Identifying the connection between Roman Conceptions of 'Pure Air' and Physical and Mental Health in Pompeian Gardens (c. 150 BC-AD 79): A Multi-Sensory Approach to Ancient Medicine

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ABSTRACT

Different genres of Roman literature commented on the relationship between the condition of the environment and physical and mental health. They often refer to clear, pure, or good air as a beneficial aspect of the environment. Yet, unlike fetid air, they provide few descriptions of what constituted healthy air quality. Moreover, aside from pointing out the association between the environment and bodily condition, the writers also did not explain precisely how the link between the two was made. This paper utilizes a comparative study of ancient literature and the archaeological remains of Roman gardens in Pompeii: archaeobotanical samples, fresco paintings, location, and surviving features. Three questions are addressed in this study: First, how did the Romans identify and define pure? Second, how did air connect to the body? Third, what were the qualities of pure air and how did they benefit the body? Not only was inhalation a means of linking air to the body, but the two were also related through sensory perception. I argue that sight, sound, and olfaction were used to identify the qualities of pure air. Through the sensory process of identification, the beneficial properties of pure air were, in accordance with ancient perceptions of sensory function, taken into the body and affected health. Thus, sensory perception acted as the bridge between the environment and health.

Key Words: Health, Sensory Perception, Roman gardens, Sensory Archaeology and History, Air Quality, Pompeii

Introduction

From the mid-second century BC onwards, Roman writers –agronomists, architects, poets, politicians, and physicians, for example– often mentioned an association between the natural environment and physical and mental health. One of the salubrious environmental factors they referred to was pure/clear air or sky (*aer liquidior*, *purius caelum*). Yet, they did not provide details about how pure air was defined and understood, nor did they explain *how* the air interacted with the body and therefore benefitted them. Most of the writers simply made the connection between the quality of the environment and bodily condition. In modern scholarship little, if any, attention is given to defining pure air and how it was perceived to affect health. In contrast, there have been some analyses regarding ancient conceptions of fetid air and miasmas (e.g. Kolowski-Ostrow 2015a & b; Morley 2015; Parker 1996) and unhealthy environments (e.g. Bradley and Stow 2012; Morley 2005). Archaeologists have also explored Roman attempts to mitigate the negative aspects of their surroundings by studying public amenities such as baths, water management, and public toilets (e.g. Jansen, Koloski-Ostraw and Moormann 2011; Fagan 1999; Purcell 1996).

The relationship between natural spaces and the body was key to Roman conceptions of health. References to *how* air of different qualities intermingled with the body are rarely given, though inhalation and respiration were ways the body could connect to its surroundings (e.g. Manetti 1999: 107). The Roman writer Lucretius (1st AD) noted the plague was caused by the inhalation of tainted air (*On the Nature of Things* 6.1125-1137). On the other hand, the Hippocratic writer of *Affections* (1) informs us that bodily humours were also modified by the senses of smell, taste, and sound, indicating that sensory perception was also believed to be the bond that linked the environment to the body.

Since sensory perception has yet to be explored in studies of ancient medicine that consider environmental effects on the body, it is the aim of this paper to address gaps in scholarship. The questions addressed are 1) how was pure air defined and recognised in ancient Rome, as concepts of nature change over time? 2) What role did sensory stimulation play in affecting humoral balance? 3) How was pure air believed to affect health? Two points are argued

in this paper. First, the Romans used vision, aural stimulation, and olfaction to identify pure air. Second, the identification of good air through sensory stimulation also helped facilitate the entry of clear air into the body.

These three interrelated questions are addressed through an interdisciplinary approach that compares Roman literature mentioning “pure air” with the archaeological remains of domestic Roman gardens in Pompeii (c. 150 BC to AD 79). Air quality tends to be mentioned in ancient literature that refers to natural environments or large villa gardens; though few details about the condition of air are mentioned for small-scale domestic gardens. Pliny and other Roman writers, as will be discussed, who wrote about spaces conducive to wellbeing projected the views of the educated and patrician classes (Myers 2005; Spencer 2010: 121). In comparison to the literature, the archaeological remains of domestic gardens from Pompeii provide information about more widely held perceptions. Gardens were common features in dwellings, with over 500 having been recorded and identified by Jashemski (1993) and Ciarollo (2004). The number is inexact because some of the gardens recorded by Jashemski were excavated in the 19th century with varying degrees of accuracy. Nonetheless, there exist a substantial number of surviving examples that can be studied to assist in determining features of pure air.

