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Chan Cahal:

Socio-economic dynamics in an agrarian Maya community in the Blue Creek polity, Northwestern Belize

Thesis submitted in fulfillment of obtaining the degree of master in art science and archaeology

Faculty arts and philosophy
Study area art science and archaeology
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2013-2014

I hereby declare that I have written the master thesis “Chan Cahal: Socio-economic dynamics in an agrarian Maya community in the Blue Creek polity, Northwestern Belize” myself.
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May 9th, 2014 Dominick Van den Notelaer

Abstract (English):

Too often, Mayanists have regarded the lowest echelons of Maya society as a homogeneous and stable group, or as passive agents following a dynamic elite class. By closely examining the changes that occurred in Chan Cahal, a farming community in the hinterland of Blue Creek, Northwestern Belize, this thesis aims to illustrate the contrary. Over time, great changes in the socio-economic character of this residential compound are discernable. By linking these to demographic changes and the social, economic and political happenings in the rest of the polity and the Maya world, we will not only try to place these dynamics in a broader context, but also to discern the mechanisms behind them.

Abstract (Nederlands):

Al te vaak hebben Mayanisten de laagste regionen van de Maya gemeenschap als een homogene en niet-dynamische groep beschouwd, of ze als passieve actoren achter een meer dynamische elite klasse behandeld. Door de veranderingen die plaatsvonden in Chan Cahal, een boerengemeenschap in het hinterland van Blue Creek, in noordwest Belize, gedetailleerd te bestuderen, zal deze thesis trachten zulke vooroordelen te ontkrachten. Mettertijd zijn er belangrijke veranderingen in het socio-economische karakter van dit residentieel gehucht waarneembaar. Door deze te verbinden met de demografische veranderingen en sociale, economische en politieke gebeurtenissen die in de rest van Blue Creek en de Maya wereld plaatsvonden, zal geprobeerd worden om niet enkel de veranderingen in Chan Cahal in een bredere context te plaatsen, maar ook om de achterliggende mechanismen te ontwaren.

Keywords: Chan Cahal, Blue Creek, Northwest Belize, Maya, Socio-economic, Farming community

Trefwoorden: Chan Cahal, Blue Creek, Noordwest Belize, Maya, Socio-economische, boerengemeenschap

Summary

Until recently, Maya commoners – who constituted at least 90% of society – have been neglected in most of the theories on the ancient Maya, or have been stereotyped as a passive, homogenous group. The only way to do justice to this group is by detailed analysis of commoner contexts. The ultimate goal hereof is not to counter the approaches that centre around the elite parts of society, but rather to overcome oversimplified perspectives – be it top-down or bottom-up – that do injustice to very complex situations. As one step towards this goal, this thesis will investigate the socio-economic complexity in Chan Cahal.

Located in the Blue Creek polity in Northwestern Belize, Chan Cahal was a residential compound at the base of the Bravo escarpment. Due to its position near fertile wetland soils, this compound could focus on producing agricultural surpluses. This made it a valuable contributor to Blue Creek's economy, which profited from various types of fertile soils combined with its location near the Río Hondo river to export agricultural goods. Since Chan Cahal appears to have been the earliest inhabited zone of Blue Creek, with occupation dating back to the Early Middle Preclassic, these fertile soils may well have been one of the prime reasons for which people settled in this zone. Furthermore, the presence of water sources and the location at the base of the escarpment, which allowed for both wetland and dryland agriculture, made it a good place to found a new settlement.

In its earliest years, Chan Cahal was an egalitarian farming community which focussed on agriculture for self-sufficiency – perhaps with a small amount directed towards trade – combined with some hunting and foraging. As it grew in population and other compounds of Blue Creek became inhabited, social complexity emerged in Chan Cahal. Initially, there is a small but clear difference visible between the extended families and the nucleated families within them. While at first this stratification is small and informal, by the Early Classic it had become institutionalized, enlarging the gap between the upper and lower social strata in Chan Cahal. This does not mean that those with a low socio-economic status were impoverished, as in fact they seem to have been relatively enriched considering they were farmers. Some even could acquire quite an affluent position due to personal achievements, though the real executive power still was in the hands of a few lineages.

Things changed drastically when around 500 AD, Blue Creek lost its independency. To Chan Cahal, this apparently meant that the Imcolel lineage, which had consolidated the greatest amount of power and wealth in the compound, moved outside the area shortly after this event. The vacant position of most influential lineage of Chan Cahal was quickly taken over by the lineage living in the U5 plaza complex, which expressed their power through various means including architectural programs. While this lineage attained socio-economic affluence, those with a lower status were not able to express any form of prestige as they had done in the previous eras. The farmlands, which were the economic base of Chan Cahal, appear to have been controlled by this ruling lineage, who used the profits generated by these fields to ensure their own position.

Though the situation of most inhabitants of Chan Cahal was hardly enviable, the compound – and Blue Creek as a whole – appears to have been economically profitable and socially stable by the end of the Late Classic. Its inhabitants could however not be prepared for the catastrophes that led to the end of the Classic era. The combination of drought and the region-wide disappearance of many of its trade partners made that Blue Creek was no longer a thriving city. Gradually, people were moving out of the Chan Cahal compound, with the last people leaving before the start of the Postclassic period.

Acknowledgements

A first word of thanks goes out to the staff and volunteers involved with the Maya Research Program. Without their efforts and relentless enthusiasm, this thesis could never have been written. The director of this program, dr. Tom Guderjan, in particular has had faith in me from the start and was willing to answer all of my questions and requests for more data. My endeavour into Maya archaeology would not have been the same without his help. We will share a Belikin very soon!

I am greatly indebted to dr. Ine Jacobs for her great job monitoring me. Moreover, I am still glad she was willing to supervise a subject that is situated far beyond her area of expertise and hope she has enjoyed this journey into Maya archaeology. Her advice helped shaping me as an archaeologist. Not unimportantly, she also deserves credit for introducing me into the world of gin-tonic.

The aid of Antoine Giacometti has proved invaluable to the completion of this thesis. I am very thankful he was willing to clean out his attic to see whether he could find something that was useful to me – he did. Furthermore, I would also like to express my gratitude to dr. Laura Kosakowsky for her helpful comments and suggesting literature that greatly benefitted this thesis. Likewise, dr. Araceli Rojas has proposed readings that shed interesting lights on the Chan Cahal data and contributed in forming my perspectives on Mesoamerican archaeology in general. I would also like to thank dr. Dries Tys for his faith in me and allowing me to follow the path that I have chosen.

My friends, family and fellow classmates not only aided me throughout this entire thesis-process, but remain a constant support.

Finally, my love goes out to my wonderful girlfriend Sofie. Without her I would probably not even have started the Art History and Archaeology program. She is both my biggest supporter as well as my biggest critic, for which I am very grateful. More than anyone – including me – she will be happy that this thesis is finally finished.

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Introduction

Every ancient society has to cope with stereotypes and prejudices. The Inca are known for their road networks and exquisite gold objects, few of us do not immediately imagine the magnificent pyramids and mummies when talking about Egypt, and when we think of Classical Greece, the Parthenon and wise philosophers naturally come to mind. This is no less true for the Maya, who have been stereotyped as a mysterious time-obsessed people engaged in pyramid building and human sacrifice. While there certainly lies some truth in these stereotypes, they are not representative of how the vast majority of people in these civilizations lived their everyday lives. In Maya society - as in most other societies -, this majority consisted of farmers and laborers. Unfortunately, notwithstanding the importance of these commoners to society, Mayanists have too often regarded them as passive agents lacking any form of dynamic, resulting in their underrepresentation in Maya research.[1] This thesis aims to counter such prejudices.

This will be done by examining the socio-economic differentiation and demographic evolution of Chan Cahal, a residential compound in the ancient Maya polity of Blue Creek in Northwestern Belize. This compound yields the earliest signs of occupation in the Blue Creek area, with ceramics dating back to the beginning of the Middle Preclassic era. It was continuously occupied until the Terminal Classic period, a time of great distress when Blue Creek and most of the other polities of the central and southern Maya lowlands were being abandoned. Consequently, it was the place with the longest occupation history of Blue Creek, rivalling many other Maya sites in occupation length. Though Chan Cahal's main economic activity was farming, there was a wide range of social strata apparent at this compound, ranging from humble farmers to elites who had close bonds with Blue Creek's rulers who resided at the site core. Though this social differentiation manifested itself in economic stratification and display of prestigious goods, many commoners still had a considerable access to exotic and "elite"-goods.

[1] For discussions on how such preconceptions on Maya commoners still shape much of the theoretical frameworks, Lohse 2007, Marcus 2004 and Robin 2009 are recommended.

Characteristics of Chan Cahal

Research History

After being shortly visited by Mary Neivens in 1974, the Blue Creek site (Fig. 1) was forgotten by archaeologists.[2] This changed around 1989 when Thomas Guderjan, who had been active as an archaeologist on various Belizean sites, had been informed by a local landowner about the archaeological potential of Blue Creek. The archaeological site was named after the Mennonite town of Blue Creek, adjacent to the ancient ruins.

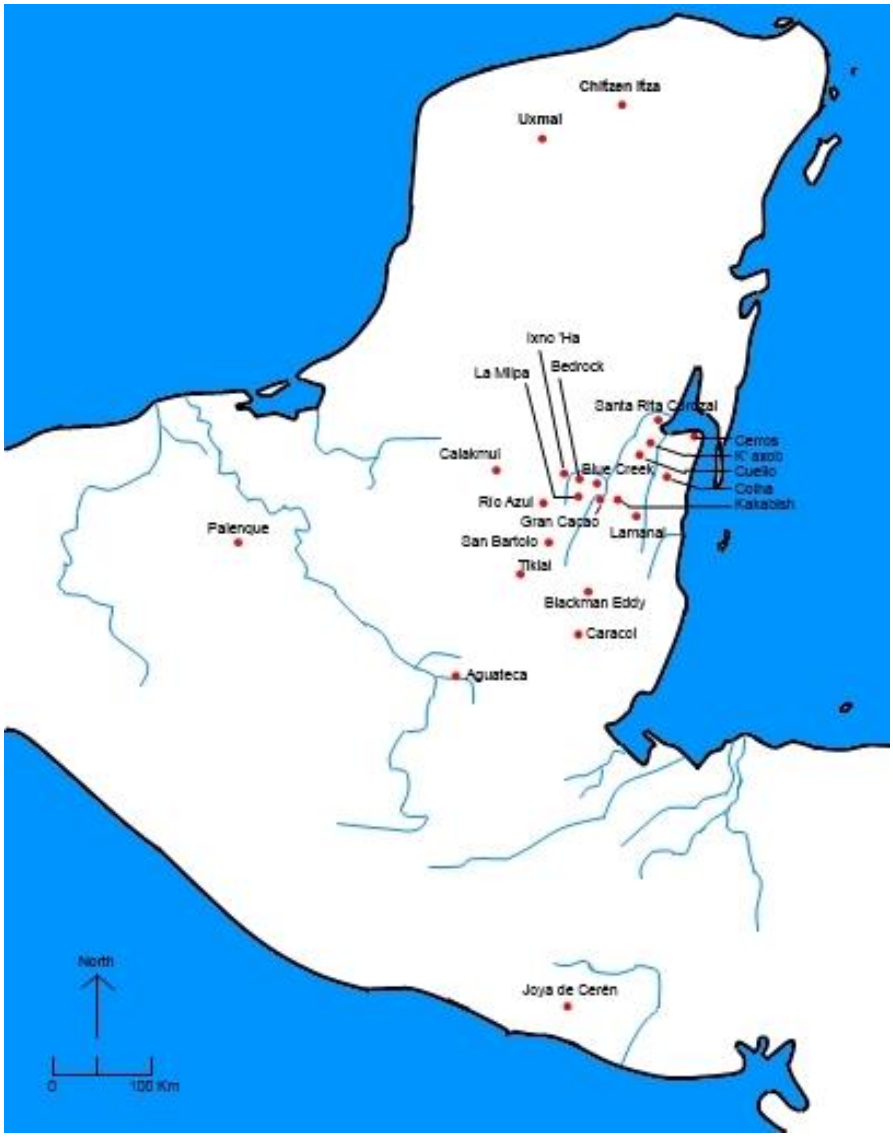

Fig. 1: Location of Blue Creek within the Maya area, with sites mentioned in the text

[2] To date, the publication of Neivens' 1974 excavations at the site core has been lost.

In 1992 excavations at the site core commenced under the moniker of the Maya Research Program (GUDERJAN *et al*. 1992). After a broad survey in 1995, it was attested that the site was much larger than earlier anticipated, containing several previously undetected residential areas as well as a large ditched field complex (BAKER 1996). In the subsequent season, the emphasis on excavations in the site core diminished with excavations being carried out in both Chan Cahal's residential area (CLAGETT 1997), and its ditched field complex (BAKER 1997). At this point it was thought that the compound was divided into two separate compounds: Chan Cahal to the north and Sayap Ha to the south, an hypothesis that was later disproved by Antoine Giacometti (2002, p. 33 & p. 107, fig. 7).[3] Though Chan Cahal is now considered as one, there is a drain separating its Northern from its Southern part. The following seasons saw both the continuation of the excavations at Chan Cahal's residential area (POPSON & CLAGETT 1999; POPSON *et al*. 1998) and the initiation of a large project conducted by Robert Lichtenstein which set out to provide a general overview of the Blue Creek site by excavating hundreds of small trenches in every known part of Blue Creek, including Chan Cahal (LICHTENSTEIN 1999; 2000).[4]

While Popson and Clagett's work had focused on the household archaeology of the humble residences of Chan Cahal and that of Lichtenstein aimed to get a better understanding of Blue Creek as a whole, subsequent work carried out by Antoine Giacometti (2001; 2002) focused on the more elaborate architectural features of the compound, which he termed "hinterland plaza complexes". During this period, an important shift in the activities at Blue Creek took place. While the board of the Maya Research Program took on a more administrative role, the Blue Creek Political Ecology Project, directed by dr. Jon Lohse, was initiated as a subdivision of the Maya Research Program to carry out field work. This also led to new research strategies, which would focus on: "(1) better understanding regional chronology; (2) examining relationships between environmental variation and related social, economic, and political developments; (3) investigating these relationships as evident in non-urban domestic contexts and settlements; and (4) better defining ties of Blue Creek to other sites in the region" (LOHSE 2003, p. 3). Because of the new regional focus, excavations

[3] The names Lichtenstein gave to these compounds illustrate their characteristics since Chan Cahal is Yucatec for "little houses", while Sayap Ha means "spring water" (LICHTENSTEIN 2000, p. 47 & 52).

[4] Since some of the most extensive excavations at the compound such as POPSON *et al*. 1998 and GIACOMETTI 2001 were never published, and the work of Lichtenstein focussed on a compound-wide documentation, there is little detailed visual footage on many excavated structures.

at the constructions of Chan Cahal came to be less of a priority in order to be able to perform activities at other, previously unexcavated centers such as Ixno 'Ha. The ditched field system, however, was more closely studied from this period on: in 2002 the Blue Creek Regional Ecology Project undertook an aerial survey to document the extent of ditched field systems at the Río Hondo, including the Chan Cahal ditched fields (LOHSE *et al*. 2003). The Chan Cahal ditched fields remain an area with great scientific interest and research has continued for over a decade now (BAKER 2003; BEACH & LUZZADDER-BEACH 2004, 2005, 2007; BEACH *et al*. 2006, 2009, 2013; GUDERJAN & KRAUSE 2011; LUZZADDER-BEACH & BEACH 2009; LUZZADDER-BEACH *et al*. 2012). In 2003, work was done at the southern portion of Chan Cahal by David Driver (2004), to gain understanding of the inter-community architectural variation in Blue Creek. By 2006, the goals of the Blue Creek Regional Political Ecology Project were reached, which made way for the old board of the Maya Research Program to continue their work in Northwestern Belize. Nonetheless, many of the perspectives of the Blue Creek Regional Political Ecology Project, such as getting a better view on the entire region, were and are still being applied. In 2007, Sarah Skinner prepared a Master Thesis at San Francisco State University, which would give an overview of excavations performed at Chan Cahal, but this thesis was never finished (T. H. Guderjan, personal communication 2013).

Structural Remains at Chan Cahal

At Chan Cahal, we can discern three basic types of constructions. The most numerous is the category of the residential structures, or houses. Also present at Chan Cahal are buildings with a ritual function. While they are greatly outnumbered by the residential structures, their construction cost and implications towards worldview and identity make them crucial contexts in discerning socio-economic dynamics at Chan Cahal. Finally, some structures at Chan Cahal are labelled as ancillary structures.

When we consider the residential structures, a dichotomy between what Elliot Abrams (1994, p. 20-28; see also JOHNSTON & GONLIN 1998) calls basic structures and improved structures is apparent. The basic structures, comprising the majority of the structures of Chan Cahal, were very humble huts - mostly consisting of a single room-, constructed with perishable materials (Fig. 2). Often, but not always, basic structures were supported by nonperishable substructures. These substructures are normally the only architectural features remaining when archaeologists unveil the remnants of such basic structures. They are characterized by a general lack of elaboration and appear to have undergone very few changes in shape or function. Such structures are still frequently being built today, and it is hard to discern major differences in style with those constructed centuries ago (KURJACK 2003, p. 287-280; MORLEY & BRAINERD 1956, p. 310). Traditionally, the improved structures are multi-roomed structures, and sometimes even multi-structure compositions. They are more elaborate and their construction would have required a significant investment regarding construction and labor costs. Therefore improved structures are mostly considered to be the dwellings of an elite class. They are also more receptive to stylistic evolutions (ABRAMS 1994, p. 25-26). Once they were constructed, however, the maintenance of these structures was not costly (ABRAMS 1994, p. 78). It is therefore perfectly possible that a family living in an improved structure had been rich in the past, but had become impoverished after a few generations. This is why it is very important to take further construction phases into account when evaluating the wealth of a family based on architectural remains (VAN DEN NOTELAER 2013, p. 13-14). While their elaborateness evidently was important in the display of social status and wealth, the improved structures also had purely practical advantages such as better fire

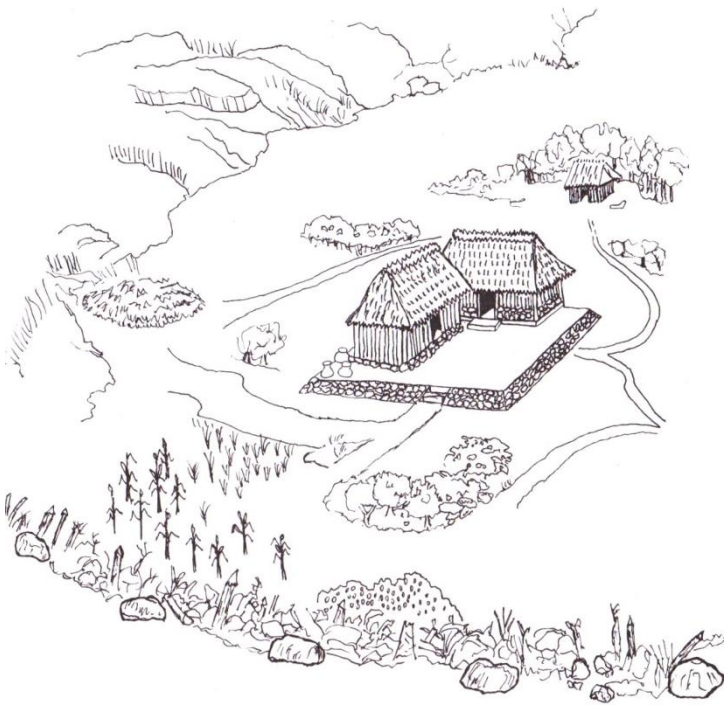

Fig. 2: Artist reconstruction of basic residential structures, based on archaeological data

resistance, better thermal regulation and less heating costs, less problems with flooding and more beneficial conditions concerning health and hygiene (ABRAMS 1994, p. 32-36).

Apart from residential structures, there are also ritual structures to be found at Chan Cahal.[5] Ritual structures consist of several subcategories, including temples, shrines, platforms for dances and rituals, etc. The distinction between residential and ritual structures is sometimes vague though, as is apparent in Chan Cahal's structure U5, which is a combination of one of the most elaborate residential structures to be found in this compound and a massive platform where ritual performances were held. This is not all too surprising since the political, economic and religious realms were closely intertwined for the Maya (e.g. SCHELE & MILLER 1986; SCHELE & Freidel 1990).

The least understood category is that of ancillary structures. This is in no small part because these ancillary structures greatly resemble basic residential structures, except being slightly smaller (e.g. WEBSTER & GONLIN 1988, p. 178). This makes it very difficult to see the difference between small residential structures and large ancillary structures, hence making it likely that many of them are being regarded as basic residential structures. Ancillary structures could have had various functions. Some of them functioned as storage sheds where crops, material or trading goods could be stored. Others were huts which were used in food preparation activities such as attested at Joya de Cerén – the "Maya Pompeii" - where the layers of volcanic ash helped to preserve perishable materials which gave us a better idea of the activities performed in these structures (HOUSTON & INOMATA 2009, p. 228; SCHAEFER s.d., p. 10-13). Until this day, some traditional communities still contain such food preparation huts adjacent to the residential units.

Agriculture

Blue Creek displays a wide array of agricultural techniques such as upland dry farming, lowland ditched fields, terraces and check dams, specialized niches such as rejolladas, and kitchen gardens (GUDERJAN 2005a, p. 8-17; 2007, p. 92-99). The ditched field complex north of the compound is the one that is most typical for Chan Cahal. This does not mean that

[5] Often, residential structures contain ritual deposits as well. The distinction residential/ritual is based on the structure's supposed primary function.

ditched field farming was the only agricultural strategy employed in this compound though. In the residential area, many of the houses were surrounded by house gardens worked by the residents for means of self-sufficiency. In 2000, Lichtenstein (p. 52-53) also reported a linear stone alignment on the base of the escarpment, which he hypothesized to be possible remnants of an agricultural terracing system. Closer examination has shown that these were actually of a modern nature (T. H. Guderjan, personal communication 2014). However, it is not impossible that these slopes were occasionally used for non-commercial agriculture.

Not only is the ditched field complex the most characteristic agricultural modification at Chan Cahal, it is also by far the largest, possibly measuring up to 6 km² (CLAYTON 2013, p. 173). Due to modern disturbances, it is hard to identify the exact boundaries of Chan Cahal's ditched field complex. Consequently, it is likely that it was significantly larger than today. Pollen analysis indicates that a variety of plants were being grown here, both food and non-food crops. (BEACH *et al*. 2013, p. 58-60). One of the most pertinent questions about Chan Cahal's ditched field complex is who had the authority over these fields (GUDERJAN *et al*. 2003b, p. 91). While this thesis will not formulate a definite solution to this question, it will put forth some hypotheses about this issue.

Though the ditches appear to have been created during the Late Classic period, these soils were already being exploited as farmlands much earlier. For now, it suffices to say that the ditched field system was being constructed to drain the fields from excess water.[6] During the Terminal Classic, the ditches began to fill with sediment, which illustrates disuse from this period on (LUZZADDER-BEACH *et al*. 2012, p. 3649).

[6] Until halfway the 1980's, modern farmers used these lands for growing corn. Because of frequent crop loss due to inundation, they are currently used as cattle pastures. Not unlike centuries ago, these lands need to be drained, although nowadays, a mechanical draining system is being used (BAKER 2003, 210-211; GUDERJAN 2007, p. 94; LUZZADDER-BEACH & BEACH 2009, p. 15).

Goals and Research Methods

As implied by the title of this thesis, our main topic will be to study the socio-economic dynamics in Chan Cahal. This will be done by placing the discernable differentiation in a temporal framework. Since it is vital to investigate how the stratification of individual contexts relates to the whole of Chan Cahal, we will also engage in calculating population estimates.

Socio-economic Differentiation

Throughout its entire history, the economic activity of Chan Cahal was directed at producing agricultural goods on the fields surrounding the compound (GUDERJAN 2007, p. 60-64). The surpluses produced by Chan Cahal and other compounds were an important factor in the economy of Blue Creek, which profited from its riparian location near the Río Hondo to function as an important node in the trade between the Belizean coastal region and the mainland lowland area (GUDERJAN 2005a, p. 7-19; 2007, p. 102-105; 2012, p. 162-163). Massive amounts of agricultural goods were exported via these trade routes. Together with cities such as Lamanai, the role of Blue Creek as an interregional passageway between riverine and overland trade gave it an important economic and political power (CULBERT 1977, p. 520; GUDERJAN 2005a, p. 17-19; PHILLIPS & RATHJE 1977, p. 103-111). This supposedly also gave an easy rise to social differentiation and economic specialization (PHILIPS & RATHJE 1977, p. 111; see also TILLEY 1981, p. 133-135). While every compound had its own type of specific differentiation and specialization, there are – mostly more subtle – differences to be found within each individual compound as well (VAN DEN NOTELAER 2013). Consequently, the goal of this thesis will be to examine socio-economic variations within the compound of Chan Cahal, which will help in gaining more insight into Blue Creek's organization as a whole as well. Since these subtle variations can only be discerned by looking very closely to the archaeological contexts, this thesis will examine each individual household – which can be seen as the basic socio-economic entity (FEDICK 1989, p. 221-222; HENDON 2004, p. 273-275; INOMATA & STIVER 1998, p. 431; JOHNSTON & GONLIN 1998, p. 155-171; LEMONNIER 2012, p. 181; MCANANY 1995, p. 111-123; SHEETS & SIMMONS 2002, p. 178) – represented by single structures, before making statements about Chan Cahal's organization on a broader level. A

special emphasis will be directed towards the dynamics exhibited by Chan Cahal. Firstly, all the changes in the archaeological data will be discerned, after which it will be attempted to explain the "why" behind these changes.

TIME PERIOD	CALENDAR YEARS, APPROXIMATE	BLUE CREEK CERAMIC COMPLEXES	REGIONAL CERAMIC SPHERE
Terminal Classic	AD 850 – 1000	Booth's River	Tepeu 3
Late Classic II	AD 750 – 830/850	Dos Bocas	Tepeu 2
Late Classic I	AD 600 – 750	Aguas Turbias	Tepeu 1
Early Classic	AD 250 – 600	Rio Hondo	Tzakol (1, 2, 3)
Terminal Late Preclassic	AD 100/150 – 250	Linda Vista	Floral Park
Late Preclassic	350 BC – AD 100/150	Tres Leguas	Chicanel
Middle Preclassic	650 BC – 350 BC	Crystal Creek	Mamom
Early Middle Preclassic	1000/800 BC – 650 BC	Cool Shade	Swasey/ Bladen

Fig. 3: Blue Creek's ceramic chronology

This thesis will try to meet this goal by combining as many strands of evidence as possible. Not only traditional artefacts such as ceramics, lithics or architectural remains should be used in this approach, but just as much attention should be given to for example the ditched field complex and geographical location. These will predominantly be approached on a functional, rather than a phenomenological base. While it will prove to be an important, but difficult, issue to consider the specific connotation of certain artefacts and artefact types in a given era, no single feature can be labelled as irrelevant when studying socio-economics from an archaeological perspective. Consequently, an exhaustive overview of all excavated contexts of the compound will be indispensable. These data will be presented in a chronological order to provide a framework which acknowledges the entanglement of all factors, whether dynamic or stable, in a given time period. Kosakowsky and Lohse's (2003) ceramic chronology remains the most important tool for investigating chronology in the Northwestern Belizean area and will consequently provide this thesis with a chronological framework (Fig. 3). Each chapter will cover one time period.[7] In any given time period, we will generally work our way from North to South, after which Chan Cahal's western section will be discussed. In other words, the U-structures will be treated first, followed by the L-

[7] The Late Preclassic and Terminal Late Preclassic period will be handled as one though, because at Chan Cahal, it is hard to differentiate these two periods from one another.

structures, to finish with the K-structures (see p. 111: plate 2). The end of these chapters will consist of a discussion in which the entanglement between the contexts and how they relate to situations outside Chan Cahal are treated.

Though Chan Cahal, considering its agrarian nature, could relatively easily access prestigious goods, no sufficient explanation for this unusual display of opulence has been formulated yet. We cannot evaluate the significance of this display of prestigious goods without investigating the mechanisms that led to these goods being available to many of Chan Cahal's denizens. Therefore, a hypothesis explaining why conspicuous goods were used in specific contexts will also be postulated.

Of course the Chan Cahal compound is not an isolated island, and consequently, it should not be studied as one. Without paying sufficient attention on how it related to other compounds of the Blue Creek polity, we can never get an accurate image of what happened in this compound and why. Some socio-economic changes for instance, can only be apprehended by looking at how the Central Precinct's political role shifted from independent to submissive. While it would not be a good idea to move away too far too often from the studied area, comparisons with other places will greatly aid in the study of Chan Cahal. Especially in its earliest history, few features left archaeological traces, so that it will be beneficial to draw parallels with similar contemporaneous contexts that yielded better insights in the respective community.

Demographic Estimates

One of the issues handled in this thesis is population growth and decline over time. A first step to deal with this is trying to make a population estimate per period. This will be attempted for the entire occupation history of Chan Cahal, with exception of the Early Middle and Middle Preclassic and the Postclassic.[8] Unfortunately there is no extensive study

[8] Because of the lack of Middle Preclassic structures that passed the test of time, the only reasonable guess we can make about it is that it is unlikely that it was not the smallest occupation period of Chan Cahal. The reason not to incorporate the Postclassic is that no extensive occupation occurred in that period: the material we have from this period can probably be connected to a re-occupation of a few persons of which there is only scarce evidence. There is thus no continuity in the transition from Terminal Classic to Postclassic nor is there any way to make a reasonable estimation of how long or numerous this reoccupation was.

on the demography of Blue Creek, so that the estimates obtained here cannot be compared to the demographic estimates of Blue Creek as a whole. Two population estimates have been calculated for Blue Creek's demographical heyday, the Late Classic period. These two available estimates are not in accordance with each other, with Driver (2008, p. 166) having calculated a population of maximum 4500 persons and Guderjan (2007, p.92) one of 12500 persons. Driver (2008, p. 166-167) continues to take percentages of his Late Classic estimate to calculate earlier population numbers. This method might be overly simplistic to make demographic inquiries. Overall, his estimates appear very low in comparison with the estimates calculated in this thesis.

Although alternative methods for making population estimates, such as calculating how big a population the water-reservoirs could support (McAnany 1990; Morley & Brainerd 1956, p. 264-265), have been tried. The most recommendable for this research – which is also the most generally used – involves counting the inhabited structures (e.g. Ashmore 1990, p. 68-69; Chase 1990a, p. 154-156; 1990b, p. 200; Culbert *et al*. 1990, p. 104; Driver 2008, p. 166-167; Lemonnier 2012, p. 185; McKillop 2004, p. 167; Morley & Brainerd 1965, p. 262; Webster & Freter 1990, p. 44-45). There are quite a few caveats to this method though. According to Rice and Culbert (1990, p. 14-18) the most important difficulties comprise: non-platform and hidden structures, nonresidential structures, the contemporaneity issue, disuse, and finally family size. We will start with handling such problematic matters and how we can try to overcome them, after which we will combine them in order to compose a mathematical formula which allows us to make a reasoned estimate.

Because Maya cities are located in very variable environs, the estimation of the amount of nonplatform and hidden structures varies greatly. For example while Diane Chase (1990, p. 201) states that at Santa Rita Corozal, the original house count may have to be doubled to get a more correct view on the number of structures once present, Culbert et al. (1990, p. 114) would add only 10% for the estimation at Tikal. The non-platform and hidden structure problem might be considered quite negligible in the Chan Cahal compound. Because of the geographical and climatological location of the compound, non-platform residential structures would risk annual inundation and are thus not considered to have been plentiful here once the technology to make substructures had reached Chan Cahal. Hidden structures would likewise not be a major problem in the Chan Cahal case since, apart

from the fact that the area has been subject to excavations over a long period of time, its location in what now are agricultural fields – in contrast to many sites that are located in the dense jungle – makes it less likely that many structures remain unseen. The percentage incorporated to tackle these two problems in this study is thus quite low compared to most other demographic calculating formulas: we shall add 20% to our original house count. An exception will be made for the Preclassic period where the amount of non-platform structures is deemed higher: roughly following Arlen Chase's (1990a, p. 153) estimate of 37.4%, we will add 33% for the Late Preclassic.

Non-residential structures also remain an important issue. In Chan Cahal, the majority of non-residential constructions are likely to have functioned as outhouses, but some of the larger non-residential structures are known to have had a religious function. There are some scholars who have tackled this issue, but many fail to emphasize the difference between several kinds of compounds. The situation regarding the number of non-residential structures in agrarian communities, for example, is likely to have been very different from elite based compounds or city centers. In Chan Cahal's case we know that certain buildings were not of a residential nature: for example the Imcolel-group, which functioned as a community shrine, or several smaller mounds serving as a base for ancillary structures. This gives us a basic idea of which structures were residential and which were not. Therefore, instead of estimating a percentage of nonresidential structures, it is more interesting to look at each structure individually and judge whether it is likely that it functioned as a residential structure or not. In the form with calculations found at the end of this paper, every structure will be listed together with its designated function.

An important topic in every archaeological inquiry is trying to get as accurate a date as possible. At Chan Cahal, this has been done mainly by use of ceramics found in relation to its structures, but sometimes the artefacts are difficult to interpret. For instance, some constructions or occupations could be securely dated to the Early Classic, while for some, we can only say that they must have been occupied somewhere in the Classic period without further specifications. This of course greatly jeopardizes our accuracy in estimating population numbers. Furthermore, especially since some ceramic complexes tend to cover a long period, two structures linked to for instance the Río Hondo ceramic complex which lasts for approximately 350 years, do not necessarily have to have been occupied simultaneously.

This problem, dubbed the contemporaneity issue, might be one of the biggest challenges archaeologists studying demography are faced with (McKillop 2004, p. 163; Rice & Culbert 1990, p. 15-17). The fact that this is a major problem can be illustrated by the fact that different researchers have quite differing ideas considering the percentage of houses that were occupied simultaneously, varying between 25% and 93% (Rice & Culbert 1990, p. 16). In Chan Cahal, and the majority of other compounds at Blue Creek, residences are occupied for a very long time (Cf. Infra). A structure built in the Early Classic, occupied throughout the Late Classic, and finally abandoned in the Terminal Classic, for instance, would certainly not be an exception. We can thus consider the percentage of structures occupied simultaneous to be quite high.

Closely affiliated with the contemporaneity issue is the problem of disuse. The difference between these two is that while the former concerns long-term abandonment, the latter is about short-term abandonment, a maximum of 10 years (Culbert *et al*. 1990, p. 109). Webster and Freter (1990, p. 47) state that the disuse number could be around 10%, but that, just like the contemporaneity, it is hard to make estimations based solely on archaeological data, which mostly do not suffice to get a grasp on such small periods. An opposing view holds that, due to the fact that population in most centers was mostly growing instead of declining during the majority of their existence, no structure would be left unused and that disuse of residences would be insignificant (Culbert *et al*. 1990, p. 109).[9] Combining the contemporaneity - which is deemed quite high for Chan Cahal - and the disuse problems, a percentage of 10 will be subtracted.

