Perception in Palatial Architecture: The Case of the AP Palace at Urkesh

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1. Introduction

The AP Palace at Tell Mozan, ancient Urkesh, was uncovered by a team from IIMAS (International Institute for Mesopotamian Area Studies) between 1990 and 2004. Work at the site began in 1984, with several of the early seasons focused on uncovering Temple BA. The blueprint of the palace (see Fig. 1) shows a building with several sectors (indicated on the plan by large letters) with diverse functions that could be identified based on the installations and finds in them. The plan of the palace indicates that the building was planned uniformly by one specialist or more who could control the design, construction, and results. The archaeological record shows that the building was constructed in a single phase: note how the four Sectors A–D are in mirror plan across the central vertical axis.

Within the palace two groups of seal impressions were found that were of fundamental importance for understanding the site and its position in the region. In the first group are seal impressions of King Tupkish and his court, which proved that the ancient name of the city was indeed Urkesh, as had been hypothesised; the second group (from a slightly later stratum) comprises the cache of seal impressions of Tar′am-Agade, the daughter of Naram-Sin, and her court.

The architecture and finds from the palace have been published elsewhere;[1] the aim of this paper is to explore how evidence from the archaeological record can support conclusions about sensory perception as it relates to ancient architecture.[2] It will focus on the haptic, auditory, and olfactory senses; the sense of taste is left out for obvious reasons, while sight has been covered in another article.[3]

2. Haptic sense: storage

In order to discuss the sense of touch a consideration of room size is necessary. During research on the AP Palace, an interesting corollary could be seen between room function (as we understand it) and the ratio between the area of the room (floor space excluding doorways) and its perimeter (understood here as the length of the walls measured inside the room). To explain, an abstract example can be of help: consider (see Tab. 1) a square room with sides of 5.5 m. The area of such a room is 30.25 sq.m, while its perimeter is 22 m; the ratio between these two measurements is 1.38. The second example is of a corridor 1 m wide and 10 m long. Its area is 10 sq.m, while the perimeter is 22 m; the ratio between these two is 0.45. The third example is of a corridor 1 m wide and 30.25 m long. Here the area is 30.25 sq.m, while the perimeter is 62.5 m; the ratio between the two is 0.48.

What makes these measurements interesting is the similarity between the two corridors (examples 4 and 5 in Tab. 1) when looking at the ratio between area and perimeter. Consider first the contrast between examples 2 and 5, which have the same area (30.25 sq.m), yet quite a different ratio between area and perimeter (1.38 vs. 0.48). Another contrast can be seen between examples 2 and 4: both have the same perimeter, yet the ratio between area and perimeter is quite different (1.38 vs. 0.45). Going back to the two corridors (examples 4 and 5), while they differ from one another quite a bit in terms of both area and perimeter, they share similar ratios between area and perimeter: 0.45 and 0.48 respectively. While both corridors are quite large, the ratio between area and perimeter for both is still smaller than that of a small square room (example 1 with a ratio of 0.5).

While these examples have been chosen to emphasise the point being made here, the ratio between area and perimeter is a discerning value for a very wide range of room sizes. Thus, this ratio can be used as an indicator of function when applied to building plans. Clearly, other indicators, such as the presence of installations or certain categories of ceramics on the original floors of the building, are more telling of function. However, often such material is not present in the archaeological record or tied to secondary uses of the built space and as such does not necessarily reflect the original planned use of the space.

To explore the potential usefulness of this tool and its relevance to the sense of touch, the AP Palace at Mozan lends itself particularly well as a case study.

Table 2 shows how the ratio between area and perimeter can serve to examine the function of the rooms of the service wing of the AP Palace; the definitions of room function (store-room, room, *iwan*, courtyard, workroom) has been determined by

1 For a complete bibliography see the project website: www.urkesh.org.

2 The research for this paper was carried out during an Art Histories and Aesthetic Practices Fellowship at the Forum Transregionale Studien in Berlin, during which I had the pleasure of having office space at the Vorderasiatisches Museum (SMB). My thanks go in particular to H. Baader, M. Hilgert, L. Martin, and G. Wolf for their support, advice, and enthusiasm for my project.