Gardens were expected to be salubrious spaces, evinced by the fact that public gardens found on the Italian peninsula were regularly placed around gymnasia and baths (Grimal 1983: 249-52, 260-4). These spaces also offered people a chance to find respite from urban life and to experience nature and its benefits. Albeit on a smaller scale, household gardens also offered similar experiences and benefits as public gardens because they shared the same features such as greenery and flowing water. Along with the frequency of domestic gardens in Pompeii, the quality of their survival on account of the eruption of Mt. Vesuvius in AD 79 make them useful for determining how the Romans recognized indicators of pure air and how the spaces were experienced in order for people to benefit from the air within them.

The argument in this study is developed in three sections. First, the concept of good air is explored to determine how it was recognized and defined by the Romans. To provide a background to how the environment could affect the body, the second section of this paper offers brief explanations of Roman

conceptions of health as well as an overview of philosophical explanations of sensory functions. This is followed by an examination of the different sensory stimuli in gardens and their impacts on physical and mental wellbeing.

New approaches to the history and archaeology of the senses are incorporated into this study to ascertain how sensory perception can be recognized in the archaeological and literary record (e.g. Betts 2017a&b; Butler and Purves 2013; Day 2013b; Feld 2005; Hamilakis 2013; Howes and Classen 2014; Skeates 2010; Tilley 1994; Toner 2014). Sensory perception is affected by age, acuity, gender, and cultural situation (Betts 2017: 23). Tilley (2010: 487) argued that although there is a universal biological body, people are also shaped by their culture and individual personhood. This means that when considering past encounters we should be open to different explanations and conceptions of sensory function than that with which we are familiar (see Betts 2017b: 23-5 for a discussion on this). Examining cultural perceptions of how the senses functioned in the past provides insights into how people thought, lived, and experienced their surroundings in the Roman world. This is especially important for scholarship on ancient medicine because, as will be shown, the senses were thought to be closely attuned to bodily function and the balance of the humours.

How was pure air defined and identified?

Anyone who has examined Greco-Roman medical texts will know that there was a common perception that environmental factors such as wind direction, temperature, and water quality could cause disease or maintain and improve health. The Hippocratic work *Airs Waters Places* (5th BC) is one of the earliest manuscripts we have that attests to these ideas. It detailed the types of diseases associated with specific landscapes and explained why people from the same areas had similar physiques and mental temperaments, as the writer said, it was a general rule that people were affected by the nature of the land in which they inhabited (*Airs Waters Places* 24; see also Hulskamp 2012; Le Blay 2005; Lo Presti 2012). The ideas expressed in this work were prominent in a variety of Roman texts, as indicated above.

The personal letters of the Roman politician Pliny the Younger (1st/2nd AD), for example, expressed that the natural environment and fresh air found

at his different villas were beneficial for his wellbeing. In a letter to Domitius Apollinaris (*Letters* 5.6) about his estate at Tusculum, he said that it was placed below the Apennines, which he described as the most salubrious mountains because the climate was temperate and the summer air was good because it was stirred by currents in it. It did not have the noxious air found at the Tuscan shore. The quality of the air, according to Pliny, explained why many from the region lived to old age. He concluded the letter stating that there was peace and quiet at the villa, 'which added to the healthiness of the place, as the clear sky and pure air (*salubritati regionis ut purius caelum, ut aer liquidior*).

In another letter about his villa on the coast at Laurentium near Ostia, the port city of ancient Rome, Pliny described a covered walkway where the air was not sluggish (*pigro*) since it caught the western breezes (*Letters* 2. 17. 19-20). Both letters indicate that good quality air had movement to it. Although this is explicitly stated when he refers to the summer air having currents in it; the Latin descriptor also suggests movement. The term *liquidior* used to describe good air which is translated as 'pure' above, also means flowing and gentle. In contrast, air with bad qualities is stale, slow, and unmoving. Aside from being clear and having movement, the texts do not specify any other characteristics of healthy air.

In both of these letters he also described other sensory experiences that were further indicators of a healthy space. For example, he mentioned the views from his villa at Tusculum like "a painted scene … and the harmony to be found in this variety refreshes the eye wherever it turns" (*Letters* 5. 6. 24-25). He also noted that there was an ornamental pool in the garden. It was both pleasurable to look at and to hear because it had a waterfall, which foamed white when it struck the marble. Although fresh air was not referred to in these passages, the sensory stimuli specify how he identified the spaces as pleasurable and, by association, healthful.