In order to make a decent estimation, it is vital to have a good idea of how many people were housed in one residence. Though there are of course exceptions and objectors, there is a broad consensus - partly based on ethnographic correlations - that the average family size per residence was between 4.9 and 5.6 individuals (Ashmore 1990, p. 68; Guderjan 2007,

[9] Two important periods in Maya history, however, are in fact associated with major decline in population. Both the transition from Preclassic to Classic and Classic to Postclassic are linked to abrupt region wide demographic diminution and settlement abandonment. The presumed depopulation in during the transition from Preclassic to Classic, however, is to some degree explainable by inadequate comprehension of the Early Classic ceramics (Awe & Helmke 2005; L. J. Kosakowsky, personal communication, 2014). At Blue Creek, no such developments are discernible during the Preclassic to Classic transition. Blue Creek's only time when such evolutions are apparent is during the Terminal Classic, when the polity underwent a drastic depopulation which eventually led to its abandonment.

p. 92; HAVILAND 1972, p. 136-138; MCKILLOP 2004, p. 164; RICE & CULBERT 1990, p. 17-18). This thesis will use an estimated average of 5.5 persons per residence in the demographic calculation.

Finally, only about 55% of the structures of Chan Cahal were subjected to excavations. In order to have a better understanding of the compound as a whole, we will multiply the last number with 1.8. This number will be rounded up to get our final population estimate.

Our formula to estimate population for Chan Cahal will therefore be:

Late Preclassic period:

#population count = 5,5*[1,8*x + 0,33*(1,8*x) – 0,10*(1,8*x + 0,33*(1,8*x))]

Classic period:

#population count = 5,5*[1,8*x + 0,20*(1,8*x) – 0,10*(1,8*x + 0,20*(1,8*x))]

Whereby x = # counted residential structures in the current era

There are two important statements to make about this population estimate formula, but they adhere to other similar formulae as well. Firstly, such calculations are – or should be – designed for specific situations. One should be very cautious in applying them to contexts for which they are not designed. It would not be considered a good idea to blindly apply this formula to other sites or even other compounds in the Blue Creek polity. Secondly, as we have seen, due to the nature of Maya settlements and demographics in general, there are many problematic factors to be incorporated in our formula. This means that our population estimate is one where the emphasis lies on estimate. The main use for our estimations is to make population growth and decline more tangible and should thus not be considered as fixed truths.

Blue Creek

While the focus of this thesis lies on the Chan Cahal compound, it is important not to lose sight on the city of which it was part. Many other compounds were present at Blue Creek, all with their own specific characteristics (Fig. 4). The interrelationships between compounds and reciprocal relationships between the agents in those compounds are what effectuated a situation to be stable or dynamic. Only a small portion of those relationships are deducible in archaeological contexts though. Many everyday contacts between agents do not leave any archaeological trace. While therefore these will not be examined in this research, it is important to keep in mind that such casual everyday contacts constituted much of social life (e.g. GONZÁLEZ 2013, p. 152; KOHLER 2012, p. 108; LEMONNIER 2012, p. 193; OLIVER 2009, p. 43-44).

Therefore, the following pages will provide an outline of the most important components of the Blue Creek polity. Firstly, a quick overview of its geographical location will be given, after which we will focus on the most important aspects of its individual compounds in order to provide a better insight of the whole of which Chan Cahal was a part.

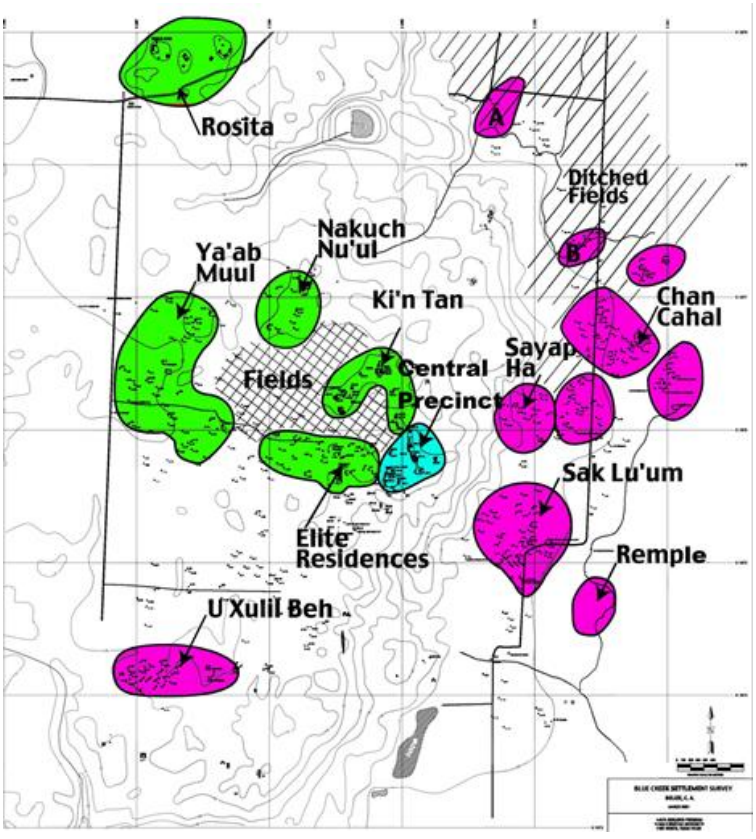

Fig. 4: Different compounds of Blue Creek (Note that Chan Cahal and Sayap Ha are drawn as two distinct compounds)

Geography

Blue Creek is located around the Bravo escarpment, which defines the verge between the Eastern Petén karst plateau and the Belizean Coastal Plains (Fig. 5 & 6). This escarpment consists of hard limestone and dolomite and has a very steep slope (LENE 1997, p. 14). The soils of the floodplain, however, have a much softer composition, as they are formed predominantly of clay, silts and sands (LENE 1997, p. 16). These soils possess extremely high fertility and productivity rates, both now and in the past (GUDERJAN 2007, p. 62-64; LENE 1997, p. 17). While some of Blue Creek's compounds were located on top of this escarpment, others – including Chan Cahal – are to be found at its base. The difference in elevation also represents social status as in general the compounds on top of the Bravo escarpment housed the upper classes, while the compounds consisting mostly of commoners are situated below the escarpment (VAN DEN NOTELAER 2013, p. 84-85).

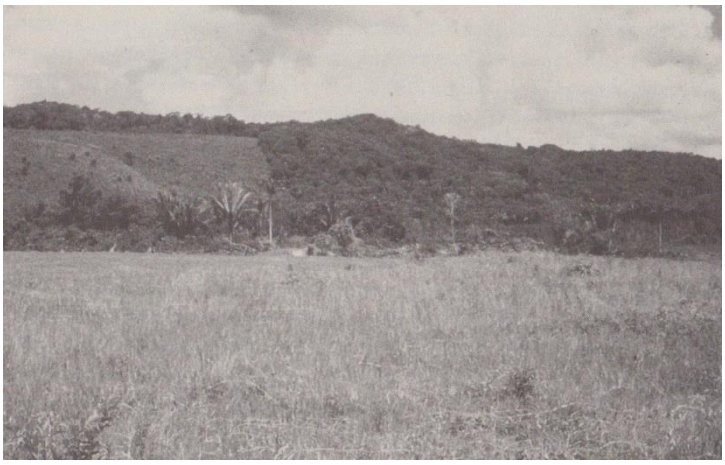

Fig. 5: The Bravo escarpment looking from the east

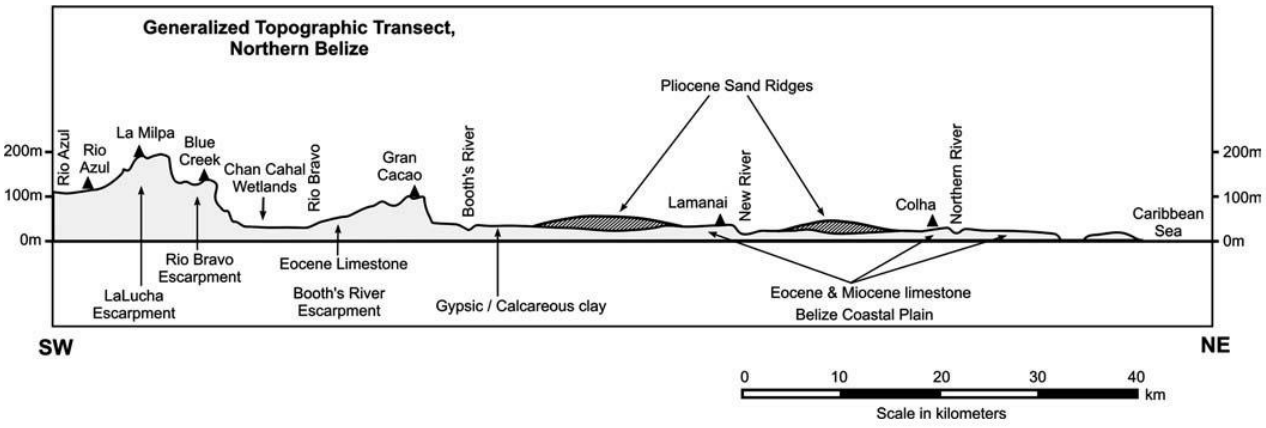

Fig. 6: Topographic transect of Northwestern Belize

Blue Creek is situated at the northeastern frontier of the Three Rivers region, an area that is defined by the Booth's river, Río Bravo and Río Azul, which contains some large sites,

including La Milpa and Ixno 'Ha, as well as several smaller centers.[10] Its location where the Río Bravo and the Río Azul merge together to form the Río Hondo, forms an important node between the coastal and the inland area. It could greatly benefit from various other water recourses and possibilities of water management in its neighborhood since there are several springs, cenotes and natural depressions, which could serve as water reservoirs in its territory. Climatologically, this area belongs to the tropical wet climate, which contains a wet and a dry season and has an overall warm temperature with relatively small temperature changes (PEEL *et al*. 2007, p. 1639-1640).

Central Precinct

The Central Precinct was comprised of two plazas, plaza A and B, and served as the political and religious center of the city. Both plaza A and B have been almost entirely excavated, giving us good insights of the situation at this center. Though only one context attests to it, there is evidence of activity in the site core from the Early Middle Preclassic period on (DRIVER 2008, p. 269). The earliest evidence of permanent constructions, which almost from its very start included monumental architecture, dates to the Late Preclassic era (GUDERJAN *et al*. 2003b, p. 83). Though they are both part of the same precinct, plaza A and B differ greatly in function. While plaza A served as a ceremonial center with several temples, pyramids and a ballcourt, plaza B – though it also had many ritual structures – served as the home of Blue Creek's ruling elite, comprising two courtyards. Although during the earliest years it was thought that Blue Creek was a satellite of another city, later research clearly demonstrated that the elites at this site core could operate independently (GUDERJAN 2007, p. 126-128; GUDERJAN *et al*. 2003a, p. 15-16; see also FOIAS 2013, p. 134-138; HAMMOND 2009b, p. 530). As the religious and political authority, these people had access to prestigious and exotic goods and actively used them to express their position. Having close connections to this site core would be one of the main instigators for prestige to many of the elite lineages at the other compounds. Once these connections were institutionalized, it became a system of inclusion- and exclusion in which justification of elite membership was created by these connections to

[10] The Río Azul flows through Guatemala, Mexico and Belize. While in Guatemala and Mexico, this river is named Río Azul, the Belizeans call it Blue Creek. For sake of clarity, this thesis will use Río Azul to refer to the river, while Blue Creek will be used when referring to the archaeological site.

the royal elites, and conversely, in which the ruling elite's position was being supported by the lower elites (GUDERJAN 2007, p. 69-70; 2009a, p. 5-7; see also CLARKE 1968, p. 46-49).

Things at the site core changed drastically around AD 500, when Blue Creek was conquered by another polity.[11] The residential structures at plaza B continued to be inhabited though, although it is unsure whether its inhabitants belonged to the family that previously ruled the polity, or whether these courtyards were taken over by another lineage. Though display of wealth and conspicuous consumption appear to have continued after these events, there are subtle signs illustrating that the loss of power also implied loss of wealth for the inhabitants of both courtyards (VAN DEN NOTELAER 2013, p. 66-67). There is a debate whether the "Special deposit 1" found at structure 3 represents a termination deposit or refuse material (GUDERJAN 2004b, p. 5; CLAYTON *et al*. 2005, p. 121-128).[12] Either way, this Terminal Classic deposit is one of the last actions uncovered at Blue Creek's site core before being abandoned.

Kín Tan

The Kín Tan compound – sometimes also referred to as the Western Group -, located northwest from the central precinct, was home to some of the most affluent non-royal families of Blue Creek. Though its earliest architectural remains date to the Early Classic, earlier depositions illustrate that there had been earlier occupation (GUDERJAN 2009b, p. 122-125). Kín Tan was located adjacent to very fertile upland bajitos which, combined with close bonds with the ruling elites provided a stable and elaborate social position to its residents (GUDERJAN 2007, p. 54-55 & 73-81; 2009b, p. 122; GUDERJAN & HANRATTY 2006). Many elaborate ritual deposits, internments and investments in architectural renovations combined with the overall ubiquity of prestigious goods illustrate the high socio-economic

[11] This subjugation to another polity has been attested in the form of symbolic architectural changes in the central precinct's courtyards, the disuse of certain political-ceremonial structures and the ballcourt and one massive caching event (GUDERJAN 2007, p. 126-128; GUDERJAN *et al*. 2003a, p. 15-16). Due to the lack of epigraphic data, however, it cannot be asserted exactly which polity conquered Blue Creek, nor can we be sure if the subjugation was caused by war, political alliances between the non-ruling elite and another polity, or by any other means.

[12] The exact function of structure 3 is also not agreed upon. While Guderjan (2004b, p. 238-239; 2007, p. 27-28) considers structure 2 and 3 to compose a pseudo-E group – a variant on the E group observatories -, others (CLAYTON *et al*. 2005, p. 121-122;DRIVER 2008, p. 205-207 & 210-211; DRIVER & KOSAKOWSKY 2013, p. 84) see the composition as eastern shrine structures as found at for instance Tikal.

status of the people living in this compound (GUDERJAN & HANRATTY 2006). After the decline in power of the Central Precinct, this status became even higher (GUDERJAN *et al*. 2003a, p. 28; GUDERJAN 2007, p. 74; VAN DEN NOTELAER 2013, p. 70-71). At the end of the Terminal Classic, two large termination rituals marking the end of occupation were held, one at the structure 46 courtyard (HANRATTY 2008, p. 35-38), and another at the structure 37 plazuela (HANRATTY & DRIVER 1997, p. 56-57), perhaps not coincidentally the most elaborate structures at Kín Tan (GUDERJAN & HANRATTY 2007, p. 160-161).[13]

Nukuuch Muul

Forty structures clustered around a hilltop make up the Nukuch Muul compound. In contrast to the Central Precinct and Kín Tan, this compound housed a wider range of social strata. Upon the central hill a plazuela, the structure 2C-6 group, which appears to have been the home to Nukuuch Muul's most affluent members, is situated. This plazuela group appears to have been initiated in the Early Classic, which coincides with the other oldest finds in this compound (DRIVER 2004, p. 57-60; LICHTENSTEIN 1999, p. 67; 2000, p. 34). Not only did the plazuela group's lineage exhibit the typical signs of the Maya upper class, its location provided it with the compound's sole water management system, lithic crops and an overview of much of the surrounding lands (LICHTENSTEIN 2000, p. 33-34). While during the Terminal Classic much of Blue Creek's population was already declining, the people of the 2C-6 plazuela group seem to have profited from the created power vacuum to draw more power and wealth to them (VAN DEN NOTELAER 2013, p. 72).

The other, and more humble, residences of Nukuuch Muul have not been subjected to such intensive excavations. Test-pit excavations have been performed on some of them, and give us an idea of the chronology of this compound. Following these test-pit excavations, it appears that the first constructions were built in the Early Classic, and that Nukuuch Muul continued to thrive with new constructions taking place even late in the Terminal Classic (LICHTENSTEIN 1999, p. 67; 2000, p. 34-35). All to no avail, this compound never saw the dawn of the Postclassic period.

[13] A similar deposit had been found adjacent to Kín Tan's structure 60, but it is unclear whether it represents a third termination deposit or that it is a concentration of refuse material (CURRID 2002, p. 97-98).

Ya'ab Muul

The Ya'ab Muul compound can be counted among Blue Creek's least intensively studied compounds. Furthermore, much of it has been damaged by bulldozing activities. These two issues make that many details about this compound remain obscure. Constructions at Ya'ab Muul are clustered in five groups, labelled group A – E, of which only group B has been subjected to excavations and group C has seen test pitting. Group B consists of 11 structures of varying elaboration, comprising several patio groups that appear to have been the homes of lower elites such as encountered at Nukuuch Muul. Both utilitarian objects such as mano's and metates and prestigious goods like jade pendants were present at the structures of Ya'ab Muul's group B (LICHTENSTEIN 1999, p. 38-42). Due to the problems mentioned above and the lack of diagnostics, no comprehensive chronology could be established. However, there is sufficient data to confirm occupation during the Early and Late Classic period, though occupation at this group may have been initiated earlier and lasted longer (Lichtenstein 1999, p. 40-41). Group C is different from group B. This group contains five platform structures, which were most likely field houses serving as storage sheds (LICHTENSTEIN 1999, p. 43). Similar to group B, there were few diagnostics, but both Early and Late Classic activity could be attested (LICHTENSTEIN 2000, p. 43-44).

U Xulil Beh

Situated about 2 km northwest of the Central Precinct, U Xulil Beh can be seen as a misfit in Blue Creek. Opposed to the pattern exhibited by the other compounds, this is the only non-elite based compound to be located on top of the Bravo escarpment. Moreover, it was only initiated during the Early Classic era, when other compounds at the polity were already manifested for a few centuries. It appears likely that the founders of this compound were immigrating farmers, who left their earlier homes in search for a better life (VAN DEN NOTELAER 2013, p. 75). While their relocation might have provided them with better socio-political conditions, it is unlikely that they gained much economic gain. The terraces constructed on U Xulil Beh's hill slopes illustrate the agricultural nature of the compound and the desire to optimize harvests (GUDERJAN 2007, p. 89; KROLL 2009, p. 46). However, the very arid conditions of the soils would have made them unfruitful. Nonetheless, the absence of grass

phytoliths suggests that a considerable amount of energy was invested in managing and maintaining these fields (BOZARTH 2009, p. 147). All tested structures proved to be humble, single phased housemounds without any form of elaboration in their archaeological assemblage (LICHTENSTEIN 2000, p. 45; KROLL 2009, p. 45-46). While all appear to have been the homes of impoverished farmers, one lineage might have had a slightly more profitable socio-economic position (VAN DEN NOTELAER 2013, p. 75). Nonetheless, there is no material evidence that the people of this lineage were actually enriched or had access to more prestigious goods.

Chum-Balaam-Nal

Excavations at this compound are still ongoing, so our observations about Chum-Balaam-Nal are still preliminary. The most important and well-investigated feature of this compound is a large courtyard consisting of five structures with some related ancillary structures, which appears to have been initiated at the very ending of the Preclassic era (PRESTON 2011, p. 16-17; PRESTON & MASTROPIETRO 2010, p. 31-34). At this point in time, only two of its structures were erected, but from the Early Classic period on, continuous construction episodes were carried out on this architectural composition, greatly expanding it in both size and splendour (PRESTON 2011, p.16-21; PRESTON & MASTROPIETRO 2010, p. 31-35). Not only its architectural aspects, but other archaeological finds - including several burials and high-status goods - attest to an elaborate status, which is reminiscent of the situation encountered at Kín Tan. This resemblance is even reflected in the abandonment pattern, as two grand termination deposits with Terminal Classic material mark the end of this courtyard (PRESTON 2011, p. 14-15 & 20; PRESTON & MASTROPIETRO 2010, p. 39).

Río Hondo

The Río Hondo compound – not to be confused with the Río Hondo river, from which its name was derived – was the place with the shortest occupation period in Blue Creek. The first people moved into this area at roughly the same time that Blue Creek lost its independence, and they appear to have left this area very quickly, possibly only after two or

three generations. All structures proved to be very humble house mounds, though items such as jade and a greenstone hacha illustrate some kind of wealth (CLAYTON 2003, p. 95; 2013, p. 180). Only seven structures were encountered here, but it is important to know that this compound was located on the banks of the Río Hondo river, which in this place also is the boundary between Belize and Mexico, and thus also the border of the Maya Research Program's permit area, so that it possible that some structures are to be found on the other side of the river. The river had greatly damaged the remains of these peoples' residences as well, which might have been the reason that they decided this was not a suitable place for their homes. Economically, the inhabitants of Río Hondo engaged in lithic crafting, and even appear to have used material from the crops near Chan Cahal (CLAYTON 2003, p. 32; 2013, p. 185-186).

Rosita

Arranged around a few hilltops lies the Rosita compound, which is comprised of over 20 structures organized in five clusters. Rosita was the compound closest to the Blue Creek dam and dock complex, and consequently could exert control over and profit greatly from this riverine trait. Furthermore, the presence of a fertile bajito near the compound and the geographical distance from the site core meant that it had a strong and relatively independent character GUDERJAN 2007, p. 56-57; GUDERJAN *et al*. 2003b, p. 90; VAN DEN NOTELAER 2013, p. 78-79). The political and economic power that came with this, translated into wealth, meant that many of the residences were quite elaborate and yielded many prestigious goods. Some of these residential structures exhibited evidence of ritual activity that clearly transcended the basic household rituals (PRESTON 2007, p. 25 & 42-44; REYES 2009, p. 36). Its independent nature and control over the trade network meant that, in contrast to the rest of Blue Creek, it continued to thrive during the Terminal Classic, with the construction of a round Yucatecan-style shrine as the most illustrative example of its wealth and interregional contacts (GUDERJAN & HANRATTY 2007, p. 161; PRESTON 2007, p. 37-38; see also CHASE & CHASE 1982, p. 601-603; HARRISON-BUCK 2010, p. 91). Nonetheless, at the end of the Terminal Classic, occupation at the Rosita compound also ended.

Sak Luum

The Blue Creek compound which undoubtedly resembles the situation at Chan Cahal the most was Sak Luum. This compound was located just 0.6 km south from Chan Cahal and was also situated at the base of the Bravo escarpment. Like Chan Cahal, it was comprised of simple housemounds, possibly with a few elite residences, though surveys have not reported the presence of monumental architecture. It lacks one of the typical characteristics of Chan Cahal though, as no remnants of agricultural fields were found here. Nonetheless, it can be surmised that the majority of Sak Luum's population were also farmers, some of them perhaps even employed on the fields surrounding Chan Cahal (LICHTENSTEIN 2000, p. 60; VAN DEN NOTELAER 2013, p. 83). Only two housemounds have been excavated, one with a Late Preclassic and one with an Early Classic construction date, but they delivered very few other data (LICHTENSTEIN 1999, p. 69).

Early Middle Preclassic

The first evidence of activity in the Chan Cahal area stems from the Early Middle Preclassic Cool Shade ceramic complex, which together with the site core, makes it the area with the earliest proof of occupation in Blue Creek (GUDERJAN 2007, p. 12 & 60). We must be hesitant however, in directly assigning this compound the "first-occupation" label. Post-holes uncovered underneath a structure in Kín Tan which were only preserved because of the construction of a later building on top of them, for instance, show us that many of the earliest structures of Blue Creek consisted solely of non-durable materials and have thus completely perished (CURRID 2002, p. 96). It appears that Blue Creek started as a small settlement in which a group of people inhabited this area, and that only later a formal central agglomeration was created (see also HODDER & ORTON 1976, p. 85-87). One could reasonably argue that it is unlikely that the first people moving into this area would have chosen a location at the base of the escarpment instead of on top of it, because the latter would not only offer better protection against flooding (which attracts insects as well), but also an overview on much of the surrounding lands. Nonetheless, it appears that these lower lying areas were indeed preferred by immigrating Middle Preclassic farmers region-wide. Estrada-Belli (2011, p. 38-39) argues that these wetland lower lying areas were more attractable because of the easily workable soils, a theory that he bases on preceramic periods, but which might be just as applicable to Blue Creek's Early Middle Preclassic settlers. Chan Cahal would even be more attractive because the gradual differences in elevation make it a suitable location for both wetland and dryland agriculture (CLAYTON 2013, p. 173; see also DUNNING 2004, p. 99). The fact that it was located on an ecotone, a place where two different ecological zones meet – in this case the eastern Petén and the Belize coastal plain -, meant that it could profit from a broad variety of natural recourses.[14] Furthermore, the possibility of water management at this location, as apparent in the springs and aguadas, would have made it very suitable to found a new settlement (see also

[14] Because the biological complexity of ecotones, these are also intrinsically very vulnerable (SENFT 2009, p. 8-9). Intense human activity in the area could therefore seriously damage such a system, possibly leading to a diversity that is in fact much lower as in one single ecosystem (SENFT 2009, p. 8). Due to deforestation, agriculture, etc. such a process might have occurred around Blue Creek as well. However, by the time that this could have taken place, Blue Creek's economy would have focused so intensively on agriculture and trade, as opposed to hunting and foraging, that the loss of ecological diversity would not have caused a major problem.

FEDICK 1989, p.220-221, 224 & 240). At least one of these springs supplied the site with potable water (LUZZADDER-BEACH & BEACH 2008, p. 50).

Only few contexts can be securely dated to the Early Middle Preclassic period. This evidence has mainly come to us in the form of refuse deposits containing Cool Shade-ceramics. Many of these middens became buried underneath later structures. The local Cool Shade ceramic complex corresponds to the Bladen ceramic complex in the Swasey regional ceramic sphere making them good indicators of Early Middle Preclassic activity (GRAÑA-BEHRENS & GRUBE 2006, p. 438; HAMMOND 2006, p. 40; KOSAKOWSKY 1987, p. 15-23; KOSAKOWSKY & LOHSE 2003, p. 5-6; SULLIVAN & VALDEZ JR. 2004, p. 186). Other sites located in this part of the Maya area that have yielded evidence of Middle Preclassic activity generally exhibit patterns of egalitarian communities with a focus on agriculture (BEACH et al. 2013, p. 44-45; MCKILLOP 2004, p. 79). Nonetheless, there are some Early Middle Preclassic examples of Maya settlements that do show some subtle signs of stratification (BROWN 2008, p. 176-177; ESTRADA-BELLI 2011, p. 39-40 & 56-62; GARBER & AWE 2009, p. 157-158; GARBER *et al*. 2004, p. 20; MCANANY & LÓPEZ VARELA 1999, p. 154-155). In Chan Cahal the Early Middle Preclassic data are too scarce to make statements on wealth differentiation. Three pieces of jade were discovered in two middens containing Early Middle Preclassic material, but these contexts were mixed with material of later periods so that they could not be assigned to any period in particular (GUDERJAN 2004a, p. 52).

Economically, the main occupation of Chan Cahal's residents in this period would have been farming, albeit with a fair share of hunting and foraging. In later eras, farmers would work on the ditched field complexes surrounding their compound, producing products for export, while relying on their house-gardens for personal use. Because the economic system of the Early Middle Preclassic period was one of self-sufficiency, such house-gardens are probably the only agricultural complexes at Chan Cahal during this period.

Blue Creek's Early Middle Preclassic period still remains very enigmatic due to the scarcity of evidence. The population number throughout the Maya area is thought to be quite low in this period, which is affirmed by the lack of Middle Preclassic sites in the area around Blue Creek – though to some extent the small number of Middle Preclassic contexts can be attributed to disturbances in the Classic period. Similar to the majority of Early Middle

Preclassic sites, there is no evidence contradicting that the settlement had a more complex organization than a self-sufficient segmentary farmer society. The available data, however, do not suffice to give a more nuanced perspective on the level of this organization, so that any statement regarding the socio-economic nature of the settlement in this period would remain preliminary.

Middle Preclassic

Since there is not much data covering this period either, the Middle Preclassic period is only a little bit better understood than its predecessor. In fact, we see no new contexts emerging in this period, though this might say more about the sampling methods and readability of Middle Preclassic contexts than it does about the evolution of the site. For the greater Blue Creek area, there are some notable finds that help clarify our knowledge of the earliest phases of this polity though. From this period on, there is more evidence of activity in the site core. The Middle Preclassic core lacks any form of permanent architecture, but middens and other deposits illustrate that people inhabited this zone during this period (HAINES 1996, p. 98; 1997, p. 19; HAINES & WILHELMY 1999, p. 50). To date, no compound of the Blue Creek polity other than the Central Precinct and Chan Cahal proved to possess signs of Middle Preclassic occupation.

In the Middle Preclassic the first steady interregional trade networks in the Maya area appear to have been established (HAMMOND 1992, p. 139). This is apparent in the Middle Preclassic data set of Blue Creek as well. Some contexts found in the Central Precinct dating from this period contained goods such as jade and obsidian, which would have to have been imported from afar (HAINES 1996, p. 86; 1997, p. 23). Whether these were imported via the Río Hondo harbor, which would later become one of the main contributors to Blue Creek's wealth and served as a trading point between Chetumal Bay and the inland Maya lowlands, cannot be fully assured (BARRET 2002; BARRET & GUDERJAN 2006; GUDERJAN 2012). However, it should be noted that other Middle Preclassic sites in the area containing obsidian all were riverine cities as well, supposedly profiting from their geographical setting to get hold of more exotic goods, making it likely that riverine trade at Blue Creek was already happening to a certain degree in this period (HAINES 1997, p. 24). Riverine and coastal trade routes would furthermore remain vital to the obsidian trade throughout the later Maya world (DREISS & BROWN 1989, p. 59-61; HAINES 2000, p. 47-48; MCKILLOP 1996, p. 50-51).

Apart from the knowledge that can be derived concerning trade routes, the presence of these artefacts also implies that certain elements in society acquired a distinct social status and wealth. The fact that these goods were found in the Central Precinct and not in Chan Cahal seems to suggest that power and authority in Blue Creek were already being

developed from the Middle Preclassic period on. Nonetheless, these distinctions might also be accounted to differences in the amount of excavated area, excavation strategies and even sheer luck (BARRET 2004, p. 218 & 273). The further lithic assemblage does not seem to hint at some sort of differentiation, as all communities appear to have a similar access to local and regional resources (BARRET 2004, p. 217).

The desire to import goods into the polity could have had an important consequence for the economic activity of the polity. Where in the earliest years economic activity – hunting, farming, etc. – was aimed predominantly at self-sufficiency, importing goods implies the production of surpluses with a certain focus on trade. Due to Chan Cahal's focus on agriculture in later periods and because of the presence of highly productive soils, we could therefore expect an expansion and perhaps intensification of the farmlands, even though this is yet undetected in the archaeological record. A small part of the ditched field system around Chan Cahal was likely already being used in this period, albeit without the presence of the later characteristic ditches. It is likely that slash and burn was the dominating agricultural strategy, which is attested by the presence of ash layers in these fields' subsoils (BEACH *et al*. 2002, p. 367; 2009, p. 1712; 2013, p. 58-60; LUZZADDER-BEACH & BEACH 2009, p. 8).[15] Because of the high amount of chloride and phosphate in the groundwater - which is detrimental to crops like maize -, it was originally thought that other plants were cultivated here (GUDERJAN 2007, p. 94; LUZZADER-BEACH & BEACH 2008, p. 50). Later pollen analysis has demonstrated that maize was in fact grown here during the later periods (BEACH *et al*. 2013, p. 58-60). This pollen analysis did not cover the Middle Preclassic period, but the focus on self-sufficiency and maize being the main staple for the Maya, makes it not unlikely that milpa's – the Maya cornfields – were already being worked at Chan Cahal from the Middle Preclassic period on.

One could rightly ask whether the entire Chan Cahal community consisted of farmers, or that there were other types of economic specialization as well. While there is no direct evidence of other economic specialization apparent, Christopher Tilley (1981, p. 137) illustrates that people carrying out different professions do not always leave marks that would distinguish one from another. While we can safely assume that agriculture was the

[15] Slash and burn, or swidden farming knows a long tradition in the Maya area. While the use of this agricultural technique in the Maya lowlands can be traced back to 3000BC (VOORHIES 1982, p. 67, it still persists in some communities in the Yucatan peninsula today.

dominant economic activity, we cannot exclude the possibility that a minority of other types of economic specialization were apparent as well. The growth in population in the subsequent periods would raise these chances significantly, though there is no differentiation visible in the economic specialization of the commoner households from an archaeological perspective.

In contrast to our modern-day Western notion of ownership, the Maya are more likely to have thought much in terms of communal ownership (DE LANDA 1987, p. 38; see also HODDER 2012, p. 26). Whenever there was land that was not already in use, persons of Chan Cahal could probably claim those lands on the basis that they worked the soils, incorporating them into their community (HODDER 2012, p. 25). A similar system where farmers can claim soils for their community on the basis of the labor performed on them is still in place in some contemporary Maya villages, sometimes in a form where the individual could "borrow" pieces of land from the town, free of charge, for as long as they wanted to work them (SCHWARTZKOPF 2008, p. 575-576). This system of communal land claims in a region with abundant fertile soils resulted in a steady expansion of the agricultural lands surrounding Chan Cahal. Neither the pace of this expansion nor the exact boundaries of the fields in these early periods can be read in the archaeological record.

The only form of permanent architecture was structure U50, which was constructed in the Middle Preclassic period as a masonry substructure.[16] Though there are no other constructions that can be designated to this period, some later buildings - namely U6, U8, U9, U14, U17, U18, U49, U54 and U56 - did have Middle Preclassic ceramics associated with them (GIACOMETTI 2002, p. 59). It is likely that in their earliest phases, these were perishable thatch and pole residences. By the Late Preclassic, all of them had become residences built on masonry substructures. A single Middle Preclassic sherd was found underneath structure L-20, but this evidence is too meagre to state that this structure also originates in the Middle Preclassic period (GIACOMETTI 2002, p. 59). It would also have been an isolated structure, since in contrast to the other Middle Preclassic contexts, there are no other concomitant finds in its direct environs. Admittedly, this might also be explained by less intensive excavations in this area.

[16] A planview of excavations at structure U50 can be found on p. 119: plate 10.

