

Urbanization in the Basalt Region of North Jordan in Late Antiquity: The Case of Umm el-Jimal

In the Roman, Byzantine and Umayyad centuries the desert population of North Jordan created and enjoyed a manageable and comfortable human habitat in the apparently hostile environment of the basaltic frontier. The shape this habitat took was a grid of towns and cities radiating from Bostra and the Jebel Druze through the relatively more fertile parts of the basaltic regions where sparse agricultural resources were exploited and distributed along the Roman-Byzantine *Limes Arabicus* and where walled civilian settlements were integrated with more purely military installations to form a secure buffer to prevent nomadic and military incursions into Syria and Palestine. Four seasons of research at Umm el-Jimal (De Vries 1981: 53–72; 1982: 97–116) have provided an ideal case study for understanding both the history of the growth and decline of this network of towns and cities and the various (natural and human) circumstances that made urbanized life in the *Harra* desert both possible and essential. This article will provide a brief sketch of each of the archaeological periods of Umm el-Jimal followed by an analysis of the circumstances ('environments') that led to the foundation, prosperity, but finally also to the death of the city.

Historical sketch

1) *The Early Roman City* (63 BC–AD 135)

Abundant Early Roman pottery on the surface and mixed in later strata indicate occupation of the site in this period. However, none of the buildings or walls excavated were built this early. In fact, only an extensive ash deposit under the foundation of the East Gate and the lower locus of another ash dump are clearly datable to this period. One gets the impression of a sparse and transitory settlement: the rudimentary beginnings of a community that was to experience gradual growth over the next four centuries.

2) *The Late Roman City* (AD 136–324)

In this period, perhaps late in the Second Century, the city received its perimeter enclosure walls designed for defense against marauding bands, rather than against large armies. The Commodus Gate (dated by inscription) gave access to the road leading to the Via Nova Trajana while the East Gate

opened onto the road (track?) leading east to neighboring settlements as far as Deir Kahf.

Late in the Third Century, perhaps as a product of the policies of Constantine, a major military fort measuring ca. 100 × 100 m. was constructed in the east part of the city (visible today as the badly ruined area northeast of the large reservoir) with its east wall facing the desert built on a line with the east perimeter wall.

The main building of the 'Praetorium' complex is also Late Roman in construction. Although a more precise date could not be fixed stratigraphically, it makes sense to see it as a product of the increased Roman presence reflected by the construction of the Fort.

None of the still standing obviously domestic structures excavated were built this early. Civilian presence may still have been minimal or else is hidden under later buildings that have not been investigated. However, the two major aqueducts supplying the city from the northeast were constructed certainly to supply the military contingent in the Fort and whatever civilian residents the city contained. (The construction date of the large reservoir next to the southeast tower of the Fort will be the subject of inquiry in a future season).

It appears that the drastic increase in size and substance of the city is a product of direct imperial control and sponsorship. The Fort is the largest and most massive structure in the history of the city; the 'Praetorium' is almost the only building that approaches Roman monumental standards of architectural design and construction quality. The primary function of the city late in this period was clearly military.

3) *The Early Byzantine City* (AD 325–491)

In the Fourth Century the Late Roman Fort continued its military function, but in the Fifth Century it was converted to domestic (possibly commercial) use. Its military function was taken over by the much smaller Barracks, built in AD 411/12.

The 'Praetorium' continued in use, but may have been adapted to domestic purposes (determined by artifacts from excavation in the cruciform room). The structure called 'Nabataean Temple' by H. C. Butler was built at this late

1. Map of Umm el-Jimal, revised in 1982.



date. Whether it is in fact a temple is not at all certain. Its once porticoed and three-doored facade appears monumental compared to the surrounding Late Byzantine domestic structures, but is certainly most plain and devoid of the sort of relief decoration on supposed temples at Bostra and Si'a.

The long barn-like room that makes up the east wing of House 92 was constructed in this period.

The major transition of the Early Byzantine period is the reduction in military emphasis (perhaps the aftermath of the passing of Theodosius the Great) and comparable increase in civilian activity including the beginning of the construction of the domestic buildings that make up the bulk of the Late Byzantine city.

