The search for a better organisation of the space and its use: a possible cause to explain the Outbreak of the Achaemenian Architecture

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Introduction

Although numerous specialists have studied Achae-
menian Architecture, we have to recognize how-
ever, that the problem of its origins is till now un-
solved. Indeed the main problem concerns the
difficulty to imagine the construction of the build-
ings on the Great Terrace of Persepolis and espe-
cially the Apadana, as the immediate outcome of a
pure theoretical architectural concept created by
some architects' offices belonging to the imperial
Achaemenid Court. By no means this possibility can
be considered likely. Unfortunately, our knowledge
on the history of the Achaemenid architecture is
still now desperately limited. We have to recognize
that it's impossible to observe the different phases
announcing the development of forms and layouts
that could be regarded as forerunners of the monu-
ments of the Achaemenid era. Traces of oldest ar-
chitectural forms dating from the time of the ancestors
of the Achaemenid dynasty are surprisingly
non-existent. We wonder whether it existed at all.
Are these precious remains till now hidden some-
where in Iran and waiting future excavations? Once
again the question is desperately wide open be-
cause the area of Fars seems to be devoid of any
previous elaborated architectural tradition. In other
words we entirely lack of any possibility of true and
appropriate structural comparison. The main issue
of this paper is to propose a different approach to
the problem. Avoiding pure structural analyse, our
study will try to focuses on the identification of the
inner circulations and the use of the spaces as the
main components for the comparisons between dif-
ferent buildings' plans.

Examining architectural structures

Three sites, not very far away from one to another, display a very outstandingly palace architecture. A fourth one, Susa, is situated in the plain of Elam (modern Khuzistan) at a great distance from the Fars and the other sites. All of the buildings seem to have been built in quick succession and it appears now that the Apadana of Susa and its counterpart in Persepolis were in great part constructed concurrently (under the reign of Darius I).

Pasargadae seems to have been created during the reign of Cyrus the Great (Cyrus II, i.e. 559–530). The works on the Great Terrace of Persepolis seem to have begun a little later maybe around

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1 This research has been funded by the Interuniversity Attraction Poles Programme initiated by the Belgian Science Policy Office.


3 About 60 km between the site of Pasargadae and the terrace of Persepolis with the neighbouring place called Dasht-i Gowhar.

4 The architecture of the palace of Susa won't be studied in this article but the reader will find a lot of significant comparisons with the Mesopotamian Architecture in the work published by Perrot on the Palace of Darius in Susa (Perrot 2010, 160–245 and especially the section written by Bucharlat 2010, 420–443).
520/518 (or even some years later), during the beginning of the reign of Darius I (522–486). According to the inscriptions of Darius and his son Xerxes, the Apadana appears to have undergone works until the first years of Xerxes' reign. Only the construction of the palace of Dasht-i Gawhar, now in a very poor state of preservation, seems to have started before the time of Darius, as some elements of its architecture seem to prove. As we have to recognize, our knowledge on the history of the Achaemenian architecture is till now desperately limited to the buildings to these four major and well-known sites. Surveys conducted in the Fars area and also some hazardous archaeological discoveries have brought to light partly preserved Achaemenian constructions, like those unearthed in the area of Persepolis and Pasargadae.

Though, we have some difficulties to link each of these constructions with a particular reign. Of course, no one can offer an architectural layout comparable to the buildings belonging to the main sites. Clearly they have been built with less technical care that leads us to consider these structures as country pavilions or the like. The archaeological situation before the rise of the Persian dynasty is even more problematic. We dramatically lack of sufficient archaeological material and information. Since the years seventies many archaeologists and researchers didn’t spare their efforts to discover new sites in the Fars area. Their hope was to unearth an architecture that could be considered as a forerunner of the constructions of the Achaemenid era. We are still waiting for some architectural discoveries from that period coming from the Tall-I Malyan excavations.

Unlike for the Fars, the archaeological discoveries in the Western Zagros area have brought on light many large buildings dating back to the 9th and 7th centuries BC (Iron Age III). Some of their architectural features could be paralleled to the ones displayed in the Achaemenian monuments. Buildings were unearthed in the sites of Nush-I Djan (level II) (Fig. 1), Baba Djan (level I and II), (Fig. 2) Hasani (level IVb) (Fig. 3) and Godin Tepeh (Level II) (Fig. 4) The great difference with the Fars lays in the existence in some sites of a former local cultural tradition dating back to the Bronze Age that already heralds the great period of constructions we shall discuss in the following lines. (Godin V-III, Hasani V, Giyan III-II, Haftavan VI-V, Kordlar).

