (2011) notes the potential for the prose to be more hyperbolic than actual in its effect.

50 Mack (2015) 168.

51 Rubinstein (2009); Mack (2015) 103; for a focus on documentation in the study of mobility, Moatti (2004).

52 Gauthier (1972) 79-81; Velissaropoulos (1980) 205-235; Rubinstein (2009); Mack (2015) 51, 65-71.

antors of the proxenia', *enuoi tes proxenia*, existed as another route to enable this process. These suggest the extent to which the identifiability of other individuals was vital for maritime success, as important as economic information in the more narrow sense of prices and quantities or information about internal politics or military movements.[53] The extensive personal networks of the *proxenoi*, and their characteristic access to higher sociopolitical levels in both their home and their host communities, rendered *proxenia* a valuable instrument in ancient espionage.[54]

The festivals position the dispensation of *proxenia* grants in the context not only of the city, but a potentially significant portion of the polis' entire proxenic network. In the strictest interpretation of proxenia, only the citizens of Samothrace would need to be able to recognize their *proxenoi*, and vice-versa. The centrality of information flow, however, casts light on the value of bringing together as large a selection of Samothrace's *proxenoi* as possible. The festival granted interactions not only with Samothracians, but with *proxenos*-carrying peers from around the Mediterranean. Davies, Mack and others have noted that the individuals who became *proxenoi*, unlike the humble, possibly fictive fishermen offering fishhooks to the gods in Hellenistic epigram, were not ordinary men. They were the latter-day princes, upwardly striving and mutually competing semi-nobles of the Hellenistic age. Their appointment as *proxenoi* should be understood as a reflection not only of their goodwill to the granting city, but of their own extensive personal networks among the notable citizens of the granting city and beyond. The proxenic ties reflected in a given Samothracian festival could far exceed the number of participants. Grants to such recipients, moreover, were most apt to stimulate their peers to seek their own proxenia from the island, acting in the spirit of competitive emulation that drove the Greek cities, and displaying the eagerness which typifies the *proxenos* paradigm.[55] These individuals could not only connect their own cities to Samothrace, but carry the information to which they were now privy to the other proxenic networks of which they were a part. These festival contexts seems most likely to initiate an information cascade, whose impact extends far beyond the names included on a single block.

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53 Bresson (2016) 299; on the centrality of information flow for safe sailing, Morton (2001) 244-252.

54 Gerolymatos (1986).

55 Collar (2013) 23; Mack (2015) 103, 170.

Proxenia as an institution is thus characterized by a high degree of indeterminacy in its adaptability to local preference and to changing political circumstances, in the range of pathways needed to activate it, and in the scope of its recipients. It both contributed to and relied on the flow of information that enabled Mediterranean movement. That function lies beyond the relatively narrow rules recorded on the grants themselves, which themselves show significant flexibility. Those information flows arguably constituted a more central and consistent element in that movement than relief from port taxes and access to local civic honors. The specific affordances for taxes, civic access and *asylia* were capable of fulfilment precisely because of the stereotypical qualities of *proxenia*, which rendered it recognizable and desirable across the broad geographic spaces occupied by Greek poleis. Those practicalities were married, however, to the heroic ethos, and to a more than rational calculation – the required 'eagerness' – on the part of those who sought it. This blend of the mythic and the pragmatic latter is key in considering the potential for the maritime benefits, which are among the stereotypical offerings of proxenic decrees, to have particular weight at Samothrace, where they would constitute a civic analogue to the mystic promises for which the island was celebrated. [56]

4. *Proxenia* as a game

Five factors recommend an approach to *proxenia* as a game: a balance between rules and flexibility; the competitive context; a reliance on communication that is paradoxical and symbolic; the question of affect and emotional engagement; and the relational aspect of both games and the institution.

The entailments of *proxenia* grants and their conventional nature fall short of law, but map attractively onto the balance between rule and freedom in game worlds. While even the most primitive forms of play imply an intuitive understanding of the rules at work, games are contingent and processual.[57] Their rules are not designed, as are those of bureaucracies, to pro-

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56 Decrees from Samothrace and Priene record evidence of two dramas produced at these festivals, focused on the doings of Dardanos: Rutherford (2007b).

57 On play and contingency, Malaby (2007) 111; Rodriguez (2006) 2; Bayliss (2007) on games simultaneously free and rule-bound; on the need for rules to provide structure,

duce consistent outcomes, but to yield a mix of the predictable and the unanticipated. Unpredictability is central to gaming, and arises from the agency of players who make choices based on emotions, perceptions, and narratives as well as the rational calculation for gain. Rules, moreover, evolve as a game is played. Malaby has argued that this kind of contingency constitutes the common ground between games and real life, which ultimately renders games engaging.[58]

The agonistic element of play and games engages with the consequentiality of *proxenia* decrees, and the striving for their acquisition.[59] Huizinga identifies the Greek impulse for competition as the model of an agonistic culture; Caillois identifies the *agon* as one of four categories of games, alongside *alea*, *mimicry* and *ilinx*. McGonigal, writing of serious games, notes that rules stoke competition, creating social stakes for tasks that otherwise have none and socially recognized rewards for achievements, at the same time that the engagement itself remains optional.[60] Proxenic decrees represent high value stakes in the striving for social mobility that characterized the Greek city states. They were a much sought-after prize, desire for which may be indexed by attempts to acquire them through bribery. The more important the granting city, the higher the prestige of the grant; the display of inscriptions at locations such as the Amphiareion at Oropos enabled competition in stone among the individuals so inscribed.[61]

Play and games are also loci for the creation of meaning, achieved through a combination of aesthetics, paradox, and metalinguistic behavior.[62] Within serious games, the aesthetics of gameplay link the ordinary world and the game world. That connection derives from a more fundamental cultural connection, which Gadamer argued, between aesthetics and the grounding of culture in play itself.[63] The concept of the aesthetic emphasizes the emergence of meaning in the interactions between object and its human consumers. This is a processual model of the emergence of meaning, which

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Susi, Johannesson and Backlund (2007); Prensky (2001); Mitchell and Savill-Smith 2004; Corti 2006. For the Brownian motions in game play, Vasey (1992).