4) *The Late Byzantine City* (AD 491–636)

The structures making up the Late Roman Fort now exist as abandoned ruins except for the west and east gates, which are linked by a wall lined roadway. The East Church and House no. 79 have been built into the ruins against the east wall of the Fort which continued to serve as a section in the east wall of the city.

The west and south city walls were refurbished, the Barracks extensively remodeled, and the tower in its southeast corner added. The numerous religious inscriptions on the tower walls indicate Christian occupancy, but whether these occupants were soldiers or monks is not yet clear.

The 'Praetorium' continued in use, but may have been adapted to domestic purposes. Possibly, the residential quarters on the west side of the courtyard were added in this period.

The construction of domestic houses, begun in the Early Byzantine Period, came to a climax in the Sixth Century. House XVIII is typical of the 128 houses built and used in this period that are still standing and give the present ruined city its characteristic appearance.

Although the early construction date of the Julianos Church still needs stratigraphic verification (Corbett 1957), it is clear that most if not all of the fourteen churches were built in the Late Byzantine Period. Typical are the North East Church, constructed ca. AD 490 and the Numerianos Church which was constructed later and had the cloister rooms and then the narthex added in successive building phases.

In the Sixth Century the military role of Umm el-Jimal continued to diminish while its growth as a prospering civilian rural community came to a climax. The community became totally Christian and devoted much of its economic gain to the construction and maintenance of the numerous churches.

5) *The Umayyad City* (AD (636)661–750)

While the Early Roman Nabataean City, much emphasized by earlier investigators (Butler 1913; Glueck 1942: 3–8; 1951: 1–34), was insubstantial, the Umayyad City, ignored by these researchers, was substantial. This period could easily go unnoticed because its characteristic architectural activity is

2. Door socket of Umayyad East Gate.



continued use and maintenance of Late Byzantine structures rather than the construction of new buildings of distinctive design.

This continued occupation is most noticeable in the middle of the city. There, both House XVIII and the 'Praetorium' were carefully refloored (plaster on cobble underlayment). The use of painted plaster in the cruciform room of the 'Praetorium' may indicate that this building was as magnificent as the more isolated contemporary desert 'castles' farther south.

In addition, the more specialized civic structures were also maintained. The East Gate was rebuilt with substantial door post and lintel masonry (probably to accommodate large wooden doors), and the main aqueduct supplying the city from the northeast was extended to the southeast corner. Although the disposition of the Numerianos Church is not yet clear, it is certain that the North East Church received its final remodeling including the installation of a chancel screen and the reflooring of the chancel area.

That the city decreased in size is indicated by abandonment and collapse of those structures investigated in the southern part. Of these, the so-called Nabataean Temple was totally abandoned and the collapsed rooms of the Barracks were used by squatters. After extensive collapse of structures (likely due to earthquake) in the last decade of the Umayyad Period, the city was not rebuilt as it had been after such disasters in the past; its ruins lay abandoned until their tentative reoccupation by the Druze early in the Twentieth Century.

Urbanization in the Basalt Desert

1) *The Natural Environment*

Unfortunately Umm el-Jimal is visited mostly in the summer when the horizons are obscured by heat and windborne dust, so that the geographic surroundings remain unnoticed. However, on a crisp January (1983) morning after a day of snowfall in the uplands, standing on the reconstruction scaffolding above the gate of House XVIII (680 m. above sea level), the world of Umm el-Jimal lay before me for the first

time. The vistas were startling. Towards the north-northeast the snow-covered height of Jebel Druze (2,000 m. above sea level, 50 km. distant), etched against a dark blue sky, appeared to float above the still green lower slopes beyond Bostra (25 km. away). From there the snowcapped horizon made a gradual descent, interrupted by an occasional volcanic peak, toward Jawa (hidden from view 60 km. away) directly to the east. Turning to the southeast the vista opened up toward the Azraq basin (70 km. away) and the Wadi Sirhan beyond. Nearly directly to the south, Qasr Hallabat was visible on its height (30 km. away). Straight west beyond Mafraq (15 km. away) the snow covered Ajloun range (obscuring Jerash from view 50 km. away) stood cowering beneath black-grey monster clouds. To the northwest beyond Deraa (40 km. away) the marvelous snowcap of the Jebel Sheikh (Mount Hermon, 130 km. away) bathed in sunlight, an apparition from another world behind the horizon of the Golan Plain. Such is the visible world with Umm el-Jimal as its epicenter, with all its points within the reach of a one or two day journey by horse or on foot.