The contexts with Middle Preclassic evidence of occupation can be grouped in two clusters: MPC-A and MPC-B.[17] Possibly, these clusters represent two extended families. Such extended families were one of the main social components of Maya – and by extension Mesoamerican (FLANNERY 2002, p. 424-425 & 429-431; ROBICHAUX 1997, p. 153-160; TAGGART 1975, p. 348-354) - social organization and consisted of a few households which had close, presumably patrilineal, family ties (DEMAREST 2004, p. 165; GILLESPIE 2000, p. 469-470; MCANANY 1995, p. 24-26). While a nucleated Maya elite family would live in a palace, courtyard or patio group, the more humble nucleated families resided in a couple of informally clustered houses (KURJACK 2003, p. 282-283). In such clusters, each individual house is likely to have been the dwelling of one nucleated family (HAVILAND 1972, p. 136).

It is important though to acknowledge some problems concerning this extended family cluster-theory in Chan Cahal. On the one hand, we only see a fraction of the actual situation because not the entire compound has been subjected to excavations. On the other hand, it could be objected that occupation at those buildings was not necessarily simultaneous since the Crystal Creek ceramic complex, which served as the main designator of Middle Preclassic activity, was in use for at least 300 years. However, since all buildings with Middle Preclassic activity were still inhabited during the subsequent eras, it can be argued that, though some of them might indeed be somewhat older than others, it is likely that by the end of the Middle Preclassic all were simultaneously occupied.

The fact that structure U50 was the only residence with non-perishable attributes might suggest a more elaborate status in this period.[18] Since only few artefacts could be securely assigned to the Middle Preclassic period, it is hard to prove whether the people living in this building indeed had a higher status by means of artefact analysis.

[17] In trying to discern clusters of structures, this thesis will use a predefined classification system. This system will use the abbreviation of the respective time period followed by C referring to cluster (e.g. MPC for Middle Preclassic cluster, LCC for Late Classic cluster …) and a letter for the concerned cluster. This letter will be kept when referring to the later situation of the cluster (e.g. LPC-B becomes ECC-B and so on) The maps of the temporal situations at Chan Cahal with indications of the clusters can be found on p. 112-116: plates 3-7.

[18] The initiation phase of this structure was originally thought to have been conducted in the Late Preclassic (POPSON & CLAGETT 1999, p. 73-76). It was by later artefact analysis that its Middle Preclassic origin was discovered (BARRET 2004, p. 273).

Geographically, MPC-B appears to have had a far less favorable location than MPC-A. The fact that its buildings were located next to the drain which separates the northern and the southern section of Chan Cahal combined with the low elevation of the ground on which they were constructed, implies regular issues of waterlogging. This might also suggest a slightly worse social position.[19] Everywhere at Blue Creek, there is a clear pattern in which the most affluent members of Blue Creek's society chose to reside on more elevated grounds whereas the more humble people lived on the lower ones. While flooding hazards were definitely one of the major reasons why those with a higher class chose to live on more elevated grounds, this also had purely psychological and strategical reasons such as using the escarpment as a boundary and having an overview over the surrounding lands (VAN DEN NOTELAER 2013, p. 62 & 71). Nonetheless, a midden related to the U9 structure did yield – apart from the usual household refuse material - a jade bead and three marine shell beads (POPSON *et al*. 1998, p. 5).

In summary, like the early part of the Middle Preclassic, the latter part is shrouded in ambiguity due to a scarcity of material remains. Nonetheless, we can say some important things about the site's earliest history. The two inhabited zones, Chan Cahal and the site core, consisted of a few perishable houses. At Chan Cahal, these houses are clustered in two groups, representing two extended families. While no class differences are discernable between those groups, one of them might have had a slightly higher social position. Though there is no hard evidence of this, it can be safely surmised that agriculture – supposedly predominantly based on self-sufficiency with a small amount of the yields orientated towards export – was the main economic activity. This situation whereby there was no monumental architecture, no major stratification and very low population density, is typical for the Middle Preclassic Three Rivers Region (ADAMS *et al*. 2004a, p. 177; SULLIVAN & VALDEZ JR. 2004, p. 186).

[19] Because of stereotypes on commoners it is often assumed that similar contexts at other sites reflect purely egalitarian society (MARCUS 2004, p. 264-270). While indeed there is no evidence of class differentiation, subtle differences should not be ignored. Michael Love (1991, p. 61) has demonstrated that at La Blanca two Middle Preclassic commoner lineages did have a slightly better social status than their neighbours. I consider a similar distinction to be reflected in the Chan Cahal data.

Late Preclassic

In the Late Preclassic, a significant population growth, which initiated important shifts in Maya life, is apparent throughout the Maya lowlands. As a possible consequence of this population boom, it appears that the onset of widespread institutionalized social stratification took place (e.g. BARLETT & MCANANY 2000, p. 104-105; HAMMOND 1986, p. 404), although there are sites such as Blackman Eddy (GARBER *et al*. 2004, p. 15-22) or Cuello (CARTWRIGHT-GERHARDT 1988, p. 90-98; HAMMOND & CARTWRIGHT-GERHARDT 1990, p. 464-469; ROBIN 1989, p. 43-47) which exhibit clear signs of differentiation prior to the Late Preclassic. Though the rise of Classic Maya civilization was once regarded as an anomalous and sudden evolution, we now know that a great deal of the characteristics of the later eras are already found in the Late Preclassic period, or at least have their roots in this period – if not in earlier periods. Many Maya lowland cities saw a widespread emergence of monumental architecture and urbanization in the Late Preclassic (e.g. ESTRADA-BELLI 2011, p. 74-78; HAMMOND 1986, p. 405 & 408; HOUSTON & INOMATA 2009, p. 86-89). The Maya hieroglyphic writing system, long regarded as one of the prime cultural achievements of the Classic period, now has many parallels in the Late Preclassic period. Although we lack inscriptions referring to individual rulers, divine kingship seems to be institutionalized from this period on. Also in Blue Creek, this meant the installment of a royal lineage (GUDERJAN 2005b, p. 131).[20] Many religious beliefs of the Maya, although never ever really homogenized, can be traced back to at least the Late Preclassic period, as demonstrated by the famous San Bartolo murals whose iconography contains Gods such as the Maize God and the Hero Twins, as well as references to ritual actions such as penis perforations or the dance of the Maize God (TAUBE *et al*. 2004).

For Blue Creek, the Late Preclassic period was one of great growth and prosperity. Most of its compounds appear to have been founded in this period. The places that were already inhabited likewise witnessed a serious population increase. For Chan Cahal, this means that both the northern and the southern portion are now being inhabited. Though we do not have an estimation for the previous era to compare with, the Late Preclassic population

[20] The absence of epigraphic evidence of these rulers can probably be explained by an emphasis on the ancestors and lineage of these rulers and impressive architectural programs, while in the Classic period, the ruler as an individual became more central (FREIDEL & SCHELE 1988; MARTIN & GRUBE 2008, p. 17; SCHELE & FREIDEL 1990, p. 103-129).

estimate of 190 persons (see p. 104) must have been a substantial increase in population number and density.

Of the southern part, only four places proved to date to the Late Preclassic period, though this low number could be explained by less extensive excavations in comparison with the northern portion. Of these four, only two can securely be designated a residential function. This means that it will not be possible to discern extended family-clusters in this part of Chan Cahal, though the possibility that there were such clusters is very likely.

Late Preclassic Cluster A

In the Late Preclassic, structure **U2** was one of the largest residential structures to be found at Chan Cahal. Apart from the Late Preclassic initiation date, excavations were unable to discern possible additional construction episodes. Nevertheless, the size of the construction alone is sufficient to derive that at the time of its initiation, U2's residents were economically thriving. Artefacts retrieved from this structure include ceramics, lithics, groundstone and obsidian (GIACOMETTI 2002, p. 124: table 5). The most salient aspect of this house was the high number of burials: no less than five internments were discovered underneath the structure's plastered floor, all of which stem from the Late Preclassic. Three of these burials appear to have been secondary internments, suggesting the remains of the deceased were at some point used in a ritual involving ancestor veneration (POPSON *et al*. 1998, p. 10; see also ASTOR-AGUILERA 2010, p. 157-160; FITZSIMMONS 2009, p. 142-169; HOUSTON *et al*. 2006, p. 71-72; NOVOTNY & KOSAKOWSKY 2009, p. 75-76). Two of these reburials had associated grave goods: one contained two jade beads, while the other contained a chert biface fragment, a mano fragment and an obsidian blade fragment. A fourth burial was uncovered, but remains elusive due to the terrible state of preservation and lack of preserved grave goods. The last grave contained the remains of an adult in a cist-type burial. This person was given a vessel and an obsidian blade as grave goods (POPSON *et al*. 1998, p. 10-11). Because all five entombments occurred during the Late Preclassic and since they contained at least one adult and one subadult, the excavators suggested that this was the internment of an entire household (POPSON *et al*. 1998, p. 10-11). While this is a tempting theory, it remains yet to be proven.

During the Late Classic period, the **U5** structure grew out to be the house of one of the most powerful people of Chan Cahal, as will be discussed later in this thesis. During the Late Preclassic, there is no evidence of such a privileged position, with only ceramic deposits indicating Late Preclassic occupation (GIACOMETTI 2001, p. 13). In this period, the structure U5 was constructed as a perishable residential construction, and only by the Early Classic, it was converted into a more impressive structure.

Though there are signs of earlier activity, non-perishable architectural constructions at structure **U6** were started during the Late Preclassic. Many further construction episodes were encountered – including at least four raisings of the plastered floor -, but for none of them a date could be ascertained, making interpretations of this construction very difficult (POPSON *et al.* 1998, p. 12). The artefact assemblage of this structure comprises only ceramics, lithics and groundstone (GIACOMETTI 2002, p. 124: table 5; POPSON *et al*. 1998, p. 12). It appears that structure U6 was not residential, but rather had an ancillary function (GIACOMETTI 2002, p. 50).

Very little is known about structure **U8** during this period. Though it appears that there was no non-perishable construction at this place prior to the Early Classic, ceramic evidence does hint at a Late Preclassic occupation (LICHTENSTEIN 2000, p. 51)

The **U49** construction, which was likely preceded by a Middle Preclassic perishable construction, was initiated as a small structure in the Late Preclassic (POPSON & CLAGETT 1999, p. 78).[21] While the size of this earliest structure led the excavators to suggest that it was initiated as an ancillary building, it was greatly expanded during the course of the Late Preclassic which, combined with the finds, suggest a residential use from at least the later phase of this period. Though these further construction phases proved hard to designate a date to, two Late Preclassic caches related to later additions to this structure suggest at least two additional building phases occurred in the Late Preclassic (POPSON & CLAGETT 1999, p. 78-82).

[21] A planview of excavations at structure U49 can be found on p. 118: plate 9.

One cache proved to contain non-utilitarian ceramics, three perforated stone disks, remains of 24 jade beads, a ceramic stamp, a bark beater[22], and an obsidian fragment (CLAGETT 1997, p. 67; POPSON & CLAGETT 1999, p. 78-82). The second likewise contained intruiging goods such as three flat round stones – sometimes referred to as "hamburger stones", jute shell and five jade bead fragments (POPSON & CLAGETT 1999, p. 82). It is also interesting to note that this was a lip-to-lip cache, a type of ritual deposit consisting of pairs of vessels where the bottom vessel is topped by an inverted vessel (Fig. 7), a ritual deposition which is found regularly in various compounds of Blue Creek (BOZARTH & GUDERJAN 2004, p. 205-207;GUDERJAN 2005b, p. 138) and throughout the area of northern Belize.

Fig. 7: Reconstruction of a lip-to-lip cache discovered at Ixno 'Ha

Furthermore, nearly hundred jade artefacts were retrieved from a Late Preclassic ceramic concentration in relation to this construction (CLAGETT 1997, p. 67; GUDERJAN 2004a, p. 20). Because the high amount of valuable goods contradicts that this concentration was waste material, combined with the observation that there is no data testifying to Early Classic occupation, this might represent a disturbed termination deposit. While such termination deposits are not uncommon in Blue Creek, it would be the earliest example of this type of religious activity in this polity. The presence of the caches, elaborate goods, and the occurrence of several construction episodes suggest that the people living here had a very comfortable economic position. However, the exhibited wealth is too meagre to really testify to a position at the top of Blue Creek's socio-political region.

[22] Since both bark beaters and ceramic stamps were instruments used in the production of paper, their occurrence in the same deposit is no coincidence. Paper-production in Maya society was predominantly carried out by the elite classes (MCANANY 1999, p. 165), though a few more humble contexts also yielded bark beaters (GONLIN 2007, p. 105). Due to the bad preservation of paper, these mostly comprise the only evidence of paper production in the Maya area.

Structure **U50** (Fig. 8) shares many of its characteristics with the adjacent structure U49. It was likewise a Late Preclassic substructure that was built on a place which saw Middle Preclassic activity and contained conspicuous goods – albeit in lesser amount – as well. After its erection in the Late Preclassic, it witnessed at least two further Late Preclassic construction phases, but modern disturbances made it impossible to discern possible further modifications with certainty (POPSON & CLAGETT 1999, p. 73-76). One midden, which was later covered by expansions to the building, contained pomacea shell and animal bone, but would have predominantly contained perished organic material. The intermediate area of this structure proved to contain a high amount of lithic and ceramic debris, pomacea shell and animal bones, which might be the result of sweeping the direct area around structure U50 clean (POPSON & CLAGETT 1999, p. 76). The high amount of lithic debris, which includes obsidian fragments, biface fragments, primary reduction flakes, and extended cores, might suggest that U50's denizens were involved in lithic tool production, either commercially or for self-sufficiency (CLAGETT 1997, p. 65; POPSON & CLAGETT 1999, p. 82). Again not unlike the structure U49, this structure did not prove to possess activity outlasting the Late Preclassic period. If the hypothesis that the concentration near structure U49 being a termination deposit holds true, it might have been a ritual in which both the people of U49 and U50 - perhaps even more families of the adjacent, but unexcavated structures - participated, which would make the high amount of jade a bit less anomalous.

Fig. 8: Structure U50 stripped to its earliest non-perishable construction phase

The **U54** residence was constructed during the Late Preclassic as a cobblestone platform supporting a perishable structure (LICHTENSTEIN 2000, p. 49). Two small and one major construction phases were executed during the same period (LICHTENSTEIN 2000, p. 49). Two middens were uncovered – one on top of the other, separated by a cobble floor – which are both notable for their abundance in pomacea flagellate shell. This fresh water snail was most likely harvested from one of the natural water reservoirs or springs adjacent to Chan Cahal and appears to have been a common addition to the diet of Chan Cahal's people.[23] Furthermore, the midden also yielded lithic material and utilitarian ceramics, including one Sierra Red spouted vessel – which might have been used in the preparation of cacao (LICHTENSTEIN 2000, p. 51; see also HURST *et al*. 2002, p. 289). The density of these pomacea shells might suggest that these remains were the refuse of ritual feasting (see also PRESTON 2007, p. 39; PYBURN 1989, p. 336; YAEGER *et al*. 2012, p. 16-20). In contrast to the decadent banquets seen on pottery, such feasts were not necessarily very expensive, making it possible that they could be carried out even by those with a low socio-economic position (YAEGER & ROBIN 2004, p. 161). Nonetheless, the architectural modifications executed during this period, do testify to a privileged economic position.

U56 is strictly speaking not a structure. Rather, it is a large midden and garbage concentration located at the most northern part of Chan Cahal's residential area (CLAGETT 1997, p. 65). The material encountered here comprised predominantly lithic refuse, which led the excavators to conclude that this – somewhat isolated – area was used to discard hazardous lithic waste, possibly from households such as that of the nearby structures U49 or U50 (CLAGETT 1997, p. 65; POPSON & CLAGETT 1999, p. 82). It is therefore not unlikely that one of these two households' lithic production exceeded the household level and that it crafted lithics to exchange within the Chan Cahal community, but that the waste hereof was swept away from the residential area (see also Sheets & Simmons 2002, p. 179-180).

Structure **U69** was constructed in the Late Preclassic as a small cobblestone platform (LICHTENSTEIN 2000, p. 49). Though it is thought to have been residential in nature (GIACOMETTI 1999, p. 1), its small size could also hint at an ancillary function. Associated with structure

[23] Pomacea shells are found in great quantities in several Maya excavations (PYBURN 1989, p. 329). While to some degree these could be intrusive, their quantity and dispersion suggest they were actively cultivated and consumed (PYBURN 1989, p. 329-331 & 336).

U69 is a midden with a remarkable artefact density, consisting almost exclusively of ceramic material, with a small amount of lithic waste (LICHTENSTEIN 2000, p. 49).

In summary, compared to its situation in the Middle Preclassic, LPC-A appears to have expanded significantly, now comprising structures U2, U5, U6, U8, U49, U50, U54, U56 and U69. Following its Middle Preclassic situation, the richest people still exhibited considerable wealth. The household level manufacturing of lithics nevertheless suggests that these were not part of an affluent elite class, but still were economically orientated towards producing activities. Due to the size of this extended family, there is a clear distinction between the most enriched and the more humble members of the family. Furthermore, this growing size and differentiation may have led to the extended family gradually splitting up, although this is not discernable in the geographical dispersion of the cluster.[24]

Northeast of Chan Cahal: Stucture U62 and U65

Little data is available on structure **U62** and **U65**. Located at the north-eastern frontier of Chan Cahal, these two structures originate in the Late Preclassic era, though the actual architectural remains of structure U65 appear to date from the Early Classic (LICHTENSTEIN 1999, p. 65-66). These two structures are not included in the maps of Chan Cahal because their positions in relation to the rest of the compound have not been adequately recorded.

Late Preclassic Cluster B

Though no architectural remains dating to the Late Preclassic were uncovered at structure **U9**, materials recovered from a midden related to the later architectural remains do indicate there was occupation during the Late Preclassic (POPSON *et al*. 1998, p. 5). These materials follow the typical household refuse-pattern, as they include ceramic material, lithic refuse and pomacea shell. Also one metate, several bifaces, hammerstone, obsidian fragments and one jade fragment were discovered in this midden (POPSON *et al*. 1998, p. 5). Since the

[24] Trying to investigate this is particularly difficult due to the fact that not all constructions in any cluster are excavated.

midden material consists of both Middle and Late Preclassic material, it is unclear to which period these materials should be ascribed.

Though not too much information is available on structure **U14**, the midden that was discovered in relation to this structure can give us some information regarding its inhabitants. Nonetheless, because it contains both Late Preclassic and Early Classic material, its temporal specifics remain ambiguous.[25] The most peculiar finds in this midden was lithic debitage, suggesting a household production of lithic material, four obsidian blades and a jade flare and bead, suggesting access to long-distance trade (POPSON *et al*. 1998, p. 6). Furthermore, samples from this midden were taken for biosilicate analysis. This has produced evidence of the presence of maize, squash, bean and cacao (BOZARTH & GUDERJAN 2002, p. 113). While the presence of maize, squash and beans are not surprising – they were and still are three basic components of the Mesoamerican diet – the evidence for cacao needs some further elaboration. Based on epigraphic and iconographic accounts, it has often been stated that cacao was a drink that was reserved for the upper classes (GRAÑA-BEHRENS & GRUBE 2006, p. 433; GRUBE 2006, p. 33; HOUSTON & INOMATA 2009, p.221; STONE & ZENDER 2011, p. 219). Since such sources generally remain silent on the non-elite part of society, some reservation in statements of exclusive access is recommended. Surely, evidence of cacao consumption is much rarer in the lower social classes, but it is not non-existent. In Joya de Cerén, remains of cacao beans and processed cacao were discovered in a very humble context (GONLIN 2004, p. 230; SCHAEFER s.d., p. 13; SHEETS & SIMMONS 2002, p. 179). Closer to Blue Creek, a commoner midden in Lamanai yielded spouted vessels, which are linked to the preparation of cacao drinks (POWIS 2004, p.62). In fact, the broader region in which Blue Creek was situated is one of the few areas in Mesoamerica where the production and export of cacao could be economically profitable (COE & COE 1996, p. 59; GRUBE 2006, p. 32; MASSON & PERAZA LOPE 2004, p. 213). This would have made cacao relatively easily accessible to a large group of people living in this area. Furthermore, the samples taken at the bottom of this midden also produced evidence of grass species, which could have been used in the construction of roofs, for example (Bozarth & Guderjan 2002, 113-114). The midden related

[25] While the oldest material in this midden was generally situated at its bottom, subdued by the later material (POPSON *et al*. 1998, p. 6), granular convection and bioturbation might have been present to some extent. Therefore, the material that was less subjected by stylistic changes such as the debitage material and the beads, cannot be assigned with full certainty to either the Late Preclassic or the Early Classic period.

to structure U14 is also the only context in Blue Creek which testified of the presence of chic sapote, a species that has a long and still lasting tradition of being planted for its fruits and gum (BOZARTH & GUDERJAN 2002, p. 113).

The 2 x 2 m test excavation at structure **U17** likewise did not yield much information concerning the construction history of this structure. However, one cache, designated "Cache 43" was encountered during these excavations. Cache 43 proved to be a so-called lip-to-lip cache. More specifically, Cache 43 comprised three sets of two Aguila Orange vessels and apart from the lip-to-lip deposition also one cylinder jar, also of the Aguila Orange type (POPSON *et al*. 1998, p. 7). It appears that this cache was deposited late in the Late Prelassic, during the Late Preclassic-Early Classic transition period (BOZARTH & GUDERJAN 2004, p. 207). The vessels of this cache proved to contain four limestone beads, two jade beads, a shell bead and one unworked shell (POPSON *et al*. 1998, p. 7). Apart from these finds, the vessels also held an earthy substance. Two samples of this substance were later subjected to biosilicate analysis. These two produced similar results as both samples consisted predominantly of palm, grass, and other tree and bush phytoliths with a small amount of maize phytoliths (BOZARTH & GUDERJAN 2004, p. 211: Fig. 1 & p. 212). In contrast with other tested caches of Blue Creek – which all came from more enriched contexts -, the Chan Cahal cache did not possess an abundance of sponge phytoliths (BOZARTH & GUDERJAN 2004, p. 211: Fig. 1). This might be the result of such exotic goods being less easily accessible to the residents of U17 (presuming that these were responsible for the material of the cache). However, equally valid hypotheses are that this could be attributed to differences in the nature and purpose of the ritual or to the sampling methods, since they give us only an idea of one of the three lip-to-lip sets of Cache 43. An additional test for phytoliths was carried out using samples from a – further unreported – midden located at structure U17. Its results were generally speaking in accordance with that of structure U14 as there was evidence of typical Maya alimentation, combined with some evidence of cacao consumption (BOZARTH & GUDERJAN 2002, p. 114). Apart from the data concerning food consumption patterns, this midden also yielded evidence of agave (BOZARTH & GUDERJAN 2002, p. 114). Today still, agave plants are being used in manufacturing ropes and needles or to brew alcoholic beverages from their leaves.

Structure **U18** dates back to the Late Preclassic era. A natural depression in the bedrock next to this house mound was used as a midden (LICHTENSTEIN 2000, p. 50). During the Late Preclassic-Early Classic transition period, a second construction phase was carried out, covering the earlier structure and the associated midden (LICHTENSTEIN 2000, p. 50). One piece of jade was recovered from the structure, but it is unknown whether this was deposited during the structure's Late Preclassic or Early Classic occupation period (GUDERJAN 2004a, p.52: table 5).

Structure **U19** was initiated in the Late Preclassic and underwent no further expansions during this period (POPSON *et al*. 1998, p. 8). Following the pattern of its surrounding structures, only poor architectural remains were uncovered, though interesting non-architectural features were unearthed. This building also had many lithic debitage refuse related to it, but unlike other structures at Chan Cahal, this also included evidence of obsidian processing, among which was one obsidian core (POPSON *et al*. 1998, p. 8). The ascertainment that one household engaged in crafting obsidian blades for self-sufficiency, while others opted to use prefabricated obsidian might illustrate that the trade routes had a relatively opportunistic, informal nature.[26] Two burials were retrieved from underneath structure U19's plaster floor. While one of the inhumations presented a lot of valuable information, the other only contained badly preserved bone fragments without any preserved grave goods (POPSON *et al*. 1998, p. 9). The deceased from the grave with good preservation had been inhumated in a flexed position, with grave goods deliberately placed around the head (POPSON *et al*. 1998, p. 9). Since the Maya perceived the head as the bodypart reflecting individualism, it is presumed that these grave goods reflect the deceased's personality or role in society (FITZSIMMONS 2011, p. 66 &68-69; HOUSTON *et al*. 2006, p. 71-72; POPSON *et al*. 1998, p. 9). The preserved artefacts included a perforated ceramic disk, part of a limestone mano, a chert biface, a jade plaque and some obsidian blade fragments (POPSON *et al*. 1998, p. 9). A last artefact associated with this internment was a hematite tooth inlay (POPSON *et al*. 1998, p. 9). While it used to be thought that such dental modifications were indicators of class status, dental modifications probably occur too frequently to be real signs of an elaborate status (TIESLER 1999, p. 5-6). Notwithstanding the

[26] This does not mean that other Chan Cahal households did not engage in occasional obsidian working. The difference is that while U19's people accessed raw obsidian material to make their own tools from it, the other households purchased obsidian tools, which could be reworked when necessary.

possible inability to derive status from it, these beautifications should be seen as statements concerning personal identity (TIESLER 1999, p. 5).

The **U44** construction was initiated in the Late Preclassic as a small platform, elevating the topping perishable construction with 0.25 metres (LICHTENSTEIN 2000, p. 51). Finds related to this structure include a range of utilitarian ceramics (LICHTENSTEIN 2000, p. 51).

Summarizing, structures U9, U14, U17, U18, U19 and U44 comprise the LPC-B, which arose out of MPC-B. I have attested above that this extended family was probably one of the poorest ones of whole Blue Creek during the Middle Preclassic. In the Late Preclassic, some aspects of their socio-economic position changed. While architecturally their residences were not impressive, these people did acquire some wealth and status – this especially becomes legible towards the end of the Late Preclassic – and supposedly had some form of ritual autonomy, as apparent in the cache and burials. In particular structure U17 and U19 exhibited clear evidence of an elaborate commoner status. On an individual base, the wealthiest persons of LPC-B are comparable to those of LPC-A, but due to the size of the cluster, the overall wealth acquired by LPC-A as a whole was significantly larger. Likely because of its size, there is more difference in wealth and status discernable in LPC-A. Because we do not know whether the extended family-identity was predominantly built on the cluster as a whole, or if the prestige of a few individuals influenced the entire perception of the cluster, we do not know how this difference was perceived by the Chan Cahal people. Regardless of this position, it appears that LPC-B's inhabitants were farmers who engaged in crafting of tools for self-sufficiency.

Earliest Activity in Chan Cahal's Southern Portion

Sometime in the Late Preclassic, a patio surface, which became the base for the structure **L24** group, was plastered directly on the ground surface (GIACOMETTI 2001, p. 6). Stone foundation walls at the south part of this plastered floor illustrate the presence of a structure that had elsewise not been recognized by archaeologists. It is presumed that a perishable construction stood atop this surface. Somewhat later, a structure was built atop the north part of this patio floor, covering a pit that had previously been used as a midden

(GIACOMETTI 2001, p. 6-7). Another pit between the two structures that had been used as a hearth was left uncovered and was most likely still being used. At the end of the Late Preclassic, invasive reconstructions were performed at the L24 composition. The southern structure was demolished and almost the entire plaza surface was being replastered, heightening the surface with 0.10 meters (GIACOMETTI 2001, p. 7). The absence of postholes in the plaster surface suggests that the previously built structure at the north of the patio was the only structure present at that time. A considerable amount of censer pieces were retrieved which, combined with the proximity to the L26 ritual group, might suggest L24's inhabitants' occupation was closely intertwined with religious activities (BROWN *et al*. 2002, p. 84; GRAÑA-BEHRENS & GRUBE 2006, p. 432; GIACOMETTI 2001, p. 7; SCHWARZ 2013, p. 322-324). Resin burning in incensarios might however also occur on a household-level, possibly even without ritual purpose (SCHAEFER s.d., p. 11). In later periods, the evidence stating a close relation between the inhabitants of structure L24 and ritual practices at the structure L26 complex will be clearer. The status that would come with this connection in one of the compound's most important ritual structures could also explain the high amount of material in and around the L26 composition, which includes a high amount of Late Preclassic and Early Classic ceramics and lithics (GIACOMETTI 2001, p. 7-9; 2002; p. 122, table 3 & p. 123, table 4).

About a hundred metres southwest of the L24 building stands structure **L26**. This structure is part of the structure L26 complex, which is also known as the Imcolel complex. Though the construction itself dates to the Early Classic period, ceramics suggest that there was already activity preceding this Early Classic construction (GIACOMETTI 2001, p. 10). Contexts in which Late Preclassic ritual structures became buried underneath Early Classic temples or shrines are not uncommon in the Maya area (HENDON 1999, p. 111). Therefore, since in later periods structure L26 and the adjacent L27 functioned as a ceremonial complex (GIACOMETTI 2001, 10-12), it appears likely that its Late Preclassic predecessor likewise had a ritual function, although its perishable nature during this time makes it hard to assess such a function with certainty.[27]

[27] A visual overview of the evolution of the Imcolel complex compared to that of the U5 complex can be found on p. 117: plate 8.

Moving to the west side of what was previously named Sayap Ha, **K34** is a small cobblestone platform with a plastered floor which was built during the Late Preclassic and saw a second construction phase at the end of this period (LICHTENSTEIN 1999, p. 68). The size of this platform suggests it served as an ancillary structure, possibly related to the nearby residential structure K33 and K32 patio group (LICHTENSTEIN 2000, p. 54-55). Since for instance, kitchen structures would be expected to have been located directly next to the residential structures, it is likely that structure K34 functioned as a storage shed.

Discussion

When looking at masonry architecture and construction episodes, there is a clear distinction between the northern and the southern part of Chan Cahal. At the northern part, we see that there is an increase in the amount of substructures, which supported the perishable constructions. The situation in the southern part of Chan Cahal, also known as Sayap Ha, is much more ambiguous during the Late Preclassic period, since only two structures can be securely designated a residential function, while two others presumably had a non-residential function. It is also important that, although the upper and lower part are to be considered as one single compound, this does not have to imply that there was no distinction in identity. Drawing parallels with contemporary situations, people could easily identify with a certain city, but specifically identified themselves with, for example, the western part of that city. It should thus be kept in mind that administrative entities are not parallel to identities. The drain that separates the northern and the southern part would be an effective visual and physical boundary constituting this psychological distinction.

Following the pattern of dispersion of goods such as obsidian and jade which are found as common in Chan-Cahal as in the central precinct during this period, Popson (2000, p.37) suggests that the core was unlikely to have had much control over the periphery. There are some important objections to be made to this observation though. Firstly, counting pieces of jade and comparing them between compounds can indeed be a useful tool in looking at the dispersion of wealth and ultimately control, but it overlooks the quality of these objects. After closer examination, it does appear that much of these conspicuous materials at Chan Cahal were of lesser quality and craftsmanship compared to the ones found at the core

(GUDERJAN 2004a, p. 17-18). Secondly, if certain status-markers are to be found ubiquitous in one polity, we should consider that its status-connotation was perhaps less active as in other polities which had a more restricted access to these goods. In their study of trade in early medieval emporia in the North Sea area, Loveluck & Tys (2006, p. 141-142 & 147-154) state that, because of their location, cities serving in coastal or riverine trade routes had more access to prestigious goods eventually leading to such goods being available to large parts of the society, hence being less suitable in discerning status and wealth. Admittedly, they are talking about a totally different region, but nevertheless, the situation at Blue Creek might be similar. Indeed, jade was found relatively frequent in Blue Creek in various contexts all over the polity, the most striking one being the cachings related to structure 4, which can be counted as one of the largest jade caching events ever uncovered in the Maya world (PASTRANA 1999, p. 95). A thorough study to determine whether conspicuous artefacts were indeed more accessible in polities serving in coastal or riverine trade routes in the Maya area could help clarify this matter, but is unfortunately beyond the scope of this thesis. That being said, we also should not take the opposite stance and consider the presence of such goods at Chan Cahal as insignificant. The ritual and burial contexts in which these objects were found do emphasize their value. Indeed, a religious connotation of jade – especially the leaf green version, which is reminiscent of fresh maize leaves – is apparent, but its socio-economic implications can likewise hardly be overemphasized. Because of the intrinsic value of this material to the Maya on religious, social, economic and aesthetic levels, the exposition of jade can be labelled as a total social fact, and its true meaning can thus only be comprehended when considered in its totality (MAUSS 1925, p. 32-33). There is some disagreement about the access of jade in the lower classes. While one group sees jade as an economic factor, acquirable to all people with sufficient funds, the other considers jade to be a restricted item, only affordable to those with a distinct status, explaining the jades in lower classes to be the result of a gift-economy where conspicuous goods were given to express relations between the elite and non-elite (For an overview, see GUDERJAN 2004a, p. 9-12). Evidently, the first theory does not exclude the possibility of gifts to express relationships either.

By trying to discern the individual motivation behind non-habitual actions that resulted in the data encountered by archaeologists, we can try to discern the significance of the

remarkable amount of jade and obsidian to the Chan Cahal community. Because of the intrinsic value of jade to Maya society, it originally circulated mainly in elite rankings. The display of jade can thus be regarded as a top-down movement, which lower classes could employ as an attempt to enhance social status. For Chan Cahal this also holds true for items such as obsidian and more elaborate burial practices. The initial goal of doing so was to distinguish themselves from their direct neighbors, much as some people today would buy a fancy car, a big flat screen TV or expensive clothing.[28] Following the knowledge that jade, as well as certain burial practices and to a lesser extent obsidian were total social phenomena, a connotation of the owner being socially and ideologically dominant might have been apparent. After a while, this practice becomes commonplace and falls into a system of in- or exclusion in the Chan Cahal community: more and more people would have wanted to be included in this system. The very fact that these commoners wanted to acquire jade thus illustrates its social relevance to the society as a whole and the individuals operating in it, although they themselves might perhaps not be consciously aware of these motivations (GIDDENS 1986, p. 6-7). However, elites would not be elites if one of their main characteristics – certainly speaking from an archaeological point of view – was a drive to distinguish themselves from the plebs. In Blue Creek's case, we can differentiate them from restricted items such as marine shell, which for Chan Cahal only appears in the K40 group, that according to architecture and artefacts belonged to one of the most privileged Chan Cahal households (LICHTENSTEIN 2000, p. 57-58), and in a midden near structure U9, which likewise showed presence of prestigious artefacts as jade and obsidian, but are more commonly found in the elite compounds on top of the Bravo escarpment. The hypothesis that luxurious items functioned as an expression of political bonds as is apparent at some other sites (HIRTH 1992, p. 23-27; YAEGER 2000, p. 133-134), does therefore not appear to fit the situation at Chan Cahal since their relative ubiquity would infirm strong socio-political statements.