Amongst the most outstanding forms and layouts that could be used for comparison we have to note for example: the columned halls, the columned porticoes, the layout formed by the entrance's group of rooms (antechamber, vestibule, stairwell) and the buttressed facades of some large buildings. All these architectural features and layouts might be considered as specific

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6 Tourouvet 2013 (article in forthcoming).
7 The main sites where architecture was unearthed are: Borazdjan, Tepe Sunqai, Fahlian, Tall-i Hakavan, Saidun, Tall-i Zohak, Baghi Firuzi, Masumabad, Sang-i Dukhtar, Tang-i Bolanghi, Buzpar. See also the outcome of the survey conducted by Sumner for a mapping of the newly discovered sites (Sumner 1986).
8 For all these sites, the reader could see the development of the researches in consulting the Bibliographie analytique de l'Archéologie de l'Antiquité (Supplements 3 & 4) (Haerinck and Stevens 1996). Hasanlu, is on the south shore of the lake of Urumiyeh – West Azerbaijan province; Baba Djan, Nush-I Djan and Godin, are all situated in the Central Zagros not very far away from the city of Hamedan.
of the period according they seem totally new in Iran. Unfortunately, the difficulty in trying to find true points of comparison is due to our own way to look at things. The formal comparative method leads more often to produce formal comparisons giving the way to insignificant or un-outstanding conclusions through a lot of poorly stated and inappropriate arguments. By no means, it's possible in that case to attribute to each room – or group of rooms – a specific function according its place in the layout and hence to distinguish any development or evolution in the use of space. Obviously, comparing plans and layouts, shouldn’t be limited to the most visible architectural structures like walls, but also to the organization of passages giving possibilities to circulations in the building. We have to admit that reflections on the inner spaces volumes are generally not sufficiently taken in account for a more appropriate and useful comprehension of the building. It’s only through the analysis of the possibilities of movement through the existence of doors,
corridors, vestibules from room to room that we can establish the real function of the different parts of any construction and to explain their place in the construction as a whole. Beyond this it’s no real interest to compare different systems of layouts.

To illustrate this approach we have to put forward the architecture of the Zagros area during the 8th century BC that seems to have developed some local but very specific structures. One of the most relevant characteristics of this architecture is given by a recurrent arrangement of rooms forming the entrance of the construction like in the Burned Building II at Hasanlu (Fig. 5). A columned portico gives access to an antechamber flanked on its short sides by a stairwell and by a room. We are puzzled to observe the existence of a bent-axis system that has been set up first to enter the antechamber from the portico and then to allow access to the great central hall. This arrangement can be observed in many other buildings and seems to reflect a sort of architectural model. Indeed, the bent-axis passage seems to have been adopted or copied from one site to another and most probably for its interest to protect the inner part of the construction from direct eyesight. We can easily observe the same structural principle in the group of rooms forming the entrance in most of the Burned Buildings at Hasanlu (Level IV). The choice for a bent axis in the passage between the antechamber and the main hall can be remark also in the Central Temple (Fig. 6) and in the Fort of Nush-e Djan (Fig. 7). In the two groups

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20 The badly preserved state of the entrance’s group of rooms leading to the Great Colonnaded Hall in Godin (Level II) makes the comparison very hypothetical even there are some clues for such an arrangement (Cuyler Young/Levine 1974, 31; Cuyler Young 1969. More recently Gopnick/Rothman 2011 chap. 7).
of buildings, the circulation from the outside of the entrance to the central part of the building (the central room) can be put side by side with no difficulties. An entrance placed in the back wall of a columned portico flanked by two rooms (guardroom and stairwell) and a bent-axis to enter in the main inner room of the building could be define as a main architectural characteristic for the constructions belonging to this period.

However, there is an even more remarkable architectural feature revealed by the archaeological excavations. The existence of a large columned hall has been discovered in the four main sites of the Zagros. The particular layout of these spaces with their multi-rowed columns led directly many scholars to compare them to the great columned spaces of the Persian Architecture. It has been recently proposed that this main architectural characteristic was originated from the Zagros and subsequently transmitted to the Persian by or through the Medes.\(^{11}\) However, recently Gopnick has pointed out that there is by no means in Iran a continuous evolution of forms and spatial organization from the columned halls of Hasanlu towards the monuments of Persepolis/Pasargadae. Indeed we prefer to speak about a challenge between a possible influence and a presumed inspiration or even a possible local self-expression architectural creation. Indeed we sometimes attach on structures more values or more meanings than they can really bring to us. We must not forget that the partially preserved structures on the ground are the sole available marks to reconstruct the architectural volumes.\(^{12}\)

In Nush-e Djan, a building of 20 m long and 16 m/15 m wide with three rows of four regularly laid supports has been discovered (Fig. 8). Probably the date of this construction goes back the beginning of the 7th century BC and according this it may be considered as the first example built in Iran.\(^{13}\) Its slightly irregular plan and the position of each of the two entrances on its west and east sides seems to show that the construction was built after the others in a place left free between the Old Western Building and the Central Temple (Fig. 1). The inner walls are decorated with deep stepped recessed niches, which are of the same type and present nearly the same dimensions as we can observe for the frames of the doors in the Urartian buildings.\(^{14}\) Moreover the architecture of the hall with its original and corner entrance shows a layout very close to the one of the building in Altintepe.

\(^{11}\) Roaf 2010, 252; Genito 1995, 111; Cuyler Young 1994, 25, 30. Gopnick has pointed out that the discoveries of multi-rowed columned buildings in Muweilah and Rumelah in the Emirates, and the columned rooms of Kerkenes Dag prove this architectural innovation has been adopted independently at different places (Gopnick 2010, 196–198).

\(^{12}\) Margueron 1986.

\(^{13}\) Stronach 1981, 130; Stronach 1977, 696; Stronach/Roaf 2007, 227.