The same day I stood in a waterless pool in the north of the city, quarried to a depth of 5 meters below the surface. I was physically surrounded and visually engulfed by dark, steel-grey basalt. The hard, dense vertical surface appeared crisp and clean as though the quarrying had been done yesterday rather than fourteen hundred years ago. Umm el-Jimal sits on the edge of the lava slope that stretches in all directions from the Jebel Druze. This huge lava deposit was created in a series of eruptions from the volcanic mountain and the various fissures and subsidiary cones on its slopes, a series that began geological aeons ago but did not end until after the first human habitation in the region. The fact that this many meters thick cap of basalt sits on a table of sediment limestone stretching from the Euphrates to the Jordan, though significant to the modern geologist and deep well driller, was insignificant to the ancient inhabitants of the city who were unable to penetrate the dozens of meters below the bottom of the pool to reach the softer and more practical material. Their world was made solely of basalt: somber, steel-grey, hard.

That day the clouds from Ajloun poured down a driving winter rain which finally forced a halt to our cement mixing and a withdrawal to the warmth of tent and sleeping bag. Although Umm el-Jimal has the reputation of being a harsh desert place, its climate is surprisingly moderate and comfortable. Though it rained that day, it does not rain enough (less than 200 mm. per year) to interrupt a construction project the way that happens in Amman. And while it rained that day it snowed in Amman and Ajloun. The temperature almost never dips below freezing here. Unfortunately again, most visitors arrive in midsummer during the noonday heat when temperatures may soar to between 38° and 44° C (Ministry of Transport 1971). What a shame to have missed the lovely cool sunny days of October and especially of April when the winter rains have done their greening, and to drive away

pitying the poor residents for their seering habitat when the proper emotion could as well be jealousy!

The point of all this is that Umm el-Jimal is not the isolated and unpleasant place that it is sometimes thought to be. I would describe the environment as tolerable but challenging. The building material is tough, but the end product durable. The rainfall is marginal and sporadic, but the soil (a mixture of basaltic and windblown loess materials) is fertile when irrigated. These challenges were apparently too great to make the effort for urban settlement here worthwhile before 100 BC (the exception, of course, is Jawa; Helms 1981) and after AD 750 (until the Twentieth Century). The question for Umm el-Jimal and its sister cities then is: Out of all the millennia of human occupation in the larger region why was the cost worth the effort in this particular 800 year period? The answer rests in the particular combination of technical skills, economic pursuits, political organization and, possibly, religious interests of the age.

2) *The Engineered Environment*

The mind's eye, picturing buildings in the Graeco-Roman city, usually sees monumental public buildings: columned temples, tiered theatres and grand stairways, heavily decorated with Corinthian capitals, relief sculpture and niches for statues all designed and built at great expense by master architects and skilful artisans. In places like Jerash and Bostra one is so dazzled by such splendor that the habitat of the ordinary folk is forgotten. The beauty of Umm el-Jimal is its plainness and simplicity. Neither imperial treasury nor local wealth enabled the grandiose and the decorative. Hence the domestic architecture of private citizens takes center stage: of the 153 recognizable structures, 128 are houses preserved up to three stories high—houses designed from the collective architectural wisdom of the ages and paid for from the profits of the local economy.

Recently an architect friend from the Royal Scientific Society visited Umm el-Jimal. He was thrilled to see the house design and construction methods. When he invited me to see his experimental designs in Amman, I understood his excitement. His objective was to create a house for rural low income and simple technology areas. All building components were small enough to be handled by two or three workmen without the use of expensive, heavy equipment. The building design was simple and straightforward enough to enable a rural farmer to be his own architect and contractor. That description applies almost precisely to the houses of Umm el-Jimal! Even the few monumental fragments, stored in modern village courtyards, are miniscule compared to the typical unit size at Jerash. And in the private houses even the largest blocks (doorway lintels) could have been transported by cart and lifted into place by man power with the help of a simple crane, but the typical wallblock could be handled by man power alone (as our local workmen demonstrate over and over again.)