Depositions of such goods linkable to one's residence, often under the form of a ritual or burial, as apparent in structures U2, U17, U19, U49 and U65, has important implications regarding the perception of identity as well. Indeed, different layers of identity can be

[28] Traditionally such items are regarded as goods by which archaeologists can estimate the wealth of the depositor. While this thesis does not want to contradict this observation, it should be kept in mind that because of their value, an individual – certainly if coming from humble origin - could make serious debts in trying to acquire them. Hence, while researchers might label him as enriched, it is entirely possible that he was actually the opposite.

discerned in our modern world, and this was probably not very different for the Maya. While the construction of a compound-identity will be discussed in the Early Classic chapter, the deposition of prestigious goods in relation to residences operates more on a micro-level. One of the first researchers to investigate the construction of identity in relation to the physical entity of the house was Claude Lévi-Strauss. According to him the house is "a corporate body holding an estate made up of both material and immaterial wealth, which perpetuates itself through the transmission of its name, its goods, and its titles down a real or imaginary line, considered legitimate as long as this continuity can express itself in the language of kinship or of affinity and, most often, of both" (LÉVI-STRAUSS 1982, p. 147). By depositing prestigious goods and even burials of important ancestors underneath or next to the house, the ideological connotation and tangibility of these materials could enhance the self-identification with the abstract notion of a house (GILLESPIE 2000, p. 473-477). Although it might have been one of the initial reasons to do so, such deposits had little effect on the prestige of the lineage living in the houses. Nonetheless, it seems to be a reflection of social status, often of just a single individual: the deceased (GUDERJAN 2007, p. 87-88). This can be illustrated by looking at various burials at Chan Cahal and Kín Tan. The residents of Kín Tan had strong relations with the rulers living in the central precinct. By contrast, such powerful bonds were not apparent with the great majority of the Chan Cahal people. While after many ritual deposits and internments, the Kín Tan people continued to exhibit clear signs that they could be considered as one of the most powerful people, similar – although much more humble – contexts in Chan Cahal could not impose a more elaborate status on the inhabitants of the concerning lineage, however highly regarded a certain individual may have been. In other words, power in the elite compounds such as Kín Tan was derived from a long tradition of bonds between the lineage and the rulers in the site core, which also ensured these bonds to persist, while the power of individuals at Chan Cahal was not based on such long lasting bonds and therefore did not last when the individual died.

Economically, Chan Cahal began to focus more and more on producing agricultural surpluses. This economic specialization does not mean that no other activities took place here. Evidence of lithic production – in most cases reshaping of earlier acquired lithic tools – is abundant. This would not have been the only economic activity directed towards self-sufficiency. Sheets and Simmons (2002, p. 180-181) note that at Joya de Cerén commoners

also engaged in working kitchen gardens, gathering firewood or harvesting non-food items such as grass and agave to meet their personal needs. In most other archaeological contexts such activities have little chance of leaving traces that are easily readable, but it seems unlikely that at Chan Cahal similar practices did not take place. Also fresh water snails, predominantly pomacea and jute snail were found ubiquitous, suggesting that these were cultivated and harvested in the natural water reservoirs that were present at Chan Cahal. (LICHTENSTEIN 2000, p. 49; POPSON 2000, p. 19). The diet of Chan Cahal's people consisted mostly of the produced agricultural goods, complemented with fresh water snails. Their practical function aside, these common activities also aided in creating a shared social identity (HENDON 2004, p. 277-278).

The Late Preclassic period marked the onset of reasonably easy discernable social stratification at Blue Creek on both a polity and a compound level. At many other places in the Maya world, water management was one of the reasons by means of which the elite class could justify and maintain their privileged positions (e.g. LUCERO 2002, p. 815-816; SCARBOROUGH 1998, p. 136-137). Due to the ubiquity of water resources at Blue Creek, this view is not applicable here. Another view, which does not have to contradict the former, holds that the religious dominancy of Mesoamerican elites established a superior socio-politico-economic position. However, this perspective denies the relative religious independence exhibited in several commoner contexts (e.g. NOVOTNY & KOSAKOWSKY 2009, p. 76-80; ROBIN 2009, p. 29-30). Furthermore, when adopting this dominant ideology perspective, one must be cautious not to fall into Marxist-inspired views that regard religion as a mere instrument to exert dominance over a large part of society (JANSEN 2004, p. 244; RAPPAPORT 1999, p. 400). Blue Creek's elite class was probably based on control over the available recourses – the fertile soils – and the trade routes.

From at least the Late Preclassic period on, the upper echelons of Maya society also actively engaged in using elaborate pottery to express their social status (ROBERTSON 1983, p. 140). Nonetheless, it is impossible to directly link elaborate ceramics to elaborate status since ceramic types that are labelled as "elite-ceramics" can also be found at very humble contexts, as for instance in Lamanai (POWIS 2004, p. 56 & 62). Because the ceramics recovered from Chan Cahal are mainly secondary deposits, little information regarding

internal status differentiation can be derived from them (L. J. Kosakowsky, personal communication, 2014).

From this period on, the people of this compound buried their deceased underneath their residences.[29] Human remains that were uncovered in anatomical correct positions at Chan Cahal always were found in a flexed position. Supposedly, this position is the result of the bodies being tightly wrapped in cloth before being buried (FITZSIMMONS 2009, p. 76-81; MORLEY & BRAINERD 1956, p.180; REESE-TAYLOR *et al*. 2006, p. 42-50). Changes in burial customs were not limited to Blue Creek alone: in K'axob for example, there is a shift from individuals lying down to individuals in a flexed or seated position in the Late Preclassic (MCANANY 1995, p. 55). The ever growing trade network and environmental changes that were occurring, would have led to various migrations which might have been the cause of these shifts and later led to more uniform religious views and practices. Blue Creek's geographical location and focus on trade did make it very sensitive to stylistic innovations, as demonstrated by various architectural contexts.[30]

The presence of ancestors buried underneath houses also has important implications regarding social identity. This way, the Maya engaged in creating a tangible sense of family relations, possibly with the house as an instrument propagating kinship awareness (GILLESPIE 2000, p. 475-477). Since the amount of interred ancestors is far too low compared to the people that resided in these houses, the family had to make an important decision which family member would be important enough to be venerated for years to come and which ones would face the inevitable fate of oblivion (ASTOR-AGUILERA 2010, p. 35 & 150; CHASE & CHASE 2004b, p. 139; GUDERJAN 2007, p. 83; MCANANY 1995, p. 60-61; WEBSTER 2002, p. 141).[31]

The transition from Late Preclassic to Early Classic is regarded as a period of distress in which many large Preclassic cities were abandoned. Although parallels with the Terminal Classic

[29] Intriguingly, these are the earliest burials encountered at Chan Cahal. It is yet unknown how the Chan Cahal people treated their dead prior to the Classic era. It has been suggested that there could have been a, yet unlocated, communal burial place at some distance from the compound.

[30] The site core's structure 1 for instance, is one of the earliest known colonnaded structures – already a rare architectural composition - in the Maya lowlands (DRIVER 2002, p. 69-74; 2008, p. 196-198). While many researchers regard the presence of such buildings as a sign of intrusion of Central Mexican cultures – where such colonnaded structures are more frequent -, it is far more likely that this trait evolved independently in the Maya area (DRIVER 2002, p. 67-68; 2008, p. 197). Furthermore, Blue Creek's ballcourt proved to be one of the first ballcourt-constructions in the region (GUDERJAN 2005a, p. 3; LOHSE *et al*. 2013, p. 104 table 5.1).

[31] Not unlike the Middle Preclassic situation, there is no trace of the deceased that were not interred in the houses. It is likely that these underwent a similar, unknown faith.

collapse warn us not to look for one single cause for such collapses, a main instigator appears to have been a widespread drought, at least partly caused by human activity (BONNAFOUX 2011, 37-38; DUNNING *et al.* 2002, p. 274-276; ESTRADA-BELLI 2011, p. 130-131; GILL 2000, p. 314-315; HODELL *et al*. 2001, p. 167-168). Due to its geographical location, Chan Cahal - and Blue Creek as a whole - appears to never have had such problems with water-scarcity, which is confirmed by the lack of centralized water control in the polity (GUDERJAN 2007, p. 100; HAMMOND 2009a, p. 51). In contrast to the pattern of droughts apparent in much of the Maya lowlands during this period, Blue Creek actually experienced at least one major flood (BEACH *et al*. 2009, p. 1720; 2013, p. 54 & 60; LUZZADDER-BEACH & BEACH 2009, p. 21). This flood might be related to the ascertainment that Blue Creek's ground water table significantly rose between the transition between Late Preclassic and Early Classic (BEACH *et al*. 2013, p. 55; LUZZADDER-BEACH & BEACH 2009, p. 21-22). Naturally these inundations had a more direct impact to the lower lying areas such as Chan Cahal than on the compounds located on top of the Bravo escarpment. It might have been as a reaction to such floods that the Maya decided to construct ditched fields complexes, such as that of Chan Cahal. Unfortunately ditches are hard to date so that we are not fully sure when these ditched fields were constructed, but at least a considerable part of them appear to postdate the Late Preclassic by a few centuries (BEACH et al. 2009, p. 1712-1713 & 1717; 2013, p. 54-55; GUDERJAN 2007, p. 95-97). Nonetheless, middens with Late Preclassic material were discovered in the ditched field area, suggesting these fields were to some extent already in use, be it with or without the construction of ditches (POPSON *et al*. 1998, p. 2-3; BEACH *et al*. 2013, p. 48 & 55). Altogether, while ditched field complexes were constructed to prevent crop failure as a result from floods such as those from the Late Preclassic period, we cannot assert that it was this Preclassic flood that caused the construction of the Chan Cahal ditched field complex. Nonetheless, Harrison and Fry (2000, p. 5) argue that ceramic evidence suggests that the Late Preclassic inhabitants of Pulltrouser Swamp were already constructing a ditched field complex. Similar assertions have been made at Cerros (FREIDEL & SCARBOROUGH 1982, p. 133-144) and Colha (JACOB 1995, p. 182-184), where agricultural ditches and elevated fields were being constructed during this period, though the Colha results were particularly difficult to interpret. The ditched field technique was thus definitely present in the area during the Late Preclassic (see also HAMMOND 1986, p. 404).

The presence of fertile soils, combined with plentiful water necessary to work them in an otherwise dry period and the possibility to export agricultural surpluses in a period where drought made them scarce, meant that the Blue Creek polity could claim a powerful position during this era. While Chan Cahal was certainly not the only Blue Creek compound producing agricultural goods, its yields definitely made an important contribution to the strength of the Blue Creek polity. This may very well explain the population growth and display of prestigious goods during these periods.

Early Classic

In contrast to most polities in its direct environs, Blue Creek continued to prosper and grow exponentially during the transition from Late Preclassic to Early Classic (ADAMS *et al*. 2004b, p. 328 & 329, table 15.1 & 331; BEACH *et al*. 2002, p. 367; GUDERJAN 2005b, p. 131-135). In this period, an invasive period of drought afflicted much of the Maya lowlands (BONNAFOUX 2011, p. 37-38; ESTRADA-BELLI 2011, p. 130-131; HODELL *et al*. 2001, p. 167-168). Robert Fry (1989, p. 101) states that during the Early Classic, a settlement shift from the Río Hondo to the New River valley is discernable. While this might be the case for the lower Río Hondo, this does not hold true for the entire upper Río Hondo and its tributaries. Due to the Preclassic drought, the settlements upstream would have needed to divert a great amount of water from the already less voluptuous river, which caused the downstream polities serious problems with water supply. While a similar pattern can be expected for the New River, much more water is transported through this stream, making it able to support a larger population.

The problems that were occurring elsewhere gave Blue Creek a very beneficial economic position, because of which it could continue to grow and keep up its display of wealth and conspicuous goods. This is also reflected at Chan Cahal, where we see the initiation of monumental architecture.[32] These "hinterland plaza complexes" were initiated as important foci for the most elaborate and solemn rites performed at the Chan Cahal compound. Apart from the hinterland plaza complexes, there is another religious innovation in the construction of non-perishable shrines. It is unknown whether Preclassic Chan Cahal did not have shrines, or if these had been built of perishable materials and have therefore gone unnoticed.

By entering the Classic period, an additional problem to the goal of this thesis rises. Some of the structures yielded very eroded material, only diagnostic to the Classic period, without further specification. This makes them unusable to investigate temporal dynamics at Chan Cahal. Therefore, these structures – namely U35, U37 and U38 - will not be discussed in this thesis, nor will they be incorporated in the demographic estimate. It is notable that all of

[32] Admittedly, "monumental" might be a somewhat misleading term. While these hinterland plaza centres would be unimpressive when seen next to some of the constructions in for example Blue Creek's site core, the effort invested in them would have given them some sense of splendour to Chan Cahal's people, whose compound elsewise existed predominantly of perishable houses built on a masonry substructure.

these structures were subjected to small test pitting, so that future excavations at these structures could give us a better idea of the specifics of these constructions or yield more diagnostics (LICHTENSTEIN 1999, p. 68-69).

Early Classic Cluster D

During the Early Classic, the Imcolel complex grew out to be one of Chan Cahal's most important and elaborate compositions. While the initial Late Preclassic composition consisted only of perishable constructions, much energy was invested in creating a ceremonial complex that reflected the wealth and authority of Chan Cahal's leading men (Fig. 9). During the start of the Early Classic period, a 0.6 meter high platform, which later saw minor extensions enlarging the platform to approximately 140 square meters in its final composition, was constructed (GIACOMETTI 2001, p. 11; GUDERJAN 2007, p. 82). Somewhat later, but still in the early phase of the Early Classic, three constructions – L26, L27 and a circular platform - were erected on this platform.

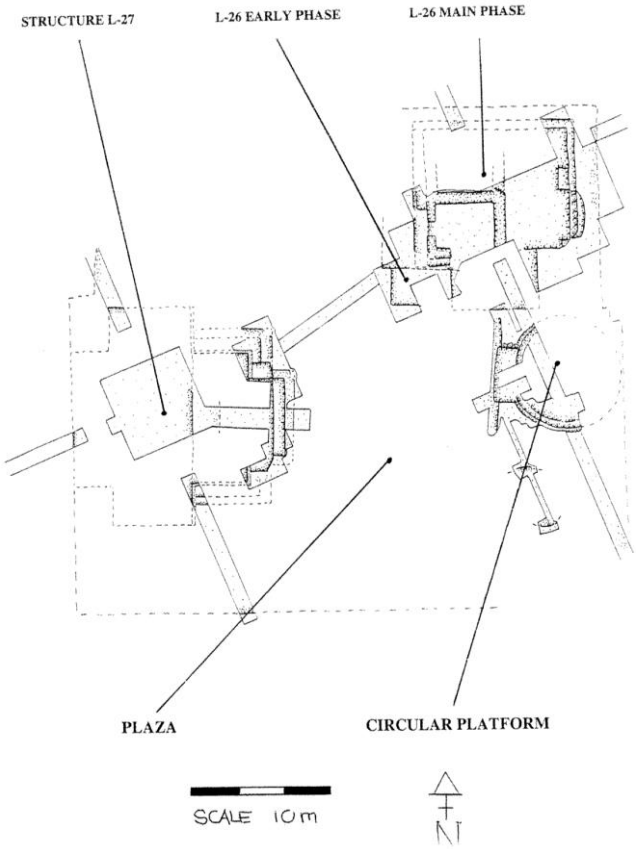

Fig. 9: Excavations at the Imcolel complex

Structure **L26** was initiated as a two-roomed masonry structure atop a substructure. In the Middle Early Classic, its rooms were filled with small cobbles and sherds, while a staircase was constructed next to them in order to transform the room structures to a heightened pyramidal platform (GIACOMETTI 2001, p. 11; 2002, p. 74; GUDERJAN 2007, p. 82). Towards the ending of the Early Classic period, another major construction phase took place at structure L26. The tiered platform and the adjacent staircase were both expanded (GIACOMETTI 2001, p. 11-12). At the same time as one of these invasive constructions, "Problematical Deposit SH3" was deposited (GIACOMETTI 2002, p. 75-76). This context was situated around an earlier deposit – possibly a ritual deposit such as a cache that was later removed – and consisted of more than 4000 ceramic sherds, 52 lithic flakes, limestone, groundstone and quartzite objects, shell, obsidian blades and a ceramic disk (GIACOMETTI 2001, p. 11; 2002, p. 74-75). Two other deposits were retrieved in relation to structure L26. One consists only of Early Classic ceramics and shows signs of burning (GIACOMETTI 2001, p. 12). The other comprises material from both the Late Preclassic and Early Classic period and yielded ceramic and lithic material. Interestingly, the material from this deposit contained chert imported from the Northern Belizean Chert Zone (GIACOMETTI 2001, p. 12). Though chert from this zone had to have been imported and is of a very high quality, only the compounds at the base of the escarpment – the non-elite based compounds - proved to have access to it (BARRET 2004, p. 222, table 9 & p. 223, table 10 & 11). Many trade routes were thus most likely monitored by the communal elites, while the direct control of the royal elites would have concerned only the most profitable or restricted trade routes. The fact that there is a tendency to import certain goods from specific regions also hints that trade was not carried out opportunistically, but happened between agents who had a social contract of working together (see also SHAW 2012, p. 122). Furthermore, this deposit contained a Teotihuacan style tripod vessel with cacao bean appliqué (GIACOMETTI 2001, p. 12). Ceramics in Teotihuacan style are not uncommon in Early Classic contexts in this part of the Maya area (e.g. BUTTLES *et al*. 2005, p. 102 & 105; SULLIVAN & VALDEZ JR. 2006, p. 82-83), but these are likely to have been local productions in an exotic style, rather than evidence of contact between regular contacts with Central Mexico (L. J. Kosakowsky, personal communication 2014; see also GUDERJAN 2007, p. 85-86). Furthermore, it appears that Blue Creek was not positioned near important routes between this Mesoamerican metropolis and other Maya sites which have attested bonds with it (ESTRADA-BELLI 2011, p. 122-124). Including all these

deposits, structure L26 yielded the highest amount of ceramics, chert and obsidian of all Chan Cahal structures (CLAYTON 2013, p. 184, table 8.1).

Structure **L27** was a 2 meter high pyramidal platform with a very pronounced staircase. At the base of this staircase, the plaster platform was paved with cobbles (GIACOMETTI 2001, p. 11). Though they are not well understood, there were various construction episodes to this building, albeit less profound as those apparent at structure L26 (GIACOMETTI 2001, p. 11-12).

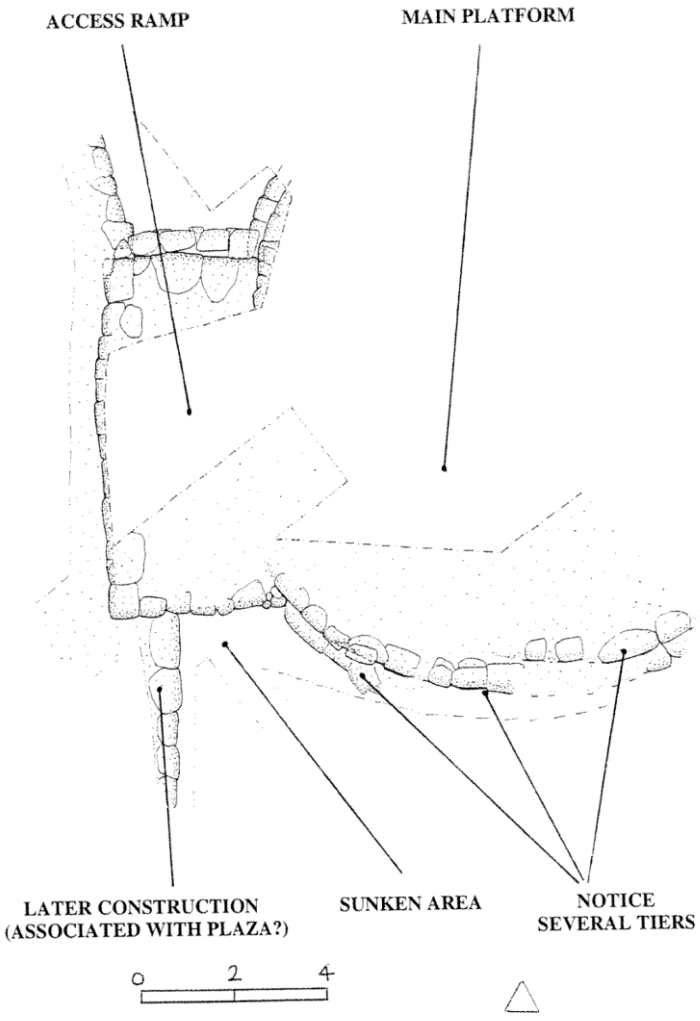

Fig. 10: Detail of the circular platform of the Imcolel complex

Apart from the two aforementioned structures, the Imcolel complex also contained a circular platform with a height of 0.5 m and a diameter of 6.5 m (Fig. 10). It was built in a single construction episode (GIACOMETTI 2001, p. 11). Similar constructions have been found at various other sites such as Altun Ha (PENDERGAST 1982, p. 186-188), Blackman Eddy (BROWN

& GARBER 2005, p. 57), Chan Chen (SIDRYS & ANDRESEN 1978, p. 639-649), Cahal Pech (AIMERS *et al*. 2000, p. 74-78), Cuello (CARTWRIGHT-GERHARD & HAMMOND 1991, p. 116; HAMMOND *et al*. 1991, p. 33-35), Gran Cacao (LOHSE & SAGEBIEL 2006, p. 319-320; LOHSE *et al*. 2013, p. 112-113), Río Azul (HENDON 1999, p. 111-113) and Uaxactun (HENDON 1999, p. 111). Such circular platforms are sometimes also referred to as "keyhole structures" since the ground plan of the circular platform and its accession ramp roughly reminisce a keyhole. These structures are hypothesized to have been platforms on which ritual dances – most likely with a restricted audience - took place (AIMERS *et al*. 2000, p. 81-82; HENDON 1999, p. 112; PENDERGAST 1982, p. 187; see also INOMATA 2006b, p. 201-203). There are numerous kinds of dances in Maya society, and though there is no way to tell which particular ones were performed at the Imcolel dance platform, there is a general agreement that ritual dances were likely related to deity impersonation (HOUSTON 2006, p. 134-144 & 146-149; HOUSTON *et al*. 2006, p. 270; MILLER & TAUBE 1993, p. 72-73; see also DE LANDA 1987, p. 36-37). The assertion that the dance platform was closely linked to one of the most enriched residential compositions of the compound, combined with its restricted nature, suggests that the rituals performed here were of an elaborate nature and could only be performed by authorized persons (see also RAPPAPORT 1999, p. 124).[33] By executing these dances at this platform, the persons in the highest politico-economic rankings of Chan Cahal could express and legitimize their position. However, there was more to it than only legitimation of power and performing religious duties since witnessing the spectacle of dance also created a sense of community (FREIDEL *et al.* 1993, p. 260; INOMATA 2006a, p. 808 & 818-819; 2006b, p. 210; RAPPAPORT 1999, p. 220). Furthermore, participating in such rituals constituted social bonds between all its participants (RAPPAPORT 1999, p. 190-193).

The Imcolel complex was the focus of both restricted and communal rituals and events (see also GONLIN 2007, p. 88-90). It is clear that the persons involved with Imcolel had a considerable amount of power in the Chan Cahal compound. The exerted power, however, should not be seen as direct control over subjugated lineages, but rather as control over the economic recourses and bonds with the political leaders (see also WEBER 1922, p. 130-140).

[33] Moreover, the iconographic, epigraphic and archaeological data seem to suggest that ritual dances were predominantly carried out by the elites. However, because the iconographic and epigraphic data are silent on the non-elite classes and because the archaeological data concerning elites is much more expressive and well-studied, we should be cautious in stating that dances were only a concern for the upper classes.

Both structure L26 and L27 were undergoing modifications at the time of their abandonment (GIACOMETTI 2001, p. 12; 2002, p. 73). This suggest that the dilapidation of the complex was quick and unforeseen. Since it can be safely surmised that the rituals performed at the Imcolel complex were the responsibility of a lineage of elites in this compound, it is not unlikely that the disuse of the Imcolel complex coincided with shifts in power and control at Chan Cahal. The fact that at the same time important political shifts also took place at the site core is not likely to be a coincidence. This will be discussed in further detail in the following chapter.

The **L24** construction was heavily modified during the Late Preclassic, a pattern that persisted in the Early Classic, as the surface floor was heightened and expanded during this period. Five intrusive burials and two partial burials – most likely reburials – were reported in relation to this expanded surface floor, three of which were subjected to excavations (GIACOMETTI 2001, p. 7). All three of these investigated burials were still in an anatomical position and were found tightly flexed positioned with their heads to the South (GIACOMETTI 2001, p. 7). Very few artefacts were associated with these burials: one completely lacked grave goods, another – which probably contains the remains of an infant or small child – included a plate and an obsidian fragment and in the last likewise a plate and a pomacea shell were found (GIACOMETTI 2001, p. 7). This latter grave also yielded a tiny shell fragment, which might have been an inlay fragment (GIACOMETTI 2001, p. 7). South of L24 a midden, only containing Early Classic ceramic material was uncovered (GIACOMETTI 2001, p. 8).

Structure **L25**, located close to the Imcolel complex, proved to be a tall substructure. Apart from the Early Classic construction date, no further architectural alterations were observed (GIACOMETTI 2001, p. 9). One intrusive burial chamber was found and excavated. Grave goods consisted of two Early Classic plates, a jade bead and a crescent-shaped pendant (GIACOMETTI 2001, p. 9).

The **L28** group was originally constructed in the Early Classic as a patio group, but subsequent architectural modifications transformed this patio group into a courtyard before the end of the Early Classic.[34] The architectural complexity of the composition suggest a high

[34] Originally, it was thought that the transformation from patio group to courtyard occurred in the Late Classic period (LICHTENSTEIN 2000, p. 55). Reinterpretation of the context however, indicated that all construction episodes were carried out in the Early Classic (GIACOMETTI 2001, p. 9)

status in Chan Cahal. Though the L28 group is less impressive in both architectural composition and artefact assemblage, courtyards are normally found in the high status precincts of Blue Creek such as the site core and Kín Tan, and are generally associated with those who had considerable power (GUDERJAN *et al*. 2003a, p. 19-26 & 33-35). This status, combined with its proximity to the Imcolel complex suggest that L28's inhabitants were closely connected to the activities performed at this ceremonial complex. Though we have already assessed that water management was not a means to power in Blue Creek, the L28 group did possess an aguada, which would have given them the privilege of a personal water reservoir (LICHTENSTEIN 2000, p. 55-56). Finds follow the pattern of typical household refuse with a notable amount of obsidian material (LICHTENSTEIN 1999, p. 69; 2000, p. 55-56).

Together, structures L24, L25, L28 and the Imcolel ceremonial complex constitute the ECC-D cluster. Much of the religious duties and accumulation of wealth during the Early Classic are to be found in this cluster, making it likely that the strongest power in the Chan Cahal compound was exerted by this extended family. Blue Creek's ruling class appears to have risen to a strong position of power during this period, and this cluster's might have been established and maintained through good relations with the leading men in the site core. In particular L28 proved to be the most complex Early Classic residential unit, illustrating the wealth and status of its residents – though no jade or elaborate graves were reported from it. Since there is a clear uniformity in burial practices – all internments in this group were directed with their heads towards the South – a shared worldview that might have differed slightly from that in other clusters is presumable.[35] In explaining which lineages grew out to be the most influential and why, many Mayanists apply Patricia McAnany's (1995, p. 96-99) "First Occupancy Hypothesis", which states that those who settled first in a given area could claim access to the most valuable recourses and forge bonds with the other powerful lineages, hence having the greatest odds at an elaborate socio-economic and political position. Since the earliest evidence – which did not show much signs of such a strong position - of activity in this area of Chan Cahal dates back to the Late Preclassic, this hypothesis does fit the data encountered at Chan Cahal. While indeed the "First Occupancy

[35] For instance the burial in structure L11 was directed with its head towards the North, while the Early Classic burial found in U5 was positioned on an East-West axis. Elsewhere in Blue Creek as well, no such uniformity in burial orientation is present. Nonetheless, many other sites in the Three-Rivers-Region have a similar burial pattern and orientation (CLAYTON 2003, p. 35).

Hypothesis" offers valuable insights in how and why status could arise, it is important to bear in mind that the ways to power were diverse, often opportunistic and involved a great amount of human agency. Furthermore, an area such as Chan Cahal, where there was no scarcity in water, no special recourses such as lithic crops, and in which the other powerful lineages were just recently emerging, made that first occupancy was something which could be easily overcome when a newly emerging lineage played their cards well.

Early Classic Cluster A

In the Early Classic, constructions begun at structure **U5**.[36] Following the earlier perishable construction, the Early Classic construction was unimpressive compared to monumental architecture as found at the Imcolel complex, but compared to most contemporaneous mounds found in Chan Cahal, this one meter high ashlar substructure did attest to some display of monumentality. One internment of a person in flexed position was uncovered and left for future excavations, but these have not yet been carried out (GIACOMETTI 2001, p. 13). The lack of occupational household debris led Antoine Giacometti (2001, p. 13) to conclude that during the Early Classic, this construction probably functioned as shrine.

Structure **U6**, an ancillary structure built in the Late Preclassic, was supposedly closely linked to the adjacent structure U5. The many construction phases at this building could not be dated. Possibly, these expansions could be related to the growing power and needs later in the history of the structure U5 lineage.

While in the Late Preclassic structure **U8** was still a pole and thatch house, by the Early Classic it had been constructed as a cobblestone base for a perishable construction (LICHTENSTEIN 2000, p. 51). At some point in the Early Classic, an additional construction episode took place, heightening the platform with 0.30 m (LICHTENSTEIN 2000, p. 51). Most associated artefacts comprise utilitarian ceramics such as bowls and jars (LICHTENSTEIN 2000, p. 51).

[36] A visual overview of the evolution of the U5 complex compared to that of the Imcolel complex can be found on p. 117: plate 8.

Attested activity in Early Classic Cluster-A was only located in structures U5, U6 and U8. Of these three structures, only U8 was designated a residential function during this period (in later periods, U5 will also be transformed into a complex that was home to a family). At first sight, it appears that the population of this cluster greatly diminished during the Early Classic. Nonetheless, many structures in the southern portion of this cluster, such as U1, U2, U3, U25, U68, U69, U70 and U71, remain unexcavated, so that it is more probable that this cluster was still inhabited by a much larger amount of people than discernable in past excavations. Moreover, the construction of the U5 shrine, the usage of the ancillary structure U6, and the likely connection between this cluster and the L1 shrine, would be very anomalous if it had been executed by only one nuclear family which did not display wealth in any other way. The Early Classic population and ritual focus on the southern part of Chan Cahal may have led this cluster to move to a more southern position. Assuming that the structure U8 family was representative for the greater part of this cluster, agrarian activities would be the main economic activity in this cluster. After all, it was the cluster located closest to the fertile Chan Cahal farmlands.

Early Classic Cluster B

During the Early Classic the **U9** house mound was constructed, covering the midden that attested earlier occupation (POPSON *et al*. 1998, p. 4-5). A possible second construction episode was encountered, but as the excavators suggested, more work needs to be done before the specifics of this structure can be comprehended (POPSON *et al*. 1998, p. 5).

There is scarce data of Early Classic occupation at structure **U14**. Architectural modifications nor artefacts dating to the Early Classic era were reported. However, the garbage concentration deposited on the bedrock near this construction did contain Early Classic ceramics (POPSON *et al*. 1998, p. 6).[37] Admittedly, this concentration might in part be attributed to natural runoff as well, rather than entirely representing a human deposition (POPSON *et al*. 1998, p. 6.). Nonetheless, it is unlikely that this whole deposit can be

[37] This midden was also subjected to phytolith analysis. The results hereof were discussed in the previous chapter, see p. 39-40.

attributed to natural processes, so that Early Classic occupation of structure U14 can reasonably be expected.

Stratigraphic evidence hints that much of the remains of occupation at structure **U17** postdating the Preclassic era was gravely disturbed by modern agricultural activity (POPSON *et al*. 1998, p. 7). Nevertheless, ceramic evidence does testify to later activity. In contrast to the two Late Preclassic caches, there is no sign that such ritual activity took place in later periods at U17.

During the Late Preclassic-Early Classic transition period, an additional construction phase was carried out at the Late Preclassic structure **U18** (LICHTENSTEIN 2000, p. 50). This covered the earlier construction and its associated midden.

The two burials uncovered underneath structure **U19** were already discussed in the Late Preclassic chapter, but due to the difficulties with dating these internments, it is equally possible that one or both are in fact of Early Classic date. According to Popson *et al*. (1998, p. 9), the inhabitants' labour as obsidian manufacturers may have given them some status. However, apart from one of the two burial contexts, there is little evidence of such a position, though indeed their occupation as sole obsidian processor might have given them some economic security. Regardless of their possible importance as obsidian workers, the people of structure U19 appear to have left their homes during the Early Classic.

Little Early Classic data was retrieved from structure **U44**. It appears that this humble residence was forsaken early in the Early Classic period (LICHTENSTEIN 2000, p. 48: table 14 & p. 49).

In short, it appears that ECC-B witnessed a serious setback in the Early Classic era. While in the Late Preclassic there was a considerable display of wealth - not exceptional in terms of the Chan Cahal display of wealth, but compared to most Maya commoner societies quite enriched -, there is no evidence of such behaviour in the Early Classic period. Moreover, some of its residences seem to have been abandoned during the Early Classic period while no new constructions appear to have been erected. A closer look at architectural modification tells us that only one structure underwent expansions, which might confirm the decline in economic position. How can this setback be explained? It is possible that the

causes which led many polities to deteriorate in this period, also got hold of this cluster. It could also be that their effects influenced the position of this extended family indirectly. Many people from other polities might have moved into this area since it had better prospects, which could also to some degree explain the demographic stability when at least one cluster witnessed depopulation. Because of this population number, there would have been a more intense economic competition as well. Indeed, from the Early Classic period on, the gap between the richest and the poorest – though still relatively low compared to Maya society as a whole – became larger. This could have led ECC-B, which in the previous periods already had an unstable socio-economic position, to decline. Theoretically, it is also possible that some of the families in ECC-B moved to other places because of marital bonds or such. If this was the case, the depopulation of the cluster would not have to be a reflection of a disadvantaged socio-economic position. This last scenario is less likely though, since the decrease in status and wealth markers do hint at such a downfall of wealth and prestige.

Northeast of Chan Cahal: Structure U62 and U65

Structure **U62** and **U65** are closely related considering their close proximity and shared isolated position in the Chan Cahal compound. Though ceramic evidence illustrates earlier occupation, the U65 housemound was erected in the Early Classic without further construction phases occurring to this building (LICHTENSTEIN 1999, p. 66). Structure U62 proved to be a small residential patio dating to the Late Preclassic period with two further construction episodes in the Early Classic (LICHTENSTEIN 1999, p. 66). One badly preserved adult burial was retrieved from underneath structure U65, but date nor any other specifics could be discerned (LICHTENSTEIN 1999, p. 66). While their composition might hint at a position as an upper low class, their isolated location might also suggest some form of marginalization. These do not have to contradict each other though. Their distance from the rest of the Chan Cahal compound might have resulted in a position that was less controlled by authorities and a greater amount of economic independence.