\(^{14}\) Tarhan and Sevin 1975, 407–408.
also situated in the Urartean geographical area. Recently Gopnick asserted that until proof of the contrary, the columned halls with regularly spaced supports are not known in the Urartean architecture. The examples unearthed in the territory of Urartu (Arin Berd, Altintepe, Armavir...) have all been built during the Achaemenid period and most probably at its beginning. Very curiously and unlike what it's generally expected for such a construction the hall of Altintepe was only entered by a non-axially but deported door through a little vestibule (Fig. 9). In the building of Nush-e Djan, a similar room (room 38) seems to have played the same function. It gave access to the columned hall through an alcove pierced in the north western's corner of the west wall. Beyond this structural comparison it seems that the two vestibules were constructed to avoid direct eyesight to the hall. If so, it seems possible to connect their function (and their purpose) to the role of protection played by the antechambers in all of the Burned Buildings of Hasanlu, and in the Central Temple and the Fort of Nush-i Djan. The presence of a bent-axis passage in all of these constructions could not have a different function.

However, if a very similar type of access can be observed in these buildings some differences are noticeable. In the Burned Building I a walled portico flanked by two rooms has been placed in front of the entire former façade formed by an antechamber bordered by a stairwell and a little room. In Burned Building II an outer portico has been constructed in front of the walled antechamber. On the same way, the portico has been flanked by one

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15 Kleiss 1988, 211.
16 Gopnick 2010, 201.
17 Most probably the monument dates from back the first half of the 6th c. BC. see Özgüç 1969, 76. Summers 1993, 93; Özgüç 1966, 44–45; Ter Martirossov 2001.
or two little guardrooms. Very strikingly the principle of the bent-axis has been repeated in these two buildings and also for the other monuments of the site as well. A carefully arrangement of spaces and a rectangular frame for the building area seem to have been the rule for their construction. The rectangular building shape give a strong impression that each of these constructions has been realized like independent unity despite the existence of groups of ancillary rooms added (maybe lately) to the basic geometrical structure.

The geometric regularity can be particularly observed in the architectural organization of the main hall with a partition in two aisles and a larger central passage by two rows of regularly spaced supports. These two lines clearly emphasize the central aisle creating an axis leading all the movements (and the sight) from the entrance towards the back wall of whom the centre is occupied by a sort of throne (like in Burned Building I) or by a recessed door of a salient outer room (like in Burned Building II) which curiously looks like the entrance of an Urartean tower-temple.\textsuperscript{18} Moreover, the columned halls of the Burned Buildings shared an additional common structural feature with the presence of a row of light supports running along the four walls of the room (Fig. 5). They are placed at the ends of each central row (for the short sides) and approximately at the extremities of the lines joining each pair of central supports (for the long sides). This system with a set of supports along the long walls may reveal an important decision in the installation of the beams and plates for the roof. The system avoids putting heavy beams directly on the wall of the great hall and thus, it seems to provide support against the thrusts (lateral pressures) most probably due to height of the structure covering the central part of the building.\textsuperscript{19} We have to note that no buttress appears on the outer faces of the buildings (the back wall and the long walls) except for the Burned Building I, which could be considered as the most architecturally improved and regularly laid construction of the site. From that point of view the Fort and the Columned Hall of Nush-I Djan with their outer walls adorned with buttresses are the best comparable constructions. All these constructions recall the exterior appearance of the walls in many Urartean buildings.\textsuperscript{20}

In the greater columned halls of Godin fortress (Godin Tappeh), the space has been obviously designed to gather large publics with a disorienting effect due to the multiplication of the supports (Fig. 4).\textsuperscript{21} The evenly spaced supports and lines of supports have the great advantage to avoid an internal division between lateral and central aisles like we have seen in Hasanlu. This multi axial system can be observed in many prayer halls of the Islamic congregational mosques giving the impression of a totally free movement.\textsuperscript{22} Hidden by the mass of the supports, the back wall of the two columned spaces of Godin have no true focal points for commanding the movements in their direction or acting as a visual architectural limit when the room is entered. Unfortunately, the excavations didn’t succeed to bring completely to light the walls of the entrance layout. Nevertheless some light traces of brick courses make the existence of an antechamber not unlikely.

\textsuperscript{18} Johnson 1975, 26–29.
\textsuperscript{19} This architectural feature led Dyson to state about the existence of balconies along the inner sides of the walls of the room and carried by these supports and the freestanding ones belonging to the nearest central row. Dyson 1980, 150–152.
\textsuperscript{20} Seidl 1994, 115–117.
\textsuperscript{21} Gopnick 2010, 202. Works about the site have been published in Cuyler Young 1969 and Cuyler Young/Levine 1974. See also the recent publication of Gopnick 2011. The inner organization of the site of Armavir (Ter Martirosov 2001) has been compared with the one of Godin Tepe but the former dates from the Achaemenid Era and thus displays rather an Achaemenian principle of space organization.
\textsuperscript{22} With the exception given by the orientation of the Qibla. For example, in Esfahan, with the 12th century columned prayer halls of the Masjd-e Djomeh.
By comparing the nature of the inner circulations in the different columned halls, it appears that those of Nush-e Djan (three rowed columned hall) and Godin (five rowed columned hall) present the characteristics of a completely new architectural principle. The high number of supports doesn’t hamper the general organization of the space that seems to have been spread out to some maximal technical capacities to emphasize the impact of its use, most probably for public ceremonies. Maybe we have to bond this new type of architecture to the appraisal in the Zagros of strong local powers that could organize and manage their living quarters according their political and economical status. Obviously this highly probable function of the great columned hall can represent the best and serious link that exists between the Godin and the Achaemenian columned halls.