The water feature in his villa was not only agreeable but was likely a sign of pure air. Other writers made the association between air and water quality; though this is more common between fetid air and stagnant or marshy water. For instance, Vitruvius stated that when looking for a space to put a house consideration should be given to whether the air and location were wholesome

or pestilent and if the water supply was useful.[1] For example, he advised that cities and fortified towns should be placed on healthy sites that were high, neither misty nor frosty, had a temperate climate, and were not in areas with marshes (*On Architecture* 1.4.1). Mist and frost were likely deemed unhealthy because they are indications of thick and immobile air, much like stagnant water. Since they are visible, unlike clear air, they were an ocular signifier of impurity. At the same time, all of the warnings about the dangers involved by being in proximity to marshes, suggests there was a scent associated with stagnant water that was unhealthy, and we learn from military writers that one of the insalubrious smells associated with noxious air was excrement.

Three writers on military matters: Onasander (*The General* 9.1) and Sallust (44. 4), whose works date to the first century AD, along with Vegetius, who lived in the fourth or fifth century AD, mentioned soldiers should move their camps in the summer because of foul odours. These were produced by bodily waste and would contaminate drinking water, with the air becoming tainted by noxious smells that caused disease (*Epitome of Military Science* 3.2).

Cooking smells were also harmful. Seneca the Younger (1st AD) wrote in a letter that he had a fever and left the city to recover from it because the city had an oppressive atmosphere and terrible odours from reeking kitchens. He also complained the kitchens created steam and soot (*Epistles* 104.6). Although it is likely that some food smells were thought to be pleasant (Flohr 2017: 52; Potter 2015: 127-9), archaeologically it has been found that toilets and kitchens were commonly placed next to each other in houses in the Bay of Naples. As well as for human waste, toilets were also used as trash receptacles for kitchen scraps, as evinced from cesspit remains from Herculaneum (Allison 2004: 99; Jansen 1997: 128; Robinson and Rowan 2015; Wallace-Hadrill 2011). The fact that toilets and kitchens were located together in houses in the Bay of Naples reveals that smells considered to be bad were allocated to one spot in the home, so they did not affect the pure air of other rooms, such as dining areas, as Potter notes (2015: 125). Allison also found that kitchens and toilets were not placed near gardens. However, she pointed out that there were

[1] See also Columella *On Agriculture* (preface 1, Preface 5. 6); Virgil *Georgics* (on Beehives) 4. 48-50; Pliny the Elder (*NH* 18.7, 32-3). For healthy land, see Cato *On Agriculture* 1.2 and Varro *On Agriculture* 1.4. 4-5/

some instances where a latrine was positioned in a room off to the side of a garden (2004: 103). These were blocked with doorways, demonstrating that the Romans attempted to keep the smells from them penetrating into other areas of the dwelling, particularly those that were healthy.

Other information about what constituted rank smells beyond the above mentioned contaminates is not presented in the literature. Yet, the archaeological remains from urban areas in the Italian peninsula reveal further possibilities for malodorous scents. Olga Kolowski-Ostraw (2015b) argues that the air in Roman cities was tainted by public toilets; fullers' pots that were placed around cities to collect urine (see also Bradley 2002); blood and rotting flesh from butchered animals, tanneries, and decomposing bodies; fish from markets and *garum* (fish paste) manufacturers; and smoke from forges, funeral pyres, and homes. There also does not seem to have been a systematic form of garbage collection, so waste was dumped in toilets, on the streets, and possibly in public water supplies. In combination, these smells can explain one of the reasons why writers commented on their preference for the air of the countryside.

In spite of Kolowski-Ostraw's findings, other scholars argue that the smells of urban spaces may not have been as poor as we think they were. For instance, Flohr (2017) studied both the location of fulleries and the activities and materials used in them. He found in contradiction to earlier arguments (e.g. Bradly 2002) that they did not smell as much as has been assumed. According to him, the scent of ammonia from the vats containing the urine only smelled in the vicinity of the containers and likely did not permeate beyond the workshops. The scent was further reduced by the use of fuller's earth, which absorbs odours. This explains why the workshops were situated between dwelling spaces rather than being placed in separate areas of the cities Flohr studied.