Shrines in Central Chan Cahal

Structure **L1** was a large platform supporting the remains of a single-room masonry structure (GIACOMETTI 2001, p. 4). Finds related to this structure comprise mainly ceramic sherds and remains of jute shell, with a small amount of lithic material, groundstone and obsidian (GIACOMETTI 2001, p. 4). It is somewhat isolated, with structure U11 as its closest neighbour, and possibly had a similar function as a shrine or ancillary building (GIACOMETTI 2002, p. 49-50). Interestingly, as Giacometti (2002, p. 50) notes, the distance from structure U11 and L1 to respectively structure U5 and L10 – two other important Early Classic shrines – are the same, though it is unclear how this should be interpreted. All of these shrines were constructed in the Early Classic, though U5 appears to have had an earlier predecessor.

The ascertainment that there were structures in the area between what was previously seen as two distinct compounds – Chan Cahal and Sayap Ha – made clear that this was in fact one single compound. One of the constructions that helped clarifying this was structure **U11**, a large mound of high workmanship. It is built up of a broad masonry platform supporting a second masonry substructure (GIACOMETTI 2001, p. 4). Apart from the initial construction, a second construction phase was apparent, both of which were dated to the Early Classic period (GIACOMETTI 2001, p. 4). One burial was discovered, but due to its bad preservation, no specifics regarding this internment could be determined. Though the artefacts found in relation to structure U11 were not of an elaborate nature, the size of the construction and the additional construction phases do hint at a powerful position. According to the excavator, the size and elevation of the platform made it possible to stage public rituals and performances at this structure as well (GIACOMETTI 2001, p. 4). If this holds true, the ceramic flute fragment uncovered near this construction might have had a role in such activities. Regarding elaboration and construction material, this structure is very similar to structure U5. Moreover, both contained one burial, which unfortunately remain ambiguous in both cases. Therefore a similar function as a shrine – perhaps even ritual foci of two rivalling lineages – is probable.

Early Classic Cluster C

Modern disturbance by agriculture made it hard to discern the specifics of structure **L8** (GIACOMETTI 2001, p. 4). Postholes underneath the construction indicate the presence of an earlier perishable construction, but it is unsure whether the postholes can be traced back to the Late Preclassic or that this perishable construction stems from the Early Classic (GIACOMETTI 2001, p. 5). Possibly due to the farming activity in this region, only few artefacts have been retrieved from this house mound.

Structure **L9** and **L10** comprise a patio group that was erected in the Early Classic (LICHTENSTEIN 2000, p. 56). The two structures are roughly the same in size and share a large basal platform.[38] Whether the function of the L10 group was residential or ancillary is not entirely clear, though the most recent excavations tend to favour an ancillary function as a public shrine (GIACOMETTI 2001, p. 5; 2002 p. 50). One intrusive chamber was found in structure L9, but its function and temporal aspects remain unclear since time restraints prevented the excavators to investigate this feature (LICHTENSTEIN 2000, p. 56-57).

On the surface, the **L11** construction seemed unexceptional. It proved to be a residential structure erected in the Early Classic and underwent a second construction episode in the same era (GIACOMETTI 2001, p. 5). On the east side of this platform, a context which at first glance appeared to be a large midden, containing a high amount of ceramic fragments, lithics and over thirty obsidian blades, was discovered (GIACOMETTI 2001, p. 5). According to the Maya Research Program's obsidian specialist, the traces of wear on the obsidian blades were consistent with some specialist activity such as carving (communication between R. Trachman and A. Giacometti, cited in GIACOMETTI 2001, p. 5). Underneath this context the remains of a male in a flexed position, estimated between 20 and 30 years at the time of death, with various elaborate grave goods were discovered (GIACOMETTI 2001, p. 5; GUDERJAN 2007, p. 84). Since more elaborate, but elsewise similar deposits in the shaft of cist-type graves are seen, for example, at La Milpa and Kakabish, the upper deposit should not be regarded as garbage disposal, but rather as an inherent part of the internment ritual (GUDERJAN 2007, p. 84; 2009b, p. 128). This grave – named Burial SH2 – contained many grave

[38] It is possible that at the time of occupation these two were exactly the same in size, and that the modern agricultural disturbance has damaged the L10 structure, making it slightly smaller than structure L9 (GIACOMETTI 2001, p. 5)

goods exemplary of a status that surpassed the standard commoner status. Near the throat, a bone head with a pierced hole on its sides and several bone beads, presumably all remnants of a necklace – were found (GIACOMETTI 2001, p. 5-6). Similar carved heads, often named bib-heads, are found much all over the Maya area, including five jade ones in a cache related to Blue Creek's structure 4 in the site core (DRIVER 2008, p. 244; GUDERJAN 2004a, p. 26-27; PASTRANA 1999, p. 104-110). Nonetheless, bib-heads appear to have been a restricted item and are generally thought to convey an iconographic message that is related to the royal authority (FREIDEL & SCHELE 1988, p. 552-556 & 563; GUDERJAN 2004a, p. 25-27; 2007, p. 84-85; 2009b, p. 128-129; HAMMOND 1986, p. 408-411; SCHELE & FREIDEL 1990, p. 102 & 121). The person interred in burial SH2 was not royal, nor did his status – though high in Chan Cahal terms – come close to that of those who reigned the polity. Indeed, as Thomas Guderjan notes (2007, p. 88; 2009b, p. 130), if this person would have had such a status, a more esteemed material such as jade instead of the animal bone of which it was crafted, would have been used. Another peculiar aspect of this grave were two bone disks, one found at each side of the skull, which were the ear jewellery of the interred individual (Fig. 11). These bone disks had jade, bone, shell and hematite inlay and each one had a carved representation of a seated person wearing a backpack, which is most likely the representation of a trader.[39] This image carved into this ear jewellery reminisces Teotihuacan imagery (GUDERJAN 2005b, p. 136; 2007, p. 85), though it is most likely crafted locally in an exotic style. It is tempting to see this as a representation of the profession of this person being a merchant, which could explain his privileged position in Chan Cahal, but this remains very hypothetical. Furthermore, an almost identical piece was

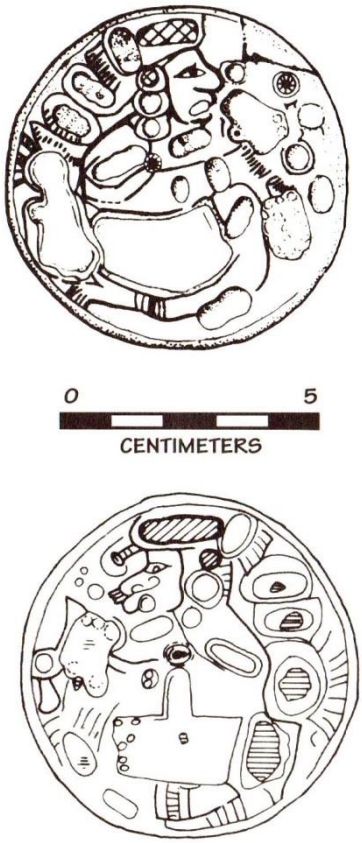

Fig. 11: Drawing of the two shell disks discovered at burial SH2

[39] Initially, the excavator regarded this to be a depiction of a person making an offering (GIACOMETTI 2001, p. 5; 2002, p. 58). However, I concur with Guderjan's (2007, p. 85-86; 2009b, p. 129) analysis that they convey a person wearing a backpack, though indeed both hold some unidentified object in their hands. Furthermore, one disk appears to display a person wearing a pouch. Pouches are not uncommon in Maya iconography, but are explicitly linked to Teotihuacano representations, and it is surmised that these represent bags in which incense was carried (NIELSEN 2006, p. 5).

looted from one of the caves in the Belize Valley region, suggesting these objects were circulating as trade goods, which might suggest that the depiction on it had little to do with the profession of the individual (LOHSE 2014, p. 87). This burial does suggest that certain individuals could climb up the social ladder due to personal actions, even without previous strong bonds with those of a high status (GUDERJAN 2007, p. 86-87; 2009b, p. 128-129). However, because this prestige was acquired by the individual rather than by the efforts of an entire lineage, this prestige also disappeared together with the individual in SH2 (GUDERJAN 2007, p. 87-88; LOHSE 2014, p. 87).

Fig. 12: Two shell disks, a bone head and four beads discovered in burial SH2

The structure **L20** group is comprised of one large platform supporting a central structure and four smaller structures. As is the case with many other structures in its environs, modern agricultural clearing had greatly damaged the composition, making it difficult to read the archaeological remains. Nonetheless, at least two architectural phases could be discerned: one Early Classic initiation phase and a second phase also occurring in the Early

Classic (GIACOMETTI 2001, p. 6). In its earliest phase, the central building was a circular platform, not unlike the one found at the Imcolel complex, though smaller in size (GIACOMETTI 2001, p. 6 & 11). The second construction episode involved a squaring of the round shape, creating a rectangular construction (GIACOMETTI 2001, p. 6). It is likely that this remodelling also implied a change in function, which might mean that its original function as a keyhole-shaped platform for dances and performances was relocated to the Imcolel complex. Since such performances and dances also included music, the discovery of a fragment of a flute in the L20 complex is not too surprising (GIACOMETTI 2001, p. 6; HOUSTON 2006, p. 143-144; HOUSTON *et al*. 2006, p. 252-253). The composition of this complex coincides with a quincunx-pattern, something that is of much significance to the Maya. The nearest parallel can be found in the Quincunx group, located about 4.5 km southwest from Chan Cahal and likewise an agricultural compound under the administration of Blue Creek. This Late Classic composition consists of one central rectangular three-roomed structure, enclosed by four circular mounds (ZARO & LOHSE 2005, p. 82-83). However, while the Quincunx observatory functioned as a solar observatory, no such function has been recognized at the L20 complex, and the fact that it had a different orientation suggests that it did not, or at least was not directed towards the summer solstice as was Quincunx. Nonetheless, quincunxes are deeply embedded in the Maya cosmology and worldview (ZARO & LOHSE 2005, p. 83-89), suggesting that the L20 complex had important ritual functions. Furthermore, the effort put in creating a platform of such a considerable size – measuring about 50 x 50 m – and its location on top of one of the compound's hills are suggestive of its importance. Whether this importance was of a shared communal (or semi-communal) nature or that it concerned only a few – possibly of elaborate status – cannot be asserted, though its central location, high visibility and lack of clear connections to a single household might be indicative of the former.

The L8, L9, L10, L11 and L20 constructions make up ECC-C, but it is likely that many of the abutting structures which weren't investigated were also being occupied during this period. This cluster appears to have been initiated in the Early Classic, and possibly represents a small migration from elsewhere into the Blue Creek polity. Though other reasons cannot be entirely excluded, ecological factors, such as the drought that occurred during the Late Preclassic-Early Classic transition period, are likely to have been the main instigators of commoner migrations (INOMATA 2004, p. 178). I envision an entire extended family to have

moved simultaneously into this area as a result of environmental distress in their place of origin. This decision did offer this lineage good prospects since, though the lineage itself never attained a high status, some of its members – in particular the person in burial SH2 – were able to accumulate some wealth and status. It is unsure that it was due to such a status of certain individuals that this cluster was able to construct two ritual constructions with communal functions. Economically, this extended family was still part of a producing class. It appears likely that their activity was mostly agricultural in nature, though some other forms of specialization might also have been apparent. Specifically, the person interred in burial SH2 appears to have been active in non-producing economic activity. His duties were likely to have involved diplomatic relations with the high and mighty, perhaps exerting some control over the production or export in Chan Cahal.

Patio Groups in Chan Cahal's Southwestern Frontier

Structure **K32** in the south-western area of the compound only yielded scarce evidence of Early Classic activity. No new construction episodes occurred, but ceramic evidence does suggest the structure remained occupied throughout the Early Classic period (LICHTENSTEIN 1999, p. 68; 2000, p. 54).

Ancillary structure **K34** was erected in the Late Preclassic and saw a second construction phase during the Late Preclassic-Early Classic transition period (LICHTENSTEIN 1999, p. 68). Typological analysis of the artefact assemblage suggests this structure became desuetude halfway during the Early Classic period (LICHTENSTEIN 1999, p. 68).

The only type of excavation carried out at the **K40** patio group are two test pits, hence only limited data concerning this architectural composition can be presented. This patio group is situated on the escarpment on the western extremity of Chan Cahal and thus overlooks much of the compound. Its structures are positioned on a large platform that has not been subjected to excavations, but the Early Classic initiation date of one of the constructions on top of this platform serves as a terminus ante quem for the platform construction. Nonetheless, it is unclear whether at this point in time the platform already had its final size or that it was still gradually modified over time. In the north-eastern corner of this platform,

a chultun was located. Only one of the tested structures of the K40 patio group, namely **K42** yielded evidence of Early Classic activity as it appears to have been initiated at the end of this period (LICHTENSTEIN 2000, p. 53: table 15). Though indeed the limited excavations do not suffice to make too much allocations concerning periods of activity, the scarcity of Early Classic material in relation to the abundant Late Classic material found during the excavations as well as surface collections (LICHTENSTEIN 2000, p. 57-58), are in accordance with the view that most of the activity in this group took place in the Late Classic period.

K44 was constructed late in the Early Classic period as an ancillary structure connected to the K40 patio group (LICHTENSTEIN 2000, p. 58). Apart from the initiation phase no further alterations were performed on this structure.

Discussion

During the Early Classic, many shrines were constructed at Chan Cahal. Most shrines in the Maya area do not possess burials (GONLIN 2007, p. 90), and Chan Cahal's burials in such structures should probably be regarded as a local variant which included ancestor veneration. Not unlike Roman state funerals (ACRE 2000, p. 118-119) - though operating on a very different scale -, these burial shrines, placed in important places and preceded by communal burial rites, indicate a socio-political importance of the interred individual which could be acknowledged by the entire community, or at least reflect the opinion of the people who interred the body, who obviously considered this person to have been an important person. Shrines were most likely already present during the previous eras, but under the form of perishable constructions. The construction of several non-perishable shrines during the Early Classic might be explained by a stronger position of Chan Cahal's leading men, architectural or religious innovations, or both. Possibly as a response to the earlier view that saw the elites as a religious dominant group and commoners merely as passive agents in ritual practices and innovations, some scholars have regarded such commoner shrines and related signs of commoner rituals as explicit expressions of ideological autonomy. Though indeed I would argue in favour of the religious independence of commoners, it is not a good idea to conceive these contexts as deliberate statements of religious independence. Rather than seeing implicit socio-political messages in such

contexts, these should be approached from a perspective in which active participation of the individual was inherent in the religious beliefs.

The construction of large ritual constructions and the rituals performed here helped in creating a sense of community in Chan Cahal. These edifices were monitored by those with a high status in the Chan Cahal community who by doing so could legitimize their position. However, this legitimization should not be regarded as the prime reason for these construction efforts, as they would always originate from a religious impulse.

If there were more buildings constructed without such platforms in this period, it is likely that they were small ancillary buildings, serving as storage sheds. There are however ancillary structures build atop substructures present at Chan Cahal. Many of them can be linked to the more enriched families. It is possible that more – perhaps all - extended families had such ancillary buildings, but that only those with sufficient means invested in constructing them on non-perishable platforms. Alternatively, it is also possible that these few ancillary structures atop substructures were the only ones apparent at Chan Cahal. If the second hypothesis proves to be true, it is still unsure whether the goods stored here were property of governing families who might have sold them to other people - in the Chan Cahal community or elsewhere -, or that they housed communal goods whose distribution was controlled by the enriched families – a subtle, yet important distinction which is not likely to be easily detectable in the archaeological record.

The Early Classic was a very dynamic period in Chan Cahal's history. The entire residential area of the compound became inhabited during this period, a demographic rise that can be at least partly explained by immigration processes. This population increase also led to more socio-economic competition, resulting in an increase in the internal stratification. This probably made that the lineage with the least affluent position, living in ECC-B, witnessed serious problems and a demographic downfall during the Early Classic. The Early Classic population estimate of 193 persons may thus appear to reflect a stable situation regarding the Late Preclassic estimation of 190 persons (see p. 104-105), but it should be kept in mind that this represents an overall estimation of a period of about 250 years in which at some times the actual population number might have been significantly lower or higher. Following

the pattern of initiation and abandonment in Chan Cahal, it is safe to say that this was certainly a very dynamic period.

The end of the Early Classic was an important transition in Blue Creek's history. While the rulers in the site core could operate relatively independently until the Early Classic, by the start of the Late Classic, Blue Creek entered its "subjugation period". How this affected the situation in Chan Cahal shall be discussed in the following chapter.

Late Classic

Various actions at the site core suggest that Blue Creek shifted from an independent to a subordinate polity during the Early Classic-Late Classic transition period. Not only Blue Creek's political history changed dramatically during this period, but other nearby sites, such as Río Azul or La Milpa saw invasive shifts in power as well, as both became respectively subordinate and highly influenced by Tikal, which was expanding its sphere of influence (ADAMS *et al*. 2004b, p. 333; HOUK & LOHSE 2013, p. 32-35; MARTIN & GRUBE 2008, p. 30). However, Tikal's influence greatly diminished when it was defeated by its arch enemy Calakmul in AD 562, an event that also lead Tikal's allies to experience a downfall (MARTIN & GRUBE 2008, p. 39-40 & 104; HOUSTON & INOMATA 2009, p. 109-110; see also HOUK & LOHSE 2013, p. 33-34). Because no such process is discernable at Blue Creek, it is unlikely that Blue Creek's subjugator was – or was closely linked to – Tikal. Since ceramic studies have pointed out that after the subjugation, Blue Creek's trade networks had changed from the Petén to the Campeche-Río Bec area (KOSAKOWSKY & LOHSE 2003, p. 10), Blue Creek's subjugator was probably to be found to the North or East.[40] A similar shift from a western to a northeastern influence, supporting this supposition, is discernable in some Late Classic architectural modifications such as the remodeling of structure 9 in the Central Precinct, which was transformed from a Petén style pyramid to one that resembles the style of the Belizean coastal plains (DRIVER & KOSAKOWSKY 2013, p. 83-84; GUDERJAN 2007, p. 40 & 128). As observable in various epigraphic accounts, the Late Classic was a time of intense political competition and transition (MARTIN & GRUBE 2008). Blue Creek was only a small pawn in this political landscape, though its position on the Río Hondo trade route and capacity to produce agricultural surpluses made that it was not one to be overseen.

Since the large population of the Maya lowlands continued to grow during the second half of the Classic period, there was an increasing demand for food products (ADAMS *et al*. 2004b, p. 328-329). This is why we can discern a peak size and intensity of the farmlands, leading to the almost complete vanishing of the earlier infield/outfield system (DUNNING 2004, p. 98-99). It is during this period of intensification that Chan Cahal's ditched field complex appears to have been constructed.

[40] Guderjan (2007, p. 128) puts forth the Kakabish polity as a possible candidate as Blue Creek's oppressor. However, there is little factual data to support or contradict this hypothesis.

The End of the D Cluster

Structure L24, L25, L28 and the Imcolel comprised the ECC-D in the Early Classic. Apart from one context, no signs of Late Classic activity were retrieved from this area. In the environs of structure L24, many test pits were excavated, all testifying to intense Late Preclassic and Early Classic, but all but one lacking Late Classic diagnostics (GIACOMETTI 2001, p. 7-8). This one context attesting to Late Classic activity was a midden located about twenty meters southwest of structure L24, which contained a notable amount of material that could be designated to the early part of the Late Classic period (GIACOMETTI 2001, p. 8). However, considering the general lack of Late Classic material in contrast to the abundant Late Preclassic and Early Classic artefacts in this area, it is most likely that this refuse concentration was deposited by people living in a nearby cluster, after the structures of ECC-D were abandoned. Similar Late Classic ceramics, accompanied by one jade bead were uncovered from the Imcolel complex (GIACOMETTI 2001, p. 12). Just like the Late Classic contexts near structure L24, these should be considered as post-abandonment deposits, possibly representing refuse or occasional ritual deposits.

The abandonment of these structures has important implications to the study of social and political affairs in Chan Cahal. Considering the absence of Late Classic material, while in the Early Classic this seemed to be the homes of a steady affluent lineage, combined with the ascertainment that the Imcolel complex was being derelict halfway construction efforts, suggests that this area witnessed a sudden depopulation. Considering the social position of the residents of these structures and the relations with the site core that came with it, the fact that this depopulation coincided with the shifts in power in the central precinct is significant. This lineage possibly fled or was exalted after the subjugation of Blue Creek. This contrasts greatly with other powerful lineages in Blue Creek, most of which continued to thrive after this event. This difference could have had many reasons: it could be that this lineage had a bigger loyalty to its previous rulers; that it was not supported by the rest of Chan Cahal, hence having lost much of its legitimation; that bad relationships with higher elites in other compounds made that its position became untenable after the connection to the royal elites disappeared; or that personal and charismatic qualities were (coincidentally) less present in the individuals of this lineage than in some in the other compounds like Kín Tan. Importantly, an internal competition for power as well was most likely apparent in Chan

Cahal, as the power vacuum created by the dilapidation of this area was immediately filled in by the people living in structure U5.

Late Classic Cluster A

While in the Early Classic, structure **U5** functioned as a small local shrine, it witnessed a great expansion to facilitate its new function as a hinterland plaza complex in the Late Classic. In the early phase of the Late Classic, a circular platform paved with slabs of high quality limestone (Fig. 13 & 14) was constructed on the west side of the earlier shrine (GIACOMETTI 2001, p. 13). The fact that there was a freestanding circular platform near structure U5 is greatly reminiscent of the keyhole structure of Imcolel, though it is of a much smaller size. This ascertainment is significant to investigate the power shifts and religious continuity during the transition from Early to Late Classic. Because of the abandonment of the Imcolel complex, its ritual functions, such as the dances performed at its circular structure, also disappeared abruptly. The family housed in structure U5 could have taken on the political duties of the ECC-D lineage, and as a legitimation hereof would have needed to ensure a continuation of the associated ritual obligations. Elsewhere in the Maya world, we see that circular dance platforms did not outlast the Early Classic period and were often transformed into other types of constructions (HENDON 1999, p. 111-112). The fact that this round structure was constructed this late may reflect a political strategy to prevent the commoners of Chan Cahal from protesting against the shifts in power. Nonetheless, following the disuse of such structures elsewhere, the round paved platform was incorporated in a room structure, testifying to a change in function.

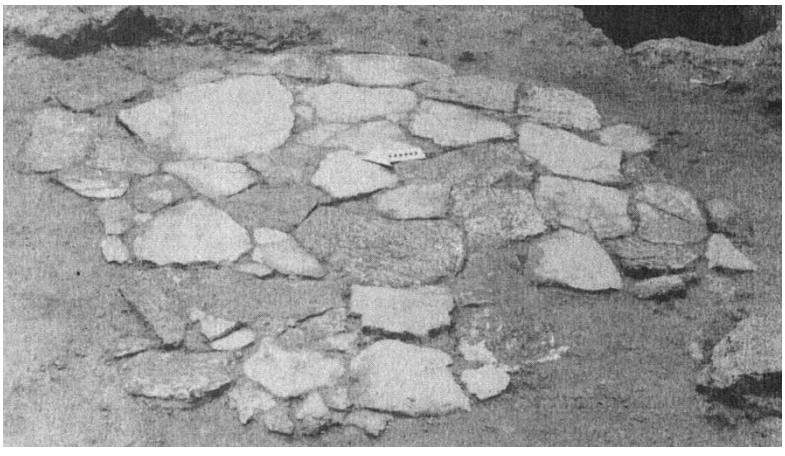

Fig. 13: Detail of the limestone slabs of U5's circular paved structure

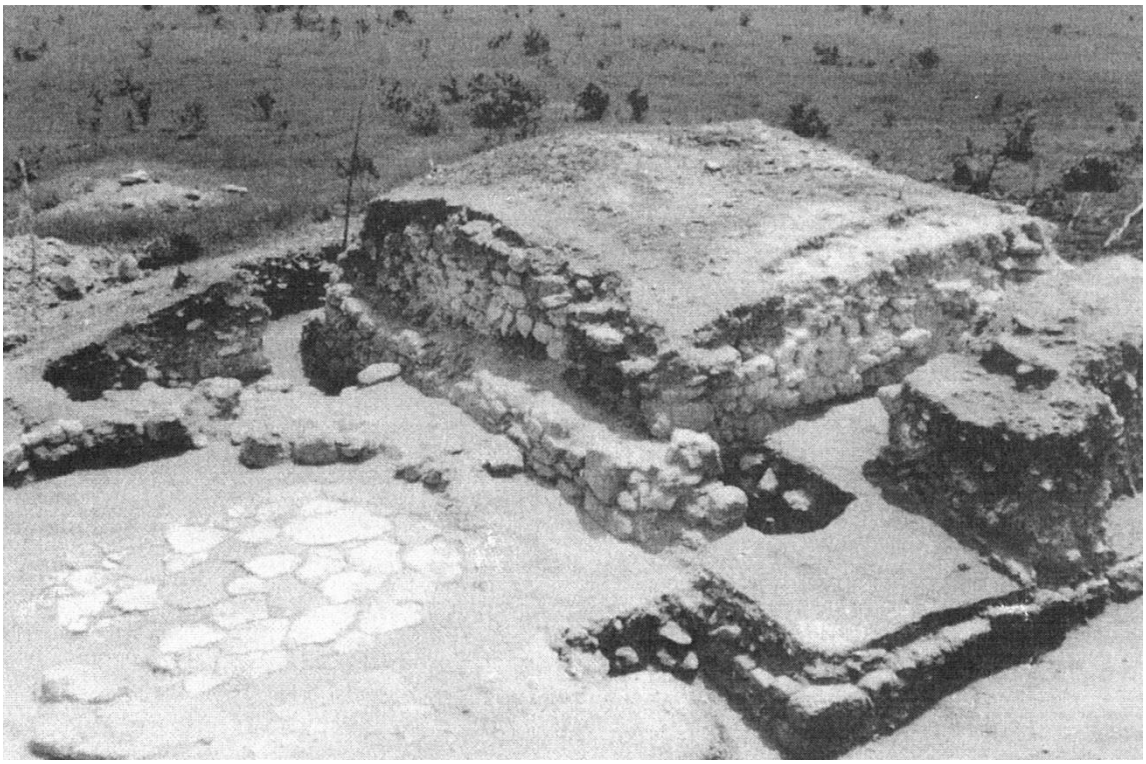

Fig. 14: Structure U5's northeastern corner with left the circular paved platform

The most invasive modifications at structure U5 took place in the second phase of the Late Classic. A large plastered platform of about 2400 square meters was constructed, which evened out the sloping terrain. Another small structure was built atop this platform, but it remains to be excavated. West of this plaza, a large midden, containing large amounts of Late Classic sherds and obsidian artefacts was uncovered (GIACOMETTI 2001, p. 13). Obsidian was a valuable good that would have to be imported from far outside the Blue Creek region. The high amounts of obsidian in this midden, combined with the ascertainment that almost no debitage or other signs of obsidian processing were discovered, might suggest that these people exerted some control over the obsidian import in Chan Cahal. This would aid in achieving and maintaining their high status. An alternative hypothesis is that obsidian artefacts, because of this exotic nature, functioned not only as utensils but also as a means of display of wealth and status. This could likewise explain the lack of signs of reworking since, in contrast to tools, prestigious goods would be used less and therefore would seldom need to be reworked. Evidently, these people could both control the obsidian trade and use obsidian to express their status.

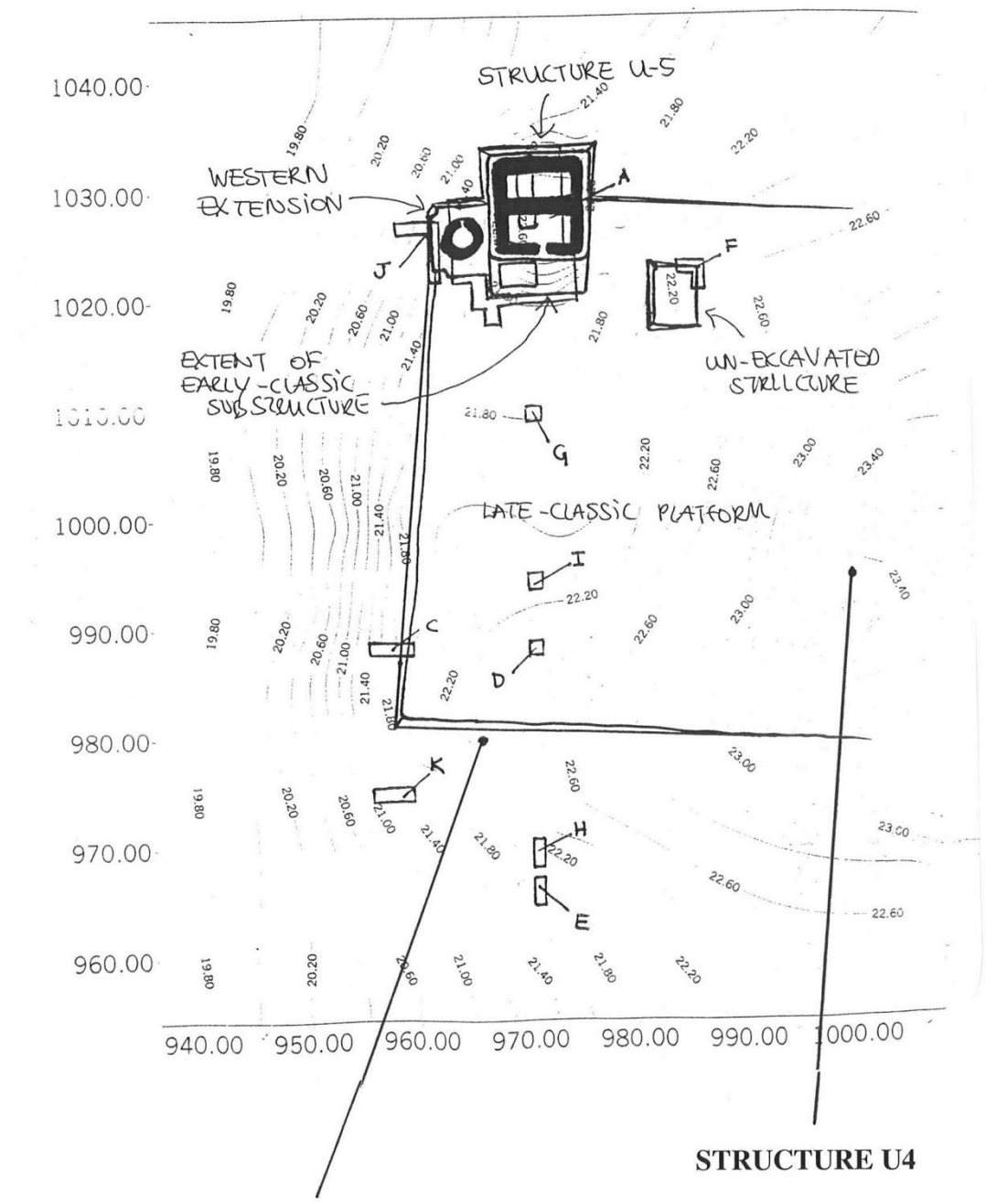

Fig. 15: The U5 Plaza complex and its plastered platform

On top of the plaster platform, east of the – by now enclosed - circular platform, a superstructure consisting of two rooms was built (GIACOMETTI 2001, p. 14). The front room contained two large benches positioned in an L-shape. Benches are found ubiquitously in Maya residences and palaces and are generally considered as attributes of residential structures of the upper class (e.g. REENTS-BUDET 2001, p. 203; SCHWARZ 2013, p. 312-313). Various iconographic variations of rulers sitting on such benches - often lavished with pelts -

while receiving dignitaries, are well-known and intensively documented. Melted plaster had been recovered from the area around the doorway and is interpreted as remains of decorative elements (GIACOMETTI 2001, p. 14).

This structure's topographical location has interesting features as well, as it cannot be seen from much of the Chan Cahal residential area, providing its inhabitants with a greater amount of privacy than most of Chan Cahal's denizens, but at the same time much of the agricultural lands north of Chan Cahal can be overlooked from its plastered platform (POPSON *et al*. 1998, p. 14).[41] It might therefore not be coincidental that most if not all of the ditched field system was being constructed when the structure U5 lineage rose to power.

What was the exact duty of the people living in U5? Ethnographic data illustrates that during the Contact period, some of the most powerful non-royal elites were batabob. A batab had important economic and administrative duties and he functioned as an intermediate between the lower classes and the rulers, some of his prime tasks comprising tax collections and organization of ritual and economic affairs (CHASE 1992, p. 120; INOMATA 2006b, p. 195-196; SHAEFER s.d., p. 4-5; WEBSTER 2002, p. 92-94). Another important title, actually one of the few Classic non-royal titles that is adequately apprehended, is that of sajal. Attested epigraphically to have been present predominantly in the Late Classic period, a sajal was a person whose duty was to serve as a deputy of the ruler in far-off centres (HOUSTON & INOMATA 2006, p. 175-176; HOUSTON & STUART 2001, p. 61-64; WEBSTER 2002, p. 158-162). No epigraphic material was recovered from any compound of Blue Creek, so that we cannot be sure about the exact title these people bore. While that of batab might have emerged only later in Maya history, and that of sajal might be unlikely because the distance between the site core and Chan Cahal was quite small, it can be presumed that the duty of U5's residents was very similar to both of them. Furthermore, the construction efforts, elaboration, and general luxurious artefacts associated with this plaza complex are in accordance with a high status.

According to Thomas Guderjan (2007, p. 97), the royal elites in the site core exerted control over the Chan Cahal – and other – fields, which was one of the bases of their power. My

[41] A similar situation can be seen in U Xulil Beh. While there was little stratification in this compound, its most elaborate building – though still a humble residential structure – oversaw the agricultural terraces west of the compound (VAN DEN NOTELAER 2013, p. 74-75)

opinion is that, rather than the royal elites, the lineage in the U5 plaza complex oversaw and monitored the activities in these fields. The site core's rulers could have meddled with the affairs of Chan Cahal's agricultural lands at certain times, but the actual executives appear to have been the members of the U5 lineage, who from their homes oversaw much of the agricultural fields. Economically, U5's power appears to have relied mainly on the mobilization of labor forces and control of the agricultural complexes, presumably with a small amount of control over the import at Chan Cahal, while that of the site core was based predominantly on tax collections, control over the most viable trade routes and the economic results of political bonds (Fig. 16).