Classification and contextualizing architectural groups

Having analysed the layout of all of these constructions we have to recognize that it’s difficult to avoid arising some relevant questions. Are the great halls of the buildings of Persepolis the direct followers of the constructions of the Iron Age sites in the Zagros? Are the builders of the monumental great halls in Persepolis directly indebted to their forerunners for their continuously improved building methods? What is the most important factor to allow us to distinguish between a possible influence, a presumed inspiration or even an ever conjectural local tradition in architectural creation? Any accurate and detailed answer to each of these three questions is till yet difficult to propose with some degree of certainty. Furthermore, the great difference in construction methods linked to the type of building, built with stones or with mud bricks, should not be lost of sight. The architecture has to be considered as the testimony of the technical knowledge of the builders for instance in the stability of roofs, walls and supports which are obviously different in these two groups of buildings. Also we must not forget that the partially preserved structures on the ground are the sole available marks to reconstruct the disappeared upper structures of the architectural volumes. This situation must be taken in account in the comparisons between the organizations of the circulations. Cuyler Young has proposed an interesting theory about the adoption by the Persian builders of foreign architectural models they could have transformed afterwards in official Persian concepts of salient features. Nevertheless, we have to pay a very careful attention to make the distinction between concepts adopted during the imperial period and those that could have been developed by themselves during the formation period of their state. During the imperial era some architectural features where obviously brought to Persia from the conquered countries and peoples, e.g.: the palm-shaped Egyptian lintel on top of windows and doors in the so called Tatchara, the multiform parts adorning the lower half of the capitals, the fluted shafts of the columns and the entablature of the doors.

Before the conquests of Cyrus the Great, the Persians had in majority no idea about the existence of these features. The sudden and apparent outbreak towards a highly specialized and developed architecture (as we have first in Pasargadae) should be linked at least to the existence of a rela-
viously long period of contacts with some more developed cultures. We have previously seen that the contacts between peoples and the always-possible circulations of technical knowledge in architecture could not give a convincing reply to the main questions about the origins of the Achaemenian Architecture. Indeed the space of time between the constructions of Pasargadae and those of the Zagros seems to short to bear witness to such an evolution in the architecture. The situation seems to be very difficult to understand without keeping in mind this theoretical assumption. Of course the lack of archaeological data about the period of the incipient Persian state’s structure makes all debates highly conjectural.

The Dasht-e Gowhar building

We have pointed out the links that existed between the Apadana Hall at Persepolis (Fig. 13) and those of Pasargadae and Dasht-e Gowhar. If we could not speak about analogy without some cautions, it’s possible however to note many similarities and resemblances. They appear not only in the layout but also in the organization of inner spaces and circulations between the different connected parts of the buildings. Some years prior to the beginning of the construction of the Great Terrace in Persepolis (around 518 BC), the buildings of Pasargadae (Palace P: Fig. 10 and Palace S: Fig. 11) and the construction of Dasht-e Gowhar (Fig. 12) clearly demonstrate the existence (and the use) at that time of common architectural features most probably coming from a unique architectural background of building concepts. Two or four porticoes generally bordered by two corner rooms flank a great central hall of rectangular shape. Rows of supports or columns have been set up in this central space and the porticos are themselves provided with one or two rows of supports. On account of their uniqueness, the different layouts and spatial organizations could be theoretically viewed as prototypes. In that, it could lead someone to point to anomalies and weaknesses in the setting up of the different structures and conversely to consider any structural evolution as marks of an architectural improvement.

The building at Dasht-e Gowhar displays a 55 meters long portico open on the southeast with two parallel rows of height columns each (Fig. 12). A unique access leads to the main central hall through its back wall. Five rows of height columns have once supported the roof of the central hall. Kleiss has proposed a reconstituted plan displaying three more porticos with two rows of columns each. The reconstitution proposed by the German archaeologist shows two corner halls, each one standing at the end of the 33 meters long northwest portico. These recall the tower-like corners of the well-known palaces of Pasargadae (Palace P and S) and those we will observe at the Apadana of Persepolis. The external walls of these two rooms are lined with the limit of the outer side of the porticos. It’s noteworthy that the general plan shows a regular rectangular form but the difference of length between the northwest and southeast porticos gives to the building a non-symmetrical layout. As we will see later these feature could represent a chronological mark for the building.

More surprisingly, the columns are set 3.65 m apart. This very short distance might just reveal that the builders did not really master the building techniques for at least to cover large roofed spaces. Indeed, the congested space must have been very uncomfortable and not easily practicable during official purposes when people had to gather in. The same problem seems to have been encountered in...
Palace P in Pasargadae were the central room is also crowded by supports. Maybe this situation could show how the technical knowledge in stone construction was limited. It has been suggested to consider that this crowded space could be compared to the situation observed in the nomadic tent where numerous poles are needed to support a stiffless roof.