Morley (2015: 116) attests that the Romans had become habituated to certain scents because there are few descriptions in ancient literature of the odours that Kolowski-Ostraw describes (see also Betts 2017b: 32 on habituation). He maintains that they were understood as scents of home and were not perceived to be a threat to people living in urban areas. However, the references above to fetid air suggest that although there might have been some

habituation to smells, they still existed, and some were thought to be dangerous.

The popularity of public and private gardens further substantiates that urban centres had poor air quality. Gardens served a variety of functions. They were used as spaces for social interaction (von Stackelberg 2009), worship (Carroll 2003: 68-71; Grimal 1984: 167-73, 310-12; von Stackelberg 2016: 126-7), and dining (Macaulay-Lewis 2016: 113-14). Allison also found in a study of artefacts from a selection of larger Pompeian gardens that they were used for food storage, food preparation, and cooking on braziers (2004: 131-2). All of these activities would have been enhanced in a pleasant environment designed to mimic the natural world (Bergman 1994; Gleason 2016: 10) that offered healthful benefits to those who used them (von Stackelberg 2009: 94).

Certain features appear regularly in the archaeological record of Pompeian gardens that can be studied and compared to determine how the Romans identified air quality. Fresco paintings of garden scenes give us an idea of how they were expected to appear and they were placed on garden walls, possibly to make the garden appear larger than they were (Kearns 2016: 164-9; Jashemski 1979: 56; von Stackelberg 2009: 30-3). Jashemiski (1993: 212-369) identified about 100 paintings on garden walls. Some of the ones she recorded were found a century or so earlier than her studies, so she was unable to see some of them to verify their authenticity. Nonetheless, many survive and were identified as some of the best paintings in the houses (Kearns 2016: 165; Jashemski 1979: 79). Their quality suggests that they were important for the viewer, possibly because they provided a form of green space that made the dwelling seem healthier than a place without any form of garden, be it real or a depiction. The scenes of the gardens tend to be similar and usually have low fences painted in the foreground with the greenery depicted behind them. The greenery on some of the paintings is wild and unkempt rather than formally arranged (Kearns 2016: 164), signifying that gardens were intended to be imitations of natural environments. Jetting fountains, reminiscent of modern birdbaths, are usually portrayed. The background colour tends to be blue, as a representation of the sky, though sometimes gold and reddish colours were used (von Stakelberg 2009: 30). Bird life and lush flora and greenery are always represented.

The greenery depicted on them is plants and trees common to the Mediterranean climate. They are a mixture of fruit trees, evergreens, vines, and flowers (Table One). Colour was added with blooming flowers and ripened fruit, such as poppies, roses, lilies iris, cherries, and plums (Table One). In comparison to the frescos, the remains of plants are evident through pollens, carbonized fruits and seeds (Table One), and casts taken from the holes left by roots in the soil, though this later method cannot always be used to identify types of tree or bush. The archaeobotanical studies for Pompeii itself are not extensive, so they only give us some indication of what was actually grown in them. Pollens also travel in the wind and might have come from nearby places rather than the gardens in which they were recovered (Dimbleby 2002: 182-3). This is especially true for grasses and tree pollens. Since it is difficult to say if certain grasses and spores were from gardens, I have not included them here. Ciaraldi (2007) also found that the variety of plants introduced to the region increased as the Roman empire expanded. Thus, only common samples and those that match what was found in the paintings are incorporated into this study.[2] At least eighteen of the plants depicted on the frescos had corresponding pollen and seed remains. For the identification of fresh air, the sensory experience would have been a mild olfactory sensation. The plants found have little to no scent or sweet scents. For example, roses, lilies, and oleanders have sweet smells, and some of the trees like pine and cypress have a mild woody aroma (Ciarollo 2004; von Stackelberg 2009: 30). Visually, the main colour of the plants is various shades of green.

As well as being depicted on frescos, the remains of fountains also survive in Pompeian gardens, indicating that moving water was a desired feature. They range in size from elaborate examples with waterfalls that emptied into pools to smaller pools and fountains with water jetting out of the mouths of animal statuettes (Allison 2004: 108-10; Jashemski 1993: 156-7), which, as Pliny said, made the water white. Some pools were painted blue (von Stackelberg 2009: 39; House of Meleager VI.9.2), possibly to imitate the colour of the sea or a clear lake. Views of the colours and moving water, combined

[2] This paper is the first of a large study on sensory perception and health, in Roman gardens, so the data collection is ongoing, so I have only referenced those from Pompeian gardens that are common. Nonetheless, those recorded in Table One are common.

with the sounds created by it would have signified that the water was fresh. Like the greenery, the water probably had no distinguishable smell, so did not taint the air.