58 Malaby 2009.

59 Huizinga (1950) 71-75; Caillois (2001/1958), 15-17.

60 McGonigal (2011) 122-123.

61 Mack (2015) 106-110.

62 Rodriguez (2005).

63 Malaby (2007) 107; Konzak (2009).

is apt for both gaming and proxenia, consistent with Jauss' emphasis on the consecutive reinterpretations that constitute the meaning of a work of art.[64] Bateson's paradoxical quality of playful communication operates similarly to connect the game world and the real. The paradox consists in the fact that the distinction between map and territory, sign and referent is always capable of breaking down, so that the world of the 'game' is collapsed with the world of the 'real'.[65] *Proxenia* shares in this aesthetic pattern, as it condenses the cultural imaginary of Homeric *xenia* with the structures of the city state. The collapse of real and imaginary underwrites the cultural clout of the institution, aligning the recipient with Pan-Hellenic and legendary counterparts. That imaginary is considerably expanded by its distribution, on Samothrace, in the context of the festival in which dramas celebrated the legendary past, and the complex semantic bundle of the rites, as the island's most famous export, would have informed the dispensation of Samothracian honors.

Proxenia and game-worlds also share a central place for emotional effort, affect and engagement. In the 'silo' of cognitive energy, emotional intensity and collective attention that attend online games, McGonigal finds much of the potential for serious games to create public good, and to unlock innovation and problem-solving energies for pressing concerns in the real world. Mack has noted the frequent praise of the *proxenos* as a figure who not only performs good deeds for the granting city, but is demonstrably eager to do so: the *proxenos* should be *prothumos,* full of heart. The framework of New Institutional Economics has cast light on the extent to which the desire for *proxenia* exceeds the calculation of future utility and specific contracts; indeed the *proxenos'* eagerness is answered with grants from the city which are as much honorary as they are indices of measurable financial reward.[66] The shared intensity of affect between contemporary gamers and ancient seekers of *proxenia* suggests the potential for a middle ground between emic and etic in game-focused approaches to the ancient world, a welcome complement to attempts to reconstruct the subaltern voices from the material and textual record.

64 Jauss (1982); Therrien (2009).

65 Wright (2008); Bateson (1976).

66 Mack (2015) 34, 63 n. 140.

Finally, the social functions answered by both serious games and proxenos-seeker offers significant common ground. The model of the game as a 'magic circle', a space separated out from ordinary rules, is balanced by games that address consequential issues, such as the casting of lots to determine inheritance in modern Greece.[67] The social stakes accommodated by game play exist at multiple levels, from the ephemeral to the critical; they include the sentiments of belonging that are the baseline of social cohesion, and which are enabled by ritual as well as gaming contexts.[68] The stakes for proxenia included the information flow that facilitated physical movement and interpersonal interactions around the Greek shores of the Mediterranean, access to legal support and housing in foreign ports, and the increase in personal status that defined social success in the flexible, evolving human landscape of the Hellenistic world of cities.

5. Designing the game: goals, parameters, and procedures

A game intended to model the dynamics of the Samothracian promise requires a data base of institutions, an appropriately framed seascape, and, most critically, a narrative able to engage modern players in goals appropriate for an ancient sea. We have chosen the *Argonautica* for this purpose, based on its historical, narrative and ritual resonance with the Samothracian case. Apollonius of Rhodes and Dionysius Skytobrachion both wrote that the Argonauts came to the island, and that at least one of their number was initiated.[69] The status of the Argo as the paradigmatic first voyage of the Greeks offers a narratological analogue to the centrality of seafaring in the ritual promises.[70] The Hellenistic floruit of the rites corresponds to the best preserved *Argonautica*s, and the Ptolemies for whom they were written were among the most generous royal patrons of the site. The pathway of the legendary voyage intersects with the sea lanes in which the island itself participated, and on which it was a notable landmark. The epic shares with *proxenia*, moreover, the ethos of the hero – articulated in legend by the ties of friendship among the Greek leaders, in Hellenistic cities by the contests

67 Malaby (2007): 98.

68 Malaby (2009).

69 Apollonius of Rhodes *Argonautica* 1.915-921; Skytobrachion *BNJ* 32 F 14.

70 Jackson (1997).

for civic recognition. The choice responds as well to the uses of heroic narrative within the world of cities, and the Samothracian experience. The Argonauts figured frequently in historical negotiations among the Hellenic cities of the Black Sea; Herodotus reports that Lemnians who claimed land on Taygetos persuaded the Spartans to grant them this territory based on their claim of descent from the Argonauts, which made them Minyans.[71] And the site, as discussed above, is exceptionally rich in epic figures, which means that those saved by the gods have their metonymous equals in the figures of Jason, Agamemnon and Odysseus.