In the admitted reconstitution (i.e. the Kleiss' plan), two lateral porticos are placed on each side of the great hall. The depth of these two rowed columned spaces fills the entire difference in length between the great southeast portico and the long wall of the central hall. The existence of the corner-halls seems to be directly linked to the function of the northwest portico. If we compare the plan to the layouts of the Palaces P and S in Pasargadae, the very long portico of the southeast side at Dasht-i Gowhar could also face a garden or something like. We have to take into account that there, at the back of its wall, only one door allowed to enter the great hall. This particularity seems to be linked to the private character of this side of the palace. This hypothesis leads us to consider the northwest one as the main and official access to the building. The entrance portico would have been set up between two halls functioning as guardrooms. We can observe a very similar arrangement of the space in Palaces P and S at Pasargadae (the northwest side of the Palace P and the west side of Palace S). Here as we will see later the mentioned

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**Fig. 9**
The Achaemenian Columned Hall of Altintepe (Summers 1993 Fig. 4)

**Fig. 10**
The Plan of the Palace P at Pasargadae (Stronach 1978 Fig. 40)

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30 We have to keep in mind that winters in the area of the Murghab plain could be sometimes extremely severe due to the altitude (about 1900 m!).

31 Nylander 1970, 111.
porticoes could be considered as the official entrance to the palace.

We could even make the comparison with the north side of the Apadana for which the portico is also seen as the official entrance. However if the layout of the building in Dasht-e Gowhar reveals through some features the still low experienced workmanship, many signs lead us to consider this building and the palace S at Pasargadae as contemporaneous. On the stone column bases and plinths discovered at the site of Dasht-e Gowhar, only marks left by edged tools can be observed. These marks could also be viewed on blocks belonging to the different buildings in Pasargadae contrary to the stone works in Persepolis where all the marks are exclusively left by toothed tools. The form of the curve and the torus of the bases of the columns in Dasht-e Gowhar could be compared to the style of those in the Palace S at Pasargadae. This form was completely put aside (out of fashion?) in the buildings of Persepolis. In fact, these mason’s clues are generally considered as chronological marks of the anteriority of these monuments with regard to the Apadana. According to a general agreement, these buildings date from the reign of Cyrus the Great or during the first years of the reign of Darius. In fact, this argument is sometimes difficult to handle alone but it seems to be of good chronological support in addition to a complement of an architectural analysis. However the layout displayed by the building of Dasht-i Gowhar has to be linked to the one of the two great palace buildings at Pasargadae.

The so called Residence or Palace P in Pasargadae

Looking at the layout of the so called Residence or Palace P in Pasargadae (Fig. 10), we are surprised to find out the same asymmetrical organization we have already seen between the northwest and the southeast sides at Dasht-e Gowhar. With its 73 meters long the southeast portico extends largely beyond the side limits of the central columned hall. It ends on each side by short bordering walls.

On the northwest side, the portico is limited on its two ends by a corner hall. The noteworthy difference with the construction at Dasht-e Gowhar is that these two corner rooms are apparently not closely attached to the outer western angles of the main central hall. This situation could be explained in case of a planned transformation of the main hall that was never carried out. Many scholars have conjectured about the existence of two lateral porticos that could have occupied the wide areas between

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32 Koch has linked it to the extension of the Apadana further west during a second stage of construction: Koch 1987, 151–153.
33 For references on the worked stones at Pasargadae (Stronach 1978) and for Persepolis (Tilla 1978).
34 Cool-Root 1979, 52–58; see also Stronach 1967, 283; Nylan- der 1965, 52–62.
35 Tilla 1978, 80.
36 The existence of corner rooms can be already observed in the Manor at Baba Djan (Zagros area), a building dating from the 9th/8th century BC (Goff 1969).
the lateral walls of the main hall and the “projecting” sections of the two porticos.\textsuperscript{37} In fact, no clear structured architectural remains have been discovered in these open areas with the exceptions of humps formed by decayed mud bricks.\textsuperscript{38} If these spaces were really occupied by porticos, they would have shown a very odd and eccentric depth mainly in contrast with the others.\textsuperscript{39} On the other hand it's important to note that the two existing porticos display approximately the same depth.

Like in the Dasht-e Gowhar building the second and shorter portico on the opposite side (northwest side) of the central hall, could represent the main access to the building. The entrance was also bordered by two corner halls which could have been used as guardrooms or something the like. A similar principle for the access could be observed in the first stage (level II) of the Manor in Baba Djan (Fig. 14) (beginning of the 8\textsuperscript{th} cent. BC),\textsuperscript{40} and in the different Burned Buildings at Hasanlu. The entrance layout in Baba Djan shows two salient rooms like towers bordering a vestibule-portico probably devoid of any support. In the succeeding stage of the Manor, the walls of the corner rooms are lined with the façade of the entrance hall. In Hasanlu, the alignment of the façade can be observed everywhere and it seems to have been the rule. The entrance is generally fixed up through an inner portico and flanked by two rooms (a stairwell and a little ancillary room). The Apadana will be equipped with a very similar entrance layout for its access but here highly much more emphasized and developed.

The long open southeast portico of the Palace P faced a large area devoid of any other construction and obviously reserved for the royal gardens.\textsuperscript{41} A sort of throne seat stood in the middle of the back wall instead of the usual central location for an access leading to the main hall.\textsuperscript{42} The access through the opposite portico (northwest side) is linked to the position of the former one and also it has not been placed in the middle of the back wall. The reason of the eccentric positions of these two doors may be due to an enlargement of the building in the southwest direction from a first architectural set up. We can not dismiss the possibility that, at the beginning of the construction programme, both accesses were set as usual in the middle of the walls (like in the other buildings). Without such a transformation, we should admit that the original central hall would have been obviously very limited to be used as a living quarter or for some official purposes (it measures 31.10 m in length and 22.10 m in width and five rows of six columns have been set up in its space).