Cisterns of fresh water were also commonly placed in the gardens (Allison 2004: 84-8; see also Jashemski 1993). These were intended for household use. Potable water was considered important for health, so the placement of the cisterns in salubrious areas meant that the water would not become tainted and harmful.

Two other signs that garden air was healthy was their location in houses and the types of rooms that surrounded them. The majority of house gardens were placed at the rear of dwellings away from streets. Street odours likely did not permeate into the backs of the houses, or if they did, the smell would have dissipated with distance from the source of origin.

Rooms that tended to be close to gardens have regularly been identified as the *tablinum*, or office, and dining rooms. Allison has verified that many of these rooms were multi-functional (2004). Some also appear to have been used as storage areas. The dining rooms, as well as *tablina*, often had windows that looked out over the gardens, likely for the scenery and fresh air to be enjoyed. This also reinforces Potter's argument, mentioned above, that dining areas were not to be placed by odorous spaces.

The other evidence for gardens being spaces considered to have pleasant smells and fresh air are the remains of dining couches found in them. Where there is evidence for food preparation in gardens, it is in the form of utensils and braziers, which are signs of small-scale cooking (Allison 2004: 126), likely to have had less smoke and steam than Seneca complained about. Therefore, the dining couches and food preparation materials establish that these were pleasant spaces for eating at certain times of the year and the day. Since physicians suggested that people eat foods that kept their digestion and humours in balance (Baker 2018), eating in mildly scented and healthy spaces would also have contributed to wellbeing.

It is apparent from the archaeological remains that fresh air was identified through sensory perception. Views of colors, greenery, and moving water informed vision. Aurally the air was recognized by the sounds of moving water, and likely the breeze blowing through leaves and branches; while

olfaction identified lightly scented smells. A statement made about drinking water in Galen's work on *Hygiene* offers further support for the idea that pure air had little to no scent.

> One must be on guard against pools of stagnant water and muddy, fowl smelling or salty water or in short those that display to the taste some particular quality. For the best water must seem to be without qualities (that is pure) and not only to taste but to smell. Such water must be sweet, but at the same time perfectly pure (*On Hygiene* 1.2)

Although the comment he made was in reference to drinking water, the aforementioned relationship between water and air qualities indicated that both were used to ascertain air purity.

Nonetheless, the question is how did pure air maintain or affect humoral balance? Vitruvius gives us an idea of *how* the Romans understood the senses to have a direct effect on bodily constitution. When speaking about theatre design, he said (*On Architecture* 5.9.5)

> The open spaces which are between the colonnades under the open sky, are to be arranged with green plots; because walks in the open are very healthy, first for the eyes, because from the green plantations, the air being subtle and rarefied, flows into the body as it moves, clears the vision, and so by removing the thick humour from the eyes, leaves the glance defined and the image clearly marked.

The sensory experiences of seeing greenery as well as inhaling green air, acted as the link that connected the environment to the body, which afforded humoral balance.

Health

Health, as opposed to illness, was generally defined in ancient the ancient world as a state of wholeness with a balance of bodily fluids or humours and a stable mind (e.g. Hughes 2008; King 2005). Although the four humours: (yellow) bile, black bile, phlegm, and blood are mentioned in medical literature as the

constituent fluids of the human body, not every medical writer described the body in the same manner (e.g. King 2015: 25; Manetti 1999: 115-20; Nutton 2005: 19). Some argued that the body consisted of four humours, such as the Hippocratic writer of *On the Nature of Man*. While others, such as Herophilus and the Stoics commented on the amount and quality of *pneuma* in the body. *Pneuma* can be translated to air or life spirit (e.g. Runia 1999: 205, 213; van der Eijk 1999: 320, 329). *Pneuma* was also found outside of the body and would mix with that located within the body. Nonetheless, the key idea was that the body should have a balance of these properties. Balance differed for age, gender, and cultural background. For example, infants were warmer and sweeter than adults; women were colder and moister than men; and those from colder and warmer regions had different temperaments and physiques.