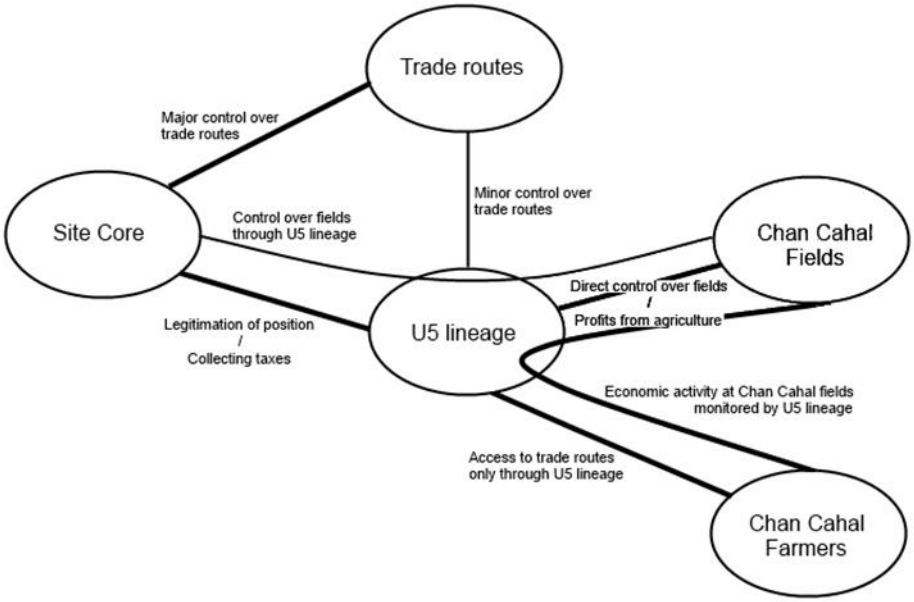

Fig. 16: Schematic outline of the basis of U5's power

For one of the most peculiar aspects of the U5 plaza complex - the large plastered platform - no sufficient explanation has been formulated yet.[42] Without contradicting the obvious implications concerning display of status and wealth, a more functional purpose must have been apparent as well. An important observation in designating a function to this platform is the ascertainment that there were several middens near the platform, all yielding ceramics

[42] Antoine Giacometti (2002, p. 66) has suggested that this was a stage for ritual performances. While indeed it is not unlikely that such performances were held here, there is little to suggest that this was the platform's prime function.

and lithics, though little evidence of processing were found – even if the hypothesis formulated below would be rejected, it is believed that these offer one of the keys to its function. The very existence of marketplaces in the Maya area has been a heavily debated subject, not in the least because of the difficulties inherent in projecting the western view of a marketplace onto non-Western societies (SHAW 2012, p. 119-120). Furthermore, the plazas in the centres of the polities could have served as marketplaces, but this was certainly not an exclusive function and the associated activities left little recognizable traces. Following the earlier ascertainment that trade was controlled by elites in Blue Creek, it is likely that the distribution of goods was carried out in a few specialized places. However, since local elites also had some authority over import and export in their compounds, small places designated as markets could have been apparent here as well. Some architectural compositions similar to the U5 plaza complex, with a heightened plaza surface and one dominating structure, have been suggested to have been marketplaces, though this designation remains to be proven (SHAW 2012, p. 130-131). If the platform did function as a distribution centre, the U5 lineage, who from their homes literally looked out over this platform, could have very actively controlled or even taxed goods coming in and out of the compound, while the connection to the most elaborate building would also make it easy for foreign traders to find this locus (HARE & MASSON 2012, p. 213 & 241). This marketplace would have been one for commodities such as pottery, lithics or salt, instead of one where luxurious goods were traded. Goods found in the middens near the platform - ceramics and lithics - were in fact the goods that needed to have been imported in great numbers from outside the Blue Creek polity. Admittedly, this is a very weak argument, since these also happen to be the materials with the highest preservation chances. Nonetheless, a close examination of wear patterns on the material is highly advisable in this case, since this could tell whether the material was used, or that it was rather thrown away when it was still “fresh”, suggesting it might have been discarded because occasional damage made it unmarketable, hence supporting the hypothesis that the U5 platform was indeed a marketplace. Apart from close examination of the material and its context, it is essential that our knowledge of Maya marketplaces expands in order to prove or disprove the theory of U5’s platform being a centre of distribution within the community.

Structure **U6** was an ancillary structure closely related to the U5 complex. Though for many of its construction phases a date could not be ascertained, many of them can be hypothesized to have been simultaneous with the expanding U5 constructions. What the exact purpose of this ancillary structure was, remains unclear though a function as repository appears likely.

Though the only construction episodes at this building were carried out in the Early Classic, structure **U8** was still occupied throughout the Late Classic era (KOSAKOWSKY 2002, p. 1; LICHTENSTEIN 2000, p. 51). The lack of construction episodes, combined with the absence of status markers – only basic utilitarian artefacts were excavated from this structure -, suggest that the people living in this structure were humble farmers.

The two investigated structures that appear to have been residential in LCC-A reflect both the highest and the lowest social strata of Chan Cahal. It is however unclear how structure U5 relates to the rest of this cluster, whose uninvestigated structures appear to have closer resemblance to U8 than to U5. One hypothesis is that, while the majority of the extended family in this cluster were basic common people, the U5 structure was the home of the lineage head.[43] Such lineage heads, in later times referred to as "Ah Kuch Kabob" were held in very high esteem, even though the rest of their lineage could have had a very low social position (CHASE 1992, p.131-132; MCANANY 1995, p. 92 & 117-118). Interestingly, Ah Kuch Kab means "He with the authority over the land", a title that would be very apt indeed for the people living in this hinterland plaza complex. An alternative view is that there are no family bonds between the lineage in structure U5 and the rest of LCC-A. The new rulers of Blue Creek could have installed a new lineage on this strategic elevated place which looked out over the Chan Cahal farmlands, to monitor the activities in this compound. The modification of an ancestral shrine to a residence of a non-related family however, would have been something which potentially could invoke much discontent in the LCC-A lineage. This, combined with the knowledge that this lineage was one of the oldest and apart from the Imcolel-lineage one of the more powerful, makes the former hypothesis more likely.

[43] A similar observation has been made by Antoine Giacometti (2002, p. 67-68).

Late Classic Cluster B

LCC-B poses a very uniform pattern. We have already established that during the Early Classic this cluster became more impoverished, leading to the abandonment of some of its constructions. The structures that were still inhabited nevertheless persisted throughout the entire Late Classic era. All excavated structures of LCC-B, namely U9, U14 and U18 tell a similar story. None proved to possess Late Classic alterations, burials or other ritual contexts. Further artefact composition shows no signs of non-utilitarian or restricted items connected to Late Classic activity. While activity until the Early Classic had been attested for structure U17, its upper portions were heavily damaged by modern activity. While this makes that no Late or Terminal Classic occupation could be attested, this is within the lines of expectation and the structure will therefore be included in the Late and Terminal Classic demographic calculations. Throughout all of its history, this cluster housed the least affluent lineage of Chan Cahal, a tendency that is repeated throughout the Late Classic period as this was home to very humble farmers.

Shrines in Central Chan Cahal

The **U11** shrine, constructed in the Early Classic, continued to be a place of worship and ritual during the Late Classic period. No further construction episodes were apparent at this construction, but Tepeu-type ceramics illustrate that this place still witnessed activity during the latter part of the Classic period (GIACOMETTI 2001, p. 4). During the Early Classic, this shrine was probably connected to activities taking place at structure U5. Since structure U5 grew in importance during the Late Classic period, it could be surmised that the relevance of the U11 shrine to the Chan Cahal compound likewise increased.

The **L1** shrine witnessed a similar evolution. Likewise, no Late Classic architectural phases were recognized, though Tepeu 2 and Tepeu 3 ceramics illustrate that this shrine was still active as a place of reverence (GIACOMETTI 2001, p. 4). While the U11 shrine might have been associated to structure U5 or even the entire cluster in which U5 was situated, the L1 shrine might have had a connection to structure L20 and its cluster. It is possible that the rites performed at these two shrines were representative of a rivalry between two lineages.

Late Classic Cluster C

Due to modern disturbances, the Late and Terminal Classic fate of structure **L8** remains unsure. While it will thus not be discussed further in any detail, parallels with other nearby structures make it likely that this housemound was still inhabited during these periods. Even though contemporaneous occupation is not confirmed, it will be included in the calculation of the Late and Terminal Classic population estimate.

In the beginning of the Late Classic, the **L9-L10** complex witnessed two additional construction phases (LICHTENSTEIN 2000, p. 56-57; Giacometti 2001, p. 5). These concerned both of the structures, which further underscores the close relation between them (LICHTENSTEIN 2000, p. 56). The artefact assemblage is consistent throughout the entire occupation period, and hints at a primary residential function, with some proof of household rituals (LICHTENSTEIN 2000, p. 56.). The presence of Central Yucatecan Slatewares illustrates that the people living in these structures were active in long distance trade networks for at least the Classic period. One intrusive burial, postdating the last construction effort, was reported, but left unexcavated (GIACOMETTI 2001, p. 5). Therefore it is unknown whether this internment dates to the Late or the Terminal Classic.

While in the Early Classic, the splendorous burial SH2 was interred in structure **L11**, no signs of affluence were found here during the Late Classic. In fact, the only proof of Late Classic occupation in this structure comes from ordinary occupational debris (GIACOMETTI 2001, p. 5). Since this comprises Tepeu 1 ceramics, but no later diagnostics, it appears that this structure was abandoned halfway the Late Classic period.

Like the adjacent L8, the structure **L20** composition was heavily damaged as a result of agricultural land clearing (GIACOMETTI 2001, p. 6). While the earliest phases of this ritual complex were found relatively intact, the upper portion of it was unreadable. Therefore, though Late and perhaps Terminal Classic activity is within the lines of expectation, it cannot be fully assured.

Structure **U65** was initiated as a small patio in the Late Preclassic. While the adjacent and closely related structure U62 was abandoned in the Early Classic, structure U65 was still inhabited and even saw an additional construction episode during the Late Classic

(LICHTENSTEIN 1999, p. 65-66). Late Classic finds related to this structure mainly comprise utilitarian ceramics, though they also included a considerable amount of fine wares (LICHTENSTEIN 1999, p. 66), suggesting its residents were still able to access and display precious goods.

Patio Groups in Chan Cahal's Southwestern Frontier

Refuse material and other occupational evidence indicate structure **K32** was still inhabited during the Late Classic era (LICHTENSTEIN 1999, p. 68; 2000, p. 54). Because no other excavations have been conducted at the other constructions of the K32 patio group, it is unclear how these observations relate to the rest of the Chan Cahal compound.

The Early Classic structure **K42**, a part of the K40 patio group, remained occupied during this period. Many of the recovered artefacts illustrate its residential nature, but also testify to an elaborate status and access to exotic goods such as Central Yucatecan Slatewares, jade, obsidian and one carved shell pendant (LICHTENSTEIN 2000, p. 58). While jade occurred more frequently during the previous periods, it is less apparent in the Late Classic, and its presence in this structure is therefore even more an indicator of wealth and prestige than the pieces of jade that circulated in the previous periods (See p. 120: plate 11). The scarcity in jade is not something that is unique to Chan Cahal, as it is observable in Blue Creek as a whole and even throughout much of the Maya area during this period, so that no connotations of impoverishment should be deducted hereof (GUDERJAN 2004, p. 49, table 2). The presence of marine shell is also important as an indicator of socio-economic status. Such items are very scarce in Chan Cahal, but appear more often in the contexts in the elite compounds such as the Central Precinct and Kín Tan. Since the trade of these items is therefore likely to have been monitored by the more powerful elites, not only status, but also close connections to these powerful elites might be apparent.

K39 was not extensively investigated, but the available data suggest that this structure was initiated in the Late Classic (LICHTENSTEIN 2000, p. 53, table 15). Considering that structure K42 was initiated in the Early Classic, while K39 appears to have been erected in the Late Classic, this might reflect that the K40 patio group was initiated in the Early Classic – a time in which

many lineages in Chan cahal acquired some wealth -, but saw intensive construction episodes during the Late Classic, hence suggesting the wealth of this patio group reached its maximum during this period. Nevertheless, since only a small portion of this structure has been investigated and most of the K40 patio group's structures did not see any excavations, we should be cautious in making any statements concerning this group, though the proportions of Late Classic material in contrast to the few early Classic artefacts do hint at more activity in this period (LICHTENSTEIN 2000, p. 57-58).

Structure **K44** was not physically connected to the K40 patio group, but was still closely related to it as suggested by its proximity alone. It most likely functioned as a kitchen structure or a storage shed.

It is unclear whether or not the structure K40 patio group outlasted the Late Classic period. So far, no Terminal Classic diagnostics were uncovered at this patio group or its ancillary building, but this could also be attributed to the limited investigations here. In this case, more extensive excavations should be considered, as these could give us a more insights in the changes that occurred during the later period of Chan Cahal's existence, the development of strong lineages and power in Chan Cahal and Blue Creek during the Classic period, as well as give us a better idea of how exclusive the position of the U5 plaza complex was.

Recourses

Chan Cahal possessed some chert crops which were never exploited by its people who preferred to use imported chert from specialized lithic exporters such as Colha. Interestingly, by the Late Classic, the people living in the Río Hondo compound did craft tools from these crops (BARRET 2006, p. 139-141; CLAYTON 2013, p. 186). Chan Cahal's preference for imported lithics might be explained because of the difference in quality, which was much higher for the imported ones than those available within the Blue Creek polity (BARRET 2004, p. 112-113; 2006, p. 133-134). However, it might be that other - less easily discernable - factors such as ideological and religious aspects also contributed to Chan Cahal's reluctance in using these recourses (CLARKE 1968, p. 114-119).

Fig. 17: Various ditched field complexes alongside the Río Hondo

The area of the Río Hondo river has long been known to be rich in ditched and elevated field complexes (Fig. 17; DENEVAN 1982, p. 196; GUDERJAN & KRAUSE 2011, p. 128-134; TURNER & HARRISON 1978, p. 360; SIEMENS 1982, 211-219). In considering why certain agricultural systems were or were not constructed, Denevan (1982, p. 181-182) states that there are two key issues to take in account: a techno-cultural (availability of the technological requirements) and an economic (cost and benefit analysis) aspect. Since we have already attested that many other ditched fields systems were built during the Late Preclassic era, the techno-cultural aspect must have been already available for a long time in this part of the Maya world. Hence, we must seek for economic reasons why this complex was only constructed in the Late Classic era. In other words: the reason that these were not being constructed earlier is that the costs of constructing and maintaining these ditches were esteemed higher than its profits.

In fact, we have a good idea of why the ditches at Chan Cahal were constructed and why this was done only by the Late Classic. By the Late Classic, human activity had greatly impacted the land, resulting in a degeneration of the upland grounds, which due to erosion could be washed down the escarpment (LUZZADDER-BEACH & BEACH 2009, p. 5). Furthermore, the rising water table made that the soils of the wetlands became saturated with gypsum, sulphate and calcium, which was hazardous to the crops (Fig. 18; LUZZADDER-BEACH & BEACH 2009, p. 21). The construction of the ditches effectuated the water table to drop in these fields, while excess rainwater would furthermore wash away more of the detrimental substances in the

subsoil (BEACH *et al*. 2009, p. 1721; 2012, p. 3649; LUZZADDER-BEACH & BEACH 2009, p. 22). Interestingly, the ditches of the ditched field complex directly north of Chan Cahal are all directed towards a central reservoir (Fig. 19). Beach *et al*. (2013, p. 52) have suggested this could have been used as a water reservoir. However, it is possible that the water that would stream into this reservoir had brought a considerable amount of gypsum, sulphate and calcium, making it virtually useless. Therefore, an alternative hypothesis should consider the possibility that this reservoir was intended to collect the hazardous elements of the subsoil.

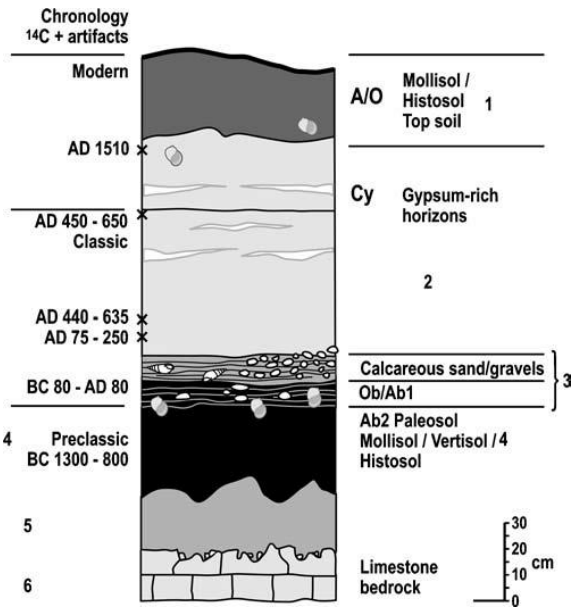

Fig. 18: Stratigraphy of the ditched fields (note the high accumulation of gypsum during the Classic period)

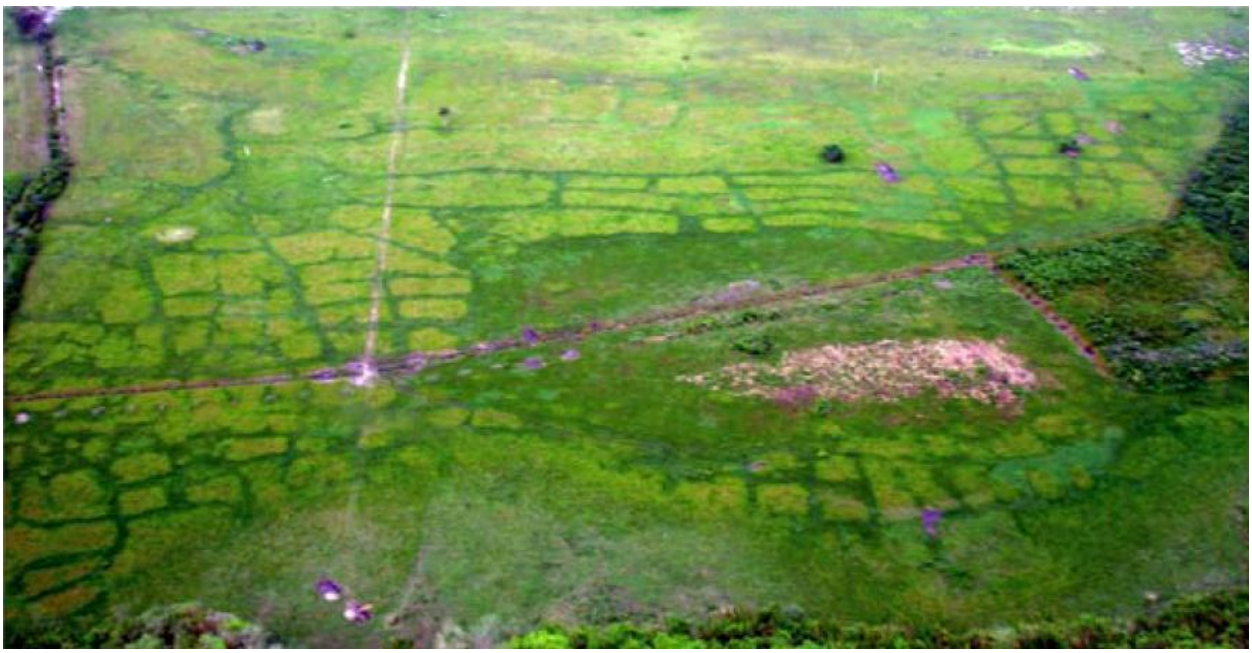

Fig. 19: Reservoir in Chan Cahal's ditched field complex

Evidently, the water in these ditches would provide the possibility to irrigate the fields as well (e.g. BAKER 2003, p. 177; DENEVAN 1982, p. 188 & 189: fig.4; JACOB 1995, p. 187). In 1997, a dam was discovered near one of the springs adjacent to the ditched fields (BAKER 2003, p. 209). While it is presumable that this feature was intended to divert and store the water of this spring, during the subsequent field season in 1998 it was found that this trait had

been destroyed by land clearing, hence no detailed description of this dam is available, nor could its function or construction date be ascertained. Furthermore, the ditches would have allowed easy canoe travel in the field complexes (GUDERJAN & KRAUSE 2011, p. 129; see also SIEMENS 1982, p. 214).

The high amount of pomacea shells suggests that the drains of this complex were being used to grow aquatic species (BAKER 1997, p. 75, 216 & 220), something that is furthermore confirmed by the net sinkers found in some of the excavated ditches (LICHTENSTEIN 2000, p. 47; POPSON *et al.* 1998, p. 2; see also TURNER & HARRISON 1978, p. 351; SIEMENS 1982, p. 217-218). The fact that the high amount of pomacea shell is only detected in some of the excavations in the ditches suggest that some parts of it were deliberately enclosed to facilitate the cultivation of aquatic species. Finally, the ditches would also impede rodents and terrestrial insects to access and damage the crops that were grown here (SIEMENS 1982, p. 218).

The Chan Cahal ditched fields cannot be seen from the ground. Occasional flyovers - which ideally are carried out after the start of the annual rainy season, when the contrast between the green ditches and more green-yellow fields are the highest - are the main instrument to investigate these features. The exact extent of the Chan Cahal ditched fields is unclear since various factors, including overgrowth, soil disturbances and erosion, greatly impede their visibility (BEACH *et al*. 2013, p. 52; GUDERJAN & KRAUSE 2011, p. 133). Because of these difficulties it is unclear whether the four portions of ditched field complexes near Chan Cahal were connected.

Fig. 20: BOP-ditched field complex (note the symmetrical and organized layout)

In comparison with some other ditched field systems in the Maya area, the composition of those at Chan Cahal appear highly irregular and unorganized. While it could be expected that this reflects a more haphazard and undelegated construction of these fields, parallels with similar ditches constructed in New Guinea during the twentieth century illustrate that even without much organization, very symmetric ditches can be

constructed (BAKER 2003, p. 170-171). Conversely, irregular ditches do not necessarily have to attest of a lack of delegation and planning. Various portions of the Chan Cahal ditched field complex show differences in shape. While for instance the most Chan Cahal ditched fields are quadrangular, the portion directly west of Chan Cahal has more elongated fields (Fig. 20; BAKER 2003, p. 207). This could reflect that construction occurred independently, but more practical reasons such as variations in the ground water table should be envisioned as well (BAKER 2003, p. 228-229).

Discussion

Regardless of its subjugation, Blue Creek was economically thriving during the Late Classic period. In fact, it is suspected that it never had as high a population density as it did in the Late Classic (GUDERJAN 2007, p. 92). Its elite class expanded exponentially as well (GUDERJAN *et al.* 2003a, p. 16). Since this conspicuous and non-producing class became larger and thus posed a bigger stress on the producing class, this might have become one of the major problems when in the Terminal Classic, environmental problems led the farmers to produce less crops.

Nonetheless, Chan Cahal's population estimate declines with about 20 percent, as the presence of only 150 persons was projected for the Late Classic (see p. 106). This downfall should not be regarded as a sign that the situation at Chan Cahal was becoming problematic. Indeed, we see less indications of a wealthy status in most households, but this can be explained by the fact that a few acquired the majority of the profits, while the large majority could only meet their basic needs. The major reason for this demographic diminution is that during the Early Classic-Late Classic transition, the people connected to the Imcolel complex, located in the south of the compound, left their original homes. As already discussed, this is likely to have had political rather than social or economic reasons.

Patricia McAnany (1995, p. 136) has stated that the loss of independence of a polity often posed a considerable burden on its households. It should be kept in mind that the elite control over the commoners could vary from polity to polity and the effects of subjugation on households should therefore be evaluated on a site to site basis (GONZÁLEZ 2013, p. 165).

Nevertheless, for Chan Cahal, the subjugation period indeed brought an impoverishment of the common people. Power in Chan Cahal became more exclusive in the Late Classic period, with all of the might and wealth centred in the U5 plaza complex, possibly with the K40 and K32 patio group as the only other places which exhibit a more affluent position. Both patio groups require more extensive excavations though. The lack of construction episodes, exotic or conspicuous goods and internments in all other residences not only suggests that these extended families were in less of a position to accumulate wealth, but also that individual status was not being acquired anymore.

Regardless of the wealth becoming less dispersed, Blue Creek and Chan Cahal appear to have had a profitable economy. This all came to pass during the Terminal Classic.

Terminal Classic

For many Mayanists, the Terminal Classic remains one of the most fascinating epochs in the Maya past. This period must have been one of great problems and distress since many centers of the central and southern lowlands, including Blue Creek, were being abandoned. While the specifics of this depopulation still remain a highly debated topic, current thinking links these events with a major drought, which supposedly initiated famines, intensified warfare, peasant revolts, and the collapse of sociopolitical stability and trade routes.[44] However, a few major centers – Lamanai being the one closest to Blue Creek - did in fact outlast the Terminal Classic period and even continued to thrive throughout the Postclassic (GRAHAM 2004, p. 226-239).

Abandonment of the lowlands followed various patterns: some cities such as Palenque (MARTIN & GRUBE 2008, p. 175; STUART & STUART 2008, p. 235-239) gradually faded away, while others like Aguateca (INOMATA & STIVER 1998, p. 433-444) or Caracol (CHASE & CHASE 2004a, p. 348-350) witnessed a more abrupt and violent ending. This illustrates that various reasons for the abandonments should be sought and that different polities reacted in different ways to the changes that were occurring during the Terminal Classic (AIMERS 2007; DEMAREST *et al*. 2004; WEBSTER 2002, p. 260-294). Generally speaking, the abandonment of sites in northwestern Belize appears to have been rather gradual compared to some other regions (AIMERS 2007, p. 332 & 335-336). In Blue Creek we can even discern different compounds responding in various ways, some profiting of the downfall of other compounds (For a detailed description of the internal power shifts in Blue Creek during the Terminal Classic, see GUDERJAN & HANRATTY 2007; VAN DEN NOTELAER 2013). The Rosita compound even appeared to thrive throughout the Terminal Classic with new and innovative constructions being carried out throughout this period and Ya'ab Muul as well appears to have attracted new people while other compounds were being depopulated. Nonetheless, by the beginning of the Postclassic period, all of Blue Creek's compounds were forsaken.

[44] While the literature on this topic is vast and continues to grow, David Webster's 2002 book *The Fall of the Ancient Maya: Solving the Mystery of the Maya Collapse* still provides a relevant discussion and overview on the theories about the causes of the Maya collapse.

Terminal Classic Cluster A

The **U5** plaza complex continued to express its social position by continued architectural expansions and other deposits. Its circular structure was razed and replaced by a large rectangular room which – in contrast to the main structure – had a perishable thatch and wooden roof (GIACOMETTI 2001, p. 14). The central structure of U5 as well saw modifications as a third bench was implanted in its front room, while a portion of one of its walls was destroyed and rebuilt (GIACOMETTI 2001, p. 14). At the same time, a new structure was erected at the north side of U5, which due to bad preservation remains elusive, though it appears to have been less monumental than the rest of the U5 complex. Finds related to this addition include storage jars and fragmentary remains of a very badly preserved burial.

The central structure of U5 also yielded two burials, both tightly flexed and without any apparent grave goods. A first interred in a pit in the back room's floor was badly deteriorated, making it hard to discern the further specifics of this internment. Though no grave goods were uncovered, one metate was found covering the fill of the grave's shaft (GIACOMETTI 2001, p. 15). The second burial was found intrusive in one of the benches of the front room and had a much better preservation. Intriguingly, no head was found with this burial. Though such decapitated, tightly flexed human remains are very reminiscent of the human sacrifices reported by the colonial Spaniards, other hypotheses should be considered too. Similar situations in which the deceased is missing his head do appear in several contexts, all in elaborate burials (FITZSIMMONS 2011, p. 64; MARTIN & GRUBE 2008, p. 35-36; MCANANY 1995, p. 62-63). Importantly, the head was seen as the most distinct element of the human body, having religious capacities that continued to live on after death (FITZSIMMONS 2011, p. 66 &68-69; HOUSTON *et al*. 2006, p. 71-72). The re-entering of tombs of powerful, often royal, lineage members is something that is attested by both epigraphic and archaeological evidence (ASTOR-AGUILERA 2010, p. 33-34; FITZSIMMONS 2009, p. 142-162; NOVOTNY & KOSAKOWSKY 2009, p. 75-76). Furthermore, the sixteenth-century Spanish friar Diego de Landa (1987, p. 57) tells of heads of important persons being preserved, displayed and revered in Colonial times. In Classic times, the heads of important lineage members were sometimes temporally removed from the tomb in order to be used in rituals and ritual dances (Fitzsimmons 2009, p. 166-169; HOUSTON *et al*. 2006, p. 71-72). Such performances can easily be imagined in the case of the structure U5's burials as well. The ascertainment

that the opening of neither of the burials was properly re-plastered or enclosed in another way other than the provisional filling, seems to suggest that these internments happened not long before the abandonment of the complex.

A great concentration of material with signs of burning - consisting mostly of ceramics, but also containing for instance one pink marine shell bead and a partial vessel with pseudo-glyphs - was discovered near the central and western structure and appears at least partially to represent an intentional deposit rather than a concentration of garbage (GIACOMETTI 2001, p. 14-15). This context greatly reminisces the termination deposit found at Chum-Balaam-Nal (PRESTON 2011, p. 14-15). This ritual deposit likewise marked the end of occupation of an important residential composition and also showed a great amount of smashed material which appears to have been burned afterwards. Both have a lower artefact density compared to the termination deposits of the Central Precinct and Kín Tan.

In the place where the headless burial was discovered, the material of the termination deposit was pushed aside. According to the excavator, this suggests that the internment dates to after the abandonment of the U5 complex (GIACOMETTI 2001, p. 15). Though this is a possibility – ephemeral Postclassic reoccupation after the depopulation of the Terminal Classic has been attested -, the material could also have been replaced due to a reopening of the burial.

As already discussed in the previous chapters, ancillary structure **U6**'s construction episodes could not be dated. No special non-architectural features such as burials or ritual deposits of Terminal Classic date were retrieved, though ceramic evidence suggests that this structure was still in use (KOSAKOWSKY 2002, p. 1).

No architectural modifications were carried out at structure **U8**, but the presence of Terminal Classic occupational ceramic debris indicates that it was inhabited (KOSAKOWSKY 2002, p. 1).

The three constructions of this Terminal Classic cluster are very diverse. Nevertheless, all three continue to carry on the pattern they exhibited during the Late Classic. There were presumably more structures inhabited in this cluster, but more excavations are necessary to confirm this. To mark the end of occupation at structure U5, a termination ritual was

conducted. Such rituals are found at various high-status residences throughout Blue Creek and the entire Maya world. Archaeologically, these rituals are visible by vast quantities of smashed material. From an economic perspective, these rituals were very conspicuous – one found at Kín Tan for instance comprised almost 235 kg of ceramic material alone (HANRATTY 2008, p. 35-38). We must however also be aware of the possibility that several households were contributing to a single ritual (see also BROWN *et al*. 2002, p. 85-92). Consequently, while in such situations a ritual linked to a certain house might tell us something about the social position of its residents, it does not necessarily reflects its economic situation. Various construction efforts conducted at the U5 plaza complex do hint at a wealthy economic position, but it is unknown how much time passed between the architectural modifications and the dilapidation of U5.

Terminal Classic Cluster B

Terminal Classic Cluster B continues to exhibit the same pattern that it did in the Late Classic. All structures that appear to have been inhabited during the Late Classic, namely U9, U14 and U18 – continued to yield signs of Terminal Classic occupation. As discussed in the Late Classic chapter, modern disturbances made it hard to discern activity after the Early Classic at U17, though this thesis will consider this structure to have been inhabited during the latter periods. Following the pattern of the Late Classic, no burials, construction episodes or signs of wealth or status were retrieved from either of its structures. As had been the case in the past, this cluster housed basic farmers who showed little signs of affluence.

The Northwestern Cluster

Structure **U65** yielded very little data which attested to Terminal Classic activity. In fact, the lack of construction efforts and scarcity of artefacts postdating the Early Classic made that it was initially thought to have been abandoned during the course of the Early Classic era (LICHTENSTEIN 1999, p. 66). Later re-analysis of the material however has suggested occupation throughout the entire Classic period (KOSAKOWSKY 2002, p. 3). Nonetheless an

impoverishment is apparent, which makes that the U65 patio group is in accordance with the evolution apparent in most of Chan Cahal's residences.

Shrines in Central Chan Cahal

The **L9-L10** complex yielded Terminal Classic diagnostics, but no architectural modifications were performed to this structure during this period. One burial chamber, intrusive in a Late Classic architectural construction phase, was uncovered here, but since it was not excavated it is unclear whether it is of a Late or a Terminal Classic date (GIACOMETTI 2001, p. 5; LICHTENSTEIN 2000, p. 56-57).

Throughout their entire history, the shrines in central Chan Cahal evolved parallel to each other. This holds true for the Terminal Classic as well, as both **U11** and **L1** have attested Terminal Classic activity (GIACOMETTI 2001, p. 4). Moreover, the encountered material does not attest to a substantial change during the transition between Late and Terminal Classic. Both structures retained their ritual function, did not undergo architectural modifications, and did not have a different artefact assemblage indicative of a change in the nature of the rites performed. Both structures appear to have been forsaken without much ado with the abandonment of the settlement, as no signs of abandonment ritual or such were uncovered.

Patio Groups in Chan Cahal's Southwestern Frontier

Chan Cahal's southwestern portion poses an image that is in accordance with the rest of the compound. All structures that were inhabited during the Late Classic were still in use at the beginning of the Terminal Classic, but none showed evidence of outlasting it. Furthermore no noteworthy aspects of Terminal Classic date, such as burials, construction episodes, or other special contexts, were encountered at structure K32, K39, K42 and K44. While this follows the tendencies of most other Terminal Classic activity zones, it should be kept in mind that excavations were very limited here, hence it is possible that more remarkable Terminal Classic contexts in this zone have gone unnoticed.

Ditched Fields as Indicators of Abandonment

Ditched field systems require a high maintenance as they can quickly fill with sediment. Analysis of contemporary ditches in Mesoamerica illustrate that ditches have to be cleansed between twice a year and every three years to prevent them from clogging (BAKER 2003, p. 172-173). This makes that the filling in of those ditches can give us a good idea of when these stopped being maintained.

Analyzed samples of the sediment in the ditches suggest the filling in had started at least by 1000 BP, which corresponds with the end of the Terminal Classic (BEACH *et al*. 2012, p. 3649). The dilapidation of Chan Cahal's ditched field system appears to have coincided with the abandonment of the compound – which is indeed not all too surprising.

Since there is evidence of Postclassic reoccupation in Chan Cahal's residential area, it is possible that these fields witnessed some cultivation at that time as well. Remnants of a wooden field house have been discovered at fields located approximately 6 km south of Chan Cahal and have been dated to the beginning of the Postclassic (PRESTON & MAJEWSKI 2010, p. 52). This illustrates that abandoned farmlands were sometimes reclaimed during Postclassic reoccupations. Such small wooden field huts should furthermore be envisioned for most if not all farmlands, though they have small chances of having been preserved.