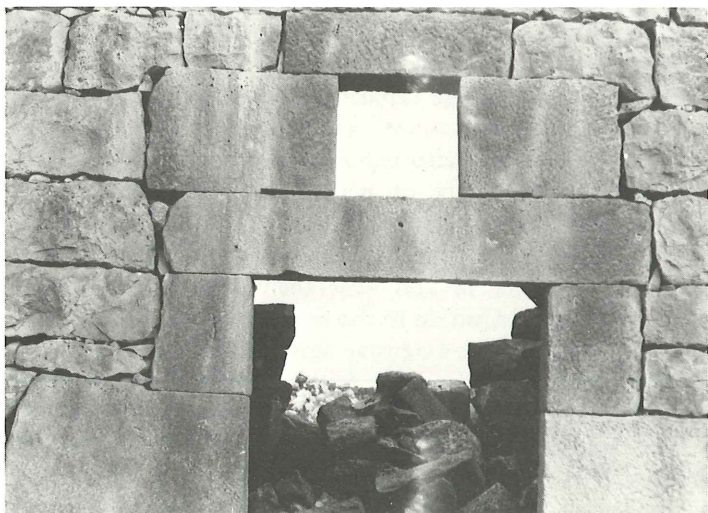
The simple, rubble-filled, two-faced wall construction too,

3. Facade of Barracks showing rows of corbels (from their rear) functioning as cross ties: the fourth and eighth courses above the lintels.

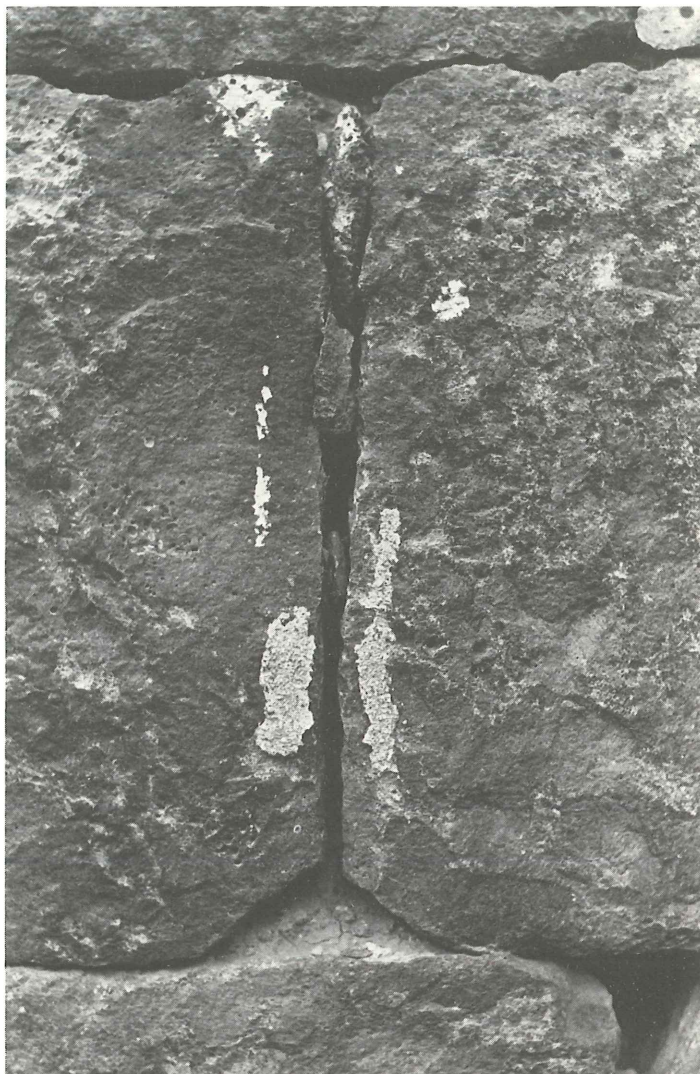


testifies to efficiency and economy. By using the aggregate rubble and clay fill packed between the two faces of a lower course as a base for the next course, it was not necessary to dress the interior faces of the stones. This reduced the stone cutter's task from fine dressing five or six faces to only one face and its four edges—a drastic saving in skilled labor cost and construction time. This efficient wall construction method combined ideally with corbeling to create ceilings and roofs (Coulton 1977: 154). The base corbel stone, to be able to support the full weight of the cantilevered roof, was laid across the entire width of the wall and as a result did double duty as a stretcher to tie the two wall faces together. It was therefore possible to build these rubble filled walls to surprising heights, because their faces were tied together by a tightly laid course of corbels at each new floor. This simple method of wall construction limited the need for carefully measured