The game is an RPG (role-playing game), with players assuming the role of Jason, the hero of the epic and the captain of the ship. The object of the game is not a replication of the mythical route of the Argo, but a free experimentation with historical strategies for success in an ancient sea. As Frasca has argued, narratives within games are arenas for innovation, in distinction to the single outcomes that define their literary counterparts.[72] Those elements within the game that come most directly from the *Argonautica*'s narrative are the heroic ethos and the emphasis on mobility. The ethos of the hero sets the goal of the game: players seek to gain fame, accumulating 'clout', our analogue for ancient *kleos*. This may be accumulated through factors that resonate with the epic, such as military and strategic accomplishments or the collective impact of high ranking colleagues; they may also accrue through the means more typical of the world of Greek cities, including the monumentalization of one's own status by setting up votives or constructing shrines in port, timely repayment of loans, or the increase in wealth that enables the success of the voyage as well as the cost of such building. The role for profit is appropriate for the economic aspects of *proxenia*, and particularly for the more recent models of the institution which acknowledge the institutions' contributions to both economic and honorary status.[73]

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71 Herodotus 4.145.2; Braund (1996).

72 For consideration of the relationship between narrative and simulation, Frasca (2003) Bayliss (2007).

73 Engen (2010) 219-221; Mack (2015) 50; Rubinstein (2009).

Actions that enable this leveling-up are part of the process of moving through the spaces of a socially networked sea. This contrasts with archaeogames that focus on a single site, or popular games set in the ancient world that emphasize either movement through the ages of man (*Age of Empires*) or combat and stealth, (*Assassin's Creed*).[74] While Jason is the player's avatar, it is the personalities beyond Jason that bring into the game the historical data on ancient *proxenic* networks (fig. 1)**.** The first step in the game, as the first event in Apollonius' epic (*Argonautica* 1.23-228), is the selection of the crew. Hiring takes place in various ports whenever players need to re-fill their ranks, having lost men to outbreaks of disease, pirate fights, starvation or dehydration. The ship comes with ten crewmembers already selected, who play important narrative roles in the Argonautica, such as Herakles and Tiphys; players select an additional twenty crewmembers for hire from a menu made up of unique individuals drawn from either the epic, from a single Samothracian block grant, or from other cities with active proxenic networks (fig. 2).[75] All choices, historical or fictive, come from historically real Greek cities, and reflect their proxenic networks. Thus Canthus, a Euboian, came from the Argonautica of Apollonius of Rhodes: he brings with him the network of the Aitolian league, which included the towns Histiaia, Karthaia, and Chalkis. The ancient names from our representative Samothracian theoria-proxenia grant come from a total of seventeen different cities, and bring those proxenic networks with them. These exemplify the variation among different poleis with respect to connectivity. Some cities, including Stratonikeia, Iasos, Priene, and Maroneia, have no preserved evidence of proxenia with any place but Samothrace; others, such as Alabanda and Parion, had two; several were significantly connected to the proxenic world. Kos, for example, participated in five known proxenic networks, including Astypalaia, Delphi, Epidaurus, Tenos, and Thera. Finally, for those significant proxenia networks which did not appear in connection with either the epic figures or these representative Samothracian

74 Mol et al. (2017); *Age of Empires* (1997-2017), Ensemble Studios/Microsoft Studios, multiplatform; *Assassin's Creed* (2007-2018), Ubisoft Montreal, Ubisoft Annecy, Ubisoft Sofia, Ubisoft Milan, Ubisoft Quebec, Ubisoft Toronto, Gameloft, Griptonite Games, Blue Byte/ Ubisoft, multiplatform.

75 The networks represented in the game are: Samothrace, the Aitolian league, Anaphe, Astypalaia, Chios, Delphi, Epidauros, Eresos, Histaia/Oreos, Kalchedon/Chalcedon, Karthaia, Kleitor, Narthakion, Tenos, and Thera.

names, identities were created, using names appropriate for the region, selected from the *Lexicon of Greek Personal Names*.[76] The *proxenia* modeled in the game is neither specifically Samothracian nor limited to the story line of the epic itself.[77]

5.1 Land, sea, sky and ships

Our graphic style is closer to the simulations for epidemiological studies than they are to the reconstructive and VR technologies used in archaeological contexts.[78] Costikyan has noted that simulation is actually improved by a visual simplicity, as this allows players to focus on the issues most relevant to a given situation.[79] The scale of the territory, moreover – reaching from Colchis to Italy to Alexandria – is unusually large by comparison with other archaeologically focused reconstructions. Our drive for accuracy and visual engagement has focused on the terrain, which has been scaled and georeferenced using satellite imaging data, accurate to a resolution of roughly 1 km.[80] In order to best approximate the experience of visual access to the environment, the simulation replicates the curvature of the earth, viewed from a height of 10 meters; to add the sense of fading visual access

76 An example is Eumedes, from Thera: players seeking to hire him learn that some of his ancestors participated in the island's colonization of Cyrene, while others were priests of Apollo Karneios.

77 We selected a record of theoroi-proxenoi from Alabanda, Kyme, Mytilene, Bargylia, Naxos, Maroneia, Priene, Kaunos, Abdera, Samos, Kos, Rhodes, Iasos, Stratonikeia, Pergamon, Parion and Ephesos, dated ca. 150 BC; Dimitrova no. 5 p 28, Fredrich *IG* XII.8. 170, Fraser (1960) 72-73, appendix III B no. 4.