Abandonment – With Which Prospects?

While at the start of the Terminal Classic there was no visible discontinuity with the Late Classic period, at the end of this approximately 150 year period, Chan Cahal – and entire Blue Creek for that matter – was completely abandoned. Just like the causes of the collapse, the faith of the Terminal Classic people is not entirely agreed upon, with theories comprising massive starvation, small portions of people fleeing into the forest or to nearby cities, or a massive migration towards the cities of northern Yucatán such as Chitzen Itza or Uxmal (migrations to the highlands of southern Guatemala have been suggested as well, but are due to the great distance less likely for Blue Creek). While this is not the place to discuss the large scale transformations that occurred during this period in great detail, a detailed

analysis of the abandonment contexts will prove to be helpful in investigating how Chan Cahal fared during these transitions.

Recently, the work of Maxime Lamoureux St-Hilaire (2011; 2013) has tried to discern the implications of the on-floor assemblages of abandoned Maya residences. His basic premise is that people tend to leave their houses in different conditions depending on their future prospects: if they plan never to return, they will leave their homes in a different condition than if they plan to return after a few weeks, months or years, and this can ideally be read in the archaeological contexts. This is a new approach in Maya behavioral studies, and will therefore need to be tested in a wide range of contexts, and possibly be adjusted. Nonetheless, it has much potential in understanding not only the Classic Maya collapse, but also that of other apparent abandonments.

When we apply this to Chan Cahal, one of the most revealing abandonment deposits is the large concentration at U5, which has been hypothesized to have been a termination deposit. Such rituals were intended to kill the building's Ch'ulel – a concept similar to that of a soul, which is inherent in both humans, animals, and inanimate objects -, though in some contexts it was followed by a rededication ritual, invoking a renewed Ch'ulel to the building, making it functional again (FREIDEL *et al*. 1993, p. 234-235; LAMOUREUX ST-HILAIRE 2011, p. 18-24; MILLER & TAUBE 1993, p. 163-164). Though there is indeed a Postclassic reoccupation at U5, no such rededication is apparent, making it probable that the intention of the termination ritual was indeed never to return, or at least having no prospects to return very soon. This reoccupation also makes that the on-floor deposits could have been intensively disturbed – how intensively is unsure, since the exact length of the reoccupation is debatable and could range from a day or two to maximum a few years.

It is important not to look only at the data of the most elaborate complex of Chan Cahal, the humble house mounds also deserve attention. Not all excavations have been extensive or documented in great detail, which is indispensable for this approach. Because of this, only the (unpublished) field drawings of the 1998 sojourn will be used.[45] Interpretation is furthermore hindered by disturbances that were either natural, such as bioturbation or

[45] The detail in the Popson & Clagett 1999 report would also allow such an analysis. However, all structures excavated during this campaign were coincidentally abandoned during the Late Preclassic period. Evidently, looking at these context would therefore learn us little about the changes that were occurring many centuries later, and are thus not studied from this perspective here.

flooding, or human, which is certain for modern times and possible in Postclassic times. After closer examination of the available sources it has been decided that only structure U9 was suitable to be approached from this perspective.

The on-floor assemblage of structure U9 consisted of four scattered concentrations of refuse material, though smaller fragmentary portions of garbage were also uncovered. These fragmentary portions could have been disturbed parts of the concentrations, or they could have been deposited separately. Furthermore a large concentration of pomacea shells was situated at the corner of the structure. For this approach, the location of the material is vital. The concentrations of material are scattered randomly throughout the entire structure. If the material would have predominantly been retrieved from the sides of the structure, this would be suggestive of pots and other material being placed on wooden shelves that decayed, hence indicating the inhabitants of this structure planned to return after some time, but did not (LAMOUREUX ST-HILAIRE 2013). Conversely, the people of structure U9 did not anticipate a quick – if any – return. The concentration of shell material is in fact situated close to a wall, but this should be approached differently. Firstly, it is uncertain whether these shells concern a human deposit, or that the wall just happened to be an attractive location for these snails. Unfortunately, it is not reported if the shells were "opened", indicative of consumption. If it would concern a human deposit, it is more likely to have been a post-abandonment refuse deposit rather than a storage of food-items since these snails were cultivated abundantly in Chan Cahal and would therefore not have to have been stored in great quantities. The lack of ceramic material in the pomacea shell concentration likewise debunks the hypothesis that these were stored on a shelve that collapsed. This data hints that no noteworthy material was left when the people of U9 left their homes and that the material found here was garbage deposited after abandonment by people of nearby structures. Consequently, U9's people appear not to have anticipated a swift return.

Only two structures have been examined to get an insight in the prospects of Chan Cahal's people during the Terminal Classic exodus, which is very little to make allocations on a compound-level. Nonetheless, considering that the depopulation was an interregional phenomenon, the supposition that this depopulation was one in which a return was not anticipated, is a valid one, and is now supported by the data from structures U5 and U9. If not looking to come back, where would these people have settled? Though unverifiable, it is

likely that some of them initially did not move outside the Blue Creek area. Some compounds, specifically Rosita and Ya'ab Muul, appear to have profited from the declining power in the upper elite regions of Blue Creek to reinforce their own position (VAN DEN NOTELAER 2013, p. 85-86). This is amongst other things illustrated by the construction of new commoner house mounds in these places, contrasting with the pattern of depopulation in the other compounds. It is not unthinkable that many of Chan Cahal's migrants chose not to move too far away and settled in these areas. If they did, it was not a successful relocation, since after a while, these compounds became derelict as well. Some of them could also have moved to the nearby city of Lamanai, a city which interestingly had comparable economic affiliations as it also relied heavily on wetland agriculture and (inter-) regional trade – which would have made for a less invasive transition -, and retained a strong position throughout the entire Terminal Classic and subsequent periods. Furthermore, as already discussed, migration to the North and into the forest are amongst the possibilities as well.

Discussion

The Terminal Classic was a catastrophic era in which cities and settlements were massively depopulated. Some polities, virtually all of them located near rivers or other bodies of water, persisted though (AIMERS 2007, p. 351; LUCERO 2002, p. 821). Whatever the reason of this survival – a combination of water consumption, irrigation water and riverine trade routes seem fairly convincing – it did not suffice to ensure the survival of Blue Creek.

If one was to look at Chan Cahal's Terminal Classic data as an isolated case, the encountered impoverishment might be interpreted as one of the symptoms of the oncoming depopulation. Nonetheless, when seen in its chronological context, it becomes apparent that there is actually little difference between the Late and the Terminal Classic data: only the U5 plaza complex underwent invasive architectural modifications and exhibited signs of wealth, while other residential units did not yield signs of an elaborate status and its people were not able – or uninterested – to invest in construction efforts. While time periods such as Late or Terminal Classic are useful, and the fact that these periods roughly overlap with ceramic complexes can be beneficial, it should always be kept in mind that ceramic complexes should not be equated to social, political or any other changes.

Following the Late Classic period, there is little to suggest that new people were immigrating into this region or that there was a significant population growth. In fact, the Terminal Classic demographic estimate of 139 persons is very close to that of the Late Classic, for which 150 people were calculated (see p. 106-107). The estimate of 139 might appear very high in regard to the downward demographic spiral in this period. Due to the nature of our estimate, which was not able to incorporate a calculation for the Terminal Classic depopulation since it remains unknown how rapid this decrease was, this estimate is one that adheres to the situation at the beginning of the Terminal Classic. We know that population had decreased to zero at the end of this period, but when this decrease started, and how long it took to come to an end, cannot be ascertained.

Conclusion

The approach adopted in this research firstly focussed on a detailed analysis of the individual structures as to work our way up to the analysis of the entire Chan Cahal compound. As an intermediate between the nucleated family or household and the entire community, clusters of extended families were hypothesized to be an important socio-economic element. While the main way of discerning these extended families by locating clusters of structures in close proximity to each other does allow for errors and misinterpretations, most extended family clusters have their own distinct character – especially in the periods before the Late Classic -, which does seem to suggest that the discerned clusters adhere to a specific socio-economic entity.

The earliest evidence of activity of Chan Cahal dates to the Early Middle Preclassic. The little data belonging to this period encountered here is suggestive of a small egalitarian community living in perishable structures and is concentrated in the northern portion of the later compound – with the exception of one ceramic sherd found in relation to structure L20. They would mainly have been subsistence farmers, though their main activity would have been interspersed with a fair amount of hunting and gathering. Since we have proof of activity starting in the Early Middle Preclassic, Chan Cahal appears to have been the earliest inhabited zone of Blue Creek. The Blue Creek polity thus appears to have been initiated as an agrarian settlement, and only later an institutionalized inequality emerged and with it the dichotomy between a ruling class and a producing class.

This pattern generally carries on in the rest of the Middle Preclassic. In fact, every structure that yielded Early Middle Preclassic material appears to have been occupied in the rest of the Middle Preclassic era and vice versa. While all other contexts suggest the presence of perishable constructions, the U50 structure was already built atop a non-perishable substructure during the Middle Preclassic. Apart from Chan Cahal, some Middle Preclassic contexts in the site core hint a small population was budding in here as well. There were no signs of permanent construction dating to this period, but finds such as obsidian suggest that these people had access to interregional trade routes. Since such items are not found in Middle Preclassic Chan Cahal, the base for later power relations might have already been laid out.

In the Late Preclassic, Blue Creek emerged as an important node between the Belizean coast and the Petén region and as a producer of agricultural surpluses. This corresponds with a substantial population in the inhabited areas and the initiation of new compounds. As in many other contemporary places in the Maya world, this also brought forth institutionalized inequality, both on a polity and a compound level. Thanks to, or despite this elite class, the farmers in Chan Cahal also got hold of a certain amount of wealth. This is true for both clusters that were inhabited in the Middle Preclassic, though there is some difference in how this wealth was divided within them. For both of them however, there are some residences that had a privileged socio-economic position. It is not unthinkable that these were the homes of the lineage heads or other people who had some authority in the cluster. Both clusters appear to have grown in population compared to the Middle Preclassic. The population growth of Chan Cahal is not only discernable in the earlier inhabited clusters, but the compound's southern section as well appears to have been inhabited from this period on. No clusters could be discerned in this newly inhabited area during the Late Preclassic, which could be a reflection of its social organization, but could also be attributed to the fact that less excavations were conducted here or because much of the residences in this period could still have been simple huts without a supporting substructure, and therefore might have gone unnoticed.

As time passed, the southern portion of Chan Cahal became more densely populated. In fact, much of the power – both social, economic, political, religious and symbolical -, became concentrated in this southern portion by the Early Classic. Not all power arose from the same processes though. The power exhibited by for example the lineage connected to the Imcolel complex, operated on a lineage level. This makes that the members of this family had a privileged position because of the prestige of the lineage, even if the individual lacked charismatic or diplomatic qualities. Another way to prestige was the individual one. Despite the relatively low position of their family, some people could acquire a high socio-economic position by personal achievements. The most expressive utterance of individual prestige in Chan Cahal is certainly the burial in structure U11, though less elaborate examples, demonstrating the differences in acquired prestige, are apparent as well. Overall, exotic and prestigious goods seem to have been fairly easily accessible to the people of Chan Cahal, which might have been due to Blue Creek's position near an important trade route. The

expressions of wealth and status aside, Chan Cahal's organization relied heavily on the exploitation of agricultural grounds. The economy of Blue Creek was focussing in no small part on the exportation of the surpluses produced in the farmlands near Chan Cahal and other compounds. This suggests these fields were controlled by elites, while the farmers who toiled these lands also cultivated house gardens to meet their personal needs.

While great shifts occurred in the political organization of Blue Creek during the transition from Early to Late Classic, its economic base appears to have been retained – its thriving economy may in fact have been one of the reasons why another polity wanted to subjugate it. While the economic output of Chan Cahal did not undergo much changes during this transition, its internal socio-economy did witness a heavy transformation. The lineage located south of the compound left their homes, and the created power vacuum was quickly filled by the people living in the U5 plaza complex. These people seem to have controlled the fields north of the compound and heavily profited from its economic gains, while the rest of Chan Cahal's inhabitants appear only to have been able to fulfil their basic needs. Archaeological data indicating wealth or high status, such as burials, construction efforts, or prestigious goods, became virtually absent in the majority of Chan Cahal's residences.

The pattern exhibited during the Late Classic was maintained throughout much of the Terminal Classic period. All power and wealth was still concentrated around the U5 plaza complex, while the rest of the people living in this compound left behind traces typical for impoverished farmers with little evidence of affluence. The collapse that was occurring throughout much of the lowlands did not leave Blue Creek unaffected. Slowly, all of its compounds, including Chan Cahal, were deserted. The exact pace of this process cannot be ascertained, but the fact that some abandoned structures were used as garbage disposals of household refuse from other nearby structures illustrates that this was no massive overnight depopulation. There is no clear pattern of economic decline in the Terminal Classic data of Chan Cahal. This does not mean there was no such downward spiral, as the vast majority of the residential structures already appeared economically depleted since the start of the Late Classic, and the U5 structure which did yield signs of opulence, might have done so to express its social position, even in times of economic decline. Furthermore, the major drought and the vanishing trade routes would have made that Blue Creek's economy was

unable to support their elite class. It is likely that these same problems lead to Chan Cahal's people leaving their homes in search for better prospects.

One of the main goals postulated at the beginning of this thesis was to contradict one of the main stereotypes of Maya commoners: that these constitute a homogenous, passive, stable, and to put it bluntly, rather uninteresting aspect of Maya society. At the end of this thesis, it should be apparent that neither of these prejudices are true, as clearly demonstrated by the Chan Cahal data. In regard to the enrichment of its lower social components, one researcher even referred to Blue Creek's population as defying the boundaries of standard Mayanist interpretations (SCHAEFER s.d., p. 7). The Chan Cahal data is indeed exceptional, but it should be kept in mind that Maya archaeology only recently began throwing off the yoke of a top-down, elite-centered approach. It is hoped that in the future, more comparative detailed data on agricultural compounds will emerge, so that it will be possible to get a better idea of how exceptional Chan Cahal's position and Blue Creek's organization actually were.

Appendix: Population Estimate Calculations

Late Preclassic

Counted residential structures:

- U2, U5, U8, U9, U14, U17, U18, U19, U44, U49, U50, U54, U62, U65, U69 & L24.

X = 16

#population count = 5,5*[1,8*x + 0,33*(1,8*x) – 0,10*(1,8*x + 0,33*(1,8*x))]

#population count = 5,5* [1,8*16 + 0,33*(1,8*16) – 0,10*(1,8*16 + 0,33*(1,8*16))]

#population count = 5,5* [28,8 + 0,33*28,8 – 0,10*(28,8 + 0,33*28,8)]

#population count = 5,5* [28,8 + 9,504 – 0,10*(28,8 + 9,504)]

#population count = 5,5* [28,8 + 9,504 – 0,10*38,304]

#population count = 5,5* (28,8 + 9,504 – 3,8304)

#population count = 5,5* 34,4736

#population count = 190

Early Classic

Counted residential structures:

- U8, U9, U14, U17, U18, U19, U44, U62, U65, L8, L9, L10, L11, L24, L25, L28, K32, K42

X = 18

#population count = 5,5*[1,8*x + 0,20*(1,8*x) – 0,10*(1,8*x + 0,20*(1,8*x))]

#population count = 5,5*[1,8*18 + 0,20*(1,8*18) – 0,10*(1,8*18 + 0,20*(1,8*18))]

#population count = 5,5*[32,4+ 0,20*32,4 – 0,10*(32,4 + 0,20*32,4)]

#population count = 5,5* [32,4 + 6,48 – 0,10* (32,4 + 6,48)]

#population count = 5,5* (32,4 + 6,48 – 0,10*38,88)

#population count = 5,5* (32,4 + 6,48 – 3,888)

#population count = 5,5* (34, 992)

#population count = 193

Late Classic

Counted residential structures:

- U5, U8, U9, U14, U17, U18, U65, L8, L9, L10, L11, K32, K39, K42

X = 14

#population count = 5,5*[1,8*x + 0,20*(1,8*x) – 0,10*(1,8*x + 0,20*(1,8*x))]

#population count = 5,5*[1,8*14 + 0,20*(1,8*14) – 0,10*(1,8*14 + 0,20*(1,8*14))]

#population count = 5,5*[25,2 + 0,20*25,2 – 0,10*(25,2 + 0,20*25,2)]

#population count = 5,5*[25,2 + 5,04 – 0,10*(25,2 + 5,04)]

#population count = 5,5*(25,2 + 5,04 – 0,10*30,24)

#population count = 5,5*(25,2 + 5,04 – 3,024)

#population count = 5,5*27,216

#population count = 150

Terminal Classic

Counted residential structures:

-U5, U8, U9, U14, U17, U18, U65, L8, L9, L10, K32, K39 & K42

X = 13

#population count = 5,5*[1,8*x + 0,20*(1,8*x) – 0,10*(1,8*x + 0,20*(1,8*x))]

#population count = 5,5*[1,8*13 + 0,20*(1,8*13) – 0,10*(1,8*13 + 0,20*(1,8*13))]

#population count = 5,5*[23,4 + 0,20*23,4 – 0,10*(23,4 + 0,20*23,4)]

#population count = 5,5*[23,4 + 4,68 – 0,10*(23,4 + 4,68)]

#population count = 5,5*[23,4 + 4,68 – 0,10*28,08]

#population count = 5,5*(23,4 + 4,68 – 2,808)

#population count = 5,5*25,272

#population count = 139

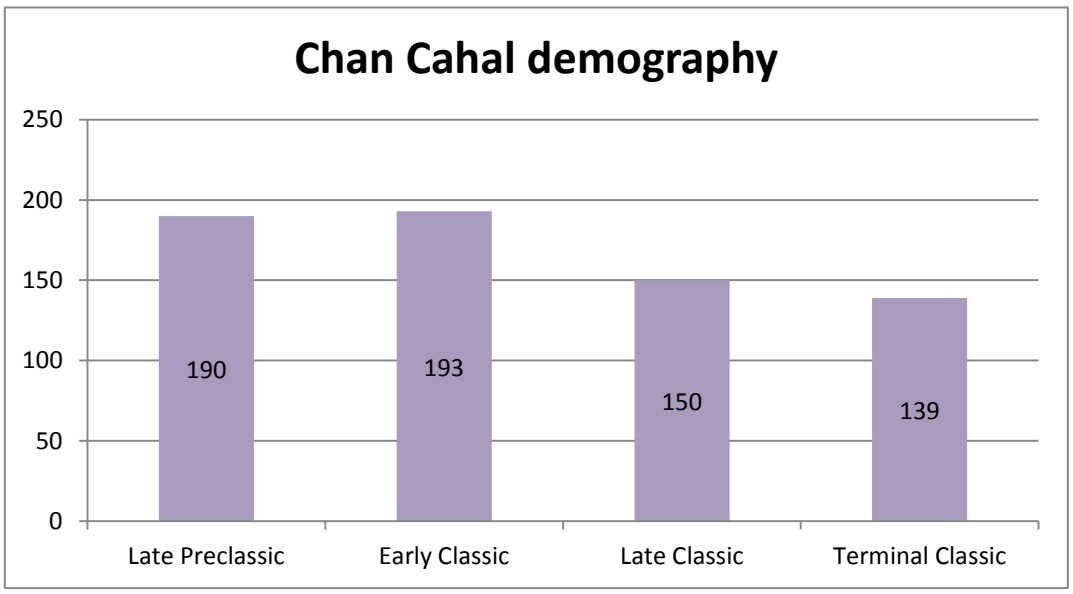

Fig. 21: Demographic evolution of Chan Cahal

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Fig. 1: Drawing by the author

Fig. 2: LOHSE 2007, p. 20: fig. 1.3

Fig. 3: KOSAKOWSKY & LOHSE 2003, p. 5: fig. 2

Fig. 4: Copyright Maya Research Program

Fig. 5: GUDERJAN 2007, p. 6: fig. 1.2

Fig. 6: LUZZADDER-BEACH & BEACH 2009, p. 6: fig. 2

Fig. 7: Copyright Maya Research Program

Fig. 8: Copyright Maya Research Program

Fig. 9: GIACOMETTI 2002, p. 108: fig. 8

Fig. 10: GIACOMETTI 2002, p. 109: fig. 9

Fig. 11: GUDERJAN 2007, p. 86: fig. 4.7

Fig. 12: Copyright Maya Research Program

Fig. 13: Courtesy of Antoine Giacometti

Fig. 14: Courtesy of Antoine Giacometti

Fig. 15: Courtesy of Antoine Giacometti

Fig. 16: Drawing by the author

Fig. 17: Google Maps

Fig. 18: LUZZADDER-BEACH & BEACH 2009, p. 16: fig. 5

Fig. 19: BEACH *et al*. 2006, p. 97: fig. 5.1

Fig. 20: BEACH *et al*. 2012, p. 3647: fig. 1

Fig. 21: Drawing by the author

Plate 1: Excel file by the author

Plate 2: Drawing by the author (note that this drawing is partially based on field sketches and could therefore contain some inaccuracies)

Plate 3: Drawing by the author (note that this drawing is partially based on field sketches and could therefore contain some inaccuracies)

Plate 4: Drawing by the author (note that this drawing is partially based on field sketches and could therefore contain some inaccuracies)

Plate 5: Drawing by the author (note that this drawing is partially based on field sketches and could therefore contain some inaccuracies)

Plate 6: Drawing by the author (note that this drawing is partially based on field sketches and could therefore contain some inaccuracies)

Plate 7: Drawing by the author (note that this drawing is partially based on field sketches and could therefore contain some inaccuracies)

Plate 8: Courtesy of Antoine Giacometti

Plate 9: POPSON & CLAGETT 1999, p. 77: fig. 31 & p. 79: fig. 32

Plate 10: POPSON & CLAGETT 1999, p. 74: fig. 29 & p. 75: fig. 30

Plate 11: Drawing by the author, based on GUDERJAN 2004a, p. 48: table 1 & p. 52: table 5 (note: only securely dated artefacts were included)

Plate 12: Drawing by the author, after LICHTENSTEIN 2000, p. 119: fig. 29

Plate 13: Drawing by the author, after LICHTENSTEIN 2000, p. 121: fig. 31

Plates

Plate 1: overview of excavations at Chan Cahal

Structure	Publication of excavations	Function	Alternative name	Operation n°	Early Middle Preclassic	Middle Preclassic	Late Preclassic	Early Classic	Late Classic	Terminal Classic
U-2	Popson *et al.* 1998	Residential	3E-21	BC 43 B						
U-5	Popson *et al.* 1998; Giacometti 2001	Plaza Complex	3E-24	BC 40 A - K						
U-6	Popson *et al.* 1998	Ancillary	3E-23	BC 43 A						
U-8	Lichtenstein 2000	Residential	3E-26	BC 39 G						
U-9	Popson *et al*. 1998	Residential	3E-27	BC39 F						
U-11	Giacometti 2001	Ancillary/Shrine?	-	CC 1 A-C						
U-14	Popson *et al*. 1998	Residential	3E-28	BC 39 A						
U-17	Popson *et al*. 1998	Residential	3E-30	BC 39 B					Disturbed by agricultural activity	
U-18	Lichtenstein 2000	Residential	3E-31	BC 39 D						
U-19	Popson *et al*. 1998	Residential	3E-32	BC 39 C						
U-35	Lichtenstein 1999	Unknown	-	BC 118 E				Unspecified eroded Classic		
U-37	Lichtenstein 1999	Unknown	-	BC 118 F				Unspecified eroded Classic		
U-38	Lichtenstein 1999	Unknown	-	BC 118 B				Unspecified eroded Classic		
U-44	Lichtenstein 2000	Residential	3E-34	BC 39 E-F						
U-49	Clagett 1997; Popson & Clagett 1999	Residential	3E-36	BC 28 D, F, J, M, N, O, Q, S & W						
U-50	Clagett 1997; Popson & Clagett 1999	Residential	3E-37	BC 28 B, E, G, H, I, K, L, P, R						
U-54	Lichtenstein 2000	Residential	3E-40	BC 39 I						
U-56	Clagett 1997; Popson & Clagett 1999	Refuse concentration	3E-42	BC 28 A & C						
U-62	Lichtenstein 1999	Residential	-	BC 112 D						
U-65	Lichtenstein 1999	Residential	-	BC 112 B						
U-68	Unpublished	Unknown	3E-43	BC 28 V	No diagnostic material					
U-69	Lichtenstein 2000	Residential	3E-44	BC 39 H						
L-1	Giacometti 2001	Ancillary/Shrine?	-	SH 7 J-M						
L-8	Giacometti 2001	Residential	-	SH 6 F & G					Disturbed by agricultural activity	
L-9	Lichtenstein 2000; Giacometti 2001	Residential	3E-11	BC 117 B						
L-10	Lichtenstein 2000; Giacometti 2001	Residential	3E-12	BC 117 C						
L11	Giacometti 2001	Residential	3E-13	SH 7 A-D						
L-19	Giacometti 2001	Ritual	Part of L-20 group	SH 7 E-L					Disturbed by agricultural activity	
L-20	Giacometti 2001	Ritual	Part of L-20 group	SH 7 E-L					Disturbed by agricultural activity	
L-21	Giacometti 2001	Ritual	Part of L-20 group	SH 7 E-L					Disturbed by agricultural activity	
L-24	Giacometti 2001; Giacometti *et al*. 2002	Residential	3E-4	SH 4 A-K; SH 5 A-E						
L-25	Giacometti 2001	Residential	3E-19	SH 6 A-C						
L-26	Giacometti 2001, 2002	Plaza complex	4E-2 / Imcolel	SH 1 A & B, SH 3, BC 123 C						
L-27	Giacometti 2001, 2002	Plaza complex	4E-3 / Imcolel	SH 2-3						
L-28	Lichtenstein 1999; 2000	Residential	4E-1	BC 123 A-B						
K-32	Lichtenstein 1999; 2000	Residential	3D-4	BC 116 A						
K-33	Lichtenstein 2000	Ancillary	3D-5	BC 116 C	Too scarce diagnostic material					
K-34	Lichtenstein 1999	Ancillary	3D-8	BC 116 B						
K-38	Lichtenstein 1999	Unknown	-	BC 117 A	No diagnostic material					
K-39	Lichtenstein 2000	Residential	3D-14	BC 116 D						
K-42	Lichtenstein 2000	Residential	3D-17	BC 116 E						
K-44	Lichtenstein 2000	Ancillary	3D-19	BC 116 F						

