SURFACES AND BEYOND: THE POLITICAL, IDEOLOGICAL, AND ECONOMIC SIGNIFICANCE OF ANCIENT MAYA IRON-ORE MIRRORS

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ABSTRACT

Surfaces and Beyond: The Political, Ideological, and Economic Significance of Ancient Maya Iron-ore Mirrors

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This thesis examines archaeological evidence pertaining to composite lithic artifacts of the ancient Maya termed "mirrors." These objects, typically consisting of flat, shiny iron-ore fragments fitted in a mosaic to a backing of stone, ceramic, or wood, are assessed concerning their political, ideological, and economic implications within ancient Maya society. The evidence, including detailed archaeological proveniences and instances of mirrors in iconography, epigraphy, and ethnohistory, is considered from the theoretical standpoints of cognitive archaeology, from the perspectives of shamanism, and a renewed conjunctive approach. Endeavouring to reveal the emic significance mirrors held for the ancient Maya who made and used them, the role of these mirrors is situated within the broader ideological framework of a *reflective surface complex*. Although prior interpretations are largely correct in designating mirrors as implements for "divinatory scrying," it is concluded that the evidence allows for a much more refined elucidation than has heretofore been provided.

Keywords: ancient Maya, mirrors, iron-ore, archaeology, shamanism, scrying, prestige goods

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TABLE OF CONTENTS

LIST OF FIGURES

Chapter 1: Framing the Research

INTRODUCTION

Archaeological scholarship focussing on the cultural remains of the ancient Maya, a Mesoamerican people whose civilization rose to prominence centuries before the arrival of Europeans in the New World, has been carried out for more than a century. Their civilization has left modern scholars, or Mayanists, with a wide variety of artifacts with which to explicate conceptions about who they were, what they believed, and how they lived. In fact, the early Maya left modern researchers with one of the richest archaeological and artistic records in human history, justifying their place as one of the most renowned cultures of the ancient world.

This M.A. thesis represents the first detailed study of a class of composite lithic artifacts termed "mirrors," which are found in the ancient Maya subarea. The motivation for this project stems from a need for these objects to be contextualized within what is known about ancient Maya society. This deficiency is highlighted by Karl Taube in a paper about iron-ore mirrors at the site of Teotihuacan in Central Mexico:

> Unfortunately, Classic Maya pyrite mirrors have received little recent attention. Although it is beyond the scope of this study, an iconographic analysis of Classic Maya pyrite mirrors could shed much light not only on Maya mirror use but also on that of Classic Maya Teotihuacan (Taube 1993: 198).

Therefore, the present thesis will act as an answer to Taube's appeal by exploring the political, ideological, and economic functions of mirrors within ancient Maya life in a comprehensive analysis. This three-pronged approach will fluctuate throughout the study between amalgam and specified considerations.

The main research questions of this thesis are therefore aimed at unravelling what has been called "the enigma of Maya mirror use" (Carlson 1981: 131):

(1) When and where do Maya iron-ore mirrors occur?

(2) In what contexts do mirrors occur in the archaeological record?

(3) What does the depiction of mirrors in visual art and texts indicate?

(4) What steps were involved in the manufacture of mirrors?

(5) What was the emic role of mirrors within ancient Maya society?

Breaking up of the research theme into political, ideological, and economic spheres establishes an etic framework from which to proceed towards the ultimate objective of this study; an emic understanding of how the ancient Maya viewed their iron-ore mirrors. While the ancient Maya might not have made the same distinctions as anthropologists, it is essential to the task of resurrecting ancient cognition that we operate according to the empirical techniques of archaeology. Therefore, the preference for demarcating the distinct social domains of politics, economics, and ideology, will serve as a guideline that can be continuously amended relative to insights that emerge in the course of this study.

Consisting of a mosaic surface made of polished iron-ore fragments adhered to a solid backing of wood, ceramic or, most commonly stone, the ancient Maya mirror type follows a unique style that distinguishes Maya specimens from those made by other Mesoamerican cultures. Accordingly, their appearance in the archaeological and artistic record of the ancient Maya, or mention in ethnohistoric and ethnographic accounts, may provide inferences as to their emic role, but ensuing interpretations must remain cautious not to overextend readings of the data. This is a necessary limitation of archaeological practice because researchers are inevitably restricted to studying only partial remains of ancient behaviour (Johnson 1999: 10). Nevertheless, with careful examination of

multiple lines of evidence, there is an opportunity to develop hypotheses about the roles and functions of ancient Maya iron-ore mirrors. While some categories of evidence provide data that are more amenable to studying the political, ideological or economic domain, it is clear that the archaeological record applies to all three.

Regarding the representation of mirrors in pictorial images, Paul Healy and Gyles Iannone (personal communication, 2006) have both cautioned that forgeries of polychrome ceramics and their imagery are commonplace. Indeed, most of the iconographic examples I reference are devoid of reliable provenience. This poses a potential hazard for the interpretation of the iconographic data. Also, artifacts that have not been excavated directly from an archaeological site by competent professionals are susceptible to questions of authenticity. This does not mean, however, that the items cannot still be helpful for an archaeological understanding. In an analysis of the problems that arise with artifacts that lack a secure archaeological provenience, James Wiseman (1984: 68) cites a position which argues that "the characterization of materials…[is] not dependent upon knowledge of provenience…an object merits scholarly attention if there is reason to suppose that such attention would add anything at all to our knowledge." The principal requirement to counteract uncertainties about authenticity is a close examination of the vessels in question, which should be conducted by experienced professionals such as Justin Kerr. Kerr (1992) points to several tests that helped to classify a painted vessel as a fake: (1) vessel form; (2) aberrant placement of glyphs; (3) nonsensical glyphs; (4) uncharacteristic depiction of human figures; (5) wrong colour schemes; and (6) inauthentic, peeling paint dissolvable with acetone.

Without subjecting them all to a destructive acetone test, the validity problems can best be dealt with through a professional examination by experts. Iconographic evidence will be applied to the political, ideological, and economic spheres of this study, but is challenging because its subject-matter is overwhelmingly elite-centric.

Likewise, pitfalls abound when one applies epigraphic, ethnohistoric, and ethnographic evidence to the problem of ancient Maya iron-ore mirrors. All three of these domains of inference yield predicaments concerning their tendency to direct the modern researcher to a lopsided evaluation of the place of iron-ore mirrors within ancient Maya society. For example, in epigraphy, although a large proportion of the hieroglyphic assemblage is satisfactorily translated, these translations are always subject to debate because the context in which a glyph occurs depends on the glyph's standing in the Maya "polyvalent" system, where all glyphs have "multiple values" (Coe and Van Stone 2001: 25). The subsequent discussion of a polyvalent hieroglyph that has been shown to represent a mirror in certain circumstances (Schele and Miller 1983) will remain attentive to the other possible meanings. Ethnohistoric sources and ethnographic publications based on fieldwork can provide adjunct commentary about mirrors, but can be untrustworthy when used directly because of the considerable time gap separating the modern and contact-period Maya from the ancient subject matter. Hence, sources of this type will be used as supplementary support rather than as primary evidence.

Economic considerations of ancient peoples can also be conjectural since interpretations of the movement of commodities in both space and time hinges to a degree on the economic model one employs. While the raw iron-ore that was consumed in the manufacture of the mosaic surfaces of mirrors was a mundane commodity, the

highly polished and finely made iron-ore mirrors themselves can be considered "luxury goods…as goods whose principle use is *rhetorical* and *social*, goods that are simply incarnated signs…the necessity to which they respond is fundamentally political" (Appadurai 1986: 38). Although the practical ability to see one's reflection in a mirror may have been a consideration in the elites' desire to obtain iron-ore mirrors, it is their possible function as symbols of sociopolitical rank that is at the core of the analysis of their economic standing.

Within the larger mechanisms of the ancient Maya state, a complex economy developed alongside and within the equally complex political and ideological systems. Therefore, in pursuing an emic perspective of the economic exchange of mirrors as luxury items, it will be necessary to first understand the value of prestige objects from an etic perspective:

> Ownership, carrying with it the direct association that can go with personal property, is a state rather than an action. The possession of rich objects carries with it more than the ability to exchange some of them in return for goods and services. By virtue of the prestige it confers, ownership offers access to social networks and to other resources that are closed to those lacking such prestige (Renfrew 1986: 161).

It is from this general understanding of the concept of "prestige items" and the political and ideological implications of owning them, that the economic value of ancient Maya iron-ore mirrors will be assessed.

Ensuing chapters seek to strike a balance between strictures inherent in the archaeological record and the reasonable advancement of both specific and general explanations of iron-ore mirrors of the ancient Maya. Each of these chapters is meant as a concentrated essay capable of standing on its own while at the same time contributing to a broader analysis of the subject.

Chapter 2 will establish the theoretical and methodological foundations upon which subsequent interpretations will be based by outlining the intellectual perspective from which the evidence will be approached. Although scholars differ in their inclinations to varying ontological orientations, one must nonetheless choose a primary epistomological standpoint in order to build a coherent argument. It is argued herein that the objective of revealing how the ancient Maya conceived of these "mirrors" necessitates a three-pronged line of attack. Chapter 2 delineates the parameters of the theoretical school of cognitive archaeology, the new subfield of the archaeology of shamanism, and the methodological priorities of the revived conjunctive approach.

Chapter 3 focuses on the evidence for iron-ore mirror specimens reported from sites since the inception of Maya archaeology in the late 19th century. Hence, in analyzing the contexts, this chapter will display the spatiotemporal incidence of these artifacts. Intended as a preliminary catalogue of ancient Maya iron-ore mirrors, this chapter documents the known specimens. Although tentative remarks concerning the implications of individual specimens will be made throughout this thesis, broader explanations are reserved until after the iconographic and geological features of ancient Maya iron-ore mirrors have been considered in succeeding chapters.

Chapter 4 concentrates on the depiction of mirrors in ancient Maya art alongside a contemplation of allusions to mirrors in the hieroglyphic script, in ethnohistoric written sources, and in ethnographic studies. These artistic and literary references to mirrors afford unique windows into ancient Maya life by illustrating candid expressions of ancient Maya thought that are sometimes invisible in the material remains of the archaeological record. When combined with the intentionality evident in the

archaeological contexts of mirrors, the total corpus of artistic, textual, and artifactual evidence offers substantial information for interpreting the larger emic significance of these objects to the ancient Maya. Although my interpretations of this data are subject to debate, they represent the first in-depth endeavour to account for iron-ore mirrors among the ancient Maya. A complete interpretation of the occurrence of these objects is not achieved until they have been located within the sociopolitical structure of ancient Maya economic exchange.

Chapter 5 seeks to amalgamate the data reviewed in Chapters 3 and 4 with an understanding of the geological and economic factors surrounding ancient Maya iron-ore mirrors. Incorporating a series of models that past and present archaeologists have proposed as plausible reconstructions of ancient networks of exchange, this chapter will discuss how these models might be applied to the hypothetical movement of iron-ore across and outside the Maya landscape. Beginning with a review of what is known about iron-ore deposits that might have been exploited by ancient Maya miners, the analysis envisages how the process from raw procurement to finished iron-ore mirrors in elite contexts might have transpired.

Chapter 6 summarizes the diverse perspectives of previous chapters, and integrates the different data sources into a holistic interpretation of the political, ideological, and economic significance of ancient Maya iron-ore mirrors. A major consideration throughout the thesis will revolve around a decision to emphasize the theocratic nature of ancient Maya polities, ruled by divinely sanctioned "Holy Lords" (*Kul Ahau*) who may (or may not) have controlled economic interactions depending on the nature of the commodity in question (Stuart 1998: 322). In this way, Maya

sociopolitics is undeniably conflated with religious ideology and cosmology. This demands that all subsequent interpretations be couched in terms of what we know about the intermixing tendencies of ancient Maya worldview, so as to ensure the most accurate emic portrayal of iron-ore mirrors. A comprehensive rendering of how the ancient Maya may have perceived these objects will comprise the bulk of this concluding chapter.

Chapter 2: Theory and Methods

INTRODUCTION

This study of ancient Maya iron-ore "mirrors" will develop according to the tenets and objectives of cognitive archaeology. The interpretive and explanatory goals of a cognitive approach represent both a natural derivative of the processual agenda in archaeology and an inevitable expansion of the postprocessual movement of the 1980's. In opposition to the strictures of the New Archaeology, which propagated a strictly materialist view of positivist science, many postprocessual researchers seek to expose the ideological aspects of the material record, an effort viewed as epiphenomenal "palaeopsychology" by some processualists (Binford 1965: 204; Johnson 1999; Pearson 2002: 12). As postprocessual tactics matured into the mainstream of archaeology, it became possible for scholars with a more philosophical bent to join the fray. The discipline began an exploration of ancient cognitive phenomena. The study of thought processes in relation to culture had already become a stimulating subfield in cultural anthropology (D'Andrade 1995; Tyler 1969), and was poised to become a fundamental concern for the archaeology of the 1990's.

This chapter will describe the theoretical and methodological priorities of the current study, while outlining the implications of iron-ore mirrors as possible ritual objects and yet-to-be-acknowledged symbols of kingship. Since our aim is to gain insights into the meaning and significance of these mirrors as perceived by the Maya who made, possessed, and used them, there must be an initial focus on the emic worldview within which these objects played a role. Through the course of my research it became increasingly clear that the context of mirrors in the archaeological and iconographic

records of the ancient Maya repeatedly implied mystical undertones. Therefore, the theoretical underpinnings revolve around a consideration of the religious category of shamanism, while the methodological application of the data proceeds according to the principle foci of cognitive archaeology.

COGNITIVE ARCHAEOLOGY

Cognitive archaeology is a relatively restricted domain of archaeology. The original proponents of the New Archaeology were justified in their misgivings about digging up ancient thoughts since, at first glance, the archaeological record of most cultures seems inadequate for reconstructions of worldview. Nevertheless, the contentiousness of the processual-postprocessual debates necessitated a move toward a more multifaceted archaeology in which all intellectual orientations would be welcome (see Clark 1993). The dogmatic authority of the New Archaeology in the 1960's and 1970's created an atmosphere in which scientifically-inclined minds were valued, while researchers interested in topics such as ancient thought were discounted. As the discipline progressed into the 1980's, however, "dissention in the ranks" (Pearson 2002: 13) emerged as it became increasingly fashionable to ponder the prospects of "recovering mind" in the archaeological record (Leone 1982; Renfrew 1982; Willey and Sabloff 1993).

Cognitive archaeology is a branch of the discipline that is still in its formative years. Therefore, the interpretation of ancient Maya iron-ore mirrors within this theoretical framework must consider the variety of ways in which the methods of cognitive archaeology are conceived by the scholars who initiated its practice. Like the field of archaeology as a whole, inquiries into ancient thought can take a variety of forms.

These range from more processual concentrations on the statistical survey of material samples, such as religious "idols," to those inclined towards postprocessualism and the quest for empathic insight into the past using more qualitative data, such as ethnographic records. The next segment is dedicated to elucidating these divergent portrayals of cognitive archaeology.

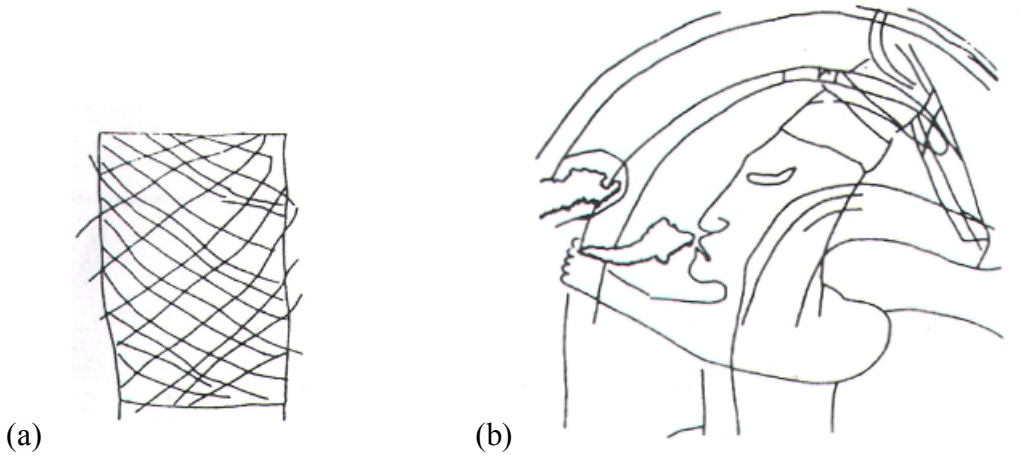
Colin Renfrew (1982, 1993, 1994) must be mentioned as one of the first advocates of a cognitive approach to the archaeological record. He maintains that he created the concept of cognitive archaeology in the early 1980's and has been pursuing a coherent method of reconstructing ancient thought ever since. He promotes a "cognitive-processual" framing of the subfield to complement the "functional-processual" approach of the rest of the discipline. In acknowledging the more postmodern applications of the cognitive approach, which he characterizes as "anti-processual" and "non-processual," Renfrew (1993: 248-249) clearly sponsors a brand of cognitive archaeology that refrains from what he sees as an unrealistic quest to find the emic *meaning* behind the archaeological record. Although a processual approach to past cognition can be valuable to archaeological interpretation, Renfrew's adherence to scientific materialism is an exceptional oddity compared to the majority of studies in cognitive archaeology.