3 Buccellati 2014; see also Buccellati 2010 for an examination of space in regard to the temple terrace at Tell Mozan.

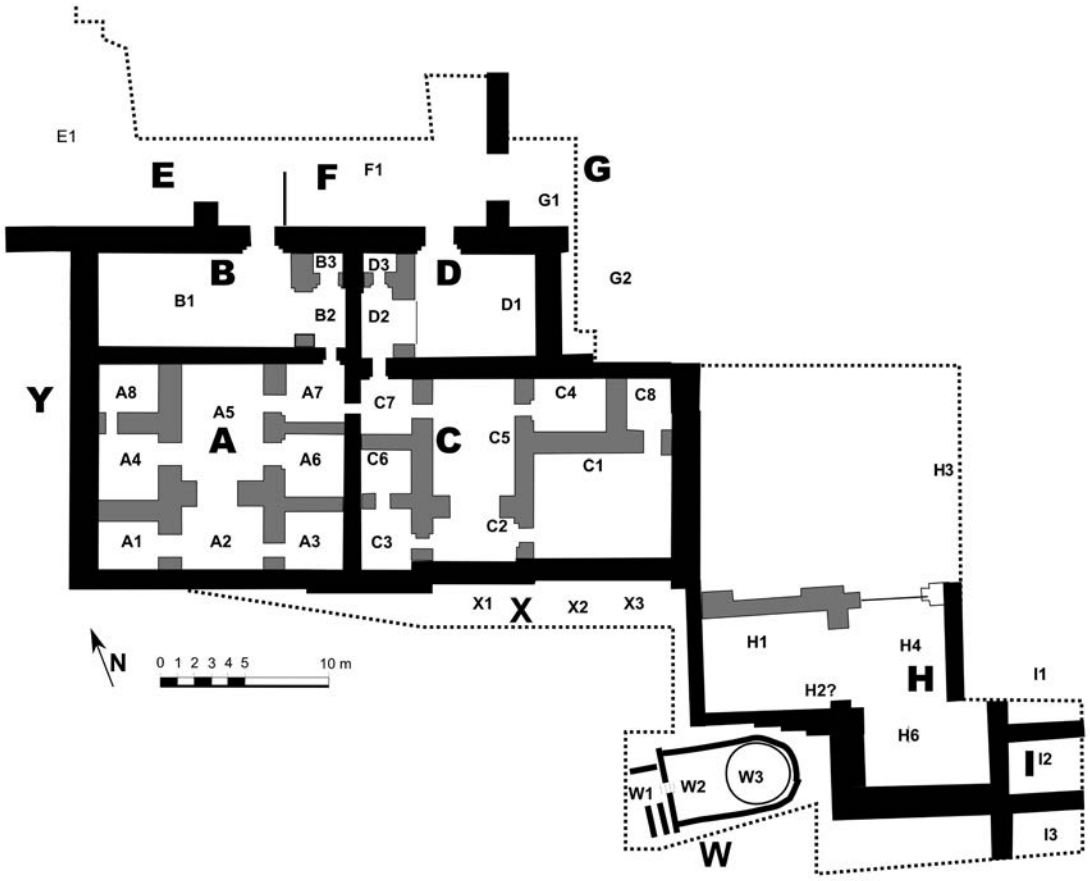

Fig. 1 Excavated portion of AP Palace with room numbers

Example	Room size (in meters)	Area (in m2)	Perimeter (in meters)	Ratio Area: Perimeter
1 (small room)	2 x 2	4	8	0,5
2 (medium room)	5.5 x 5.5	30,25	22	1,38
3 (large room)	15.625 x 15.625	244,14	62,5	3,91
4 (medium corridor)	10 x 1	10	22	0,45
5 (long corridor)	30.25 x 1	10	62,5	0,48

Tab. 1 Examples showing relationship between area and perimeter

architectural features (e.g. a wide opening along the long side of a rectangular room for an *iwan*) and the archaeological record, rather than by the ratio described here, and thus these definitions can serve as a way to test this tool (and avoid a circular argument).[4] The X and Y columns present the measurements of the room in metres, while the Area and Perimeter columns show the measurements for each room. The Area/Perimeter Ratio is calculated by dividing the values from the two previous columns. The 'Change on Previous' column gives the difference in that ratio with the previous room's value, a calculation useful in grouping the rooms. By calculating the change on the previous room (when the rooms are sorted by the area/perimeter ratio) certain groupings can be seen by noting where the difference is greater than 0.2, as marked by the dotted lines. These groupings can be seen clearly when displayed as a chart (Fig. 2). These measurements can, ideally, in conjunction with the architectural configuration of the building, the finds from the rooms, and the installations