Also like in the palace of Dasht-I Gawhar, the central hall shows a very congested space, uncomfortable and hardly practicable for meetings. The general arrangement seems to recall an old traditional architectural norm perhaps reflecting the structured space we can observe in a nomadic tent. Maybe the great number of columns seems more simply to be linked to the change coming from the material used for the roof, from a light weaved shaftless cover of the tent to a heavy wooden and mud covered flat roof. Here too it seems to witness the anteriority of such a construction with regard to the more open layouts where inner circulations are not hampered by the lack of space.

In the columned hall of Palace P in Pasargadae the analysis of the layout shows that pillars of roughly the same dimensions built in baked (?) bricks have once existed. Here they were lined in two rows placed along and at very short distances of the sidewalls of the central hall. According their position in the hall and the dimensions of the rectangular depressions left on the floor it’s not unlike the pillars were used to support heavy balconies.\textsuperscript{43} The comparison seems quite plausible according to the heavy form of the pillars and their use instead columns. Linked to these balconies the possibility that once three-stories private apartments have existed in the empty areas flanking both sides of the hall (between the two long columned porticos) may be admitted according the discoveries of humps of bricks by Sami\textsuperscript{44} and Stronach\textsuperscript{45} in these areas. Huff established an interesting architectural comparison with the inner space organisation of some well known historical palaces in contemporary Iran\textsuperscript{46}.

\textsuperscript{37} According to this, Kleiss, as we have seen before, has bore all these architectural structures on his reconstruction layout of the palace of Dasht-e Gowhar.

\textsuperscript{38} Stronach, 1978, 78 and see notes 8–11.

\textsuperscript{39} Concerning the existence of a possible palace quarter in these areas and the comparison with the living quarters in the palaces of the Safavid and Qadjar period in Iran, see Huff 2005, 382.

\textsuperscript{40} Goff 1969, 117.

\textsuperscript{41} Stronach 1978, 107–112.

\textsuperscript{42} The existence of a throne seat there at that place may be linked with some public performances that have taken place in this open area instead of the very limited and congested central hall.


\textsuperscript{44} Sami 1970, 47.

\textsuperscript{45} Stronach 1978, 78–89.

\textsuperscript{46} Huff gathered together all the theories about the existence of private apartments in the two areas flanking the main hall (Huff 2010, 339–361). Even if these areas are devoid of any clear architectural structure the comparison with the Islamic architecture could be now considered likely. Huff 2005, 376–377.
deed balconies were the only way to allow some people coming from the private apartments to attend to the ceremonies performed in the hall.

If this hypothetical reconstitution of the inner space organisation can be regarded as probable it could affect our perception about some columned areas like the central hall of the Burned Buildings II (Hasanlu). Indeed, Dyson remarked that five columns were placed along each of the west and east walls of this hall, and two others against the north and south walls marking the ends of each of the two rows of self-standing columns. For this researcher, these observations make the existence of balconies possible because the fitting out of these columns at their places can’t be explained otherwise without any difficulties. If such arrangement seems very likely to have existed for example, in the pillared halls of some Urartian buildings, we have some strong doubts that balconies (or platforms) have been placed on the top of these relatively thin supports. The comparison between the blocks discovered in the central hall of the palace P and the pillars observed in the great halls in the Urartian architecture seems much more appropriate.

We have seen above that at the end of the 7th century BC, a very large columned hall was built in the fortified palace of Godin Tepe (Fig. 4). This hall (28 m long × 24 m wide) displays five rows of six columns each and according to this layout this monument represents a daring architectural innovation. The space has been obviously designed for large publics with a disorienting effect due to the multiplication of the supports. On the architectural point of view its arrangement is very close to the central hall of the Apadana and could have represented a forerunner model for the later constructions of Pasargadai and Persepolis. We have to remind that the end of Godin level II occurred in the mid-6th century BC and the construction of the first phase of the Apadana is believed to have started at the very end of this century.

Beyond the similarity of the architectural concepts, forms and structures, we have to point out the similarity of functions between the monument and its Achaemenian counterparts. There is no more a main axis formed as in Hasanlu by a larger aisle bordered by two rows of columns, or formed by a central row of columns like in Nush-e Djan. It means that the back wall of this great columned space doesn’t represent a visual limit when entering the room. Indeed, if this wall is structurally bound to other architectural features (for example: walls, towers…) the hall seems to have been used first as an independent unit. Unfortunately, we have only little information about the entrance but it’s not unlikely that the hall was entered through a portico or a vestibule flanked by two little guardrooms like in Pasargadae and Dasht-I Gowhar. Indeed we have some reasons to believe that the group of rooms formed by the columned portico flanked by the two little guardrooms were introduced in the Achaemenian construction from the Zagros architecture. At least it could illustrate the transmission (and the adoption) of such a successful and easily reproduced architectural principle from one construction to another.