The development of a coherent agenda for a cognitive archaeology was substantially encouraged by ground-breaking efforts in rock art studies, particularly the innovative techniques employed by David Lewis-Williams (2001; Lewis-Williams and Dowson 1988; 1993). In considering the Palaeolithic rock art of southern Africa, Lewis-Williams uses ethnographic analogy and ethnoarchaeology to show that "researchers can go beyond generalized, theory-derived assertions about 'the art' to precise

demonstrations that deal with specific images and their intelligible features" (Lewis-Williams 2001: 18). Although still controversial, the work of Lewis-Williams and his then graduate student, Thomas Dowson, adopts a "neuropsychological model" to explain the abstract imagery in Palaeolithic rock art. They argue that since ethnohistoric records reveal the apparent antiquity of shamanistic religious practices for the San peoples of southern Africa, this infers a shamanistic context for the intent of the ancient rock art. Shamanism, to be discussed in more detail below, is a central theme in cognitive archaeology. The religious category of shamanism is generally defined by techniques and ritual behaviour that are conducted with the intention of inducing altered states of consciousness. Shamanistic societies are distinguished by this belief that the generation of altered states facilitates contact with spiritual beings residing on another plane of existence that usually goes undetected in the normal waking state (Eliade 1964; Pearson 2002: 95; Price 2001: 6).

Lewis-Williams and Dowson's (1988: 202) neuropsychological model emphasizes the universality of human biology regarding visual phenomena experienced during altered states of consciousness. They point to "entoptic phenomena" where predictable modifications of the visual field, mainly "geometric forms such as grids, zigzags, dots, spirals, and catenary curves" can be categorized and replicated in a laboratory setting (see also Blainey 2006a, 2006b). Furthermore, these entoptics can be identified repeatedly in the Palaeolithic rock art of southern Africa, indicating the plausibility of Lewis-Williams' shamanistic interpretation of the images. This research inspired successful correlations for the prehistoric art of other regions, especially those places where shamanistic behaviour has been ethnographically documented, including

Siberia and Central Asia (Devlet 2001), the North American arctic (Sutherland 2001), Germany (Dowson and Porr 2001), and the Western United States (Whitley 1992a). The popularization of the neuropsychological model eventually touched the Mayanist community when William and Anita de Laguna Haviland explored the entoptic nature of graffiti images scratched onto the temple walls of Tikal, Guatemala (Haviland and Haviland 1995; Figure 1).



(a) (b)

Figure 1: Graffiti from Tikal— (a) "Grid" entoptics (b) "Catenary Curve" entoptics (Haviland and Haviland 1995)

The popularity of the neuropsychological model's endorsement of entoptic phenomena spurred interest in the less tangible aspects of the archaeological record by lending credibility to a realm of research that had previously been overlooked. Just like the development of flotation techniques (used to recover pollen, seeds, and other buoyant specimens, which had been discarded beforehand) established the indispensable field of archaeobotany (Struever 1968), cognitive archaeology gained significant traction with these compelling rock art studies.

Contrary to Renfrew's claims, the coining of the subfield of a cognitive archaeology has also been attributed to David Whitley (Whitley 1992b), an inspiration

that followed a stint of postgraduate research at the University of Witwatersrand under the auspices of Lewis-Williams (Pearson 2002: 84-85). The cause was later taken up by other supporters (Bender 1993; Hodder 1993; Peebles 1993), including two prominent Mesoamericanists, Kent Flannery and Joyce Marcus (1993, 1996, 1998). This flurry of publications in the 1990's signaled the advent of studies in cognitive archaeology as a standard subfield within the discipline.

Whitley's views represent the strongest voice for the postmodern/postprocessual attitude ridiculed by Renfrew. Unfortunately for Renfrew, his "cognitive-processual" approach has waned while Whitley's rigorous "post-positivist" perspective has become a standard template for studies into cognitive archaeology. This is mainly due to lapses in the New Archaeology's implementation of "archaeology as anthropology" (Binford 1962). Whitley argues that there was a disparity in this objective "because just as archaeologists were emphasizing their intellectual ties and allegiance to their 'mother-discipline,' they apparently turned their backs on certain major intellectual transitions then occurring within anthropology" (Whitley 1992b: 59; see Leach 1973). In making this historical allegation, Whitley is reacting to concurrent endorsements of processualism acting as a *Behavioral Archaeology*, a true science that "incorporates the description and explanation of spatial patterning to reveal the mechanisms of past decision making within a positivist framework" (Earle and Preucel 1987: 511). Positivism strives for the generation of laws that are predictable and revelatory of knowable principles underlying broader internal and external processes (Johnson 1999: 38; see Binford 1980). This position is furthered despite the fact that "starting about 1957, the behaviorist paradigm was rejected by many in anthropology (and other human

sciences) in favor of a cognitive formulation" (Whitley 1992b: 60). Thus, one can see how the positivist tenets of hard-line processualism were incompatible with the contemporaneous outlook of the very discipline to which they were linked, illustrating why Renfrew's view of cognitive archaeology has floundered.

Whitley's discourse is essential to the intentions of the current thesis, because it promotes the idea that it is possible to infer the emic meaning of artifacts, such as ancient Maya iron-ore mirrors. His view of cognitive archaeology advocates that "while maintaining an allegiance to scientific method per se, and to the inherent rationality this implies, cognitive archaeologists insist that explanation and interpretation of prehistoric human societies and culture must look beyond the evidential level, past the behaviour that created our archaeological record, to the cognitive systems that underlie it" (Whitley 1992b: 69). The crucial point revolves around the prioritizing of belief systems as significant determinates of decisions and behaviour carried out within the cultural arena: "That is, it is the purpose of cognitive archaeological research to elucidate the system of beliefs that constitute a culture, thereby defining the cultural logic or situational rationality within which decisions were made, institutions were constituted, and actions performed" (Whitley 1992b: 70). Although Whitley is blatantly predisposed to a postprocessual heuristic, his work nevertheless serves as an important basis for the interpretive goals of this thesis.

The joint writings of Flannery and Marcus (1993, 1996, 1998), however, embody the most practicable approach. In emphasizing a moderate theoretical standpoint, they are optimistic about the interpretive implications of studies aimed at excavating ancient cognition, while at the same time remaining cautious not to overextend their stance into

unverifiable speculation. Contrasting new research with "subsistence-settlement archaeology," they designate the central themes of investigation where a cognitive archaeology holds sway:

> Cognitive Archaeology is the study of all those aspects of ancient culture that are the product of the human mind: the perception, description, and classification of the universe (cosmology); the nature of the supernatural (religion); the principles, philosophies, ethics, and values by which human societies are governed (ideology); the ways in which aspects of the world, the supernatural, or human values are conveyed in art (iconography); and all other forms of human intellectual and symbolic behaviour that survive in the archaeological record (Flannery and Marcus 1996: 351).

This compartmentalization of the cognitive aspects of culture has its pitfalls, in that it separates domains that are most certainly interrelated in many respects, but Flannery and Marcus nevertheless encapsulate the general scope of cognitive archaeology. In setting these boundary lines, they distinguish the cognitive elements of culture from more traditional concentrations of archaeology. They fashion a window of opportunity for archaeologists who are interested in the non-physical aspects of the human condition, what Joan Vastokas (2005) calls "humanist archaeology," while underscoring an awareness that "such cognitive approaches can only be used when conditions are appropriate; that is, when the body of supporting data is sufficiently rich" (Flannery and Marcus 1996: 352). It is for this reason—their ability to legitimate archaeological research into the intangible while requiring a sufficient sample of material correlates as an essential prerequisite—that the framework set forth by Flannery and Marcus will serve as the methodological foundation for the analytical and interpretive goals of this study of ancient Maya iron-ore mirrors.

Recent publications pertaining to cognitive archaeology suggest that this subfield will continue to thrive well into the new century. The variety of cognitive perspectives reflects the healthy pluralism of archaeological scholarship:

> Unknowing devotion to one metaphysical system prevents the recognition of those of other archaeologists, and critical self-awareness is therefore the first step to the comprehension of the position of others and the bursting of the bonds tied by one's own metaphysical assumptions. Metaphysical systems may be invented ensembles and the archaeologists may be free to choose according to whim, since the choices are not between right and wrong; but judgment can still be exercised in terms of the validity of the concepts selected, the appropriateness of the ensuring explanation for the scale of concept selected and then the adequacy and power of that explanation thereafter (Clark 1973: 13).

Central to these latest developments is the increasing focus on how considerations of cognition can inform inquiries into the exotic practices and beliefs of shamanistic worldviews, a primordial cultural tradition whose material and ethnographic correlates are found across the globe (Winkelman 2000). Regarding popular contentions that the worldview of the ancient Maya can be categorized as shamanistic (Freidel et al. 1993; Reilly 2002: 410; Sharer 1994: 515-516), the following discussion will attempt to outline the constituents of shamanism so as to ground subsequent considerations of its applicability in examinations of the emic significance of iron-ore mirrors.

SHAMANISM

Shamanism has been a subject of debate since the 17th century, when the first Westerners struggled to explain the mysterious ritual behaviour of Siberian groups whose religious ceremonies revolved around individual specialists termed *saman*. These individuals were venerated as religious leaders because of their alleged ability to act as agents of mediation between the human and spiritual domains:

> A fragmentary picture emerged of an 'ensouled world' in which everything was alive, and filled with spirits – animals, natural features, even what to Western eyes were inanimate objects. To such beings could be linked almost every aspect of material life: sickness and health, the provision of food and shelter, success in hunting, and the well-being of the community. The maintenance of good relationships with these spirits was thus of crucial importance, and the most striking of the travelers' stories concerned the special individuals who attained states of trance and ecstasy in order to send out their souls to communicate with these beings, to enlist their aid or bind them to their will, sometimes even to engage them in combat (Price 2001: 3).

This definition is remarkably appropriate given what we know about the ancient Maya worldview and serves to position the functional context into which we can analyze iron-ore mirrors.

Modern shamanistic studies in North America began with Mircea Eliade and his influential work, *Shamanism: Archaic Techniques of Ecstasy* (1964). Eliade advances a formidable hypothesis in an effort to universalize the concept of *shamanism* to include all societies that practice communication with the otherworld through ritual trance. Among the many contributions this text provides for the current thesis is "his concept of hierophany, the sudden irruption of the sacred in the profane world, sacred time opening to the transcendent, resulting in radical discontinuities" (Doniger 2004: xiii; see also Eliade 1964: 32). In sourcing the concept of shamanism to the ecstatic rituals of Siberian and Central Asian peoples, he points specifically to specialized religious practitioners termed *saman* in the native language. It is quite likely that the ancient Siberian ancestors of the first people to enter the Americas brought their cosmological and religious worldview with them when they crossed over the Bering Land Bridge over 11,000 years ago (Fagan 2000: 73-76). Moreover, the use of mirrors is closely tied to shamanistic practices in eastern Asia. Eliade describes how "the mirror is said to help the shaman to

'see the world' (that is, to concentrate), or to 'place the spirits,' or to reflect the needs of mankind, and…looking into the mirror, the shaman is able to see the dead person's soul" (Eliade 1964: 154; quoted in Saunders 1988: 20). It will become apparent as the evidence is discussed in following chapters that the Eliade quotation is suitable as a description for the manner in which ancient Maya mirrors were viewed in their prehistoric context. It must be mentioned that the anthropological preoccupation with shamanism has been censured by some (Kehoe 2000; Klein et al. 2002), but that it nevertheless remains a commonly discussed religious category within the discipline.

Before delving into the distinguishing features of what has been termed ancient Maya "state shamanism" (Reilly 2002: 410; Schele and Freidel 1990: 95), it is important that one understands the broader picture regarding the mystical inclinations common to all shamanistic cultures. In particular, two recent publications will aid the current treatise in that they successfully employ the methods of cognitive archaeology to expose new insights into ancient shamanism. The appearance of *The Archaeology of Shamanism*, a volume edited by Neil Price (2001), and *Shamanism and the Ancient Mind: A Cognitive Approach to Archaeology* (Pearson 2002) signal the successful dissemination of cognitive archaeology after the 1990's. These seminal works act as the springboard for subsequent studies of ancient shamanism likely to be generated in the archaeology of the new millennium.

A collection of the world's foremost experts of rock art and ethnographic shamanism are assembled by Price (2001) in an ambitious volume committed to founding a subfield focused explicitly on the comparison of prehistoric and historic shamanism. It is perhaps too ambitious a task for the short volume as it is strained to pack 13 disparate

studies into 250 pages. Nevertheless, the individual chapters offer a modest introduction to a vast topic since each of the hundreds of cultures that can be categorized as shamanistic "could and do form the subject of book-length studies in their own right" (Price 2001: 7). As will become apparent below, this is true of the ancient Maya forms of shamanism as well.

The Price (2001) volume is helpful as an introduction to the general traits that characterize the various shamanistic worldviews, but its usefulness for the interpretation of a narrow topic, such as ancient Maya iron-ore mirrors, is limited. It is important to note, however, that the concept of an Archaeology of Shamanism establishes a discrete avenue of inquiry within the larger subfield of cognitive archaeology. For this we can point to common threads that run through the studies of otherwise unrelated past and present cultures. For the ancestors of the San peoples of southern Africa, "reality was a shifting, elusive notion…it was this mercurial property that was so open to manipulation by individuals and groups" (Lewis-Williams 2001: 29). Legends of groups in Central Asia reflect a "belief in a posthumous journey into a mountain" corroborated "by the frequent location of the graves of shamans at the foot of mountains, whilst their ritual attributes were buried in caves considered to be entrances to the other world" (Rozwadowski 2001: 75). It is common among Siberian groups for objects "to be perceived as being animate, that is charged with life forces and consequently demanding special attention" where "these animate objects may have particular symbolic value in the relationship of communication and exchange, which link human:spirit domains" (Jordan 2001: 102-103). Finally, among the peoples of the North American arctic, "a human capacity to transform into an animal is a widespread belief, especially in the case of a

shaman taking the form of an animal spirit-helper in order to visit a distant realm of the universe" (Sutherland 2001: 139). As will become apparent in the next section, all of the abovementioned traits of shamanistic worldview are observable in the archaeological and iconographic records of the ancient Maya.

James L. Pearson (2002) also explores the extraordinary unity of worldview observed in ethnographic and archaeological observations of shamanistic societies from vastly different regions of the globe. In reviewing the history of the development of cognitive archaeology, Pearson emphasizes shamanism as a useful device in efforts to penetrate ancient systems of thought, an endeavour he calls "Archaeology's Final Frontier" (Pearson 2002: 1). Following the work of Whitley and Lewis-Williams, Pearson sketches a foundational structure for all subsequent research in cognitive archaeology by demonstrating the successes of rock art interpretations relative to the general beliefs of shamanism. He depicts these early studies as watershed moments in the history of the discipline, since they legitimated cognitive approaches by placing "shamanism at the center of a broader framework that, for them, brought the diverse and puzzling evidence of this art into a coherent, flexible pattern" (Pearson 2002: 51). This is followed by a description of universal features of the "shamanic universe." Many of the cosmological principles common to virtually all shamanic worldviews were shared by the ancient Maya.

Common shamanistic elements cited by Pearson include the three-tiered universe, with an Upperworld and an Underworld (the Maya *chan* and *Xibalba* respectively), which can be reached via portals, such as caves (Maya *ol,* or *ek' way-nal*). The middle world is broken up into directional quadrants surrounding a central *axis mundi*, often

represented by the metaphor of a World Tree or Cosmic Mountain (the Maya *Wakah-Chan* and *Yax-Hal-Witz* respectively). The universe, and all the animate and inanimate objects contained within it, is imbued with some form of ectoplasmic force, for which there is the ancient Maya correlate of *ch'ul*, translated as "soul-stuff" (Freidel et. al. 1993; Pearson 2002: 69-70). Furthermore, there is the most convincing case for the shamanistic nature of ancient Maya worldview in the narrative of the Quiché Maya *Popol Vuh*, where the Hero Twins traverse effortlessly between the Middle-world of humans and the spiritual underworld of Xibalba (Tedlock 1996). Hence, for the purposes of this study, shamanism can reasonably serve as a theoretical construct for making inroads into the emic significance of iron-ore mirrors within ancient Maya politics, ideology, and economy.

In closing, Pearson remarks on the tension that still exists between the "subsistence-settlement" and cognitive camps of archaeology. He cites Timothy K. Earle and Robert W. Preucel (1987: 509) and their defence of archaeology against what they labelled the "radicals:" "we remain unconvinced of their ability to penetrate the mind of a prehistoric people…Particularly troubling to us are their apparent rejection of theory and disregard for a replicable and verifiable methodology" (Pearson 2002: 145). Instead of encouraging dialogue, critical statements like this have acted to create a confrontation between the two sides where each views the other as a threat to the interpretive goals and methods of their own theoretical paradigms. Indeed, the two pursuits can coexist and complement each other as long as each realizes that their approaches focus on different spheres of the archaeological record; more scientifically-inclined researchers can study the remains of the physical realm, while those of a more "humanistic" (Vastokas 2005)

bent will expound on the ideational realms of metaphysical belief (Blainey 2006a). Yet, this discrepancy in the interpretive goals of behavioural and cognitive archaeologies does not discount the fact that the findings of each augment that of the other, since both camps are intrinsically connected by their rigorous elucidation of different aspects of the same archaeological record (Whitley 1992b: 72).