Plate 2: Chan Cahal: structure overview

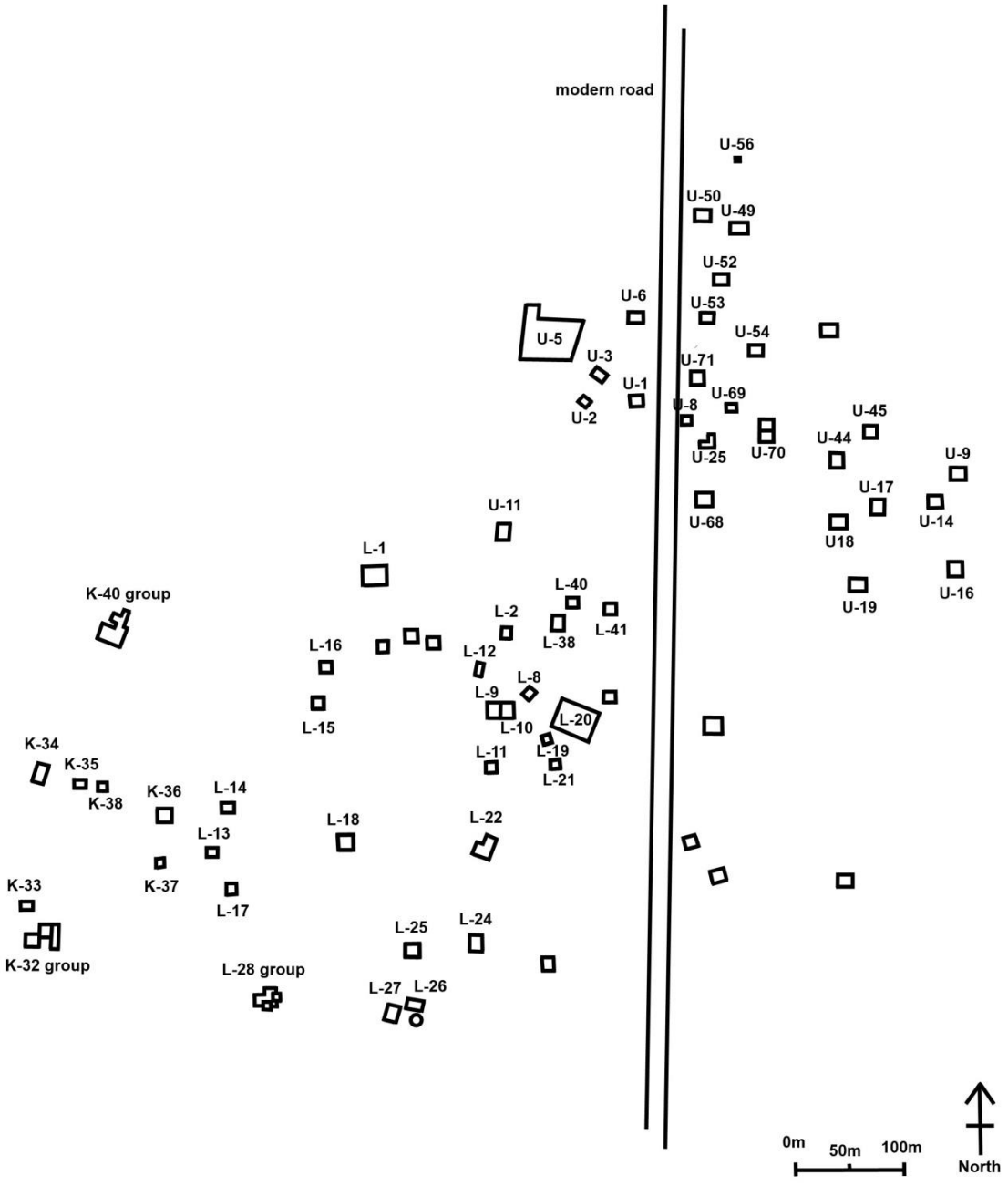


Plate 3: Chan Cahal in the Middle Preclassic period

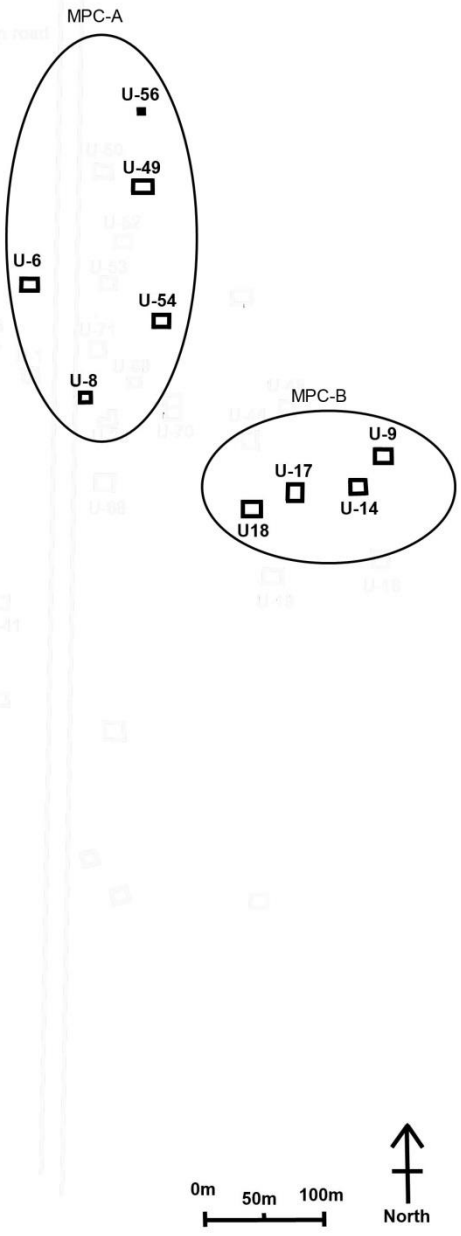


Plate 4: Chan Cahal in the Late Preclassic period

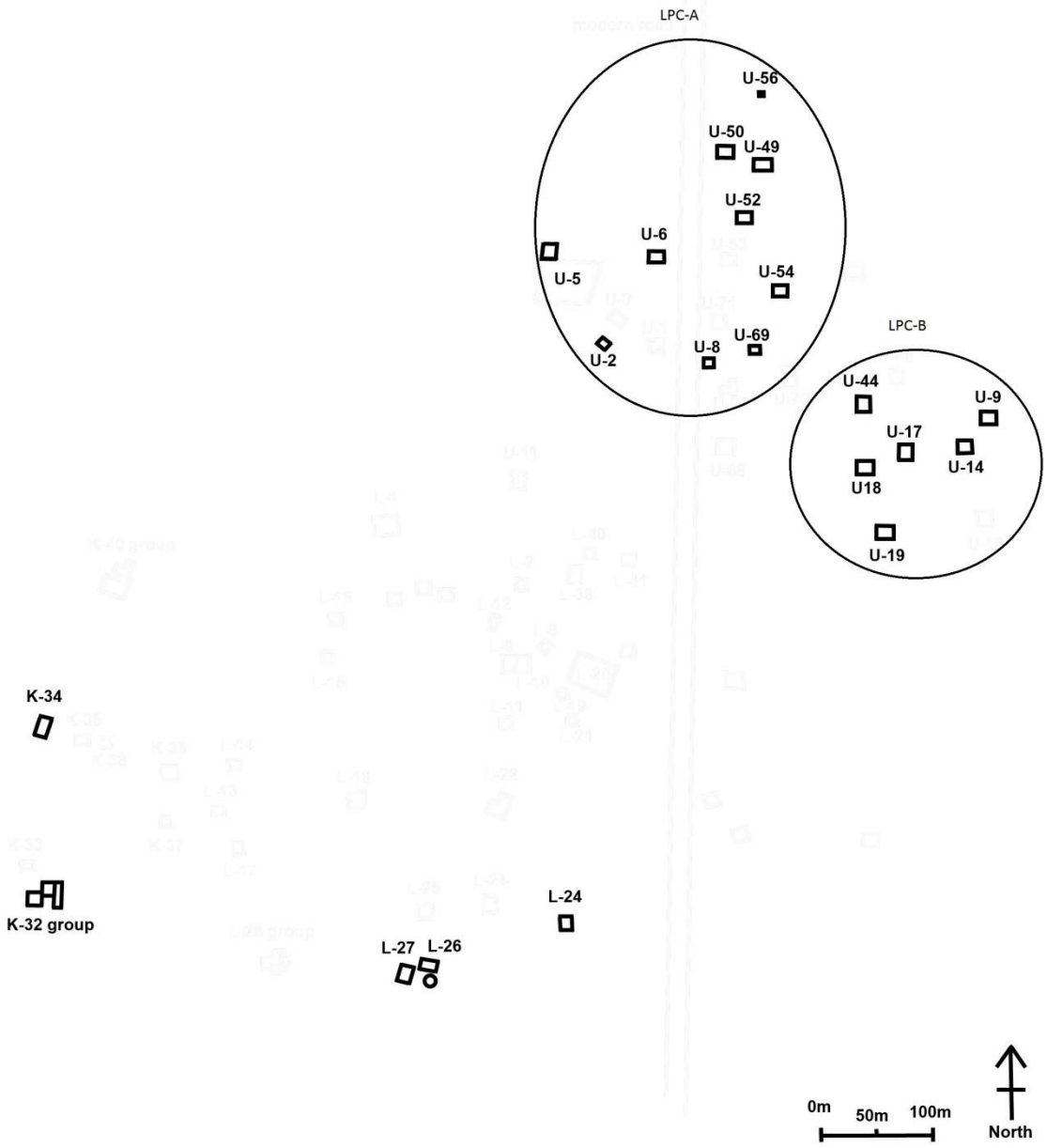


Plate 5: Chan Cahal in the Early Classic period

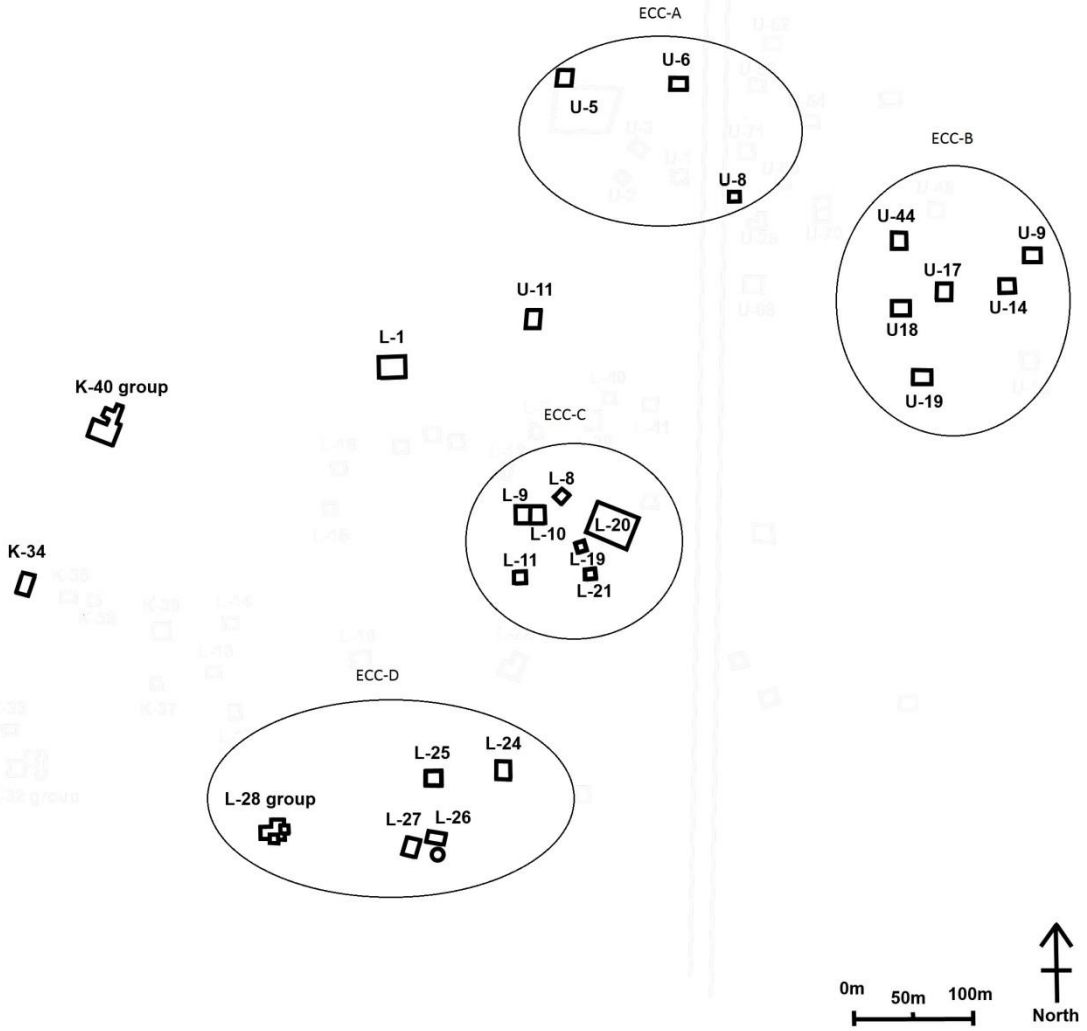


Plate 6: Chan Cahal in the Late Classic period

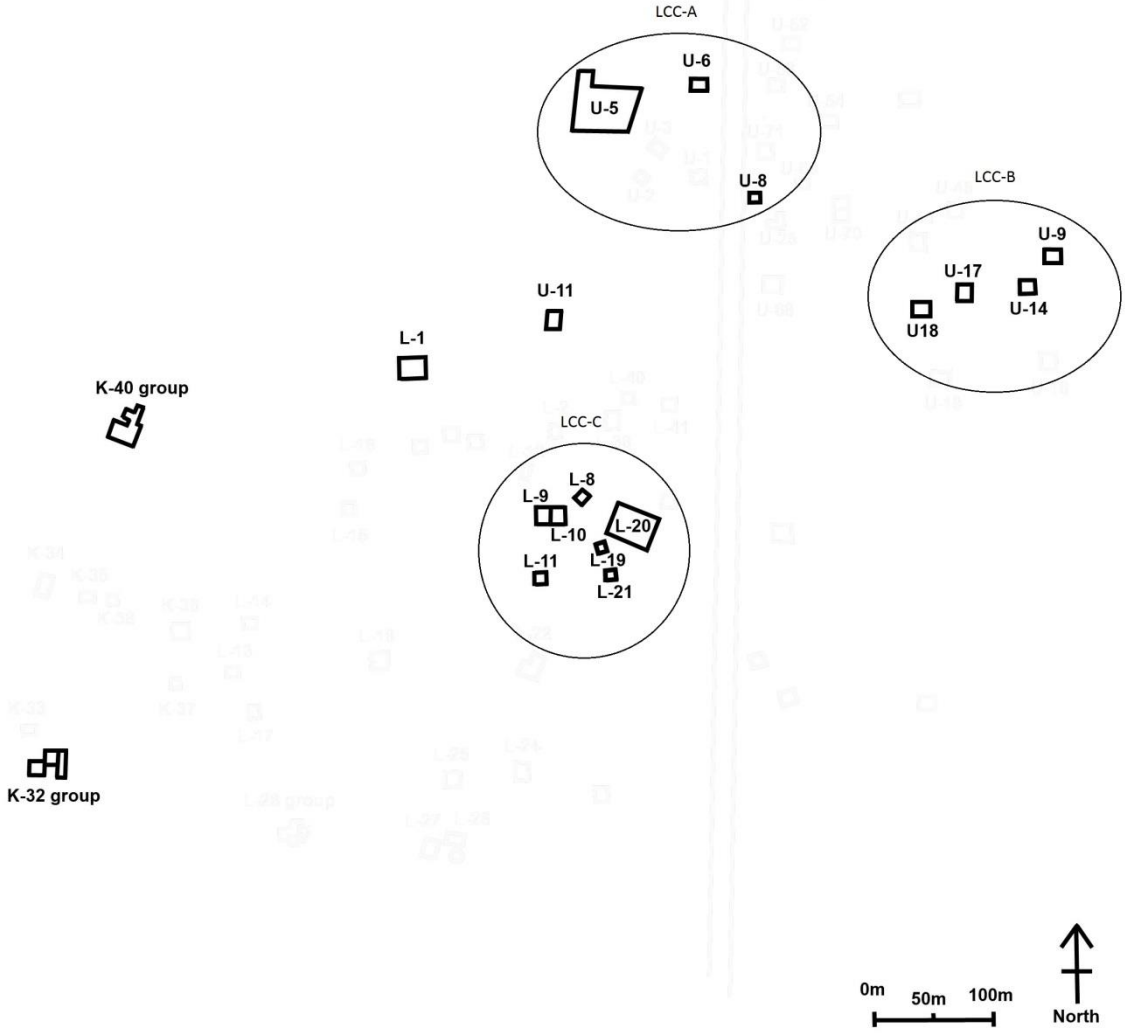


Plate 7: Chan Cahal in the Terminal Classic period

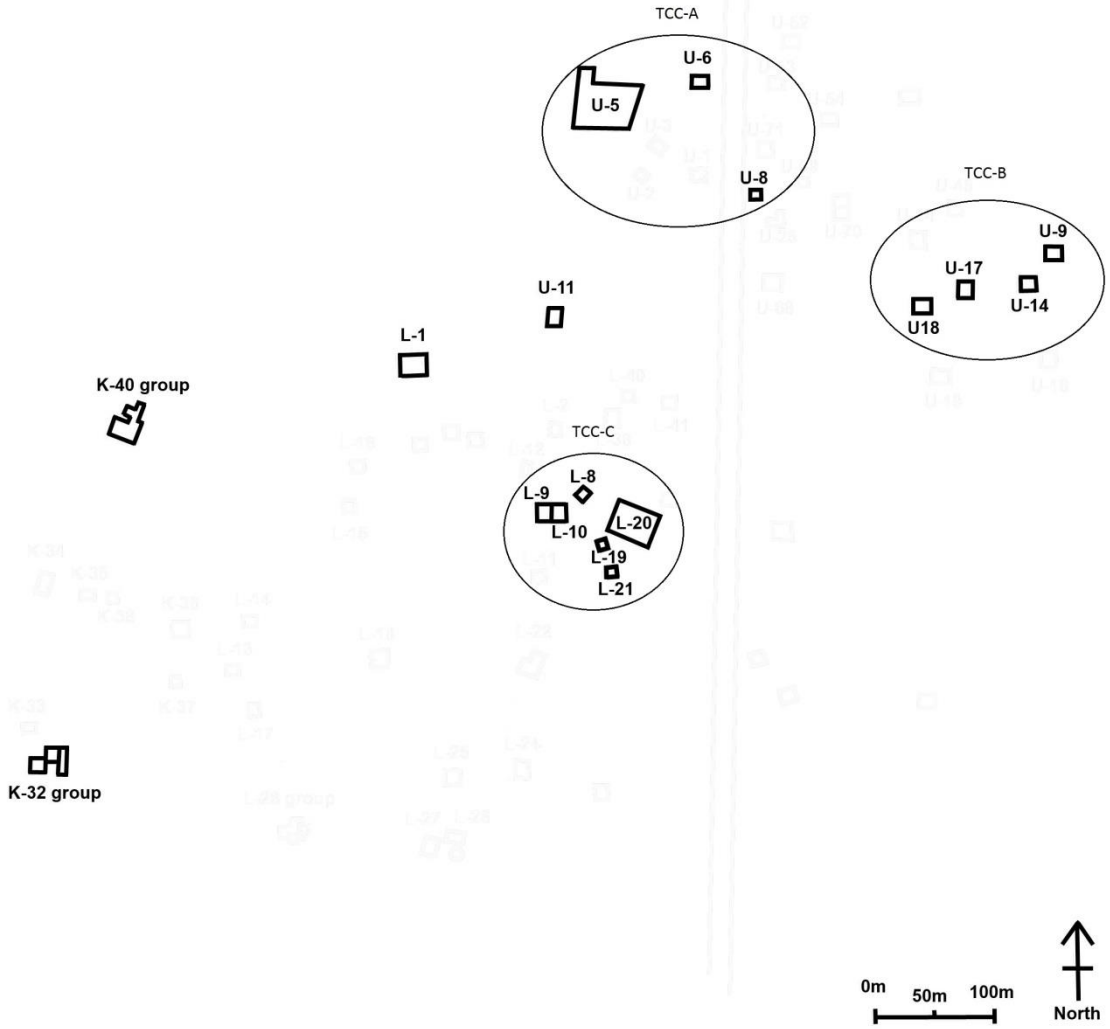


Plate 8: Diachronic evolution of the Imcolel and U5 plaza complexes

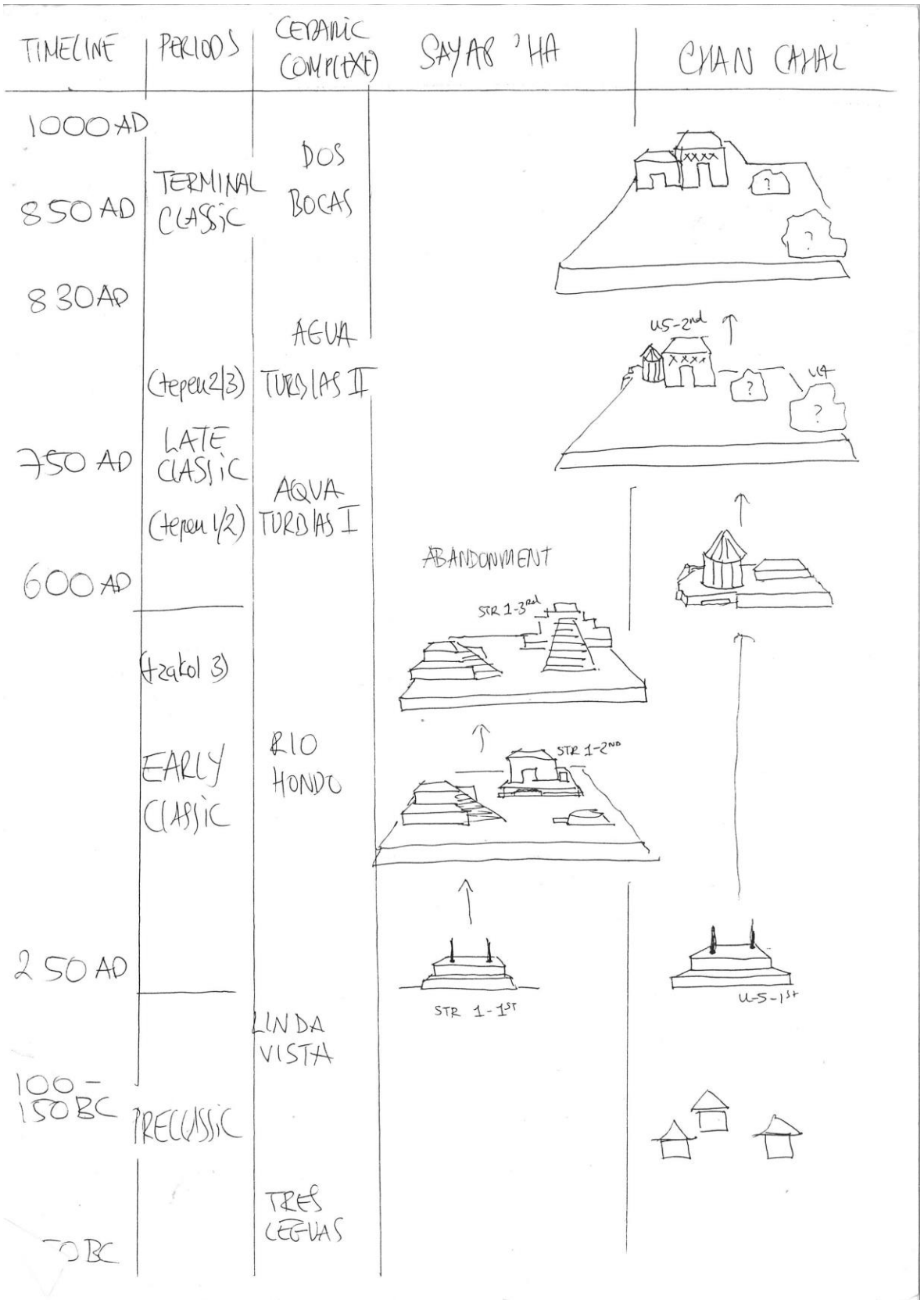
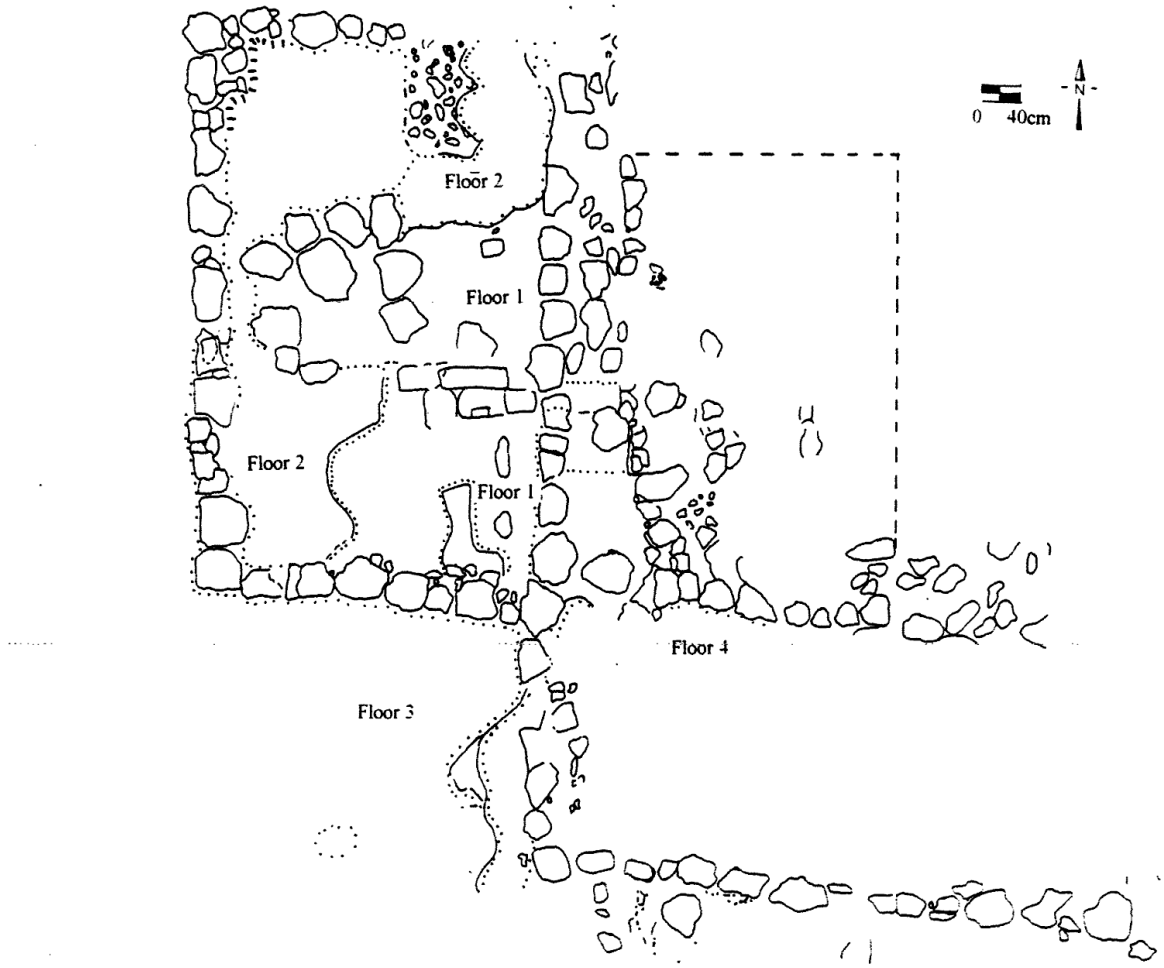


Plate 9: Excavations at structure U49



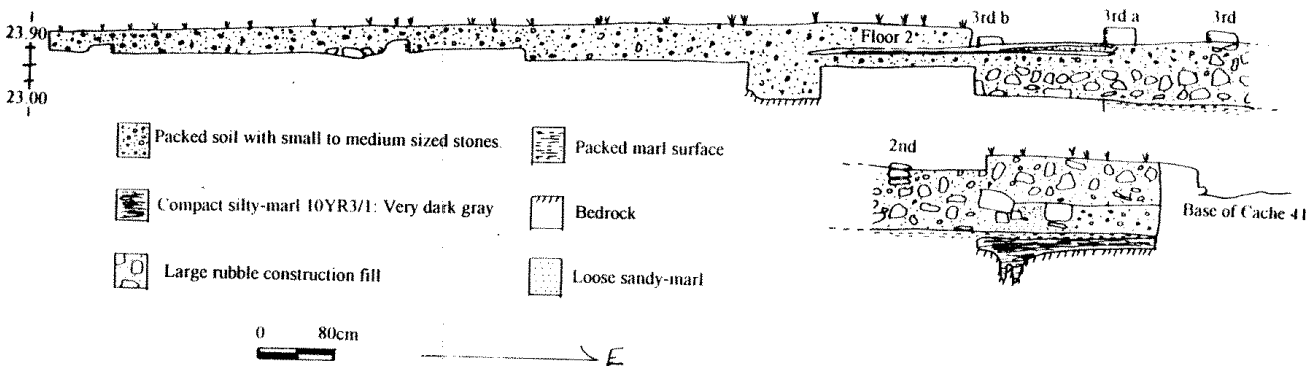


Plate 10: Excavations at structure U50

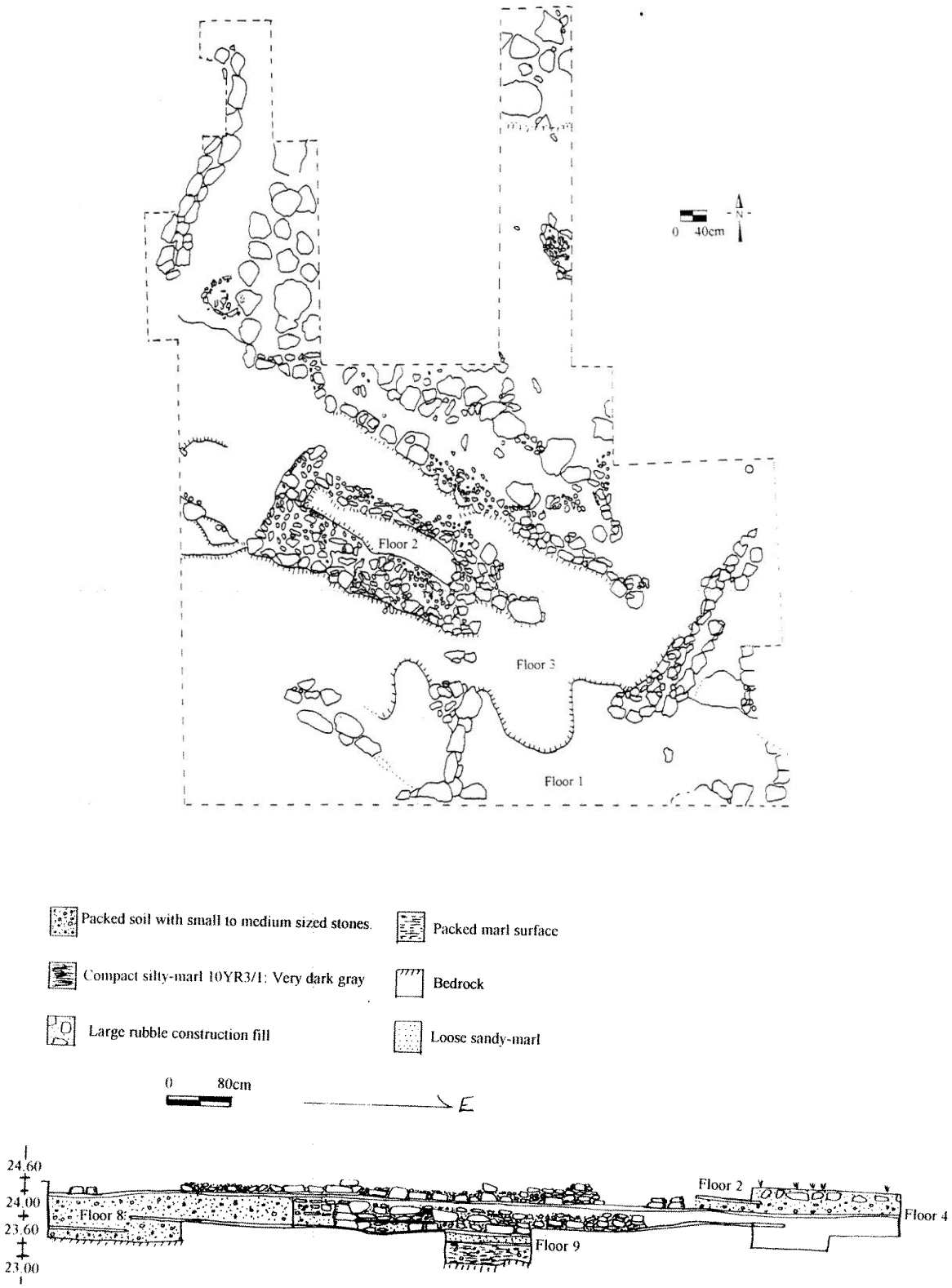
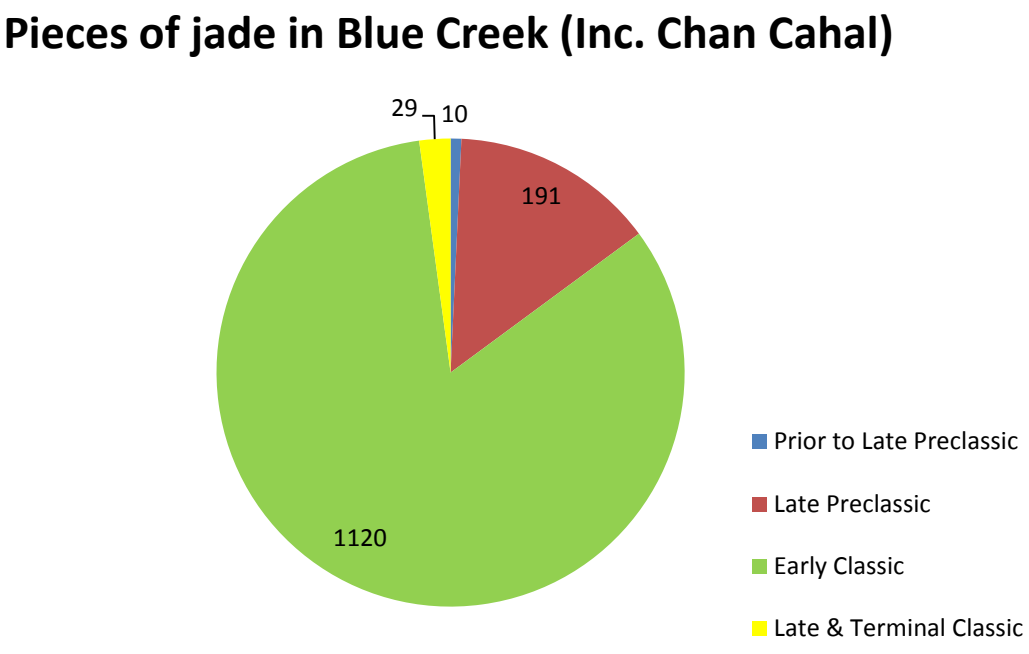


Plate 11: Occurrence of jade



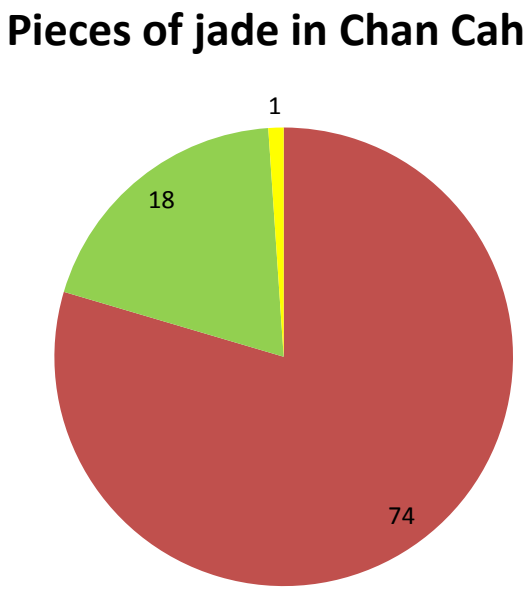


Plate 12: Planview of the L26 Group

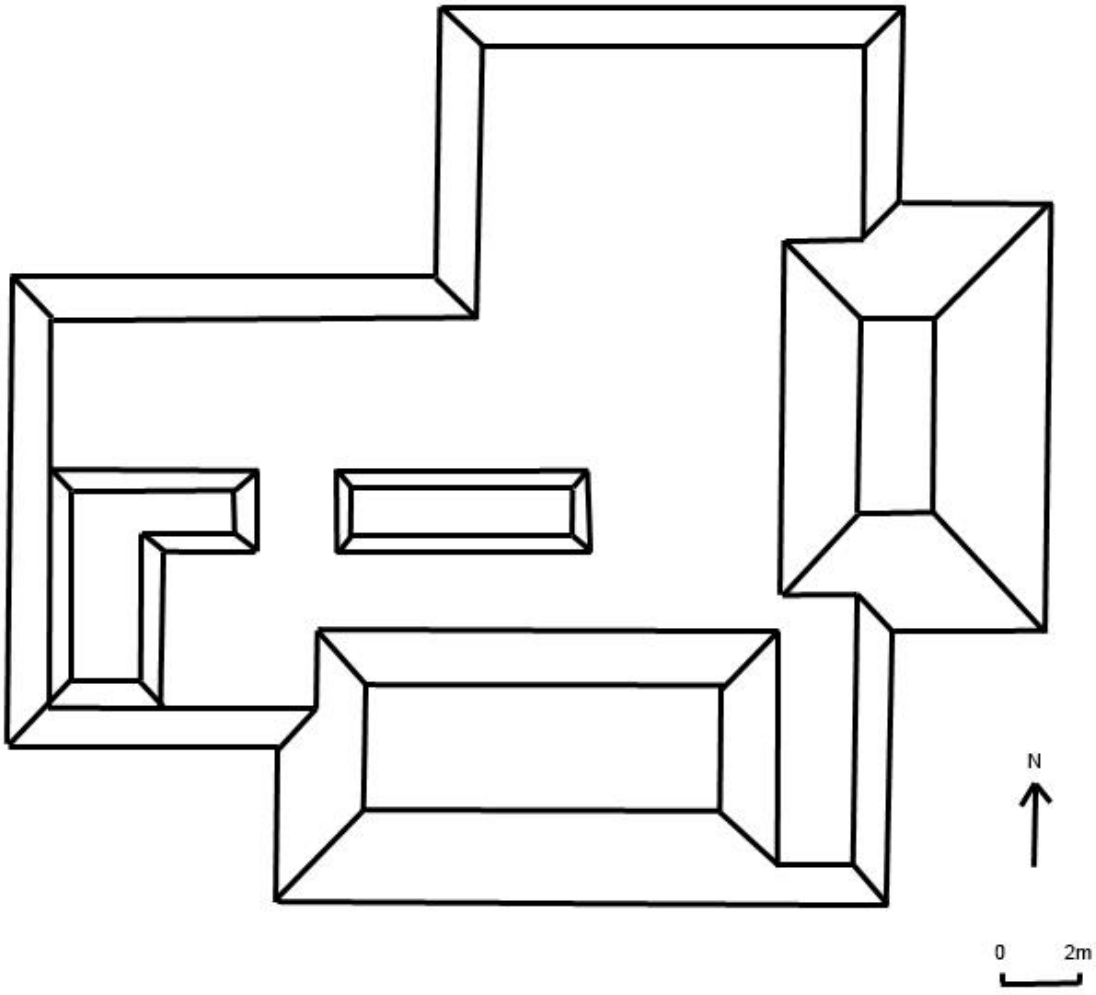
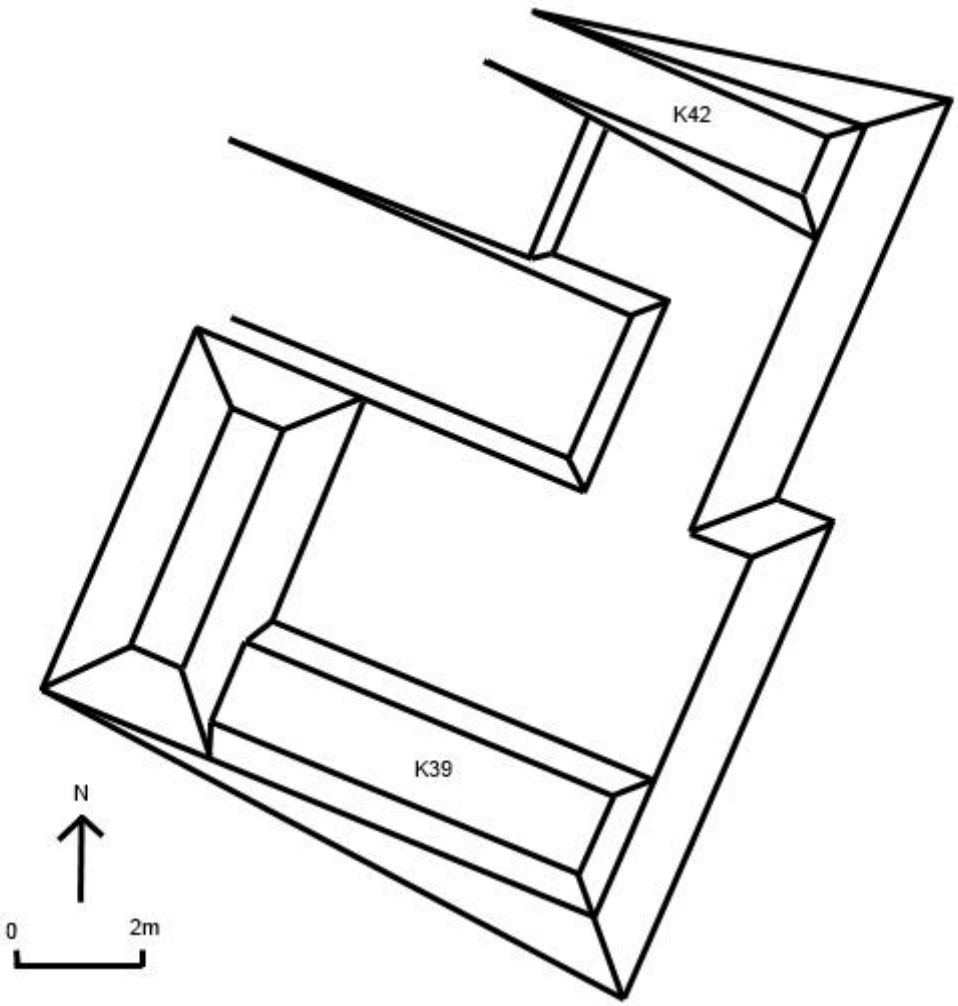


Plate 13: Planview of the K40 patio group



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