4. Doorway in House XVIII showing contrast between finish of regular wall stone and doorway masonry.



5. Closeup of masonry joints showing high quality of fitting and remnants of plaster pointing.



and finely dressed blocks to door and window posts and lintels and to arches. In these cases careful fitting was necessary to achieve the proper structural soundness.

The result of such methods was an affordable, no frills, domicile that provided shelter, protection, comfort and a base for the residents' daily routine. This simplicity and economy ought not to be confused with low quality. That the Umm el-Jimal masons built durable houses is shown by the fact that they still stand, though unattended for over twelve hundred years. It can be added that in design too, they were ideally suited for rural life on the desert fringe.

A resident of Umm el-Jimal could visit the provincial capital in a one day round trip; Jerash or Si'a would take two days. He must have done so and been familiar with those places. What a thrill it must have been to walk through the gate of Bostra onto column lined streets, straight as a pin; city blocks laid out on a rectangular grid; agora, theatre and

temple, each precisely in its proper place according to the grand design of the city architects (al-Megdad 1982: 269–271). What a marvel of modernity: the open vistas down the uncurving streets, the ease of finding an address with a few simple directions, the comfort of knowing exactly where you were and where to go, the order and rationality of it all! Imagine in turn a visitor from Bostra coming to Umm el-Jimal intending to do business at House XVIII. He enters through the Commodus Gate and is instantly engulfed in buildings placed helter-skelter, some rectangular, but most trapezoidal to fill any available space between and against other buildings. Streets are merely the crooked alleys of varying width (though all are narrow) between the unmapped building sites. He wanders between two buildings and is instantly swallowed up by the city: the view is blocked by walls in every direction; the instructions to find House XVIII are long and confusing and need to be solicited again after 50 meters. All appears disorderly and irrational.

One can imagine our man from Bostra arriving home to his orderly and planned existence with a sigh of relief, marveling over the fact that places like Antioch and Ephesus, though thousands of kilometers away could make him feel less like a stranger than this place which is almost close enough to be a suburb. I wonder, however, what sort of a sense of homecoming our Umm el-Jimal resident had. Our tendency would be to say that he returned with a sense of envy. Bostra was the progressive place, aglitter with its splendid decoration and in tune with the rest of the marvelous Graeco-Roman world. Umm el-Jimal was the rural corner, plain and backward appearing, at the end of a road on the edge of a desert. It is also possible, however, that he found things in Bostra too straight, too regular, too organized, too regimented and too sterile. It is possible that he was more than happy to come back to this place, to step from the wide open spaces of the desert into the secure envelope of buildings in which no two streets were the same but in which every nook and cranny was familiar. He at least liked it well enough to invest his time and money into buildings intended for generations to come. Such planning and investment would not have taken place if generation after generation grew up with a dream of escape to the glitter of Bostra and places beyond.

3) *The Economic Environment*

Umm el-Jimal has traditionally been thought of as a caravan city (Glueck 1942: 3–8; 1951: 1–34). There are good reasons for this. Any goods moving from Arabia and the Persian gulf would arrive on the frontier of the *Provincia Arabia* via Azraq somewhere in the vicinity of Umm el-Jimal and could move on or be transshipped from there to Bostra and on into Syria. There is also the familiar notion that the Nabataeans used the circuitous desert route to move goods from Petra around the Decapolis to Damascus.

Nevertheless, the caravan theory is not without problems. Caravans from the Wadi Sirhan could have stopped elsewhere: Mafraq, Umm es-Surrah or Summa, for example. In

fact, if it is realized that Umm el-Jimal is one of dozens of similar cities, some of them equal to it in size, in the region between Mafraq and Deir Kahf, the caravan theory takes on a different perspective. While it is not invalidated, it can no longer serve as the primary explanation for the existence of Umm el-Jimal and its neighboring towns. There is also an archaeological problem with the theory that Umm el-Jimal may have been on the route between Petra and Northern Nabatene. As stated above, in the period of Nabataean pre-eminence the site was only sparsely settled. This settlement could as well be the product of Nabataean influence radiating out from Bostra in the late First Century AD as the remains of a caravan stopover point.