It’s possible to note that the improvements in the organisation of the entrance are directly linked to the enlargement of the columned halls. This phenomenon can be observed from the construction of Dasht-I Gowhar to the ones of Palace P and Palace S in Pasargadai. One of the most outstanding technical improvements is the capacity to extend the inner space with freestanding columns that are more and more distant from each other. The construction of a four columned porticoes buildings (the Palace S) contributed to convert the main hall in a protected space more available for activities like meeting and ceremonies that were formerly performed outside. As we have already supposed for the construction of the Palace P, the raising of the roof in the central hall is linked to the needs about airing and lighting.

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47 Dyson 1980, 150–152.
48 In Çavustepe (Eastern Anatolia) the excavations have revealed a very large building known as the Pillar Building or the Palace (Erzen 1988). Here a long central hall (81 m long on 15 m wide) with two rows of pillars gives access to rooms through the side corridors. The access of this hall is located at the eastern end of the south corridor and a flight of steps is observed at the west end of the same corridor. The piers are supposed to have supported the floor of a second level and maybe the ceiling was carried by other supports placed at the top of the former ones. This suggestion is proposed taking account of the existence of cisterns in the floor of the basement and the dimensions of the pillars. Consequently, it’s not impossible that heavy wooden galleries or balconies were placed around a probably roofed central space (Dyson 1980). In that case, the needs for airing and lighting must have required covering the hall with a roof placed on a higher level than for the surrounding rooms. In Kefkalesi near the city of Adilevez and also in the Urartian Area a similar type of architecture has been unearthed revealing two different forms of halls (Ogus 1967). In the long one, the piers are supposed to have supported balconies topped by a roof. For the almost square hall the dimensions (26 m long on 23 m wide) seem to be too big for a roof covering completely the space.

49 Nylander asserted in his study of the monuments of Pasargadai that obviously the architectural model of all the central rooms with supports finds its origin in the great hall of Godin (level II) (Nylander 1970, 112).
51 For some thoughts about the chronological sequence of the Achaemenian Palace Architecture before the construction of the Apadana (Tourovets 2013, article in forthcoming).
52 The existence of a throne in the long southeast portico of the Palace P seems to allow us this suggestion.
If we compare the plans of the Palace S and the Apadana we could observe that the long portico of the former is replaced in the later monument by a set of narrow rooms beyond the back wall of the central hall.

The so called Audience Palace or Palace S in Pasargadae

Before going any further in our investigation, we can say that the analysis of the layout displayed by the Palace S in Pasargadae seems to reveal an extremely new development of the architectural concept of the Achaemenian palace (Fig. 11). The so called Audience Palace or Palace S in Pasargadae is located not very far away from the Palace P and faces the same largely open area, allegedly a garden. Obviously, if the general layout reveals the strong ties that bond this building to the two former ones we have seen, however, this construction displays the most complete and developed architectural programme ever built prior to Persepolis. We could say that with the construction of the Palace S, the palace architecture reached its topmost position before entering the era of the great imperial Persian architecture. The layout displays a central columned hall bordered for the first time by four porticos.

Looking at its size, a comparison with the dimensions of the others main halls leads to accept that a standard dimension could have been the rule in the construction for such a space.53 The other main architectural evolution is illustrated by the lateral porticos that are fitted out with two rows of 8 columns each and by the long northeast one with its two rows of 14 columns each. The opposite portico that faces the southwest direction, displays two rows of 24 columns each. As usual two corner halls are built at each end of the supposed entrance portico. Their almost square plan is mainly due to the length reserved for the entrance portico. The overall layout of the construction already shows many characteristics of the future Apadana. The four porticos are of the same depth and of the same type, i.e., with two rows of supports. Only the main central hall maintains its rectangular-shaped form but the outstanding difference with the former palaces can be pointed out in the reduced number of the columns. To support the roof, only two parallel rows of four columns have been set up. They are set 7.90 m apart and the columns are set 6.45 m apart. We can observe here a real technical improvement that is most probably due to the development of architectural knowledge and experience. According to the new and much sought-after official functions of the building such an arrangement makes the organization of public performances and official ceremonies easier. It’s totally deviates from the old traditional architectural norms based on the former technical possibilities.

Looking at the layout, we can easily observe that the building is realized as a unit. By no means it’s possible to increase the surface or to add some ancillary rooms without breaking or hampering the political impact offered by this particularly well thought out architectural form. The doors are set in the middle of the walls of the hall and their axis directly gives on a free passage between columns. Porticos are regularly placed around the central hall. All these features give the impression that an architectural perfection has been sought and consequently a balance between the different parts of the building. For all of these reasons, the architectural organization of the Palace S heralds the magnificent architecture of the Apadana (Fig. 13). A careful examination of the plan of the Apadana may help us to perceive many architectural features that have been brought from much older constructions. In a very real sense, the Apadana is not really a “revolutionary” building but it combines a long set of architectural improvements that have been used for a long time and incorporated here in a much more perfectly organized layout. Some of these fit-out’s have been already presented in this study like the columned porticoes bordered by corner rooms, the non-axial entrance’s layout and the columned rooms. Some more have to be mentioned. First is the curious layout formed by thick walls we can observe beyond the south (back) wall of the central hall of the Apadana. Instead of a fourth portico, we observe two long corridors running parallel to the outer face of the back wall. Each one, connected via a single door to the main hall, gives in turn access to an enigmatic group of narrow rooms and short passageways.54 This restricted space seems to be inappropriate for living or even for administrative works. According to the thickness of the walls, we can suppose that this part of the building served to support a storey

53 For the Palace S we note the dimensions (32.25 m x 22.15 m). They are nearly the same as the great central hall of Palace P (31.10 m x 22.10 m). The dimensions of the hall of Dasht-e Gowhar (about 32 m x 22 m) are based on the plan proposed by Kleiss (Kleiss 1980, Abb. 2) and therefore, they are hypothetical.