Over the past two decades, Cognitive Archaeologists have progressed to the point where Earle and Preucel's (1987) criticisms are no longer appropriate:

> Using multiple lines of evidence and arguments that incorporated strong relations of relevance, they had developed an approach that gave them access to prehistoric cognition and an understanding of the way in which it was expressed in the art. Furthermore, they had a method for interpreting variations in the archaeological record—a tool for explaining the extensive "diversity" that had confounded the processualists—that could account for much more than any ecosystemic approach (Pearson 2002: 160).

The practical insight of Pearson's monograph, combined with its theoretical depth, will surely inform all future studies in cognitive archaeology, including the current thesis. Now that some of the principles of cognitive archaeology and shamanism have been outlined, they are considered within a discussion of ancient Maya mirrors.

Iron-Ore Mirrors in the Context of Ancient Maya State Shamanism

Since it may be possible that ancient Maya cosmology incorporated shamanistic features, we need to test for other qualities shared between the ancient Maya view of the universe and that of similar ontologies. Ancient Maya iron-ore "mirrors" provide a conspicuous instance of material objects that might have been used within a shamanistic context. These objects, to be analyzed in their specific contexts in the following chapters, must first be examined as material entities relative to the cultural system in which they operated. The following will outline the plausible grounds for a shamanistic role of

mirrors among the ancient Maya, while considering earlier theories that have been proposed for the use of iron-ore mirrors among the ancient Mesoamericans.

Although there has been no intensive study conducted on mirrors from the Maya subarea, a number of detailed (but relatively dated) contributions have been published regarding the description and possible functions of assorted mirrors from elsewhere in Mesoamerica and beyond. The vast majority of these initial reports concern non-mosaic, concave specimens made from a single piece of iron-ore and usually termed "Olmec-style." The earliest archaeological account of New World mirrors appeared in a paper by Erland Nordenskiöld (1926) in which the author provided a catalogue of a variety of convex and concave iron-ore mirrors stored in European museum collections. Other early references to New World iron-ore mirrors include Mason (1927, North America and Mesoamerica), Ekholm (1973, North and South America), and Strauss (1977, North and South America). In addition, there have been a number of early archaeological site reports that have mentioned mirrors in passing, such as those by Merwin and Vaillant (1932: 87, the Maya), Lothrop (1937: 102-105, Panama), Kidder et al. (1946: 126-135, Maya), Smith and Kidder (1952, Maya), Drucker (1952, Olmec), Porter (1953: 102; plate 4b, Valley of Mexico), Curtis (1959: 287, Olmec), Drucker et al. (1959: 176-182, Olmec), Flannery (1968, Oaxaca), Grove (1970: 9, Olmec), Joralemon (1971: 12, Olmec), and Gay (1972: 50-52, Olmec). Furthermore, some authors have commented, with various degrees of precision, on the technical aspects of iron-ore procurement and mirror manufacture, inlcuding Gullberg (1959, Olmec), Pires-Ferreira (1975, Oaxaca) and Woodbury (1965, Maya).

More recent studies of Mesoamerican mirrors have expanded on the earlier ones by cataloguing, classifying, and empirically testing the type and functions of actual specimens. In two chapters from the volume on *The Olmec and their Neighbours* (Benson 1981), processualist scholars buttress their geophysical appraisal of a variety of concave iron-ore mirrors from the Olmec region with "speculations" about their functions. The concurrent shift from the New Archaeology to a discipline with both processualist and postprocessualist priorities is apparent in the stated objectives of both papers. Robert F. Heizer and Jonas E. Gullberg (1981) focus primarily on Olmec mirrors from the site of La Venta, Tabasco; two whole specimens unearthed in the 1955 field-season and five fragmentary examples excavated in 1942 and 1943. Since the mirrors were located purposefully along the central axis of the site by the Olmec, and are perforated, presumably to be worn as pendants, they suggest that "the mirrors here served some ceremonial or ritual use, and that their use was reserved for the priests" (Heizer and Gullberg 1981: 113).

The La Venta paper parallels the interpretive "speculations" of an exhaustive chapter by John B. Carlson (1981) in the same volume, in that both entertain the notions that these mirrors were used as "Promethean" fire-starters and/or manipulators of the sun's light (Carlson 1981: 119, 125; Ekholm 1973; Gullberg 1959: 282; Heizer and Gullberg 1981: 113, 116). Olmec mirrors have indeed been successfully used to start a fire by reflecting the sun (Gordon Ekholm, personal communication, cited in Heizer and Gullberg 1981: 115). However this suggestion is conjectural at best (Carlson 1981: 118; Cooper 1949: 291-292), based mostly on references to Garcilaso de la Vega's (1966 [1616]: 362) ethnohistoric account of Inca practitioners using small concave bowls to

reflect the sun's light to cause fires. Other suggestions for the utilitarian functions of these objects include mirrors as "astronomical instruments" (Schagunn 1975), a "camera obscura" (Gullberg 1959: 283), a geomagnetic "lodestone compass" (Carlson 1975; 1981: 130), as "divinatory" objects (Carlson 1981: 127-130), as "part of the infinitely elaborate ritual paraphernalia used by priests or leaders in whose graves they have been found" (Woodbury 1965: 175), and as "symbols of power" (Carlson 1981: 124).

Carlson's (1981) paper goes beyond cataloguing the concave artifacts and expounds on the vagueness of previous explanations by adding three new ideas asserting the emic meaning of these iron-ore mirrors as symbols of elite authority. Besides their obvious associations with light and the sun, these mirrors are repeatedly linked with deities sporting "smoking-mirror" forehead elements. Carlson terms this pattern the "Smoking-Mirror-God tradition" where continuity exists between the Maya God K (K'awil) and the Aztec god of Cosmic power, Tezcatlipoca, both of whom are identified with rulership and characterized by a foot or leg replaced by a serpent (Carlson 1981: 125-126; Miller and Taube 1993: 164-165). Carlson's "*third* side of the speculation involves the possibly worldwide tradition of the use of the mirror in divination" in referring to religious conceptions in ancient China (Carlson 1981:126-127, 130). Although this is a weak analogy that relies heavily on an assumption that the mystical qualities of mirrors are perceived universally, it nevertheless signals the arrival of emphases on the cognitive undertones of these artifacts. Finally, Carlson prophetically remarks on the notable promise of epigraphic evidence suggesting a glyphic symbol representing a mirror (Carlson 1981: 127-128). This sign, the *nen*  glyph, was subsequently identified (Schele and Miller 1983) and will be the subject of discussion in

Chapter 4. In closing, Carlson (1981: 129-130) underscores that both the ancient Chinese and ethnohistoric Siberians used mirrors in their "shamanistic divinatory tradition." This correlation lays the groundwork for ensuing treatises linking the use of mirrors with shamanism.

The next major study of mirrors pursues an interpretive expansion of Carlson's "speculations." A cross-cultural perspective guides the text of Nicholas J. Saunders' (1988) chapter "Anthropological Reflections on Archaeological Mirrors" alongside an equally penetrating portrayal of the ideological ramifications of shamanism. Saunders argues that unlike the common view of mirrors in modern Western culture, their existence within a shamanistic ideology recommends a sympathetic openness to the concept of a spiritual Otherworld. His introduction stresses (if redundantly) the need for an emic understanding of shamanistic cognition:

> Most of the available information on archaeological mirrors concerns their physical attributes, i.e. identifying the geological source of the constituent materials, ascertaining the method of production, creating models to explain their movement through and across the social and physical landscapes and recording their archaeological context. Such legitimate concerns however are not designed to tell us how and why mirrors were used. An overemphasis on technology can create a paradigmatic straight-jacket, constantly generating ever more refined descriptive analyses whilst masking other potentially valuable insights into the possible function of mirrors and the wider notions surrounding reflected images (Saunders 1988: 2).

Saunders then proceeds to review a multitude of wide-ranging ideational correlates to supplement the corpus of materialist data concerning ancient New World mirrors. In referring to shamanistic belief, he posits that "the translation of a metaphysical belief into a physical object links the mirror and its material form with a wider concept surrounding notions of reflected images and parallel spirit worlds" (Saunders 1988: 4). Thus, he

infers obvious associations that mirrors have with the surface of water (Saunders 1988: 7), and eyes, particularly that of jaguars (Saunders 1988: 9-12). These associations with eyes, the surface of water, and the mirrors themselves constitute what I will term a *reflective surface complex* of ancient Maya worldview, where all luminescent surfaces are perceived as exceptional renderings of liminal space, seen as the threshold between the natural and spiritual realms. The notion of an ancient Maya *reflective surface complex* developed herein is closely associated with, or part of the larger divinatory "casting and scrying" complex identified by Taube (1983: 120-121) for Teotihuacan. Indeed, at Teotihuacan, the casting of seeds and maize kernels is commonly associated with mirrors in their visual iconography.

Saunders (1988: 13-22) sees a connection between the materialization of these liminal thresholds and the restricted control of such objects as a universal trait of shamanism. He locates the use of such objects alongside the phenomenon of "state shamanism" discussed above. He suggests that these shamanistic "tools" help to "reinforce ideological activity," and that these objects maintained their utility for emerging elites in the development of social complexity, as can be seen in the archaeological records of the Olmec and Maya civilizations. This connection of mirrors with an ancient Maya political elite hording their privileged role as state shamans corresponds to Appadurai's (1986: 57) general inventory of elite enterprises: "the politics of diversion and of display; the politics of authenticity and of authentication; the politics of knowledge and of ignorance; the politics of expertise and of sumptuary control; the politics of connoisseurship and of deliberately mobilized demand." Although Saunders'

essay is perhaps overly general in its focus, it nevertheless represents an important progression towards a more informed emic understanding of ancient New World mirrors.

The ancient Maya mosaic plaques of encrusted iron-ore fragments found archaeologically, and depicted artistically, are termed "mirrors," which unfortunately renders their identity as fixed to Western concepts of reflective surfaces as vanity "mirrors." This does not portend that the label must be changed so as to avoid misrepresenting them; actually, the term is so widely used among Mayanists that changing it may prove untenable. Nevertheless, it is important that modern Western perceptions of "mirrors" (see Melchior-Bonnet 2002; Roche 1985; Schiffer 1983) not impede our quest to understand how the ancient Maya perceived the dark, reflective plane of these mosaic plaques:

> …although a single reflective surface is important for cosmetic use, this is by no means the only function of mirrors. It is clear that in ancient Mesoamerica, mirrors were also important in costume and divinatory scrying. Rather than being devices for personal cosmetic use, the circular pyrite mirrors functioned primarily in dress and divination (Taube 1993: 170)

The most recent study of ancient New World mirrors was conducted by Taube (1993) focussing on "The Iconography of Mirrors at Teotihuacan." The author depicts mirrors as Pan-Mesoamerican costume ornaments, worn on the small of the back, the chest, and in headdresses, while also being associated symbolically with eyes, faces, flowers, fire, water, spider webs, warrior shields, the Sun, and caves. This interpretation echoes a much earlier interpretation of these objects as "ceremonial breast-ornaments" (Joyce 1929: 449). Because of the low number of mirrors found in an archaeological context at Teotihuacan, Taube opts to rely on the mirrors excavated from Kaminaljuyu to inform their extensive occurrence in the Teotihuacan iconographic record. This is based

on the established contact between the two sites during the Early Classic period (Braswell 2003b). This focus on the illustration of mirrors in Teotihuacan art demonstrates a successful outgrowth from Saunders' arguments as it provides a methodological benchmark for more cognitively-oriented research into ancient Mesoamerican mirrors. Along with the Olmec corpus, the Teotihuacan mirrors further exhibit a well developed Mesoamerican mirror tradition.

Another interpretation of the emic significance of the Maya mosaic iron-ore mirrors comes from David Freidel, Linda Schele, and Joy Parker's (1993) review of ancient Maya shamanism. In *Maya Cosmos: Three Thousand Years on the Shaman's Path*, they discuss these mirrors in relation to ritual cache offerings and a clear preoccupation with liminal portals:

> The objects placed in these offering plates are the material manifestations of *ch'ulel*, the holy 'soul-force" of the universe. Because *ch'ulel* resides in blood, red pigment—both cinnabar and hematite—were often substituted. When heated, cinnabar yields mercury—a liquid mirror that the Maya made offerings of in small bottles or pooled in shells. Hematite, before being ground into red pigment, could be polished and used as mosaic mirrors. And mirrors, both liquid and solid, were portals to the Otherworld into which people could gaze and discern true reality (Freidel et al. 1993: 244).

The above passage places ancient Maya mirrors within the broader focus of cognitive archaeology as it assesses the material components of iron-ore mirrors according to how the ancient Maya might have perceived them. This interpretation is contingent upon a perception of ancient Maya (and Mesoamerican) society as shamanistic (Stuart 2002). In the end, when mirrors have been alluded to in passing, their portrayal usually revolves around notions of their functions within a shamanistic cosmology:

> Sacred objects since Olmec times, mirrors opened portals into the Otherworld through which ancestors and gods materialized themselves.

> They gave rulers the special vision of prophesy (Schele and Mathews 1998: 222).

This is also true of the latest assertion that as emblems "of political and religious authority…mirrors functioned as divination tools, providing symbolic access to the other realms" (Fields and Reents-Budet 2005: 106). Correspondingly, ancient Maya mirrors in general have been characterized recently as "one of the most ancient Mesoamerican symbols of the portal to the spirit realm, out of which gods and ancestors are reborn" (Looper 2003: 104).

The implications of the archaeological, iconographic, epigraphic, and ethnohistoric data (all to be evaluated in later chapters) allow for a defensible standpoint that ancient Maya religion had multiple shamanistic inclinations. This is perhaps the result of "intellectual baggage" stemming from ancestors who crossed into North American through the Bering Land Bridge from Siberia (Carlson 1981: 130; Furst 1977: 20; Miller and Taube 1993: 152; Sharer 1994: 515). Accordingly, Mayanists and scholars of ancient Mesoamerica have wondered if the concept of shamanism might be a means of describing the duties and status of the elite priestly classes, particularly that of ancient Maya rulers:

> By the Preclassic period, as society increased in size and complexity, full-time specialists and leaders began to establish themselves, and the management of unseen forces became a fundamental concern of the ruling elite, who saw to such matters both to reinforce and support their own elevated status and to ensure prosperity…In a very important sense, the Maya ruler served as chief priest and shaman for his subjects, protecting them from disease and misfortune, divining the future and the will of the gods, performing rituals to ensure the success of the state, and maintaining the cosmos through his own blood sacrifices. In this way the functions of political and religious leadership were fused in the person of the Maya ruler (Sharer 1994: 515-516).

This conflation of politics and religion is a common theme of ancient Maya cognition where, unlike the modern Western tendency to compartmentalize, the *cuxolalob* worldview perceived the natural and supernatural aspects of existence to be one and the same (Sharer 1994: 513-514). Essentially, "at the center of this belief system was a perception of reality wherein time, space, the physical world, and the supernatural realm were continuous, interconnected parts of a universe in which humans and gods interacted on all levels of existence" (Gallenkamp 1985: 23). For the purposes of understanding the political, ideological, and economic significance of iron-ore mirrors, the unifying propensities of *cuxolalob* must serve as a fundamental referent.

The texts that are the most helpful for elaborating on the emic meaning of iron-ore mirrors are those that deal directly with the specificities of ancient Maya shamanism. Although many Mayanists have dabbled in this topic, the majority of research coalesces around the influential work of Schele (Freidel 1998) whose revolutionary breakthroughs in epigraphy and iconography designate her as s paramount figure in the history of Maya studies. Schele's insatiable drive to empathize with the individual agents of ancient Maya society helped to inspire the cutting-edge cognitive explorations so fashionable in today's Mayanist community (Graham n.d.; Houston 2000; Houston and Taube 2000; Houston et al. 2006; Marcus 2003a; Mathews and Garber 2004; Meskell and Joyce 2003). A common sentiment uniting all of these cognitive studies revolves around the conviction that emic comprehension of past lives derived from the material record is possible and that phenomenological universals of the human condition infer experiential qualities of ancient Maya life. Chief among these universals is the propensity of all cultures to explain the nature of reality. The shamanistic worldview is one of many

practicable metaphysics found amongst the world's cultures, providing a window of insinuation from which to envisage the functions of iron-ore mirrors.

It is understandable that critics of the cognitive approach may question the above claims because it appears that the proponents of ancient Maya "state shamanism" are claiming to know what the ancient Maya thought about these objects without any empirically testable evidence. This is true, but remember that most cognitive archaeologists are working within a *post-positivist* paradigm believing that all knowledge about the world is subjective and context-dependent, a view summed up by the most eminent of post-positivists, Karl Popper: "Science after all, is a branch of literature" (Popper 1972; quoted in Whitley 1992b: 57).

This runs counter to the *positivism* championed by the New Archaeology, which deemed scientific progress to be indicative of a teleological movement towards the acquiring of actual knowledge about the true nature of reality (Johnson 1999: 37-44). Thus, it is apparent that current archaeological interpretations are encumbered by a clash of modern worldviews, wherin the beliefs of the individual researcher colour the explanation of the archaeological record. A solution to all the ontological conundrums of the discipline exceeds the capacity of the current thesis, which will couch all subsequent interpretations within post-positivist suppositions while maintaining explanatory rigour required by the cognitive approach of Flannery and Marcus (1996). It is the stated bias of this study of ancient Maya mirrors that some interpretive speculation and uncertainty is warranted when it infiltrates new domains of past culture that would otherwise be inaccessible:

> Interpretation involves a perceived gap between the known and the unknown, desire and a result, which is to be bridged somehow. There is

> thus uncertainty, both at the outset of interpretation (what does this mean?) and at the end of the act of interpretation…Rationality is not an abstract absolute for which we can formulate rules and procedures, but is better conceived as the willingness to recognize our partiality, that our knowledge and reasoning are open to challenge and modification. Final and definitive interpretation is a closure which is to be avoided, suspect at the least (Shanks and Hodder 1995: 6).