4 For an analysis of the architecture in the AP Palace see Buccellati 2016.

Room	Room Function	X (in m)	Y (in m)	Area (in m²)	Perimeter (in m)	Ratio Area: Perimeter	Change on Previous
D3	storeroom	1,73	1,49	2,6	6,4	0,400	-
B3	storeroom	1,91	1,56	3,0	6,9	0,429	0,029
B2	iwan	1,91	3,79	7,2	11,4	0,635	0,206
C6	room	3,34	2,21	7,4	11,1	0,665	0,030
C8	room	2,37	3,16	7,5	11,1	0,677	0,012
D2	iwan	2,17	4,26	9,2	12,9	0,719	0,042
C2	iwan	5,22	2,10	11,0	14,6	0,749	0,030
A3	room	3,24	3,03	9,8	12,5	0,783	0,034
A1	room	3,48	2,91	10,1	12,8	0,792	0,010
A6	room	2,94	3,65	10,7	13,2	0,814	0,022
C7	room	3,18	3,34	10,6	13,0	0,815	0,000
A7	room	3,09	3,45	10,7	13,1	0,815	0,001
C4	room	3,42	3,25	11,1	13,3	0,833	0,018
A8	room	3,38	3,34	11,3	13,4	0,840	0,007
A4	room	3,42	3,35	11,5	13,5	0,846	0,006
C3	room	3,36	4,09	13,7	14,9	0,922	0,076
C5	courtyard	5,08	5,28	26,8	20,7	1,295	0,372
A2	iwan	5,42	5,48	29,7	21,8	1,362	0,068
C1	room	7,05	4,75	33,5	23,6	1,419	0,057
A5	courtyard	5,25	6,97	36,6	24,4	1,497	0,078
D1	workroom	8,20	6,29	51,6	29,0	1,780	0,283
B1	workroom	11,52	6,10	70,3	35,2	1,994	0,214

Tab. 2 Rooms of the service wing of the AP Palace, sorted by A/P proportion

present, aid us in understanding the function of rooms within an architectural space.

How does this tool relate to the sense of touch? To Table 2 one can add information relating to the area possibly used for storage. Assuming that storage would have been located along the walls of a room, be it in portable storage containers or on shelves or benches, the storage area in a room would have taken up a 75 cm wide[5] strip along each wall, excluding the space in front of door and/or *iwan* openings. In order to perform this calculation, one multiplies the perimeter by 0.75 to arrive at the total area along the walls potentially used for storage. From this number we must subtract the overlapping areas in the four corners of the room, as well as the space in front of doorways and wider *iwan* apertures.

The penultimate column in Table 3 shows the total area used for storage, while the last column shows the percentage of room space that would have been dedicated for storage along the walls. One should note, however, that some rooms would have been large enough to accommodate storage also in their centre; while such a practice was not evident in the AP Palace (the larger rooms were used as kitchens or as places where containers were inspected), it should be considered when applying this method to other buildings.

Notably, when sorted by percentage of area used for storage, the rooms can be divided into two groups, as indicated by the dotted line in Table 3. The rooms above the line would have been primarily suitable for storage due to their relatively large potential storage area, while those below may not have been used for storage at all, or would have had limited space for it. The distribution of rooms can be seen in Figure 3, with the rooms above the dotted line in Table 3 marked with a shaded X. The dotted line in the table was placed between Rooms A4 and A8, between which there is the largest jump in percentages of available storage space – a 7 % difference.

5 A width of 75 cm would include space for pots, cloth bags, and boxes; of course, in specific cases a more precise number can be given, but this figure serves as a general depth for storage elements.