Diseases were thought to arise from imbalances in the properties. The disproportions could be caused by an inadequate regimen –which included diet, exercise, sleep, bodily evacuation, and sexual activity– as well as external environmental factors such as poor air and water quality, and changes in the seasons, and weather. To reiterate, the Hippocratic writer of *Affections* also noted that sensory experiences, such as smell, affected bodily balance. How the Romans understood the senses to work is crucial for their belief that the environment affected this equilibrium.

Sensory function

We first see descriptions of sensory function in the fragments of the PreSocratic philosophers (6^{th}/5^{th} centuries BC), whose ideas, and those that developed from them, influenced later Roman conceptions. Similarly to ancient medical theories, arguments for how the senses functioned also differed amongst the philosophers. Nonetheless, the majority of ideas put forth maintain that there were five senses that operated comparably to the sense of touch (e.g. Squire 2016: 17, note 70). Contact was made with an external sensory stimulus by the sensory organ, such as the eyes viewing an object or the nose picking up something's scent. Ultimately, the item was physically captured and brought into the body by the sense organ (Aristotle *On the Soul* 3.3, 429a; Nightingale 2016: 55-6; Rudolph 2016; Squire 2016: 12). Once in the body the stimulus could affect humoral balance (e.g. Baker 2018; Totelin 2015, 2018). The

theories of the atomists, and later the Epicureans who embraced their ideas, give us an idea of how this interaction worked. They argued that all things emitted effluences (thin replications of atoms) that moved from the object into the particular sense organs. According to Lucretius, atoms had shapes that were suited to the different organs: colours fitted the eyes, flavour the mouth, and smells the nose (*On the Nature of Things* 2. 685-687). The shapes also determined whether smells were pleasant or harsh (Lucretius *On the Nature of Things* 4. 673-686), which is significant for understanding bad and good air. Sounds and views of objects were believed to work in the same manner. Alternatively, the Stoics were proponents of the *pneumatic* theory and believed that *pneuma* contained smells, sounds, and flavours, for example. It was omnipresent and connected everything together including the soul through an intermingling of *pneuma* inside and outside of the body (Baltussen 2015: 44).

To restate, Betts and Tilley pointed out that sensory perception is based on different characteristics, such as gender and culture, much like the differences in humoral construction. It is likely that ancient beliefs about sensory function were also believed to be affected by age, gender, and humoral constitution, as sweet tastes were associated with children (Totelin 2018). However, examination into this lies beyond the scope of this study.

Once in the body, the stimulus was comprehended either in the brain or in the sensory organ. For the sense of smell, for example, the Roman medical writer Celsus (1st AD) said it occurred in the nasal passages (*On Medicine* 8.1.5-6.). Galen, on the other hand, said that the nasal passages led to the brain where smell was understood (see Totelin 2015: 18-21 for a discussion on the theories). Although there were differences in beliefs about whether the brain or the sense organ recognized sensory stimuli, once in the body the sensation affected the humours, as Vitruvius and the Hippocratic writer on *Affections* report.

Multiple Sensory Experiences of Garden Air and its Healthful Benefits

Returning to the garden features, we now explore how the sensory stimuli indicative of pure air could affect humoral balance. I argue that pure air afforded a multi-sensory experience, all of which helped maintain or correct mental and

physical wellbeing. There were three main sensory stimuli associated with locating and experiencing pure air: vision assessed colour, plants, and movement; the aural sense detected the sound of water and moving air; and olfaction perceived the slight scents of greenery.

Since vision was thought to be the primary sense in the ancient world (Squire 2016: 9-16), let us begin with it. Three common colours found in the gardens associated with air and water quality were green, blue, and white. The Latin words for these colours take on meanings that express their beneficial attributes. Viewing the colours therefore meant that their associated qualities were also incorporated into the body. Previous studies have found that green was good for the health of the eyes (Baker 2011; Trinquier 2002) and was associated with corporal health (Bradly 2009). The Latin for green is *viridus*,[3] which can also mean greenery as well as youthfulness, blooming, refreshing, fresh, and vigorous.

Blue (*caeruleus*) can be understood to relate to the sky, the sea, the deep sea, and dark sea. It is also associated with the sky before it rains (Bradly 2009: 9-11). Most of these associations imply movement. Bradley points out the swirling movements of water could be why serpents were sometimes called *caerulei* (2009: 11). Consequently, blue was the opposite of stagnation.