It is from this self-conscious perspective of *hermeneutics* (Hodder et al. 1995) that the present treatise will advance its interpretation of the emic meaning of ancient Maya iron-ore mirrors. In trying to achieve this goal, iron-ore mirrors will be considered according to their functionality within an active social milieu, a hypothetical reconstruction that is now possible because of recent phenomenological inquiries into how the ancient Maya may have experienced, rationalized, and sensed their universe. In closing this chapter, I situate the current thesis within the contemporary theoretical environment of Maya archaeology, so as to better justify the emic interpretation of the collected raw data on iron-ore mirrors.

Recent Trends in Archaeological Theory: Implications for the Study of Mirrors

Developments churning within the wider discipline of archaeology inevitably colour studies of the ancient Maya. The climax of the paradigmatic debate between proponents of processualism and postprocessualism is embodied in Michael Shanks and Christopher Tilley's *Re-Constructing Archaeology* (1992 [1987]). The blatantly nihilist viewpoints expressed in this critique of archaeological theory and methods epitomize the most drastic claims of postmodern approaches that, although they are logically coherent, fail to address the "real" world material remains that archaeologists are attempting to interpret. While some proponents of metaphysical dismantling (the questioning of all epistemological axioms) in archaeological thought and practice (Shanks and Tilley 1992

[1987]: 7; see Arendt 1971; Boella 1993: 171) lauded Shanks and Tilley (Leone 1989), there was a bemoaning from the archaeological mainstream. This radical push towards the extremes of postprocessualism appears to have been the last straw, where the discipline conceded the need for "pluralism in archaeology" but resented how Shanks and Tilley "trash all approaches but their own" (Watson 1990: 221). The publication of, and subsequent reaction to, *Re-Constructing Archaeology* displays the advent of the present age where paradigmatic versatility is sought after, but has largely remained an elusive goal.

The recent calming of previously turbulent scholarship has yielded increasing acquiescence with the range of archaeological projects considered acceptable. An optimistic portrayal of the discipline following the publication of *Re-Constructing Archaeology* contends that a multiplicity of metaphysical presumptions is allowable so long as mutual respect for each other's rigorous research objectives is maintained (see Clark 1993). More pertinent to the present study, the emic meaning of the materials modern archaeologists are scrutinizing is now considered a tolerable pursuit. This advance is typified by the upsurge in the publication of less abrasive treatises focussing on the development of an "interpretive archaeology" (Johnson 1999: 85; Shanks and Hodder 1995: 5). Most prominent among these volumes is the work of Ian Hodder, accompanied by an extensive list of collaborators (Hodder 1987, 1991, 2000; Hodder et al. 1995; Preucel and Hodder 1996). While the school of thought that assembles around Hodder has a tendency to occasionally cast doubt "about the adequacies of the processual programme" (Hodder 1987: vii), the founding of an "interpretive" archaeology is an effort to gain acceptance of the idea that:

> The interpretation of the past through material culture is not necessarily dependent on the nature of the archaeological evidence as observable facts. The archaeological record is neither fact nor fabrication, and because it represents an engagement with the material remains and conditions of other people's lives our understanding of it is sometimes little more than impressions or feelings. Hence, interpretive practice involves far more diversity of thought than the subscription to a single mode of practice or theoretical stance allows. Similarly, our understanding of the material residues which we wish to interpret is just as tainted and context-depended as the interpretations we place upon it. Hence, in some ways, there is no inconsistency between different conceptions of an archaeological record. The inconsistency lies in the manner of interpretation as opposed to our everyday experience of the lived world (Richards 1995: 217).

Just as the scrupulous pursuit of scientific objectivity pervades the established methods of modern archaeological excavation, the theoretical perspective from which unearthed artifacts are interpreted demands pointed attentiveness to the subjective factors that influence the stance of the modern researcher.

With regard to the Maya subarea, a growing number of "interpretive" endeavours illustrate how the expanding scope of archaeological inquiry has encouraged scholars interested in the cognitive elements of the archaeological record to probe the capacities for retrieving ancient thoughts. A deep familiarity with the religious and ideological themes that recur throughout ancient Mesoamerican iconography and epigraphy provides a host of Mayanists with the evidential clout to make justifiable emic claims about ancient Maya cognition (Houston 2000; Houston and Stuart 1998; Houston and Taube 2000; Meskell and Joyce 2003; Palka 2002; Stross 1992). In particular, Stephen Houston, David Stuart, and Taube's *The Memory of Bones: Body, Being, and Experience among the Classic Maya* (2006) espouses a truly existential approach to the ancient Maya view of the world. This publication will certainly remain as a landmark work, in that the systematic application of a phenomenological method is supported by abundant

references to a wide range of "codified images that, with careful study, reveal unsuspected clues to body concepts and to the nature of what the Maya regarded as life and experience" (Houston et al. 2006: 1). This publication in particular will be treated as an archetype, which the current discussion will abide by as an exemplar of how to make guarded forays into the often equivocal domain of ancient thought.

The emerging solidarity among archaeologists of all stripes has given way to a terminological reformation whereby the residual divisiveness connected with the theoretical schools of processualism and postprocessualism is being replaced by revamped conceptualizations of paradigmatic diversity. In many ways, these trends can be seen as an implementation of Bruce Trigger's (1991: 561-563) call for a "holistic archaeology," wherein the processualism-postprocessualism debate is remedied by "effecting a synthesis of these seemingly opposed positions." This overhaul of the way the discipline views itself involves the acknowledgement of the "two cultures" in archaeology where "archaeological scientists and theoretical archaeologists are quite simply speaking in different languages and have quite different visions of what the study of archaeology entails" (Jones 2002: 1-2).

THE REVIVAL OF A CONJUNCTIVE APPRAOCH IN ARCHAEOLOGY

Previous studies of ancient Mesoamerican iron-ore mirrors provide an excellent foundation upon which to build a comprehensive analysis of the distinctive mosaic specimens from the Maya subarea. Accordingly, there must be equal attention paid to current theoretical developments within the discipline because it is from this perspective that the data-sample will be viewed alongside a reconsideration of the earlier studies. The concluding remarks in Chapter 6 will highlight interpretive advances that have been

realized. The current chapter has provided the necessary demarcation of the boundaries of application relative to current theoretical and methodological trends in archaeology. Ensuing chapters will recall many of the viewpoints and issues discussed above as the emic significance of ancient Maya iron-ore mirrors is assessed according to available archaeological and iconographic evidence.

With special reference to Maya archaeology, the thesis chapters to follow emphasize the burgeoning adaptation of Walter Taylor's *conjunctive approach* (Ashmore 2004: 100; Canuto and Fash 2004: 53; Carmack and Weeks 1981; Fash 1994: 195; Fash and Sharer 1991; Foias 2004: 149; Golden and Borgstede 2004: 6; Houston 2000: 179; Taylor 1967[1948]; Willey 1982). The increasing popularity of conjunctive research during the 1990's exhibited a growing concern with mending the gap between processual and postprocessual archaeologies; an endeavour aimed at amalgamating the strengths of the two sub-cultures within the discipline (Hodder 1991; Wylie 1992). In essence, the new conjunctive approach is not so new, in that it is customary to deem that "archaeology (including settlement studies), epigraphy, iconography, and architectural restoration—in combination can provide more information than any single discipline could provide in isolation" (Fash and Sharer 1991: 172). What is remarkable, however, is the current theoretical atmosphere of the discipline where disagreement between the processual and postprocessual camps has subsided to the extent where both pursuits are acknowledged as valuable. This is an academic environment in which the conjunctive approach is nourished and can be fully implemented for the first time because of the improved intellectual camaraderie.

The theoretical and methodological milieu of contemporary archaeology appears to be characterized by the explicit acknowledgement that remnants of discord between hardline processualism and postprocessualism are detrimental to the future development of the discipline. In a recent exposé on the present state of archaeology, Andrew Jones (2002: 22) recommends that:

> …in order to begin to consider the possibilities of relating scientific archaeology with interpretive archaeology we must retain an aspect of each. The strengths of scientific approaches are reflected in their methodological rigour and reproducibility, while the strengths of interpretive approaches are reflected in their theoretical rigour and their ability to provide a coherent and satisfying account of society. The problems of embracing these two aspects of contemporary archaeology are manifold, and we must move through a difficult epistemological minefield in order to provide a more satisfying account of the past which encompasses both approaches.

Jones' perspective is both balanced and practicable. In fact, I have incorporated the objectives that Jones outlines into a recent paper, arguing that the comprehensive archaeological record of the Maya demands that certain cultural remains be delegated to appropriate categories (Blainey 2006a). The collection and interpretation of strictly utilitarian remains can continue to be designated as belonging to the jurisdiction of processualist traditions while iconographic and hieroglyphic evidence falls into cognitive categories where interpretive/postprocessual approaches work best. Initially, this may seem a trite statement, but Jones is underscoring the hitherto lack of success in implementing a mutual appreciation between scientifically-inclined researchers and those predisposed to a humanist approach to past culture. The current thesis, in reviewing and interpreting the evidence for ancient Maya iron-ore mirrors, will seek to bridge the paradigmatic divide. In the chapters that follow, the archaeological, iconographic, and

epigraphic data relating to ancient Maya iron-ore mirrors will proceed according to the theoretical and methodological tenets of overtly conjunctive ideals.

In bridging the divide between materialist and idealist approaches, this investigation into the political, ideological, and economic significance of ancient Maya iron-ore mirrors will incorporate and advocate the inclusion of both priorities. After all, when considering the archaeological records of complex civilizations like the ancient Maya, which have left modern archaeologists with a bountiful corpus of cultural remains, it is imperative that *all* categories of evidence are studied relative to the whole. The discussion now turns to the archaeological (Chapter 3) and artistic (Chapter 4) databases of iron-ore mirrors and the assertion that these objects embodied portals to the Maya Otherworld reserved for the exclusive use of elites.

Chapter 3: Archaeological Mirrors: Contexts and Spatiotemporal Distribution

INTRODUCTION

In general, ancient Maya mirrors are marked by the following traits: (1) a circular or square mosaic surface consisting of fitted iron-ore pieces (e.g. pyrite, hematite) adhering to the mirror back with sticky (vegetal?) resin; (2) some sort of whole, or compound backing to the mirror, made of either ceramic, wood, or stone, onto which the iron-ore fragments adhere; (3) either one or two pairs of "suspension holes" on opposite edges; and (4) a general association with elite burial and cache deposits of monumental architecture. The archaeological occurrences of iron-ore mirrors and their respective contexts provide important evidence for understanding their emic functions and purpose. The archaeological context, including site derivation, raw materials and dimensions, associated materials, location within a site, chronology, and the classification of their immediate provenience, informs all subsequent explanations concerning the emic functions of these artifacts. Although strictly iconographic (Taube 1993) and anthropological (Saunders 1988) studies of Mesoamerican mirrors provide useful insights, no interpretation of these mirrors can be complete without assessment of the physical specimens unearthed in systematic excavations. This chapter reviews the corpus of Maya archaeological mirrors, including some notable examples found outside the Maya subarea, with the intention of uncovering patterns that may appear across time and space. Trends regarding the artifacts commonly associated with the remains of iron-ore mirrors will also be considered relative to the burial and cache contexts in which they are most frequently found.

Following Coe's (1999: 10; Iannone 1993: 52-54) chronology, ancient Maya iron-ore mirrors can be traced archaeologically at sites active during the Middle Preclassic (900-300 B.C.), Late Preclassic/Protoclassic (300 B.C-A.D. 250), Early Classic (A.D. 250-600), Late Classic (A.D. 600-900), and Postclassic (A.D. 900-1530) periods. Before delving into the intricacies of the associated provenience of artifactual mirrors, it is imperative that their chronological distribution be considered alongside their spatial occurrence in the Maya subarea.

The Maya subarea is divided into six "generalized environmental-cultural subdivisions" which include from South to North, the Coastal Plain and Piedmont, the Southern Highlands, the Northern Highlands, the Southern Lowlands, the Central Lowlands, and the Northern Lowlands (Sharer 1994: 21; Figure 2). All but the Pacific Coastal Plain and Piedmont are reviewed herein because this excluded category did not turn up any mirror specimens during the review of site reports. However, this does not preclude that future studies might uncover mirror remains documented from Preclassic sites such as "Izapa, Abaj Takalik, El Baúl, and Chocola" (Sharer 1994: 26). Accordingly, the following will locate ancient Maya iron-ore mirrors within space and time.

SPATIOTEMPORAL DISTRIBUTION

Iron-Ore Mirrors from Outside the Maya Subarea

Olmec Mirrors: Whether the ancient Olmec's influence on subsequent Mesoamerican civilizations represents a "mother-culture" (Blomster et al. 2005; Cheetham 2006: 46; Neff et al. 2006a, 2006b) or a "sister-culture" (Flannery 2000; Sharer et al. 2006) remains moot. The pervasiveness of "Olmec-style traits" across

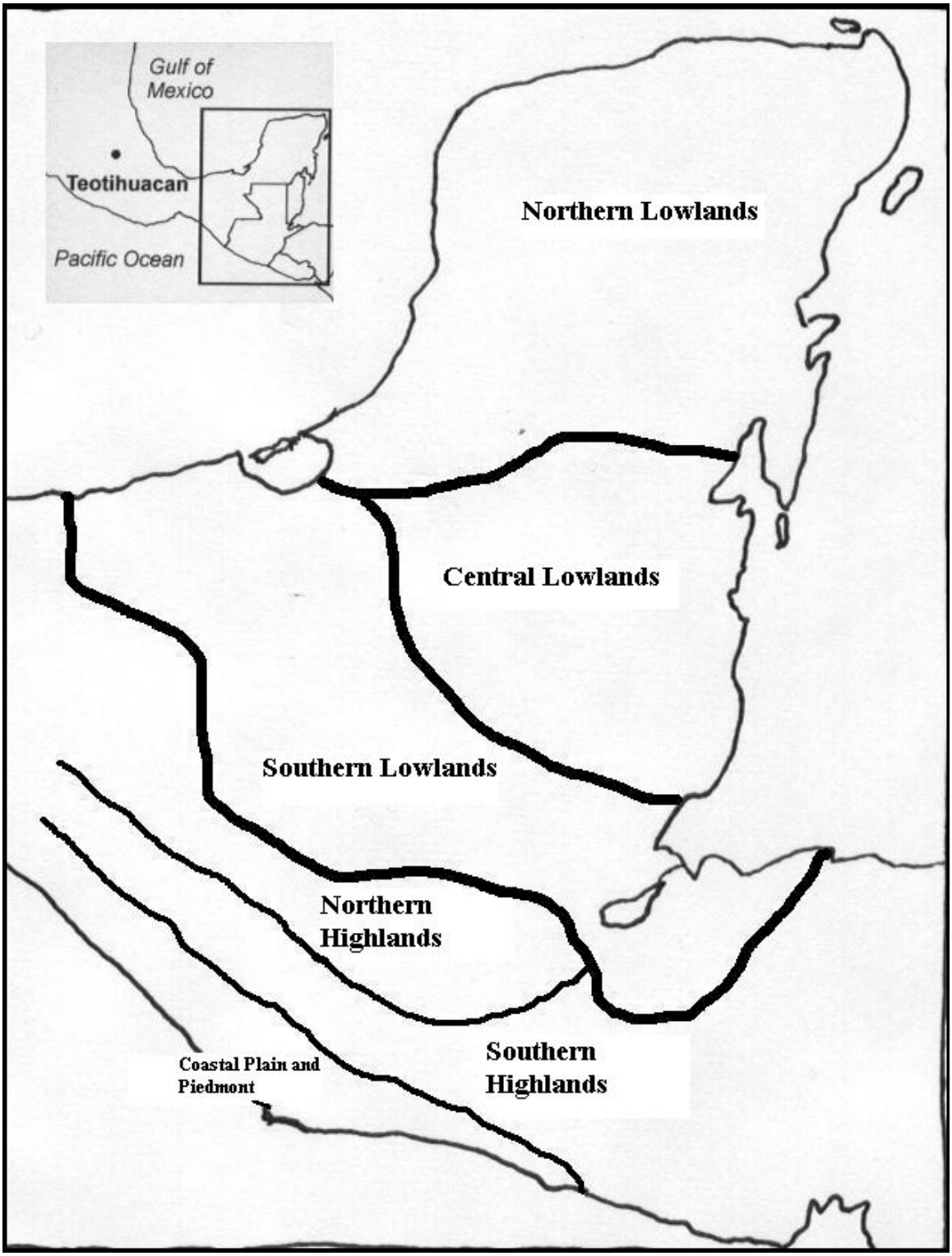


Figure 2**:** Maya Subarea and regional boundaries (adapted from Braswell 2002a and Sharer 1994: 21)

Mesoamerica is an undeniable indicator of this people's standing as the region's "first great cultural horizon" (Evans 2004: 186; see Willey 1962, 1999). Recently, a "block with a hitherto unknown system of writing has been found in the Olmec heartland of Veracruz, Mexico," perhaps a direct precursor to the writing system of the ancient Maya (Martínez et al. 2006).