78 Balicier (2007); Morgan (2009).

79 Costikyan (1994).

80 The simulation uses GTOPO30 elevation data; the dataset has a grid space of approximately 1 km. One unit of Unity world space is the equivalent to 1193.920898m in the processed, projected DEM (digital elevation model) raster. A subset of the GTOPO30 dataset is used to reference only the Mediterranean area and project into the EPSG:32634 standard. The projection used is for visual reference only. For accurate placement f cities, the origin of the unity world space (0,0,0) is set to match the southwestern corner of the GTOPO30 subset; latitude and longitude were taken from Pleiades https://pleiades.stoa.org/

for objects in the distance, a fog fades in at ~15 km.[81] (Fig. 3) As a seascape, this environment includes the night sky, currents and winds as well as shoreline. The stars were programmed using a predictive model of axial precession determined by NASA, so that they are in the appropriate positions for the year 200 BC. *(Fig. 4)* The stars are presented through a series of nested celestial spheres that rotate around the ship, creating a 'mariner-centric' simulation; the constellation maps were taken from NASA's Tycho Catalog Starmap and Deep Star Maps.[82]

The base speed for a ship is 5 km/h, which can be affected by the crew, their relative levels of nutrition and hydration, the deterioration of the ship over time, and random events such as pirate attacks. Wind and water zones are based on directional vectors with set magnitudes: a ship sailing directly into the wind of 4 km/h will have its speed reduced by that amount; sailing directly with the wind will add that same velocity to the ship's speed. The same principle applies to the water current zones. Visual signals of these impacts take the form of moving 'waves' that flow in the direction of the current, and bobbing wind trails that move overhead. (Fig. 5) Sails may be furled or unfurled as players decide whether to proceed under windpower or by rowing.[83] These are critical reminders of the extent to which geospace

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81 A simple geometric formula to calculate the horizon distance from an average of 10 meters is: Horizon Distance = $\sqrt{2Rh}$ where R = the earth's radius, and h = the height of the player's eyesight from the surface of the earth. We assume an optical height averaging 10 meters from the deck of an ancient ship so:
Simulation View Distance = $\sqrt{2}\ x\, 6378km\ x\, .010km \Rightarrow$ 11.29km
(https://web.archive.org/web/20131717132700/http://mintaka.sdsu.edu/GF/explain/atmos_refr/horizon.html) This formula assumes an average radius of 6378 km for the earth's surface. Since the engine assumes a 2d plane, this distance of 11.29km doesn't take into account the height of a mountain or a mountainous coastline--which would still be visible at further distances. To improve the player's sight--the distance has been increased to 20km to simplify the experience of being able to see taller objects from further away, while not affecting a player's reasonable viewing distance of flat coastlines.

82 The formula for axial precession used is referenced from Capitaine, Wallace and Chapront (2003).

83 The wind zones are 98 x 128 in-game units (roughly 98 km x 128 km) in size, laid out in a grid. The water current zones are 24 x 24 in-game units (roughly 24 km x 24 km) in size, laid out in a grid. The direction and magnitude of the forces are aimed to be

in the ancient sea is never inert, but a matter of continual movement with predictable patterns. Increasing familiarity with these over time will be part of the players' learning curve into decision making in a maritime setting. The embodiment aspect of the game play is further augmented by the programming of the physical requirements for the sailors: crewmembers require food and water, at a rate drawn from NASA figures for the required daily intake of food, and the National Academies Institute of Medicine for daily water intake. We increased these slightly to account for the physical exertions of rowing and being subject to direct sunlight.[84] Dehydration and starvation figured significantly in our earliest playthroughs, and highlighted the extent to which regular stops for water were critical in maritime success.

The surfaces over which players move are thus textured and variable rather than coherent and inert; we needed as well to approximate the fragmentation of the ancient economies. This translates into the variable access to resources in every port. Renewal of water and food and repairs to the ship translate into monetary exchange in the game-play experience: the ship arriving in port needs to balance the costs of provisioning and repair against the desire to gain wealth, acquire information, or erect monuments, toward increasing their score. The cities reflect differential access to materials beyond the basics of water, wine and grain – goods include timber for ship repair, and gold, silver and copper and slaves for trading.

based on real-world meteorological data. As is currently stands, they are loose approximation of existing patterns of the Mediterranean until we can locate reliable longitudinal data.

84 The daily intake of food is roughly .71 kg per day once the astronauts' food packaging is removed. The IOM's recommended daily intake of water for the average male is 3.71l per day (also 3.71kg). Because the crewmembers are onboard a ship and performing strenuous physical activities such as rowing and being subject to direct sunlight, we have raised the average to an even 5l of water per day per crew member.
NASA Food intake: http://www.nasa.gov/vision/earth/everydaylife/jamestown-needs-fs.html (accessed 11 November 2018).
National Academies Institute of Medicine (IOM) water intake: http://www.nationalacademies.org/hmd/~/media/Files/Activity%20Files/Nutrition/DRIs/DRI_Electrolytes_Water.pdf (accessed 11 November 2018).