The Latin words for white are *albus* and *candidus*. Both terms can be translated to bright, pure and clear. When used in reference to water, the terms indicated that it was neither muddy nor blocked. Seeing the three colours afforded the body with growth, vibrancy, clarity, movement, and brightness.

The sound of moving water and likely the light rustling of branches and leaves brought about through breezes were beneficial sensory experiences. The Romans wrote that music and calming sounds soothed the mind and induced sleep (Cicero *Tusculan Disputations* 5. 113; Seneca *de Providentia*; 3.10; West 2000: 62-4). The Roman poet, Horace, for example, wrote that calming sounds had the power to allow people to rest, as noted in one of his *Epodes* (2.23-8), “it is a delight to lie under an old holm oak, or in clinging grass; meanwhile the streams glide between their steep banks, birds twitter in the

[3] The Latin translations used in this section for green, blue, and white were taken from the Lewis and Short *Latin Dictionary*.

trees, springs burble as their water gushes forth, sounds that induce a pleasant sleep." Garden fountains imitated the sound of flowing water (Grimal 1984: 300), so could have helped balance the mind.

Music is not a natural sound associated with pure air, but ancient theories about music often mention how it harmonized the mind. For example, when speaking about melancholy, the third century AD writer Censorinus (12.4) said that the physician Asclepiades restored the minds of the insane, deeply disturbed by some illness, with harmony. He also stated that Pythagoras listened to music to balance his mind (Censorinus 12.3). Music in the ancient world, as Martin West noted was believed to have harmonising properties. According to Platonic theory "music, the soul and the whole universe were governed by principles of mathematical order and proportion" (West 2000: 64). Although, there is little evidence for the use of music therapy in medical practice from the period, the philosophical and anecdotal literature about its balancing principles suggests that similarly the sounds of nature, especially those that called to mind pure air, could also help calm the psyche.

Air quality was also identified through olfaction. Technically pure air was not supposed to have a scent, but some of the plants found in gardens would have emitted light or sweet aromas, which did not carry harmful elements. Medical treatises that mention smells often use the descriptors strong, heavy, sweet, or harsh to designate them (Totelin 2015: 25). Sweet smells, as with sweet tastes, were usually a sign of nutritive factors (Totelin 2018: 66). The gentle scents from gardens, particularly pine, cypress, and possibly sweet scented flowers could nurture the humours.

Viewing images of greenery and water, such as those found on garden frescos were also likely to stimulate sensory perception and the humours. For example, Day (2013a: 299) argued that the images of plants found on Minoan pottery vessels were deliberately designed to create the effect of fragrant flowers. Her premise is based on the work of Stephen Houston and Karl Taube who established the idea of synesthetic material culture when examining Mesoamerican artefacts. They argue that seeing objects, such as a painting of a rose, calls to the viewer's mind other sensory stimuli, like the flower's fragrance. Since the fresco paintings were regularly found on the walls of house gardens they also reinforced the experience of being in a garden by evoking

sounds, views, and smells. This idea finds support in some ancient philosophical discussions on memory, or rather, as Squire states are better understood to describe cognitive impressions caused by sensory experiences (2016: 17-18). The sensory experience was imprinted on the mind. When someone heard a description of a garden, for example, the listener would be able to envision it because they had seen one in the past. At the same time, seeing a fresco could also bring to mind other cognitive impressions, such as the smells and sounds of gardens. Therefore, the experience was relived and the body would react accordingly, just as if there had been a first-hand encounter.

Conclusion

As stated at the beginning of this paper, many studies of ancient medicine have commented on the association made in the medical sources about the relationship between the natural environment, health and humoral constitution. However, the question of *how* nature influenced the body had been overlooked. Moreover, it was recognized that air had to be of good quality to benefit the humours, but questions as to how it was defined and recognized also had not been considered. Through a comparative study of archaeological remains with ancient literature, it has been shown that the Romans used sensory experiences to identify pure air. They understood it to have little to no smell or a sweet scent. It was visually identified by the colours blue, green, and white along with moving and transparent water. It was heard by harmonizing sounds that signified movement. In turn, in accordance with ancient philosophical theories on sensory functions, the sensory perceptions had in the gardens helped balance the humours. Therefore an active sensory experience was the vital link between nature and the body, explaining how air balanced the humours.

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