Among the numerous traits shared between the ancient Maya and their Olmec forbearers are what archaeologists term "mirrors" made of pieces of polished iron-ore. Although the Olmec used similar materials to manufacture a reflective surface, mirrors found at Olmec sites differ from those found in the Maya subarea in three respects: (1) the Olmec mirrors are produced by polishing one whole piece of iron-ore, while the Maya mosaic versions are constructed of smaller fragments fitted together; (2) Olmec mirrors seem to lack the stone/ceramic/wood backing that is so characteristic of Maya varieties; and (3) the reflective surface of Olmec mirrors is concave such that the surface is ground into an inverted contour while Maya mosaic mirrors are normally flat. On the other hand, Olmec-style mirrors do share with Maya specimens the characteristic drill-holes, presumably for suspension, and a high frequency of occurrences in both cache and burial contexts (Carlson 1981; Cheetham 2006: 44-45; Heizer and Gullberg 1981; Kidder et al. 1946). Spanning the middle to late phases (ca. 1000-600 B.C) of Olmec civilization (Evans 2004; Heizer and Gullberg 1981), an extensive catalogue of 25 iron-ore mirrors from throughout the Olmec area can be found in Carlson (1981: 120-121). It is also worth noting that Olmec mirrors have been analyzed by a physicist interested in their optical qualities (Lunazzi 1996).

Perhaps the best known Olmec artifact relative to the discussion of mirrors is a small jade figurine of a female of "elite status" measuring 8 cm tall with a "hematite mirror ornament" around her neck (Figure 3a). The figurine, housed at the *Museo Nacional de Antropología* in Mexico City, was found in Mound A-2 in a "columnar tomb" at the Mexican site of La Venta (Drucker 1952: 154-155, Plate 46[1]; Fields and Reents-Budet 2005: 106; see also frontpiece in Pires-Ferreira 1975). A similar "Olmec style" clay figurine with a pendant of hematite around its neck (Figure 3b) is documented and portrayed in Porter (1953: 102, Plate 4B).

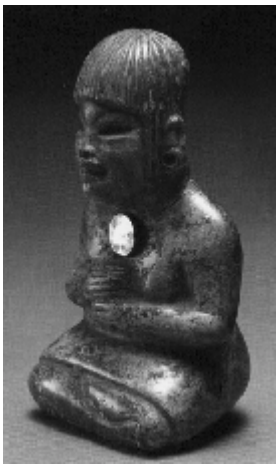
(a)  (b) 

Figure 3: Olmec figurines with hematite neck pendants (a) Fields and Reents-Budet 2005: 106 (b) Porter 1953: Plate 4B

Mirrors of the Maya-Tehuantepec Interface: In a travelling exhibition organized by the Los Angeles County Museum of Art, three artifacts are of particular interest to the present study (Fields and Reents-Budet 2005: 106). An unprovenienced "carved mirror" ornament with an intact surface "made of faceted pieces of hematite" is labelled as having originated in Southern Veracruz about AD 200-500 because "a cave saurian is depicted on the back, enveloped in cloud scrolls and water vapour." This particular motif of scrolls enshrouding central figures resembles a carved mirror back from Kaminaljuyu

(Kidder et al. 1946: Figure 156, upper) which is conventionally considered to represent the "Tajín style of Veracruz" (Coe 1999: 86; Woodbury 1965: 174). However, three similar mirror backs from Zaculeu seem to combine this Tajín style and that of Kaminaljuyu:

> Most of the free space between the figure and the geometric border is occupied by rounded-rectilinear scrolls. On many scrolls a narrow line parallels one edge, and numerous small, rounded hooks extend inward (Woodbury and Trik 1953: 235).

It is suggested "that in Early Classic times there still survived some of the features which probably derived from a more unified and widespread pre-Classic style" (Woodbury and Trik 1953: 234-235, Figure 131, 282a,b). Thus, there is considerable reason to suspect that reputedly Tajín style carved mirror backs might actually represent iconographic motifs that are native to the Maya subarea rather than imports from distant Veracruz.

An "extremely rare wooden figure" is also known that:

> …may once have held a square mirror, and the figure's pose suggests a trance state associated with divination. His features and costume are neither entirely Maya nor Olmec but rather combine aspects of the two styles (Fields and Reents-Budet 2005: 106).

This peculiar wooden specimen (Figure 4a) has no solid provenience but is "said to have been found in the border region of the State of Tabasco and Guatemala" and is radiocarbon dated to "537 A.D. +/- 120 years" (Ekholm 1964: 1-4). The suggestion that this wooden sculpture held a mirror in its lap is questionable. If it did once hold a mirror, it may be similar to the dwarf figures depicted as mirror-holders on Maya painted pottery (see Chapter 4; Kerr vessel #'s 1453 and 5110). A similar, yet badly decomposed, wooden sculpture (Figure 4b) of similar size (c. 40 cm/15 in.) and style was found by a tourist in an unidentified Belize cave and dates to the Early Classic period (Stuart and

Housley 1999). Perhaps these wooden figures are the extraordinary remnants of what was once a more widespread proclivity of the ancient Maya wood carvings of dwarf mirror-holders.

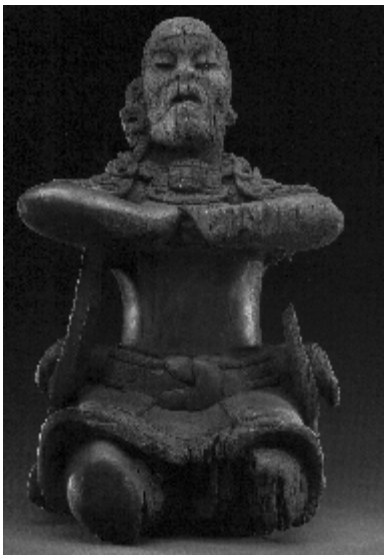
(a)  (b) 

Figure 4: Unprovenienced wooden sculptures (a) Fields and Reents-Budet 2005: 107 (b) Stuart and Housley 1999

Several mirror specimens were also unearthed at Chiapa de Corzo, "an important site probably associated with Mixe-Zoquean occupation" located immediately west of the western Maya periphery (Sharer 1994: 21, 92). A total of ten mosaic pieces of pyrite were recovered from Chiapa de Corzo, dating to the Maya Late Preclassic, Protoclassic, and Early Classic periods (Lee 1969: 3, 99-100, 144-145, Figs. 53 and 101b,c). More specifically, an elite Chiapa de Corzo burial in Tomb 1, Mound 1, dating to the Late Preclassic-Early Protoclassic included a skeleton whose "lobes of the ears had spool-shaped earplugs with thin mosaic hematite mirror facings" (Agrinier and Lowe 1960: 39-42, Plate 19e). Associated grave goods included a "prismatic obsidian spearhead," shark teeth, carved objects of multiple media, ceramics, jade beads, shell, and cinnabar.

Mirrors of Central Mexico: Taube (1993: 169) states that "although mirrors of the Formative and Postclassic periods are well known, there has been little interest in the intervening Classic Period of highland Mexico." His study is focused almost exclusively on the iconography of mirrors at Teotihuacan, emphasizing the well-established interaction between Teotihuacan and Maya centres such as Tikal and Kaminaljuyu that lasted from at least the first until the seventh centuries A.D. (Braswell 2003c: 103). The nature of this interaction remains a debated issue. Proposed scenarios for the relationship between the two regions range from a "single-event" to "multistage" interactions with the characterization of Teotihuacan as either the solitary, or one of many foreign influences on Early Classic Maya development (Marcus 2003b: 348-352).

Taube's (1993: 170) focus on the iconography of mirrors follows from the fact that "although mirrors are relatively common at Teotihuacan, there is relatively little information describing their precise archaeological context." His interpretation of the iconography of mirrors in highland Mexico might aid the current discussion of ancient Maya iron-ore mirrors in that "many of the same forms and attributes found with mirrors at Teotihuacan were also present among the Classic Maya" (Taube 1993: 198). As with the evidence pertaining to mirrors from regions outside the Maya subarea, the occurrence of Teotihuacano mirrors demonstrates that these devices of light-reflection constitute a pan-Mesoamerican cultural trait.

Mirrors of Oaxaca: An intriguing early trade network between the Valley of Oaxaca and the Olmec region has been documented through comparisons of iron-ore mirrors from both locales. It has been suggested that the similar nature of mirrors from the Olmec site of San Lorenzo, Veracruz, and a mirror manufacturing workshop at San

José Magote, a site in the Valley of Oaxaca dating to approximately 1000-800 B.C., implies that "the Olmec probably first became aware of the possibilities of polishing iron ores when they came in contact with highland Oaxacan peoples who had access to the sources" (Flannery 1968: 89, 106, Figure 7; see Flannery 1972: 403). Furthermore, the site of Etlatongo in the Nochixtlán Valley of Oaxaca reports the recovery of a single magnetite mirror fragment from Mound A, a Preclassic structure located in "the western portion of Area 3" (Blomster 2004: 56).

A key point about the Valley of Oaxaca is the intensive research conducted by Pires-Ferreira (1975) in documenting the local sources of iron-ore in the region, some of which were exploited while others may have been overlooked by the ancients. Source deposits of iron-ore in the Maya subarea will be discussed in Chapter 5. Given this evidence for iron-ore sources in Oaxaca, the possibility that the materials which were used for Maya mirrors were imported from afar cannot be discounted.

Mirrors of Honduras: A curious slate mirror back fragment (Figure 5) found in the vicinity of the Patuca River in Northeast Honduras bears a carving of two human faces on the reverse side (Smithsonian Catalogue A373430, Carrie Dennett, personal communication, 2006). Although certain features of the nostrils and lips on the two figures resemble examples from the ancient Maya San Bartolo murals and eccentric flints respectively (Miller 1999: 228; Saturno 2006), it is uncertain whether the images represent Maya persons. The sharpness exhibited at the tip of both figures' noses conflicts with the conventional aesthetic of ancient Maya iconography (Reents-Budet 1994), but it is possible that the Patuca specimen, which lacks chronological control,

predates this Classic Maya convention. Nevertheless, this slate back with a drill hole on the edge is likely a Maya import, like the Costa Rica mirrors described below.

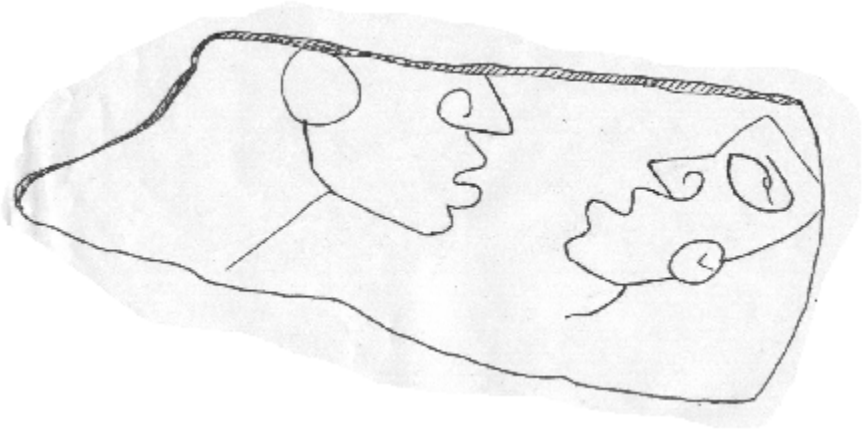


Figure 5: Mirror back fragment from Honduras (Smithsonian Catalogue A373430, Carrie Dennett, personal communication, 2006)

Mirrors of Costa Rica (see Figure 24 below): Mora-Marín (2005: 50, Figure 3) provides a diagram of a "slate-backed pyrite-incrusted mirror disk" from the site of La Fortuna that has a Mayan hieroglyphic text written in two vertical columns carved onto the back face. Along with other pyrite specimens found at the site of El Tres, the twelve slate mirror backs from La Fortuna and the seven slate mirror backs from Guacimo in Costa Rica appear to be mosaic imports from the Maya subarea, dating to the Early Classic period (Mora-Marín 2005: 11; Stone and Balser 1965). The text on the piece from La Fortuna "briefly tells of the ascent to power of a king: 'During the month of *yaxkin* during the month of [?] the king or lord [?], ninth successor in his lineage, tied the royal band for himself [crowned himself]" (Juan Vicente Guerrero Miranda catalogue entry #433 in Schmidt et al. 1998: 628-629). An even more detailed hieroglyphic text carved into a slate mirror back found in Nicoya, Costa Rica, reads:

> It was separating into two. The place seven-black-precious yellow was born from the carapace of the turtle *uaxaktun* [Uaxactún emblem glyph], he harvested from his tongue its sacred substance [he let blood] the son of the

> puma-turtle the protected son. Of jaguar divine sun eye or king of *uak* [emblem glyph] (Juan Vicente Guerrero Miranda, catalogue entry #434 in Schmidt et al. 1998: 629).

Yet another carved slate mirror-back from Bagaces, Costa Rica, displays the glyphic expression *u-baah*, a Mayan term meaning his-"head," "face," "body," "image," or "self," that will be discussed in the next chapter (Houston et al. 2006: 60-67). These Costa Rican slate mirror backs are obviously imports from the faraway Maya subarea and have implications for the discussion of mirrors at the end of this chapter.

Mirrors of Panama: Lothrop (1937: 102-105, Figs. 68-71) reports finding several mirror backs at the Central Panamanian site of Coclé. The corpus includes several stone mirror backs with either a square or circular shape and one or two suspension holes drilled near the center. Since Panama bridges the regions of Lower Central America and South America, it is not surprising that the stone-backed varieties are accompanied by the occurrence of mirror frames made of cast metal. Of the two specimens found at Coclé, one is simply a "pyrite mirror set in a gilded metal frame" (Lothrop 1937: 104, Figure 70), while the other is much more eccentric. The frame of the latter is described as "an anthropomorphic figure of the Bat god blended with certain attributes of the Crocodile god" (Lothrop 1937: 105, Figure 71).

Iron-Ore Mirrors of the Maya Subarea

A major task of this thesis is collecting and reviewing all known examples of iron-ore mirrors excavated in the Maya subarea (see Appendix A). My research required an extensive gathering of raw data from published Maya archaeological site-reports. Essentially, Appendix A is divided by sites in alphabetical order with archaeological evidence for mirrors listed. In addition to identifying sites with evidence of mirrors,

Appendix A contains an estimate of the minimum number of specimens (# of mirrors); a physical description of the mirror forms (type); the size of mirrors; the composition of the mirror back (backing material); the composition of the reflective surface (surface material); the provenience (archaeological context); number of suspension holes, if present; description of the edges; chronological age (date); documentation (reference).

As with any archaeological venture seeking to assemble the entire corpus of a specific class of artifacts, the process of accumulation relies on repeated cross-referencing of publications, so as to ensure the inclusion of all specimens cited by subsequent authors and to avoid duplication. This process has been complicated, however, by the lack of consistent terminology and documentation, especially concerning the geological material that composes the mosaic mirror face and backing. Regarding archaeology of the Maya subarea, unsystematic references to excavated iron-ore "plaques" (Coe 1959; Kidder et al. 1946; Smith and Kidder 1951; Woodbury 1965), "discs" (Gann 1918; Thompson 1897), "fragments" (Merwin and Vaillant 1932), or "pieces" (Ricketson 1929) have appeared in site-reports for well over a century.

The modern fondness for the informal term "mirror" actually dates to the earliest reference to a class of iron-ore artifacts from the site of Chamá, Guatemala, by Erwin Paul Dieseldorff (1893). Some scholars from the first half of the 20th century thought that "the small disks of iron pyrite, which Dieseldorff would prefer to label and explain as mirrors, probably served as mosaic incrustations of utensils or ornaments (ear pegs or similar articles)" (Seler 1904: 87; see also Gann 1918). Likewise, other scholars opted for "the more noncommittal term, 'pyrite-incrusted plaques'" (Willey 1972: 141) in an attempt to disengage the unidentified functions from notions associated with the modern

concept of mirrors (Kidder et al. 1946; Smith and Kidder 1951). Over time, it seems that Dieseldorff's original designation of these objects as "mirrors" has prevailed so that the connotation of these iron-ore objects with a term referring to a modern Western vanity function is now firmly embedded in the literature.

This thesis seeks to elucidate the emic significance of these iron-ore "mirrors" according to the ancient Maya who made and used them, regardless of the terms previously employed by scholars of ancient Mesoamerica. Thus, the ensuing review of the archaeological dataset will continue the use of the term "mirror" while attempting to maintain an impartial stance relative to their emic conceptualization and functions, issues to be addressed and elaborated upon in later chapters.

Unfortunately, these so-called "mirrors" excavated before the development of modern dating techniques were assigned questionable chronological dates because their provenience was linked to glyphic dates on what were often assumed to be contemporaneous monuments. As J. Eric S. Thompson (1931: 336) states:

> It is almost a tragedy that the ability to decipher dates should have preceded any application of the ordinary rules of dirt archaeology to the Maya field. For, as a result, the evidence supplied by pottery types and their sequences, art styles and the development of architecture is ignored or refashioned to fit into the very uncertain structure of dated monuments. Such a scheme is on the level with the efforts of archaeologists of a few decades ago, who attempted to relate Pre-history to biblical dates.