5.2 Humanizing the landscape

We sought as well to factor in those elements which rendered the Mediterranean a human sea, specifically the use of local narratives and the use of *proxenia*. Narratives have been made part of the landscape through multiple means: they are pop-ups in connection with poleis and their numismatics, a narrative accompanies every individual who may hired as a crewmember, and they inform the pirate events embedded in the game. The poleis themselves are a representative sample of the historical reality: both the limitations of team members and the gestalt approach to game design mitigated against attempting to include every known city. Our sample includes the cities which appear on the Samothracian inscriptions, as well as poleis with significant proxenic networks beyond Samothrace's, for a total of 249 cities and 130 individuals. Every city has a very brief story attached, drawn from its myths, rites, history or archaeology. Thus when pulling into Thasos, a dialogue box informs players that it was colonized by Phoenicians, likely drawn by its metallurgical resources, and was named for the son or grandson of Agenor, the Phoenician king. They learn of the rape of Europa, the quest to recover her, and the local legend of Herakles. Coins have been selected for every city that issued them; we are in the process of using these as another access to local myth and legend, with copyright-free sketches allowing us to present these as an invitation for players to further explore local myths as they pull in to port (Fig. 6) The crew members available for hire also come equipped with historically meaningful accounts of the narratives of their home towns, as a civic focus is an appropriate complement to the polis-centered phenomenon of *proxenia*. Thus, if hiring Chrysaor son of Artemidoros, who appears on a Samothracian inscription of the second century BCE, the player reads "A landlubber from Caria, but very well connected with that ethnicity. He may be helpful if we sail south of Miletus, and his city has strong ties with Rhodes. His closeness with the goddess of necromancy, ghosts, and the moon, Hecate, is a bit unnerving". Hiring one of the Argonautica's crew, Eurytion, son of Irus, the player reads: "Peleus killed him by accident during a hunt, and his father Irus refused to accept the sheep and cattle offered to appease his loss (Pindar Fr. 48; Antoninus Liberalis 38).

The humanization of the Mediterranean consisted of added risks as well as securities. In order to further recreate the complex topography of the ancient sea, we have selected forty-two pirate events from the historical record, and located them, whenever possible, in the proper places on the map. Players may encounter Cretan, Aitolian or Illyrian pirates; text pop-ups add to the pedagogical force. Thus, when sailing near the Thracian Chersonese and Propontis, by Lycia, players find themselves face to face with Aetolian pirates, as recorded in Polybius 4.6.2, 5.3.7; 15.23.8: the player reads "Beware the Aetolian pirates! They sail for plunder on Cephallenian ships. The piracy of their citizens builds their political base". Near Imbros, a pop-up reports the events recorded in *IG* XII.8.53, how Lysanias brought news of a piratical attack, and so received a gold crown from the people of the island. Ancient observations about pirates that come without geospatial coordinates are part of random pirate events, which can engage loss of life, kidnapping and economic cost. (Fig. 7)

5.3 Gamified *Proxenia*

Within the game, the value of these connections needed to be quantifiable in order to enable 'leveling up'. Our programming solution has been to factor these into the clout value of the player, Jason, as his or her outcomes in port and in clout level are directly impacted by the aggregate clout of his crew. Every crewmember brings behavior as well as civic clout into the algorithm of the game. The individual level of every crewmember is a factor of reputation and behavior, and ranges from 0-100. That number is not listed on the hiring screen; familiarity with these values should accrue organically with repeated playthroughs. The crewmember's clout is, however, referenced obliquely and approximately in titles that accompany the individual: thus scores of 1-10 are 'despised', 11-25 are 'unsavory', 26-50 are 'common', 66-75 are 'respected', 76-90 are 'heroic' and 91-100 are 'legendary'. These numbers are unchanging: they are a factor of each individual's contribution to the mission. Crewmembers also bring with them a clout score from the network of their home city, which is based directly on that historical city's degree of proxenic engagement.

The formula for generating aggregated clout for individual exchanges combines clout of the player, his original city, the combined crew, and the network are as follow:

Individual player clout = PC

Combined crew clout = CC

Player's network clout = PNC

Player's origin city clout = POCC

Crewmembers' origin city clout = COCC

CC is calculated by cycling through all the crewmembers and dividing the sum of their combined individual clouts by the total possible clout.

PNC reflects whether or not the event in question is within the proxenic network of the player. If it is, PNC is a value of 100; if not, it is 50.

POCC reflects whether or not the player's hometown network is the same as the network of the event in question. This returns a value of 0-100. If the player shares the same network then the player's hometown clout is returned. If it is not a member, then a value of 0 is returned.

COCC reflects the membership of the crewmembers' hometowns in the network in question. If there is a match from at least one of the crew, that city's 0-100 population level will be divided by 2 and returned as the value. If there is no match, then a value of 0 is returned.

With these five variables, the aggregated clout can be calculated by dividing the sum (hypothetically a maximum of 500) by 500:

$$\text{Aggregated clout} = \frac{((PC \times 2) + (CC/2) + PNC + POCC + (COCC/2))}{500}$$

In this formula, PC is given a weight of 2, CC and COCC a weight of ½, and PNC/POCC a weight of 1. The player's individual clout represents 2/5 of the possible influence in an interaction, making it the strongest factor. The final value is a percentage represented by 1-100; this is used to determine the outcome of a triggered event. Because not all factors return 100 points, it is impossible for a player to receive a score of 100. The best-case scenario would be an aggregate score of 450/500 or 90%: a player, that is, will always have a small chance to fail an event.