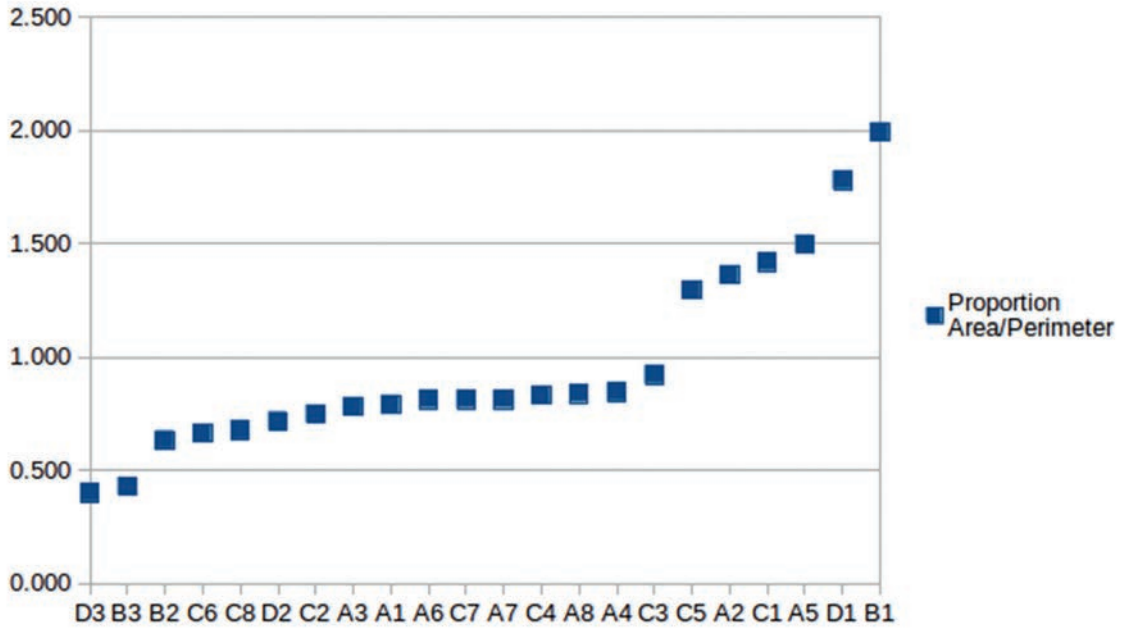

Fig. 2 Chart showing groupings of proportion between area and perimeter

Room	Room Function	X (in m)	Y (in m)	Area (in m^2)	Perimeter (in m)	Ratio Area: Perimeter	Change on Previous	Doors	Iwan Apertures	Area for Storage	% of Room Not Storage	% of Room For Storage
D3	storeroom	1,73	1,49	2,6	6,4	0,400	-	1	-	1,7	35%	65%
B3	storeroom	1,91	1,56	3,0	6,9	0,429	0,029	1	-	1,9	38%	62%
C6	room	3,34	2,21	7,4	11,1	0,665	0,236	1	-	3,4	54%	46%
C8	room	2,37	3,16	7,5	11,1	0,677	0,012	1	-	3,4	55%	45%
A3	room	3,24	3,03	9,8	12,5	0,783	0,106	1	-	4,0	60%	40%
A1	room	3,48	2,91	10,1	12,8	0,792	0,010	1	-	4,0	60%	40%
A6	room	2,94	3,65	10,7	13,2	0,814	0,022	1	-	4,2	61%	39%
C4	room	3,42	3,25	11,1	13,3	0,833	0,019	1	-	4,3	62%	38%
A8	room	3,38	3,34	11,3	13,4	0,840	0,007	1	-	4,3	62%	38%
A4	room	3,42	3,35	11,5	13,5	0,846	0,006	2	-	3,6	69%	31%
C3	room	3,36	4,09	13,7	14,9	0,922	0,076	2	-	4,1	70%	30%
A7	room	3,09	3,45	10,7	13,1	0,815	-0107	3	-	2,7	75%	25%
C7	room	3,18	3,34	10,6	13,0	0,815	-0,001	3	-	2,6	75%	25%
C2	iwan	5,22	2,10	11,0	14,6	0,749	-0,066	2	1	2,5	77%	23%
C1	room	7,05	4,75	33,5	23,6	1,419	0,670	2	-	7,4	78%	22%
D2	iwan	2,17	4,26	9,2	12,9	0,719	-0,700	2	1	1,8	80%	20%
C5	courtyard	5,08	5,28	26,8	20,7	1,295	0,576	2	1	4,8	82%	18%
B2	iwan	1,91	3,79	7,2	11,4	0,635	-0,660	2	1	1,3	82%	18%
A2	iwan	5,42	5,48	29,7	21,8	1,362	0,727	2	1	5,2	83%	17%
D1	workroom	8,20	6,29	51,6	29,0	1,780	0,417	1	1	8,6	83%	17%
B1	workroom	11,52	6,10	70,3	35,2	1,994	0,214	1	1	11,0	84%	16%
A5	courtyard	5,25	6,97	36,6	24,4	1,497	-4,97	3	1	5,4	85%	15%