As a result, some of the mirror specimens excavated at certain Maya sites cannot be precisely dated and will be remarked upon simply regarding their spatial location. Furthermore, dating problems continue to plague modern researchers who, despite the latest technologies and rigourous excavation methods, cannot avoid the ambiguities of dating deposits with mixed remains, as exhibited within a burial chamber at Seibal:

> Such a situation is not uncommon in provenience units that come from late (Bayal) structural fills. In such cases the Bayal sherds obviously date the fills, or architectural building episodes, but they do not necessarily date the artifact specimen or specimens in the fill, as these artifacts may very well have come from much earlier refuse deposits (Willey 1978: 5).

Ancient Maya iron-ore mirrors with uncertain or unknown dates will be addressed in a section dedicated to these "problematic specimens." Those instances of mirrors with probable, yet still uncertain, dates will be included in the main spatiotemporal review, but accompanied by appropriate disclaimers and/or a bracketed question mark [?] in Appendix A.

The discussion below will encompass the spatiotemporal scope of the various forms of ancient Maya iron-ore mirrors with the intention of exposing general trends. Considering the uneven distribution of source deposits of the raw materials required for the manufacture of iron-ore mirrors (see Chapter 5), the adoption of Sharer's (1994: 21) map of "generalized environmental-cultural subdivisions" provides the most appropriate template for spatiotemporal assessments. Aiming to shed light on the trade implications of either raw iron-ore, or iron-ore mosaic mirrors in a finished state, across different regions, the following will conflate a temporal synopsis of excavated mirrors with a breakdown of their occurrence within each of the regions of the Maya subarea. A tabulation of all mirrors discussed in the spatiotemporal review is included in Appendix A.

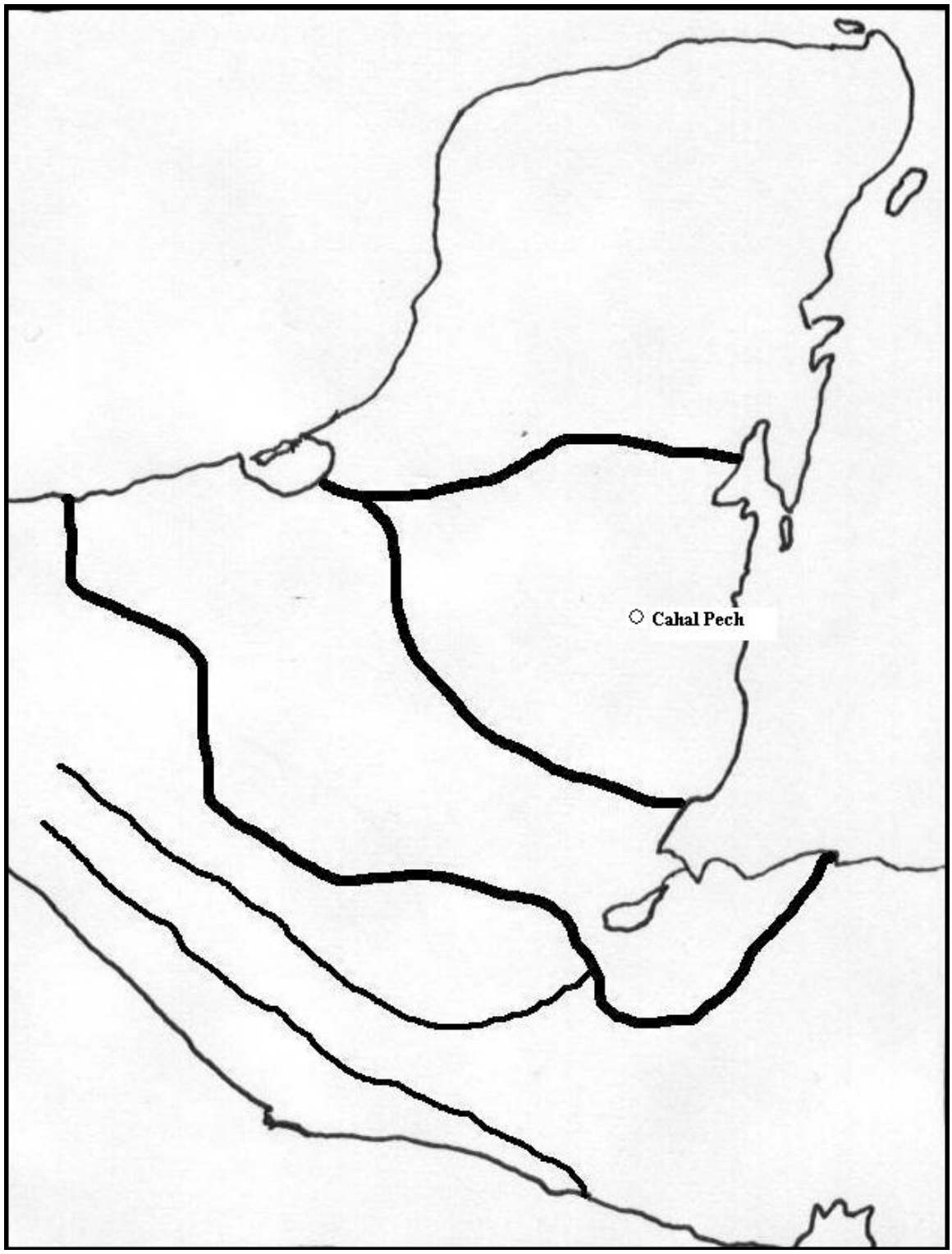


Figure 6: Sites with evidence for mirrors dating to the Middle Preclassic period (adapted from Braswell 2002a and Sharer 1994: 21)

THE MIDDLE PRECLASSIC (900-300 B.C.; Figure 6)

The Central Lowlands

Cahal Pech: After extensive review of the data, only one mirror specimen was found dating to the Middle Preclassic. This oldest of known evidence for Maya mirrors exists as a slate disk fragment, found in the fill of Structure B4/8th at Cahal Pech. It is only a crude fragment but its circular shape and distinctive suspension holes distinguish it as a mirror backing. This example demonstrates Maya manufacture and use of slate-backed mirrors as far back as ca. 600 B.C. (Awe 1992: 302-303, 306, Figure 91a).

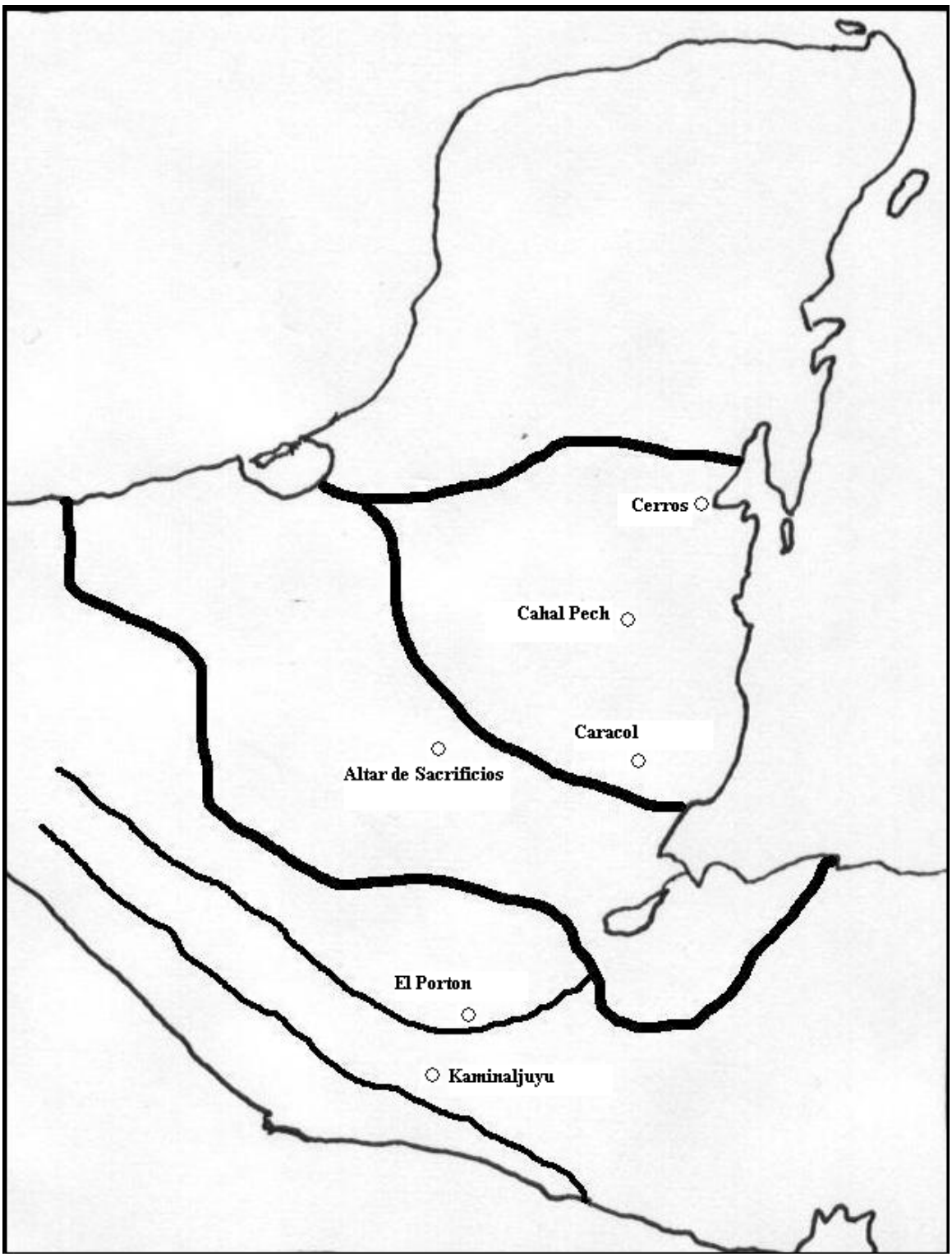


Figure 7: Sites with evidence for mirrors dating to the Late Preclassic period/Protoclassic (adapted from Braswell 2002a and Sharer 1994: 21)

THE LATE PRECLASSIC/PROTOCLASSIC (300 B.C – A.D. 250; Figure 7)

The Southern Highlands

Kaminaljuyu: In a detailed study concerning the excavation of the Preclassic deposits of Mound E-III-3 at this site, Shook and Kidder (1952: 116) found more "pyrite incrusted plaques" to complement those found in Classic period contexts. The remains of mosaic mirrors and mirror backs were associated with Tomb I and Tomb II, the elite burials located within this structure. One or more fragmentary mirror back specimens were found inside an incised ceramic jar in Tomb I. One fragment of pyrite, 1 cm square and 7 mm thick, adhered to a surface of mostly decomposed backing. In Tomb II, the remnants of perhaps two or three ceramic mirror backs were found smashed with only a few fragments of pyrite left intact. These rectangular pieces of iron-ore (pyrite) had measurements of 3 x 3.5 cm and 1.3 x 3 cm respectively with a thickness of 5 mm. Tomb II also included what is described as a "crystalline hematite plate" that was apparently pushed aside in a previous frenzy of looting of the grave. An oval shape with dimensions of 3.5 x 1.8 cm, it consisted of one whole piece of worked iron-ore.

The Northern Highlands

El Porton: It is reported that three separate Protoclassic caches at this site contained the remains of multiple mirror backs (Sharer and Sedat 1987: 263-264). A chart displays records of seven mirror backs in Cache 11, one in Cache 19 associated with 1 schist, and a half mirror back fragment from Cache 22 associated with 32 jade beads, all of which were found inside Structure J7-4 (Sharer and Sedat 1987: Table 14.2).

The Southern Lowlands

Altar de Sacrificios: In excavations conducted by Gordon R. Willey at Altar, a small pyrite mosaic piece "was in Cache 7 and dates as Salinas-Ayn (Protoclassic to Early Classic)" (Willey 1972: 142). Although the dating of these mirrors straddles the transition period immediately preceding the Classic period, it is included here despite the inconsistency in the literature, where the Protoclassic or Terminal Preclassic period (ca. A.D. 100-250) is sometimes conflated with the Early Classic (Evans 2004: 291; Schele and Miller 1986: 11-13; Sharer 1994: 138).

The Central Lowlands

Cahal Pech: Accompanying the lone mirror back fragment at this site dating to the Middle Preclassic are two specimens that date to the Late Preclassic. A single mosaic polygon piece made of either pyrite or specular hematite was discovered in the fill below Plaza B (Floor 3c), said to be "highly polished" on one side. Additionally, the fragment of a slate mirror back was unearthed from the fill of Structure 1 (Awe 1992: 302-304, 306, Figs. 91b, c).

Caracol: In an article appropriately titled "Before the Boom," Chase and Chase (2006) discuss what is known about the Preclassic occupation of Caracol, a site that is well-known for its zenith in the Classic period. Within Special Deposit (S. D.) C8B-5, a lidded urn stored inside a pit under the third floor of Structure A6-2nd, one "pyrite mirror fragment" was unearthed alongside "one *spondylus* shell pendent, one worked flamingo-tongue shell, two stingray spines, one shell bead, one jadeite bead…and the bones of two burnt quail." Another Late Preclassic cache (S.D. C8B-1), buried into the fill of Structure A6-2nd when it was encased within the later Structure A6-1st, consists of a "lidded barrel…urn" with layered contents:

> The bottom of the urn was filled with 345 malachite pieces, *upon which 2 mirrors* had once been placed, indicated by the recovery of 279 pyrite/hematite inlay pieces and their decomposed backings. The upper part of the barrel was filled in with a beehive or honeycomb that was still intact. Immediately below this honeycomb were preserved pine needles, 27 pumpkin seeds, and 4 other unidentified seeds. Beneath these terrestrial items, *but above the lower malachite and mirrors*, were a host of other items: 41 stingray vertebrae, 4 whole stingray spines, 5 fragmentary stingray spines, 4 shark's teeth, seaweed, faunal material, cinnabar, burnt word (?), 1 jadeite pendant, 1 turtle, 1 jadeite "whale," 1 jadeite flower earflare with central tubular bead, 9 jadeite beads, 1 large pearl, 1 small pearl, 1 shell fire serpent, 4 shell Charlie Chaplin's, 2 shell turtles, 3 shell "spines," 1 shell point, 2 pointed shells, 4 circular shell markers with inlays, 1 piece of coral, 1 shell with leather (?) attached to it, 15 natural shells, 1 large *spondylus* shell, 2 large scallop shells, 1 large clam shell, and 1 large fan shell (Chase and Chase 2006: 51-53, italics added).

The crowded lavishness of the items contained in Caracol S.D. C8B-1 is exceptional, but many of the contents here represent a cross-section of materials commonly associated with iron-ore mirrors in Maya burial and cache contexts from later time periods. Among the most frequent recurring materials, all of which imply high status, are worked objects made of jade, shell, ceramic, stingray spines, stone, obsidian, bone, and in the Postclassic period, sometimes even copper. The layered composition of this cache from Caracol resembles the tripartite arrangement of contents in numerous caches reviewed by Mathews and Garber (2004: 53), suggesting the cosmological allusions of such ritual customs to the ancient Maya belief in a three-tiered universe.

Cerros: The remains of several mirrors, all of which date to the Late Preclassic period, were found at this site located on the coast of the Bay of Chetumal in Belize (Garber 1989: 67-68, 90-92, 131; Appendix B-61). Six shell disks (SF's 163, 164, 165, 166, 167, and 168), which "may have functioned as mirror backs," were discovered associated with 86 "specular hematite mirror fragments" (SF-148) in Cache 1 from the summit of Structure 6B along with "polished stone heads, ear flares, and Spondylus

shells." Notably, all specular hematite from Cerros was confirmed as such by "Michael J. Holdaway, Department of Geology, Southern Methodist University…made through the use of x-ray diffraction." Separate finds of specular hematite mosaic pieces were found as follows: 12 mosaic pieces (SF-985) from Cache 9 on Structure 5C-1st of which 9 "fit together to form an incomplete mirror"; a variety of Special Finds consist of mosaic pieces, including SF-1420 (eleven pieces), SF-1113 (two), and SF's-1115, 1165, 1174, 1175, 1391 (one each) all from Feature 1A, as well as SF-1778 (one) and SF-1784 (one) from Feature 2A. The implications of mosaic pieces found in small numbers are put forward in this fashion:

> These fragments may not relate to the abandonment of individual structures, but may be associated with the abandonment of the entire residential zone prior to its burial by the construction of the Feature 2A plaza…In the summary discussion of shell beads it was suggested that shell beads were included in the termination rituals of domestic structures but were never included in the termination of public monumental architecture. More exotic materials, such as jade and specular hematite, might have been more appropriate for those rituals. The abandonment of a significant portion of the Feature 1A zone may be more closely related to the termination of a public structure than it is to a private dwelling. This would account for the presence of very rare items such as specular hematite mirrors in the uppermost levels of Feature 1A (Garber 1989: 92).

The possibility that mirrors or mirror fragments played a central role in Maya termination rituals will be discussed further below.