The only archaeological evidence thus far of commercial activity comes from the Early Byzantine period, when the Fort may have been converted from military to marketing use (a thesis to be tested by further excavation). The East Gate of the Fort-become-market-place became the North East Gate of the city and opened directly onto the highway (still traceable) headed east to Umm el-Quttein and other neighboring towns. If we suppose that those towns were already sizeable in the Fifth Century, it is not unreasonable to see the movement of goods between them to be the source of the market activity.

All this does not dismiss the caravan theory, but it does put it into a context. The economic environment of Umm el-Jimal is far too complex to be explained by a theory involving a single activity, and the evidence for caravan activity is in fact very slight.

There is, however, an activity that had to consume most of the time of most of the people: food production. To support the relatively large populations, the towns of the black 'desert' had to produce large quantities of food locally in an environment made only marginally productive by inadequate rainfall three years out of five. Evidence that agriculture was a major economic activity comes mainly from the Late Byzantine period.

To enable this, an elaborate hydraulic system was constructed to supply both town and countryside. The two main canals supplying the reservoirs of Umm el-Jimal were constructed in the Late Roman period, but still maintained and extended to the southeast corner in the Umayyad period. The extensive water storage capacity inside the city itself is well known. What is not as well known is that the countryside around the city was also extensively subjected to hydraulic engineering. A variety of water diversion, diffusion and storage installations, similar to those in the Negev (Evenari 1971), for irrigation of fields and watering of flocks are to be found everywhere in and near the wadis in the country between Umm el-Quttein to the east and Summa to the west. In addition, there are extensive agricultural installations like terraces, corrals and, possibly, barns. All of this awaits careful study in the upcoming season of the Umm el-Jimal Project.

The fact that almost all the main floors of the Umm el-Jimal houses were barns and stables (with the people living upstairs) is indicative of extensive and careful animal husbandry.

6. Canal of Late Roman construction maintained through the Umayyad period. View from north wall of city looking away to the east.



Possibly Umm el-Jimal and its neighbors raised enough meat to supply Bostra, or horses and donkeys to be used for military and civilian transport. Such marketing of surplus agricultural products combined with the commercial activities described above would have brought in the capital necessary for the extensive construction of houses and churches that took place in the Late Byzantine period.

Given the evidence of intensive agriculture at Qasr Hallabat uncovered by Dr Ghazi Bisheh (Bisheh 1982), it is tempting to speculate that agriculture continued to be the economic base at Umm el-Jimal in the Umayyad period. Possibly this agricultural heritage was inherited by the farmers of Hallabat.

4) *The Political Environment*

While Umm el-Jimal may have begun as a stop on the south to north Nabataean route, it clearly flourished after Rome absorbed the region into the empire as the province of Arabia. From the Early Roman through the Early Byzantine periods Rome (and Constantinople) took direct responsibility for the protection of Syria and Palestine by the development of the frontier defense system, the *Limes Arabicus*. Thence came the construction of a chain of legionary fortresses, forts and watchtowers linked by a road network from east of the Jebel Druze to the Gulf of Aqaba (Graf 1978; Parker 1976).

This deliberate fortification provided the stability and safety that enabled the development of permanent settlements like Umm el-Jimal by the local Arab–Aramaic–Safaitic populations who had previously been nomads in the region and/or who had previously lived in the more developed parts of Syria and Palestine. The working hypothesis of the Umm el-Jimal Project is that Imperial defensive policy did more than merely enable this settlement; it actively sponsored and encouraged such settlements as a means of cementing together the chain of fortifications. A local population with serious

investments in buildings and agricultural production will support and assist the military by supplying agricultural produce and participating in the defense of its own settlement. Moreover, the settlement of nomadic tribes into sedentary communities diminished the number of potential marauders against whom the Roman defenses were constructed.