All of these proxenic connections mean that the Argo becomes a traveling instantiation of inter-polis connectivity. That connectivity translates, in port, into the hiring of crew, the cost of monumentalization, the price of loans, and information flow and navigation. The clout and job of each figure, other than those from the narrative of the *Argonautica*, has been chosen by our design team. They are labeled as either a sailor, a warrior, a slave, a passenger or a navigator. All crewmembers are located in a port, and their

cost is based on their individual clout as well as the aggregate clout score of the player. The higher the player's aggregated clout score, the more affordable the crewmember is. Crewmembers may also be fired at any port, in order to make room for passengers, navigators, or any configuration of crew that suits the goals of the moment. Sailors, for example, offer a small bonus toward ship speed and positive outcome in events such as storms: the increased ship speed has positive impacts on food and water consumption as well as certain random encounters. Warriors boost the chances of success in combat-oriented random events, in particular the forty-two pirate events which have been embedded in the game. Slaves provide no immediate bonuses, but are purchased for a one-time fee, and cannot leave the ship unless sold. Any individuals may leave the ship if the player fails to provide at least one day's worth of food and water for the entire crew.

Proxenia in the form of clout also affects purchases, constructions, loans in port and information flow. The construction of shrines is a significant avenue to increasing clout, and one that echoes the trail of altars, tombs, and votives through which the Argonauts, in legend, commemorated their journey. These were widely familiar practices in the historical Mediterranean, and afforded mortal sailors the opportunity to steer themselves in the footsteps of Jason and Odysseus.[85] Within the game, such shrines rely not on the labor of players but their ability to purchase the shrine, at a price which reflects their aggregate clout score. The higher a player's score, the higher the cost of the monument – and correspondingly higher clout accrues to both player and the settlement upon its completion.

Social networks also shape the cost of money. Loans to purchase supplies, goods for trade, and provide wages for crewmen may be taken out in port, and the loan interest rates depend on the player's aggregate clout score and the population of the city, with higher clout translating into reduced interest rates. Loan amount is calculated by the city population and player's clout score. A city population score of 100, and a player clout score of 50, would yield a final amount of 2500 currency units:

500 x ([population score]/1000) * [aggregate clout score])

The final amount due on the loans are calculated at the onset: it does not matter if the player repays early or late. The amount due is calculated as the

85 Malkin 1998: 94-120.

interest for the predetermined loan period, added to the initial amount. Not repaying a loan on time will incur severe penalties:

[base interest rate] = 10 + ([population score]/1000)

[final interest rate] = [base interest rate] – ([base interest rate]* [aggregate clout score])

[total amount due] = [loan amount] + ([loan amount] * ([final interest rate] / 100))

Information purchased in port, and the services of a navigator, are also affected by the aggregate clout score of the player. Information in port includes the relative supplies and prices of goods in other locations, as an aid to decisions to buy and sell; the hiring of navigators in the game reflects the historical practice of hiring local guides in the ports along the Mediterranean, who could guide ships through the limited area about which they resided.[86] The reliance on local residents for knowledge of the seaways informs both Jason's interactions with King Kyzikos (1.961-980, and the flood of information provided by Phineus after the Argonauts free him from the ravages of the Harpies (2.316-426). Within the game, the information comes in visual rather than verbal form: once a navigator is hired, the city requested as the next port is marked by a tall vertical pillar of light shooting into the sky; players can then aim their ship in that direction. (Fig. 8) The prospect is complex, however: in a Mediterranean full of mountainous islands and rocky shores, the pillar may lie beyond multiple land masses, forcing the player to navigate the coast in search of the location. Both of these forms of information offer an approximation, in the game, of the information flows enabled by ancient *proxenia*, which exceed the rational calculation of any individual. Repeated playthroughs and increased familiarity with the game are intended to lead ultimately to a multi-faceted, organic sensibility for its operation. This is our avenue for reconstructing in our players the mentality of operating in the cascade prone, open-ended fluctuations of a networked ancient sea.

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86 Morton (2001) 189-214, 245-250, 267, 271, 281, 245; Theophrastus, *de Signis* 3, notes that it is always possible to find a local resident able to interpret weather signs.

6. Data gathering and analysis

The goal of this game from a historiographic perspective is the generation of sufficient amounts of data, through multiple playthroughs and increased player skill levels, to provide a meaningful comparison for the analysis of social network formation based solely on preserved epigraphic materials. This approach reflects a key principle of serious games: the need to approach raw data, generated in virtual environments, as a first step toward fresh insights. Those insights emerge from conversation with data emerging from the non-virtual world. Network analysis of Samothracian proxenia inscriptions suggests highly clustered, scale free networks, formed by non-random patterns that reflect preferential attachment.[87] (Fig. 9 & 10) Similar analysis can be done on the data we hope will emerge from *Sailing with the Gods*. The data generated by the game is stored, with player consent, in a system of temporally distinct linear routes in a comma delimited spreadsheet (Fig. 11). Every leg of a player's journey takes a snapshot of data that represents a single row within the datasheet; these routes are created every time a player selects a destination, leaves or arrives at a port. The data uploads to the server either when the player clicks the 'Save Data' button or when the player restarts the game. Uploaded spreadsheets can be imported as layers into a GIS program showing the various routes taken by different players. (Fig. 12) The data saved includes latitude and longitude, the cargo manifest, the names of the crewmembers, and the status of the crew vis-à-vis starvation and dehydration. This allows us to gauge how cargo and crew may affected travel decisions. The ports and routes derived from the csv files can be converted to nodes and edges for a network graph. As the number of players increases, and their time in play grows, we anticipate that the directed connections between each stop will form larger potential networks. The combination of many players' graphs, particularly after players interact with the game for longer periods, should be able to provide complex network graphs – and thus, we anticipate, a meaningful comparison with the networks generated from epigraphy alone.