THE EARLY CLASSIC (A.D. 250 – 600; Figure 8)

The Southern Highlands

Kaminaljuyu: The most intensive and consistent survey of iron-ore mirrors excavated in the Maya subarea is the seminal study conducted at Kaminaljuyu by Kidder, Jennings and Shook (1946). Nearly 10 pages are dedicated to describing what are termed "pyrite-incrusted plaques," 35 of which were found as part of Early Classic "Esperanza"

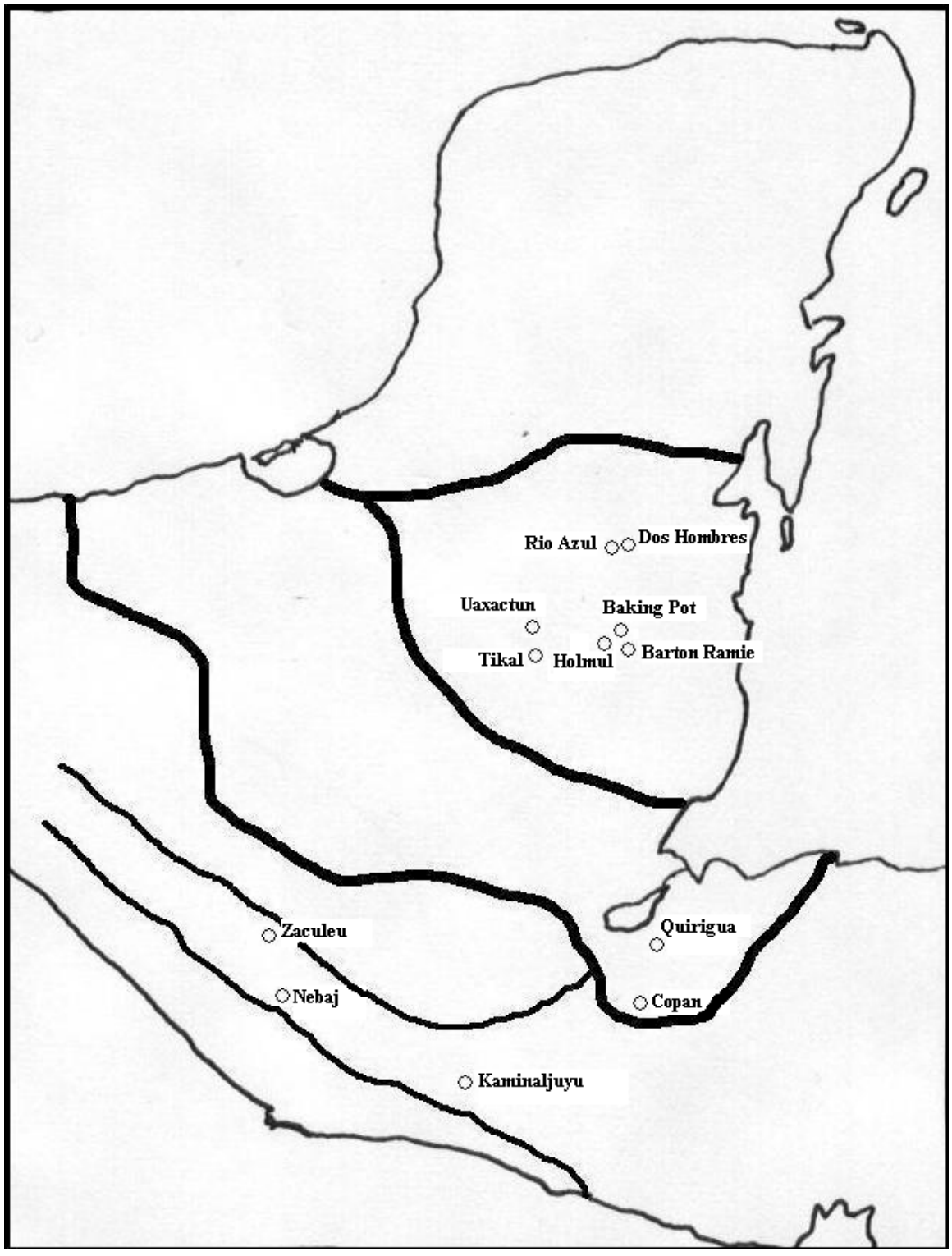


Figure 8: Sites with evidence for mirrors dating to the Early Classic period (adapted from Braswell 2002a and Sharer 1994: 21)

period assemblages, interred within Mounds A and B in the elaborate tomb burials of Kaminaljuyu elites (Sharer 1994: 95). The complex assortment of grave-goods found in these tombs, and others like them, will be assessed in the "discussion" section later in this chapter.

In initiating a typology for the mirrors at Kaminaljuyu, the authors designate five diagnostic traits, of which at least one is possessed by each mirror in their collection (Figure 9). The list includes the diameters of 29 "normal type" plaques with slate or shale backings, a "plaque with central discs," the decorative surfaces of five "compound plaques," three stucco-coated "painted plaques," and a "plaque with carved back" (Kidder et al. 1946: 126-135, 234-238).

Mirrors were found in a variety of burial contexts, including associations with Skeleton 6 in Tomb A-I (three mirrors), a young adult female skeleton in Tomb A-II (two), an adult male in Tomb A-III (six), a middle-aged male in Tomb A-IV (two), a middle aged male in Tomb A-V (one), a young adult male in Tomb A-VI (three), a middle aged male and a subadult in Tomb B-I (six), an adult male in Tomb B-II (four), an elderly male in Tomb B-III (four) (Figure ten), an elderly male in Tomb B-V (two), an elderly male in Tomb B-VI (one), and with an infant in Minor Grave 1 (one). The position of these mirror remains relative to skeletons varies from the feet, knees, groin, shoulders, head, and is sometimes isolated away from the body, which is usually in a sitting position. Perhaps the only instance of archaeological evidence for the practice indicated by Taube (1993) of hanging mirrors as costume adornments is the square mirror from Baking Pot found lying "beneath the lower vertebrae...(facing away from the body)

and probably had been attached at the small of the back to a belt or other garment" (Figure 18; Bullard and Bullard 1965: 13).

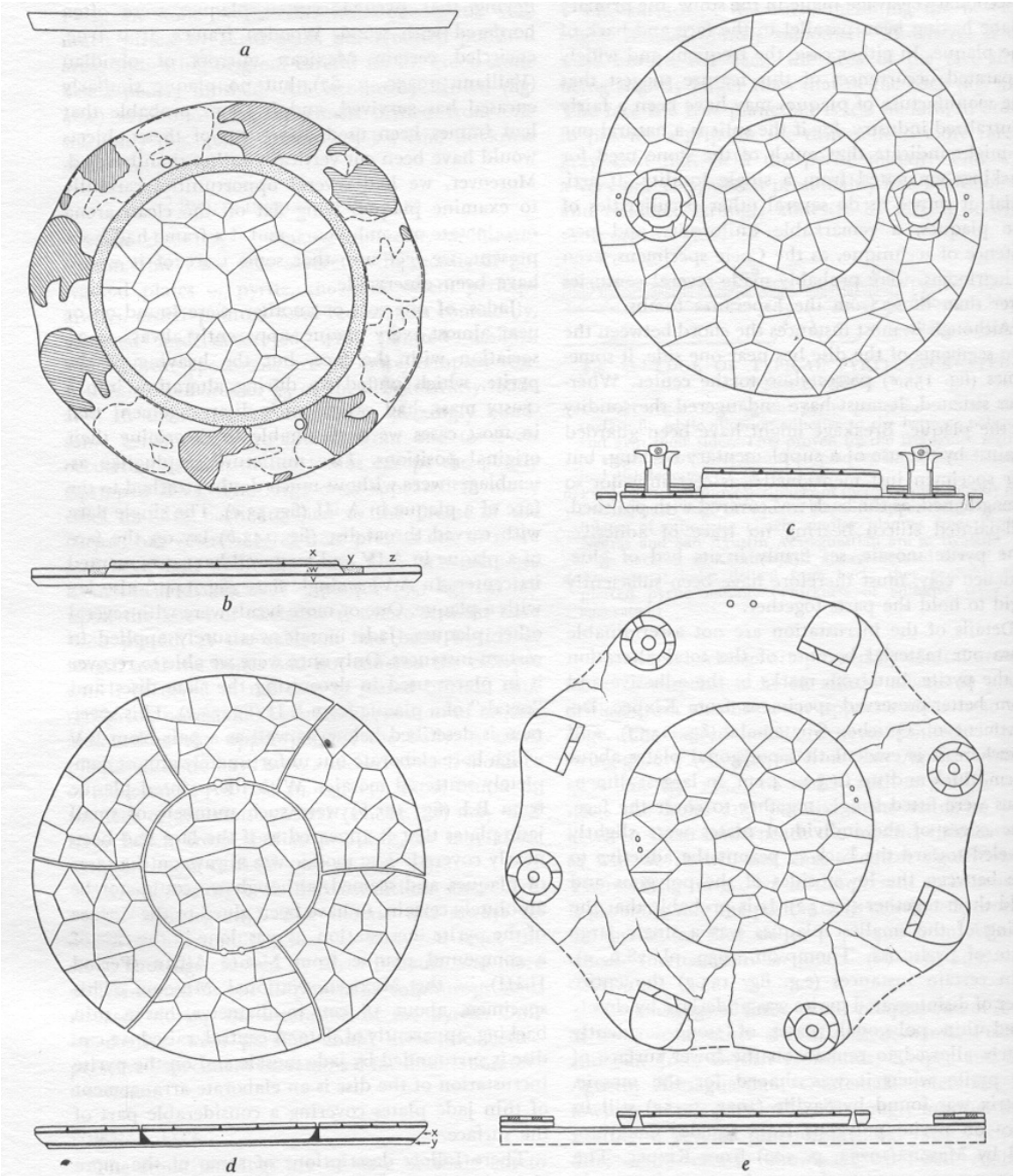


FIG. 53—PYRITE-INCRUSTED PLAQUES

Mosaic restored on basis of plaques shown in fig. 155,*e,g,j*. Thickness of coats of adhesive (shown in black) somewhat exaggerated in sectional drawings.
a: Section of unusually heavy slate backing without suspension holes. Back and beveled edge less well smoothed than usual; face rough and bears red stain of disintegrated pyrite. Diam. 22.1 cm. [Minor Grave 1].
b: Face and section of compound plaque (fig. 155,*i*). The "bird heads" are probably stone matrix of pyrite. In section: *v* represents main slate backing; *w*, central disc; *x*, restored pyrite

Figure 9: Depictions of the mirror varieties found at Kaminaljuyu (Kidder et al. 1946: 128, Figure 53)

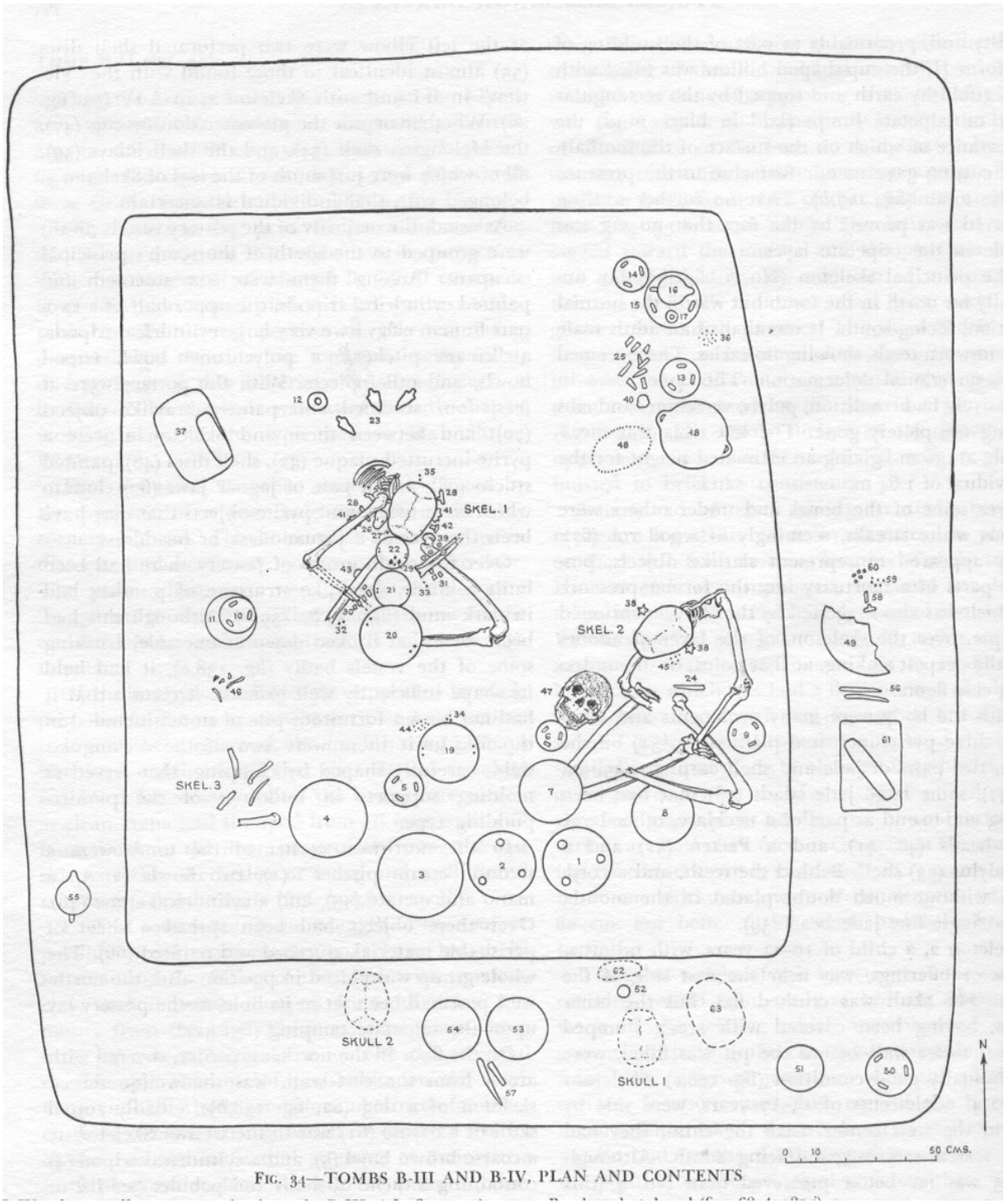


Figure 10: Tombs B-III and B-IV from Kaminaljuyu; mirrors are #'s 19-22 (Kidder et al. 1946: 78, Figure 34)

Perhaps the most intriguing passage provides words of wisdom for modern Mesoamericanists seeking to explain the emic functions of these objects:

> Although they have usually been identified as mirrors, we think it improbable that the pyrite-incrusted plaques served as such. The many small plates of the mosaic, no matter how accurately fitted, would have formed a poor reflecting surface, yielding a much broken-up image…whatever their function, these brilliantly shining discs seem to have formed part of the ceremonial costume and must greatly have added to its barbaric splendor. They must have been very costly, for the labor involved in their manufacture was obviously enormous, to say nothing of the presumably high value of the material which went into their incrusted faces (Kidder et al. 1946: 130-131).

The inference that the surface would have been a "poor reflecting surface, yielding a much broken-up image" is belied by my personal encounter with an astonishingly well-preserved (or rehabilitated) specimen (Figure 11) on display at the New York Metropolitan Museum of Art in the summer of 2006 (Fields and Reents-Budet 2005: 106). I was surprised that when I looked into the iridescent mosaic surface expecting to see a broken image, my reflection was actually a complete likeness multiplied across the mirror's face, much like a bee's eye-view. Regardless of the iridescence, it is probably safe to say that these "mirrors were not used for cosmetic purposes, but for scrying, gazing upon the reflective surface for purposes of divination" (Taube 1983: 112). In any case, the use of the term "mirror" in the current thesis is continued despite interpretations of the emic functions of these objects emulating the cautious reclassifications of Kidder et al. (1946) and Taube (1983).

Nebaj: The highland site of Nebaj provides the most extensive collection of mirrors ever unearthed at one site in the Maya subarea, yielding "over 200 more or less whole specimens and fragments of many others" (Smith and Kidder 1951: 44). Of the roughly 212 specimens excavated from the elite tombs, burials, and caches of Mound 1

Figure 11: Superbly conserved mirror in museum exhibition (Fields and Reents-Budet 2005: 106)

(Tomb 1) and Mound 2 (Tombs 1 and 2; Burial 1), approximately 164 (77%) of them can be reliably dated to the Early Classic period occupation of the site. The excavators also sort the 196 "specimens sufficiently complete for determination of number of holes for accurate measurement" by diameter, distinguishing between the 34 with "two holes" and the 162 with "two pairs of holes," presumably means for suspension (Smith and Kidder 1951: 46). Also, there appears to be a general trend where specimens with drill holes located at the edges correspond to the Early Classic period, while those with a pair of holes in the centre of the mirror-face tend to be dated to the Late Classic period (Smith and Kidder 1951; Willey 1972: 143).

The temporal breadth of the assemblage at Nebaj, stretching from the Early Classic to the Post-Classic periods, will necessitate a return to this site's collection in the ensuing spatiotemporal review. In view of the inordinate amount of mirrors discovered at

Nebaj, the specimens from this site must be emphasized as an enigma that inflates the total number of specimens listed in the mirror database (making up more than 40% of the total identified in Appendix A). These finds also suggest Nebaj as a likely production hub specializing in the manufacture and export of iron-ore mirrors, akin to the Preclassic mirror workshop identified at San José Magote (Flannery 1968: 89, 106, Figure 7; see Flannery 1972: 403).