From the work done so far, it appears that imperially sponsored construction for defensive purposes predominated in the Early and Late Roman periods. This includes possibly the construction of the Commodus Gate in the late second century and certainly the construction of the East Gate, the 'Praetorium' and the Fort in the late third century. If this is true, Umm el-Jimal may have had a primarily military function in these two centuries.

In the Early and Late Byzantine periods the balance shifted from military to civilian. In keeping with Byzantine strategic shift toward more mobile defensive armies (Tomlin 1981: 253), the Fort was replaced by the much smaller Barracks, constructed by the Dux Pelagius in 411/12 (Butler 1913: 166). Then, with the adoption of the Ghassanid phylarchy as a buffer state in the fifth century, even the Barracks may have been given up to civilian use. Ironically in this situation the city, with possibly only a local civil defense manning its reconstructed walls in times of danger, enjoyed its most prosperous era and greatest domestic architectural expansion.

One can only speculate about the role of the city in the imperial politics of the Umayyads. On the one hand it had lost its frontier status and was now located near the heart of the Empire. On the other hand, it could have served a role in the policy of keeping the Arab militias bivouacked on the desert frontiers rather than allowing them to mix with local subject populations. Then again, the city may have simply continued as the civilian town it had become in the Late Byzantine period, though with a smaller population. The rather deluxe refurbishing of the 'Praetorium' poses other questions. Was its role similar to that of the Desert Castles? Was it the residence of a 'gentleman-farmer' supervising agricultural activity similar to that at Qasr Hallabat? It is safe to conclude that without the central strategic significance the place had in the Roman Empire, it no longer enjoyed primary support and protection. While earthquake repairs were still considered worthwhile in the course of the period, the final catastrophe, coincident with the Abbasid revolution and the political shift to Iraq, was not followed by such a display of confidence in the future. The place was abandoned.

5) *The Religious Environment*

Although religion is undoubtedly an essential factor in the lives of the people of Umm el-Jimal, it is not a primary factor for explaining the existence of the city itself. The Nabataean religion came with the settlers, and the shift to Christianity came to the already well established city. Rather than explanatory, comments on religion can only be descriptive of the essential character of the people.

That the early residents worshipped Nabataean deities is fairly certain from the famous altar stone dedicated to Dushara. What is no longer as certain, however, is that this worship took place in a local temple. The so-called Nabataean temple was not constructed until the fourth century AD. If its original use was Nabataean worship, it would mean that the religion persisted to a late date and that conversion to Christianity was relatively late. This is a distinct possibility, but not as probable as the possibility that this apparently monumental building had some other use. Be that as it may, the need for a primary center of worship at Umm el-Jimal itself may have been pre-empted by the nearness of the Jebel Druze and the major Nabataean cult center there at Si'a. This occurred to me during my visits this past winter, when the mountain was so visible and so near, the single overpowering feature on the visual horizon. One could imagine Dushara residing there and attendance at sacrifices at Si'a could be accomplished in a three to four day round trip.

The rather late conversion from Nabataean religion to Christianity is not in conflict with the architectural evidence. The earliest evidence for Christianity is the famous Julianos inscription dated AD 345 (Butler 1913), but no longer to be associated with the founding of the church in which he discovered it (Corbett 1957). No churches were built before the fifth century, and most if not all were constructed after AD 490.

The co-existence of the large number of churches has become less amazing as similar situations continue to be discovered at other contemporary sites (e.g., Rihab and Khirbet Samra). However, this great appetite for church building still needs adequate explanation.

Christianity continued at Umm el-Jimal to the end of the Umayyad period. This became clear from our investigation of the North East Church where the final reflooring of the chancel area and the installation of a fine limestone chancel screen took place in that era. Whether there was also conversion to Islam as was thought earlier cannot be concluded with certainty now. Our investigation of the Numerianos Church, which Howard Butler thought had been converted to a mosque, has yielded no evidence of that conversion. How-

ever, our examination of the remodeling of the apse area of that church awaits completion.

In conclusion it should be noted that a number of the same factors that enabled the settlement of Umm el-Jimal and the southern Hauran in late antiquity are again contributing to its resettlement. It is my fond wish that our growing knowledge of that first set of circumstances may inspire the dreams and aspirations of the present inhabitants.

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