Tab. 3 Rooms of the AP Palace with area for storage calculation (sorted by last column)

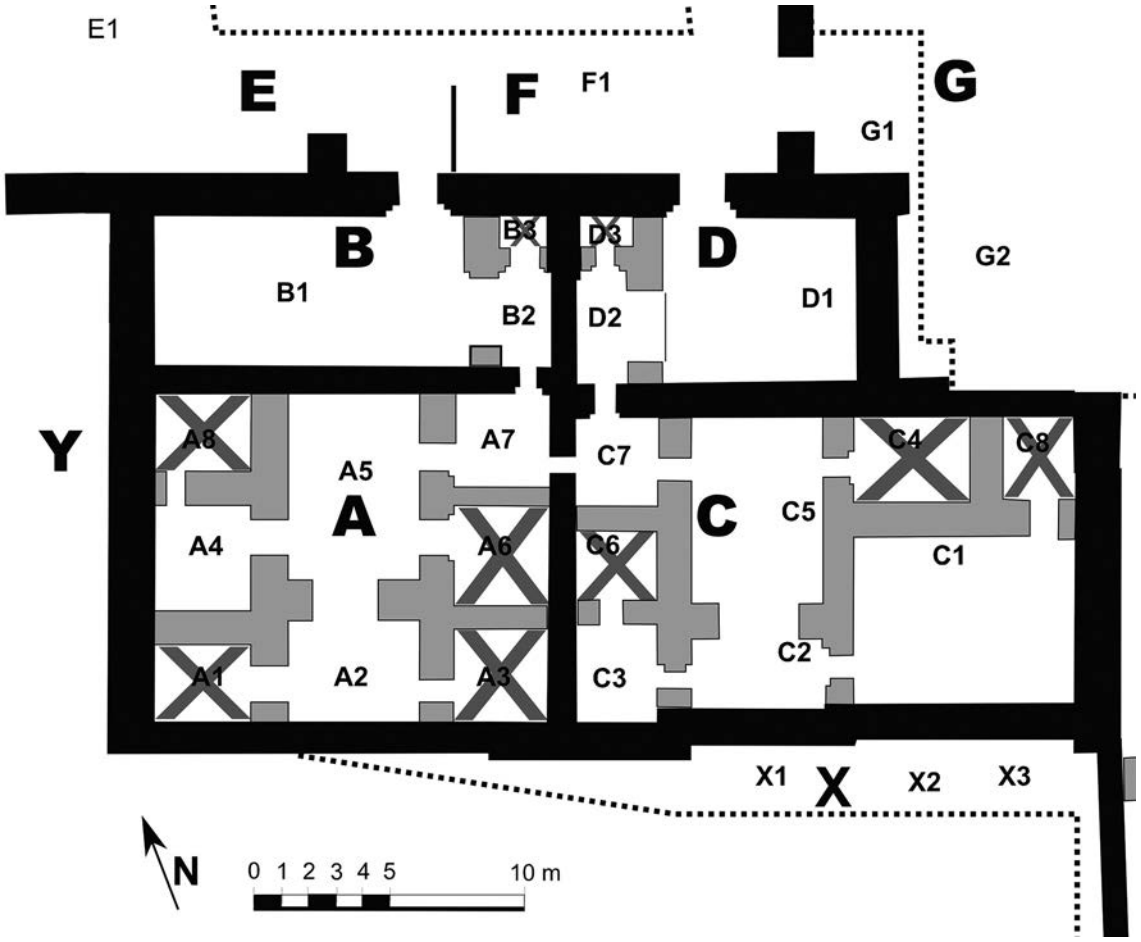

Fig. 3 Detail of service wing of AP Palace with rooms suitable for storage shown with shaded X

This division, however, must be understood only as a point of departure for a study of storage and space. Note the difference in Table 3 between Rooms A4 and A6 (31% and 39% of room available for storage), which seems odd as, looking at the floor plan, they are nearly identical – the primary difference being the presence of a second door leading to another room. It may be posited that A4 was a workroom with an attached storage space, but such a difference can only be determined on the basis of additional information from the archaeological record. In general, the content of the rooms and/or the installations present must also be taken into account and they sometimes contradict this mathematical division. One example is Room C6, which appears like a room for storage, but due to the presence of installations connected to water (drain, brick-lined shaft) was more likely a water closet. Room B1 is also of interest, since it is the room where most of the seal impressions mentioned before were found: this was likely not a storage area, given the uniform distribution of these seal impressions throughout the room, but may have rather been a place where items brought from the storage areas in Sectors A or C were opened.