87 Blakely (2016).

7. Prospects

Serious games reveal patterns of human interaction that go beyond the rational, but impact action in the day to day physical world. The challenge of *Sailing with the Gods* is to integrate the cultural technologies of imagination into a simulated seascape informed by historically accurate measures of success and risk. The primary imaginarium on which we draw is narrative – from the life stories of sailors to the images on coins and the epic of the Argonauts. This integration of the mythic and the real informs the toponyms of Samothrace, the initiates who could model themselves on the Argonauts, and the abundant ritual, visual and legendary *sema* for safe passage at sea that crowded into its sanctuary.

The challenge of the rites is to investigate the relationship between these signs and the maritime success they signify, and so apprehend how Bateson's paradox, the collapse of the distinction between map and territory, could have informed the lives of historical figures attending the rites. The potential to generate meaningful data is real, and the game is evolving as we identify bugs, improve the user interface, and press forward with new visuals. *Sailing* offers the high stakes, goal orientation, and problem-solving of serious games. It is most serious in its capacity to translate lessons learned in the experimental space of the game into historical contexts. Our player outcomes will ultimately fall between historical simulation and the anthropology of gaming communities: our hope is that these will provide a new middle ground for bridging the etic perspective of historians with the emic experience of social networks in an ancient sea.

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8. Figures

Fig. 1: Game illustration ‘Jason’, created by Christina Gilstrap, in version alpha 4.4 of the game

Fig. 2: Navigational pillar, screenshot from *Sailing with the Gods*

Fig. 3: View of the horizon, screenshot from *Sailing with the Gods*

Fig. 4: Night sky, screenshot from *Sailing with the Gods*

Fig. 5: Wind and wave trails, screenshot from *Sailing with the Gods*

Fig. 6: Aigeai Coin, © M.C. Mundy (2017), some rights reserved

Fig. 7: Pirate event, screenshot from *Sailing with the Gods*

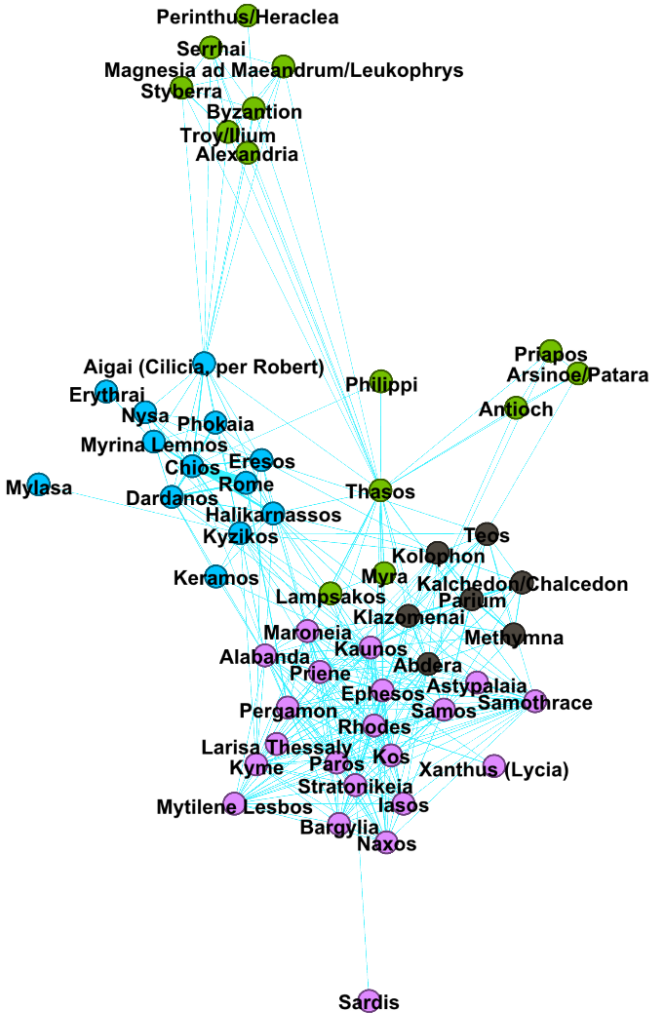

Fig. 8: Samothracian Network, Force modularity analysis, created in *Gephi* by J.C. Mundy and Sara Palmar, Emory Center for Digital Scholarship