54 A single row of columns marks the southern and outer border of the building, i.e., the so called “Royal Porch”. Here the diameter and the span between these columns are curiously very short. It seems to be all what remains of a long time disappeared original portico of unknown extent (Schmidt 1953, 77–79).
maybe for the private apartments for the king.\textsuperscript{55}

We can observe a similar arrangement of rooms in the corner towers. Here the space has been divided in long and narrow rooms that are very inappropriate to have served as magazines.\textsuperscript{56}

Indeed, the thick walls seem to have been set up to support a storey from where many luxurious items have fallen during the collapse of the building.\textsuperscript{57} This architectural fit-out recalls the layouts formed by the long rooms separated by thick parallel walls in the \textit{Fort of Nush-I Djan} (Fig. 7) and in the building of Gubbah (Fig. 14). The best reason for these arrangements is to carry an upper storey (for a living quarter?). The so-called \textit{magazines} in Godin Teppeh (level II) dated from the VII\textsuperscript{th} century BC seem to have been constructed for similar functions.

It’s not unreasonable to think that the corner rooms giving access to a storey and probably to the roof of the \textit{Apadana} recall the organization concept we have seen in Hasanlu, in the second stage of the \textit{Manor in Baba Djan} and in the \textit{Fort of Nush-I Djan}. All these layouts show that at least one of these corner rooms was used as a stairwell. In fact the system of access to the corner rooms through the portico has been kept unchanged from the buildings of Hasanlu, Nush-I Djan, Baba Djan to the palaces of Pa-

\textsuperscript{55} We agree with Huff who gave serious critics against the opinions given by Schmidt. (Huff 2005, 376–377 vs. Schmidt 1953, 74–75, 77–78).

\textsuperscript{56} As Schmidt asserted (Schmidt 1953, 74–75), these rooms have only 2 m in width and the thickness of the walls reaches 1.50 m to 1.90/2.10 m.

\textsuperscript{57} Huff 2010, 316–317.
sargadae and then in the Apodana. Unfortunately we have to few elements or clues for Godin Tepeh. However it’s possible that a stairwell and a portico have once existed in the large area devoid of any architectural structures that encroaches the remains of the first part of the great columned hall. Another question may be arisen about the existence at Pasargadae of a stair in the rooms flanking the porticos.

Conclusion

We have seen that the concept of hiding the interior of the main hall from a direct sight from the outside has been developed in the different buildings through a bent-axis system or a simple non-centred doorway. The new principle of space organization in the buildings of Pasargadae allowed putting this traditional arrangement aside. However it seems to reappear in the north (main) portico of the Apodana where two doors have been fitted out in the wall at a separate distance from the median axis of the building. This fitting-out avoids creating a direct view in the direction of the throne for anybody who enters the hall.

With these examples of arrangement and layout organizations, we have pointed out architectural similarities between some constructions and structures. However by no means we can speak about formal architectural copies but only of architectural concepts that have been kept and adopted by the Iranians during all the stages towards the development of an imperial Achaemenian Architec-

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58 In the Palace P we can observe that a second access has been restored in the façade wall of the corner rooms. In the other monuments the presence of a second door seems more hypothetical.
ture. According to this it’s not unreasonable to consider that the Apadana represents not only the topmost technical improvement of the architecture but also the successful outcome in the organization of the space. During all the different stages we have encountered we have noted a clear tendency to improve connections and circulation in search of a better and more rational use of the architectural layout. We can infer that the beginning of the Achaemenian Architecture is less indebted to influences coming from foreign models than to knowledge developed step by step during a long period of time by the Iranians themselves. By no means, we try to exclude the possibility of a lydian-ionic technical support in the construction of the first palaces in Pasargadae and in Dasht-i Gawhar. However if such an influence has ever existed, its impact seems to be superficial and reserved for some architectural decorative details (fluted torus, bases of columns, coloured contrasts of plinths) or reserved to some technical works (use of tooth-chisel equipment). The choices established by the Persian builders for their constructions are essentially locals and based on their own experience. At the end of the line of development, we find the Apadana where all the technical knowledge and long-term improved experiences in architecture have been gathered in one unique building.

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The search for a better organisation of the space and its use: a possible cause to explain the Outbreak of the Achaemenian Architecture

Abstract

The question about the origins of the Palace architecture of the Achaemenian period in Persepolis and in Pasargadae are far to be solved. The main issue of our article is to propose another approach to this problem through a comparative architectural study with the elaborate architectural forms of some buildings unearthed in the Zagros Area. To scrutinize this architecture, dating back to the first half of the Ist Mill. BC leads to develop comparisons with the Palace Achaemenian Architecture. Some of the most prominent architectural characteristic of the Zagros buildings could be regarded as forerunners of the monuments of the Achaemenid era. However the comparative architectural approach has its own limits and shouldn't be limited to the most visible structures. We have to take account of the possibility of comparisons presented by the study of the inner organization of circulations and movements in the different buildings. Our aims is to explain the situation of the different parts of the constructions and finally to point out their similarities.