3. Haptic sense: temperature

Since it is our skin that has receptors for perceiving heat and cold, considerations of the perception of temperature can be examined together with the haptic sense.[6] Temperature as it relates to the archaeological record can best be seen in the exposure to sunlight in architectural spaces and the materials chosen for construction.

With regard to the AP Palace, a consideration of sunlight and its thermal properties can best be seen in the two complete courtyards so far uncovered, A5 and C5. Neither of these two have a doorway on the northern side, meaning that access to the rooms to their north was possible only through a circuitous route passing through A7 and B2 (when moving from A5 to B1) or C7 and D2 (when moving from C5 to D1). This may have been intended to avoid a south exposure for Rooms B1 and D1, which would have let in a great deal of heat in the summer months.

The walls of the AP Palace are made of mudbricks, the standard material used in virtually all construction in the ancient Near East. A 40 cm thick mudbrick

6 McMahon 2016a, 337.

wall can help maintain the temperature difference between interior and exterior spaces for up to twelve hours, after which no difference in temperature can be felt.[7] Considering this, it is not a surprise that mudbricks were the primary material for construction in the ancient Near East and are still in use today.[8] The fact that mudbricks remain a common material in local construction helps archaeologists understand many aspects relating to their use, but may also be a hindrance, as archaeologists' relationship with this material is conditioned by the modern social framework in which the architecture plays a role.[9]

4. Auditory sense: intimacy and disorientation

The second sense is that of sound; absolute acoustic values[10] are perhaps the most difficult to determine, as many relevant factors remain unknown in the vast majority of cases. The height of the rooms and the materials used for roofing would have affected how sounds were carried; the presence or absence of furniture and textiles would impact the ability of sound to propagate; even the materials from which footwear would have been made impact the sounds footsteps would have made. Most of these variables cannot be determined through the evidence present in the archaeological record, as they leave no trace or are most likely to be removed. McMahon's study of acoustics, based on reverberation times in the principal rooms at Neo-Assyrian Khorsabad, is one of few studies on acoustics in our field that looks closely at materials of construction and room spaces to determine acoustic properties.[11] The study considers diverse acoustic conditions (reverberation times) for different numbers of people, as well as the effect of echo on the audience's ability to hear (or better understand) the proclamations of the king in the throne room. However, the aforementioned lack of information from the archaeological record makes such a study difficult to apply to other, earlier contexts or contexts where less extensive excavation programs have been carried out. For example, reverberation times in cathedrals pose some of the same problems of acoustics that McMahon demonstrates for the throne room at Khorsabad. In the case of cathedrals, the problem can be solved by the use of a canopy, the type of element that would not have left traces in the archaeological record.[12]

In cases where acoustic properties are difficult to measure on a numeric scale, a more emic approach can prove fruitful. The AP Palace at Tell Mozan can be considered in terms of intimacy and disorientation, criteria that depend on the room size in relation to the distance that sound can carry.

A space with acoustic intimacy is defined as such in which the time between the arrival of direct sound and the arrival of the first reverberation of that sound from the surrounding environment (Initial Time Delay Gap; ITDG) is under 20 milliseconds.[13] While the archaeological record does not provide enough data to enable calculating precise values related to sound, knowing the materials and room sizes does enable one to calculate a maximum ITDG value for a room. As a rule of thumb, when the distance from the reflecting surface is more than 7 m, the room no longer has the acoustic properties necessary to be considered intimate. (Note that the 7 m distance is calculated by adding the distance from both the source and the recipient to the reflecting surface). Thus the rooms of the service wing of the AP Palace are intimate spaces, acoustically speaking, as opposed to the larger rooms that would have presumably existed in the formal wing of the palace or to comparable rooms in other palaces of the period. People working in these rooms would have been constantly aware (in terms of sound) of others in the same space, even if they were not seen, and the noises from movement and actions would have been perceived in addition to speech.