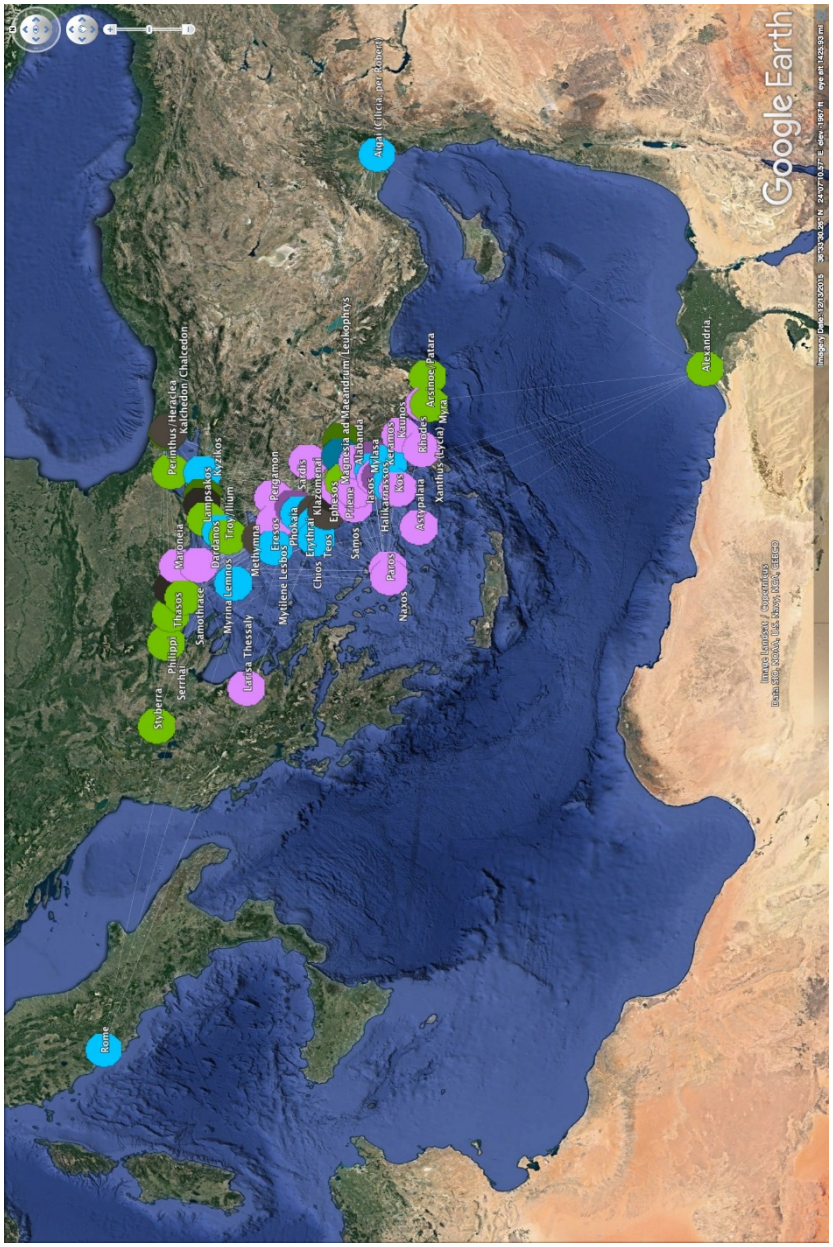

Fig. 9: Samothracian Network in GIS, created by J.C. Mundy and Sara Palmar, Emory Center for Digital Scholarship

timestamp	originE	originN	originZ	endE	endN	endZ	Water_kg	Provisions_kg	Grain_kg	Wine_kg
0.1278742	4.974549	19.21067	39.32497	4.974038	19.21067	39.32731	287.2125	297.8773	0	0
0.1278742	22.93899	19.21067	2168.64	4.728013	19.20834	0	287.2125	297.8773	0	0
0.129263	22.93899	19.21067	2168.64	4.728013	19.20834	0	288.2125	298.8773	0	0
0.481118	4.974038	19.21067	39.32731	4.97432	19.21067	39.28915	277.8879	297.1631	0	0
0.5001937	4.97432	19.21067	39.28915	4.974397	19.21067	39.28228	275.9803	296.8465	0	0
0.6220482	4.974397	19.21067	39.28228	4.974444	19.21067	39.25702	263.7948	294.8236	0	0
0.8022799	4.974444	19.21067	39.25702	4.973959	19.21067	39.2517	245.7711	291.832	0	0
0.9001415	4.973959	19.21067	39.2517	4.973603	19.21067	39.2659	235.9851	292.2074	0	0

Fig. 10: Comma delimited spreadsheet for player tracking

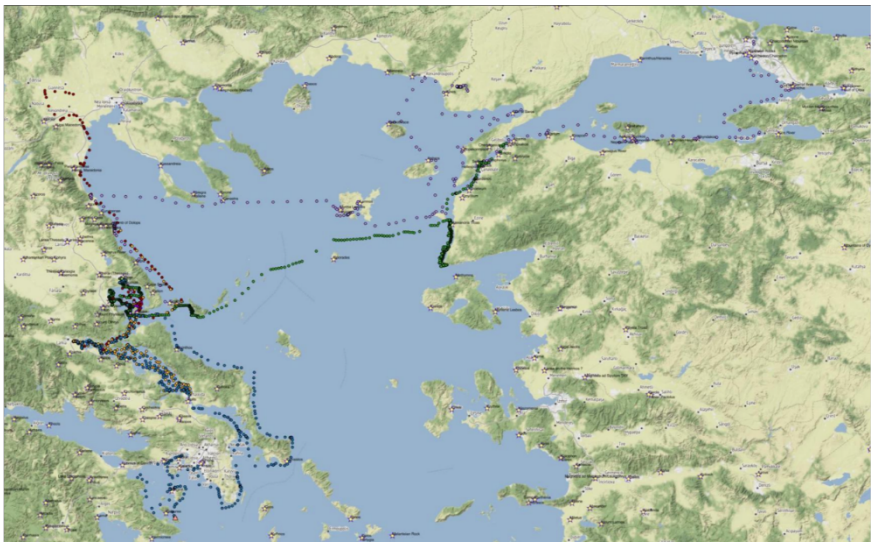

Fig. 11: Player routes in GIS