The many small rooms of the service wing (Sectors A, B, C, and D) tend to be quite maze-like, which had a marked effect on auditory perception. This sense of disorientation became apparent after installing the conservation wireframes and burlap covering the walls and raising the wall height to above eye level.[14] Suddenly, one could not see from one room to another over the tops of the walls as they had been preserved in the archaeological record, and people calling to each other had to say exactly where they were. When limited to auditory perception, the division of space into a number of small rooms meant that the speaker could be in several different areas, and with the walls as reflective surfaces, the direction from which the sound came was either not indicative of where the speaker was situated, or was indistinct. This sense of disorientation would have been amplified in ancient times, as all the walls would have been of solid mudbrick material and the roof would have been in place. Since mudbrick material is so dense and has such a low ability to transmit sound waves, structure-borne sound would have been virtually absent, meaning that all sound would have been carried through the air. Thus all sound would have been perceived by someone in a room as coming from the doorways (assuming it was heard at all), with no

7 Aurenche 1981, 46; Doat et al. 1979.
8 Oates 1990.
9 Hurcombe 2007.
10 Here I use 'auditory' as referring to the sense of hearing but when speaking of sounds themselves I use the term 'acoustic'; I have explicitly avoided using 'aural' so as not to use an overabundance of overlapping terms.
11 McMahon 2016b.
12 Berg 2011.
13 Cavanaugh, Tocci and Wilkes 2010, 215.
14 Buccellati 2004.

indication as to the exact point of origin from inside the room (apart from a sense of intensity, which would have been an indicator of how far the sound had travelled).

5. Auditory sense: upstairs – downstairs

The second example of sound relates to the roof. The formal wing, Sector H, was raised through terracing over 2 m above the service wing of Sectors A, B, C, and D. Thus the floor elevation of the stone courtyard would most likely have been at the same level as the roof of the service wing, and it is possible that one could access the roof of the service wing from the rooms of the formal wing. This means that the sounds from a courtyard (particularly C5) would have been heard by those on the roof, and might also have been heard in the rooms of the formal wing.

This configuration is particularly interesting because, as we understand the architecture and function of these spaces, there would have been little contact between people working in these two areas, and to go from one space to the other, one would have had to walk quite a distance.[15] Sector C was, to our best hypothesis, involved in the administration of goods and perhaps the working of textiles, while the formal wing would have been limited to members of the royal court and their visitors. Someone on the roof (coming from the formal wing) may have heard sounds of those working in the courtyard and adjacent rooms, but would have seen little unless they approached the edge of the roof, and even then they would have seen only the courtyard itself and not into the rooms. Someone in the courtyard, on the other hand, might have heard sounds from the roof above, but would likely only have glanced up on the basis of an auditory cue.

6. Olfactory sense: cooking

The third sphere of perception is the sense of smell. Like sound, smell can be difficult to calculate on an etic level; in fact, both senses are often both set aside in favour of a focus on touch and sight.[16] However, as with sound, an emic approach can provide insight into contexts from which an understanding of the sensibilities of ancient city dwellers can be hypothesised. Smell is a particularly interesting example, as the archaeological record seems to show a marked difference between modern and ancient sensibilities in how certain smells are avoided.

In the AP Palace, the kitchen was located in Room D1. Here the presence of cooking installations (a *tannur* and an *andiron*) would have produced quite a bit of smoke when in use. While this was most likely a roofed space, there would still have been openings

Fig. 4 Open drain exiting AP Palace (MZ V16d1167)

(perhaps a raised roof with windows along one or more sides) allowing the smoke and other smells associated with cooking to escape. What makes this particularly interesting is the fact that today the wind often comes from the west, and this was most likely the case in antiquity as well. This is curious, as it means that these smells would have been carried from the kitchen area towards the formal wing, specifically to the open area of the stone courtyard, which lay directly to the east. As this courtyard lay (as far as we know from the excavated portions of the palace) at the centre of the formal wing, and since the stone paving indicates that it was a prestigious space,[17] it seems odd that the plan of the palace did not place the kitchen in a position farther from it, or at least downwind of it.

7. Olfactory sense: sewage

The second example of smell relates to waste water, in particular sewage. The situation in the 3rd millennium is often in contrast to later sensibilities, though techniques of water transport were in use in some settlements already in the 4th millennium;[18] extensive use of sewer systems in an urban context appears first in Roman times.[19] In the ancient Near East there

15 See the discussion on stairways and Sector G in Buccellati 2016.

16 See, for example, Howes' criticism of Ingold's *The Perception of the Environment* (Ingold 2000; Pink and Howes 2010).

17 For an analysis of the stone courtyard in terms of energetics see Buccellati 2016.

18 Hemker 1993; Sievertsen 2014.

19 Koloski-Ostrow 2016.

is extensive archaeological evidence of waste water being transported outside the house, but it was then released into public spaces, normally along streets. In fact, a common form of toilets in the 3rd millennium was the sloped-drain toilet, which carried the waste water along a channel or pipe, only to release it beyond the external wall of the house.[20]

This is the situation with the waste water coming from the AP Palace as well, which was dumped into the open area to the south of the palace (Fig. 4). It is striking that immediately adjacent to the drain opening one finds Platform X, an installation that predates the AP Palace and was considered important enough during the planning for the south wall of the palace to be accommodated by a sort of niche. This is a very good indication of the insignificance attributed to smells: while a pre-existing structure was significant enough to condition the highly symmetrical plan of the AP Palace, the drain exit was not moved farther south or kept in a closed channel to distance the smells from the building.

8. The question of context

While the focus of this article is on exploring how one can understand the impact of the architecture of the AP Palace on the ancients' haptic, auditory, and olfactory senses, the theoretical presuppositions on which the approach rests should be made explicit. The postulate at the heart of my discussion is a continuity of human sensory perception between the people of the past and us. This is not an assumption but rather a postulate for which a case can be made. It is a debate paralleled in other fields, for example, in geology, where comparable theoretical approaches are collected under the term 'uniformitarianism',[21] or in anthropology in the debate between Watson, Gould, and Wylie.[22] Perhaps the best framing of the criticism and a reply can be found in Arnheim's *The Dynamics of Architectural Form*: "… some readers might maintain that my descriptions are adrift in space because they do not specify who is doing the looking under what historical, social, and individual conditions. In fact, they will say, I am talking about things existing only in my own mind, since they are bound to be viewed differently by the next person. I reply that my appraoch [sic.] seems to me indispensable because one must establish what people are looking at before one can hope to understand why, under the conditions peculiar to them, they see what they see."[23]

A point in favour of this approach is in the discussion above of the olfactory sense relating to the kitchen and the drain in the AP Palace. As the palace was a planned building (some of the indications lie in the mirrored architecture and the complex drain system) there was a choice made as to where to place the kitchen and drain openings. The choice made by the architect is different from what one would expect in a modern context, thus it is precisely its contrast with our own *habitus* that aids our analysis. The reason for the ancient architect's choice is not evident in the archaeological record, nor could it be, yet a pattern of such decisions (such as the prevalence of slope-drain toilets that discharge sewage into the street) can lead to a hypothesis about ancient sensibilities.

The three senses considered in this article were examined individually, but clearly our interaction with the world around us is a multi-sensory experience. One might question the validity of an approach that considers the senses in a serial manner rather than a parallel one, and such criticism has been voiced in other research contexts.[24] While the whole is certainly greater than the sum of its parts, studies of perception in the context of the ancient Near East are still in their infancy, and to begin with the whole without understanding the parts would not lead to a complete understanding. Additionally, the aim here is to consider perception through the evidence of the archaeological record, where evidence relating to the diverse senses can be found in separate, distinct contexts. It is only by first identifying specific contexts, determining a pattern and explaining potential exceptions, and, finally, proposing a general explanation that one can base an understanding of one or more senses on archaeological data.

9. Conclusion

There remains the question of how (or even if) this type of perceptual analysis can help us as archaeologists. In my view, it is through such analyses that we can better understand the archaeological record, by considering a building's blueprint not only through the lens of its planning and the human activity within the space, but also by how the senses would have played a role in both the architects' construction of space and in the way that this space might have conditioned its users.

A consideration of perception during fieldwork can also aid excavation strategy, proposing avenues of research and data collection that might not have arisen otherwise. As an example, one might follow drains out of buildings to determine where their outlets are in order to check the hypothesis that dirty water was carried only as far as the street, meaning that the smell of sewage would have been present directly next to the house it came from.

It is through perceptual analysis that we can better understand the people of the past and the decisions

20 McMahon 2015.
21 Gould 1987.
22 Watson and Gould 1982; Wylie 1982.
23 Arnheim 1977, 4.
24 Ingold 2000; Cytowic 2010; Pink and Howes 2010; Pink 2015; McMahon 2016.

they made in creating their environment and how our sensibilities may differ. It is through such an analysis that we can understand the sensorial impact that the ancient world would have had, in order to communicate this understanding to contemporary society, bringing the past closer to our audience, while firmly adhering to the evidence provided by the archaeological record.

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