Zaculeu: The relatively large number of "mosaic-decorated plaques" unearthed at this site in south-western Guatemala is indicative of the extended occupation period which reaches from the later part of the Early Classic period to the Spanish Conquest in the 16th Century (Woodbury and Trik 1953: 232-239, 448). The remains of at least 34 mirrors found with material dated to the Atzan phase at Zaculeu are said to correlate with the ancient Maya Early Classic period (Wauchope 1955). Observing that "the mosaic is so well fitted that the joints are barely discernible," Woodbury and Trik (1953: 232) denote these specimens as "true masterpieces of craftsmanship," an appraisal epitomizing the general consensus among the treatments of well-preserved mirrors cited herein. The observations of the Zaculeu mirrors consistently follow those from Kaminaljuyu, such as the notation that the "contact edges of" the pyrite "plates are bevelled, permitting the adhesive layer to penetrate between the plates and hold them more securely" (Kidder et al. 1946: 126, Figure 52a; Woodbury and Trik 1953: 233, Figure 129). Much of the analysis of the Zaculeu mirrors resembles the earlier interpretive methods of Kidder et al. (1946).

The Early Classic corpus of mirrors from Zaculeu is disproportionately composed of approximately 33 whole and fragmented "circular plaques with edge-holes" acquired

from a tomb beneath Structure 1. The specimens are described collectively as having backs "invariably of slate, from light to dark gray," and measure with a "mean diameter" of 15.7 cm (Woodbury and Trik 1953: 236). The authors choose the most distinctive of these specimens for detailed description (Woodbury and Trik 1953: 233-236). These include "one plaque, which is far better preserved than the rest, probably because of its location in an incensario, which demonstrates the exquisite precision with which the plates of pyrite were fitted" (Woodbury and Trik 1953: Figure 282d). Another "one of the larger disks (diameter 21 cm)" exhibits "a petal-like border around a central area" (Woodbury and Trik 1953: Figure 130), while other distinctive borders include one "found badly shattered…decorated on its back with a band of red stucco upon which is painted a scroll design in white" (Woodbury and Trik 1953: Figure 132). Yet another "one of the larger disks (diameter 19 cm) is notched shallowly at intervals of about 4.5 cm" and has on its back face "a border of bright orange-red stucco 1.7 cm wide." Outside of the tomb, in the fill of Structure 1, three additional fragments of "circular plaques" were discovered.

The remains of three mirrors with carved backing were also included in the tomb. One "magnificent piece of carving" (Woodbury and Trik 1953: Figure 131) depicts "a central figure, standing with legs spread on a platform…skirted, and his spread arms support wings" (Figure 12). Fragments of another carved plaque (Woodbury and Trik 1953: Figure 282a) resemble the images on the back of the first, but "portray an even more elaborate scene" where "a central figure, probably bird-headed, is surrounded by seven or more small crouching figures" and "the one directly above the central figure is winged." The third, carved "badly rotted disk has a curvilinear design incised on the

back in a style quite distinct from that of the two preceding disks" but maintains the emphasis on illustrating "lines ending in scrolls or hooks" (Woodbury and Trik 1953: Figure 282b).

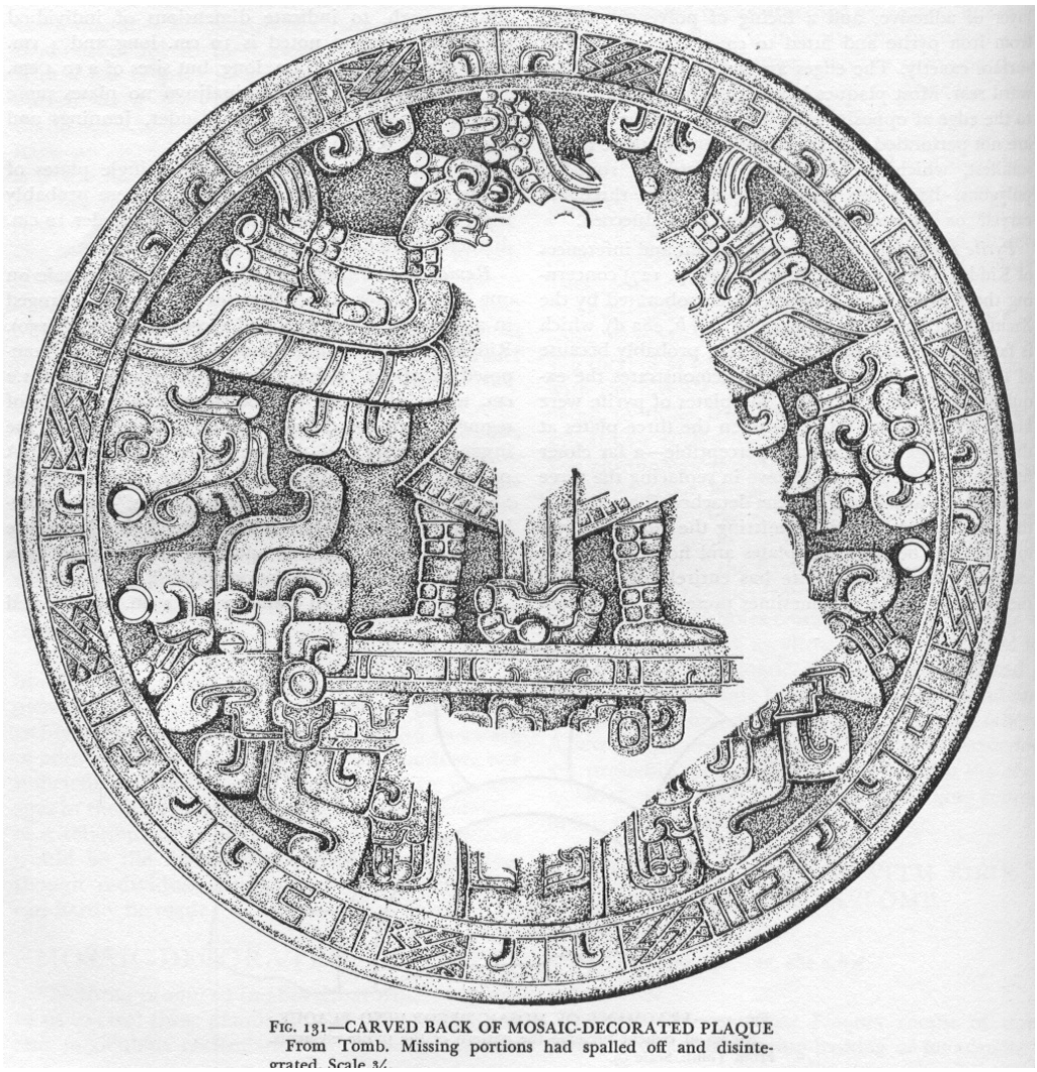


FIG. 131—CARVED BACK OF MOSAIC-DECORATED PLAQUE
From Tomb. Missing portions had spalled off and disintegrated. Scale ⅜

Figure 12: Mirror back from Zaculeu tomb (Woodbury and Trik 1953: 234, Figure 131)

The Southern Lowlands

Quirigua: This site boasts the remains of two Early Classic mirrors, each found in "Special Deposit" contexts. The "badly disturbed" SD 16, Group A (associated with Monument 21) contained "a broken backing for a pyrite plaque or mirror" made of shale together with "bone fragments and streaks of cinnabar, along with its derivative, liquid

mercury." Three vessels make up Cache SD 21 of Structure 3C-14, which yielded "bits of pyrite" with "large amounts of cinnabar and some mercury…and the central pair held at least one bird bone and what is probably an armadillo palate (Ashmore et al. 1983: 58-59).

Copan: A prominent inhumation of an elite adult female (Burial 93-2, also known as the "Margarita Tomb") within the depths of the Acropolis at this site boasts two carved mirror backs (Figure 13). The interred adult female individual, said to have been "between 50 and 60 years old at death" was accompanied by a rich assortment of luxury grave goods, implying that she was a "person…of very high rank" (Bell et al. 2004: 140).

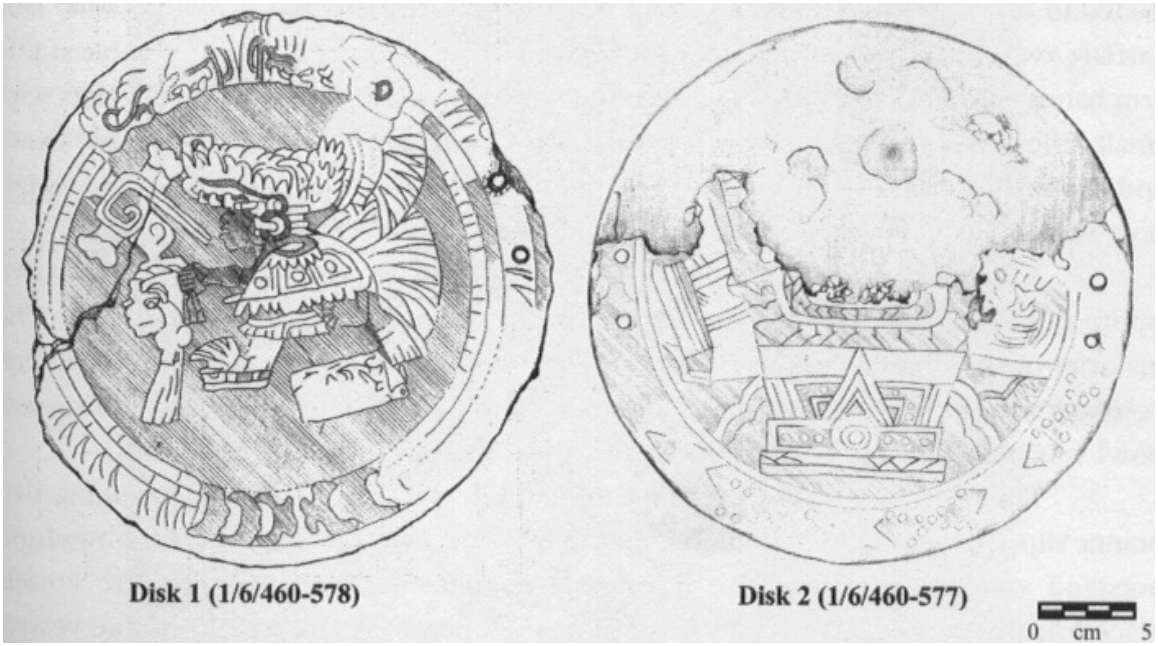


Figure 13: Carved mirror backs from the Margarita Tomb, Copan (Bell et al. 2004: 140)

The associated artifacts include multiple Teotihuacan-style ceramics, faunal bones, "a massive jade, shell and pearl necklace," "carved jade pectorals…a large, solid jade earflare…double strand arm bands made of large jade beads…jade plate wristlets with small reflective pyrite elements…a belt of jade beads and earflares, shells, and bird heads…a pair of jade and shell mosaic earflares with mother-of-pearl backs…a jade bead

necklace…two concentrations of green-stained bone needles bundled into organic wrappings…*Oliva* shells, stingray spines…shell rings…a worked bone spatula and awl." The context of the mirror specimens themselves is described as follows:

> The stuccoed basket lid lay on top of two disk-shaped slate and pyrite mirrors. These seem to have been wrapped in a finely woven textile and then bundled into a loosely twined container. Other objects, including carved shell rings and bone needles, were also bundled into the wrapping. The mirror backs are stuccoed and painted. One shows a winged Teotihuacan-style figure standing in profile and framed by a scaled serpent. A speech scroll emanates from the figure's mouth and an object dangles from his hand. The painting on the other disk depicts a large, central Mexican-style headdress, and the border is formed by yellow dots and stars (Bell et al. 2004: 140).

This burial context is highly unusual in regard to both the opulence and extremely well preserved nature of the tomb's contents. Unlike most of the burials reviewed herein, this tomb features intact organic material and a skeleton that is complete enough to be aged and sexed (Bell et al. 2004: 139-141, Figure 8.5).

Another very well-preserved interment, Burial V-6 located below Structure 10L-26 containing the remains of an elite adult male, held "a slate-backed pyrite mirror" along with Teotihuacan-style ceramics, "a large jade pectoral," "a shell plate necklace, sheets of gold-coloured mica, two large shell rings, and small *Oliva* shell 'tinklers'" (Bell et al. 2004: 155).

The Central Lowlands

Tikal: Specimens from this "crucible of the new lowland Classic tradition" (Martin and Grube 2000: 25) have been unearthed "in Early Classic tombs and caches, and fragments in refuse and fill may be of Late Classic date" (Hattula Moholy-Nagy, personal communication, 1961, cited in Willey et al. 1965: 491). In a recent publication

by Hattula Moholy-Nagy (2003: 93-94), she mentions the occurrence "slate-backed pyrite mosaic mirrors at Tikal in the Early Classic period (Manik ceramic context)."

The remains of at least 15 mirror backs are documented in the extensive Tikal Reports along with countless recordings of "specular hematite" in the form of "mosaic elements," "flecks," "dust," and "granules" (Coe 1990). What is described as "a large, multi-piece limestone disc, its underside contracting an array of 1,458 natural square pyrite crystals (13 altered to limonite…)" was found in Cache 79 of Structure 5D-26-1st (Coe 1990: 321). Associated with Skeleton A, an adult male from Burial 10 in Structure 5D-34, was "a pyrite-paved sandstone plaque, or "mirror," its severely decomposed remains poised against what had been the upper left thigh (locus 41, overlying crushed Sk. C callvarium)" (Coe 1990: 483). One final Early Classic specimen derives from Cache 98 in Structure 5D-33-2nd where "2 shale fragments, probably of an incomplete pyrite-encrusted plaque backing (yellow residue noted)" were found (Coe 1990: 516). All other mirrors from Tikal were recovered from Late Classic and Problematic contexts.

Uaxactun: The remains of hematite mosaic pieces were recovered from various Early Classic contexts according to the site reports of excavations at Uaxactun. Kidder (1947: 52) documented the discovery of 75 pieces associated with Burial A-20, "several" others in Cache B-2, and two pieces in Cache B-8. Additionally, "two small pieces" of hematite were found in a cache buried at the base of Stela 4 (Ricketson and Ricketson 1937: 159-158, 197; Plate 67 e #'s 13 & 14).

Holmul: A project carried out by Merwin and Vaillant (1932: 86-87; Plate 32, *aa*) at the Guatemalan site of Holmul found "fragments of mineral…with Skeleton 12 that are

most probably iron pyrites (Plate 32, *aa*)." Skeleton 12 was dated to Holmul III, a phase that falls roughly within the Early Classic period.

Dos Hombres: This site is located in the Three Rivers Region, which contains the larger Maya site of Rio Azul, with a territory likely reaching into small portions of what is today Belize, Guatemala, and Mexico, situated as it is at the fork of the three borders. An undesignated Early Classic tomb in an unspecified platform structure at Dos Hombres includes "hematite mirror fragments" amid "nine complete vessels, 11 *Spondylus* shells, two greenstone ear spools…and over 20,000 pieces of obsidian found just above the tomb entrance" (Sullivan and Valdez 2006: 75-76).

Rio Azul: The remains of an unspecified number of mirrors, all dated to the Early Classic period, were vaguely documented as found associated with the grave goods of elaborate tomb burials at Rio Azul. Two of these specimens are reported to be "incised with hieroglyphs." Adams (1999: 217-218) underscores his belief that iron-ore objects were imported from the Guatemalan Highlands and that "given the difficulties of manufacture and assembly, it seems likely that these mirrors were imported as finished pieces." Additionally, one round ceramic mirror back was recovered from Early Classic Tomb 4 at this site (Hall 1987: 143-144).

Barton Ramie: The remains of a datable mirror back were found at this site. The fragments of "brownish-grey" slate were associated with Structure BR-1 "in a mixed Hermitage-Tiger Run refuse provenience," corresponding to the transition phase between the Early and Late Classic periods (Willey et al. 1965: 474, 490-491; Figure 295 i).

Baking Pot: In Burial 15 of Mound G, Group I at Baking Pot, ceramics, jade beads and ear plugs, shell, worked bone, and the remains of an iron-ore mirror were

found interred with an exceedingly decomposed skeleton in an elaborate tomb supposedly dating to the Early Classic period (Willey et al. 1965: 491). Along with these "eleven diminutive pieces of iron pyrites" were found "four incisors…inlaid with iron pyrites and a fifth was bored, but the inlay had been lost" (Ricketson 1929: 15-17).

THE LATE CLASSIC (A.D. 600 – 900; Figure 14)

The Southern Highlands

Nebaj: Mirrors dating to the Late Classic make up a rather low proportion of the over 200 specimens found at this site. No more than 20 mirrors can be dated to Late Classic times, suggesting that Nebaj suffered the same fate as Kaminaljuyu with "the apparent withdrawal of contacts with Teotihuacan by about A.D. 600" (Sharer 1994: 147). Although the regal status of these centers limped along into the Late Classic, their success from earlier times had subsided.

Of the Late Classic period mirrors from Nebaj, all of which derive from sources within Mound 2, 10 were obtained from within the fill of Tomb 4, five come from Cache 6, one from Cache 7, and four were found associated with Cache 14 (Smith and Kidder 1951: 46).

Zaculeu: One Late Classic specimen is associated with material dating to the Chinaq phase at this site (Wauchope 1955). A whole slate mirror back, with decayed pyrite powder on its face, was found in Cache 1-9.

The Southern Lowlands

Bonampak: A pyrite mosaic mirror with a polychrome stucco-covered sandstone backing was found in extraordinarily good condition "as part of a mortuary offering at the feet of an important individual buried in a large tomb at Bonampak." This circular

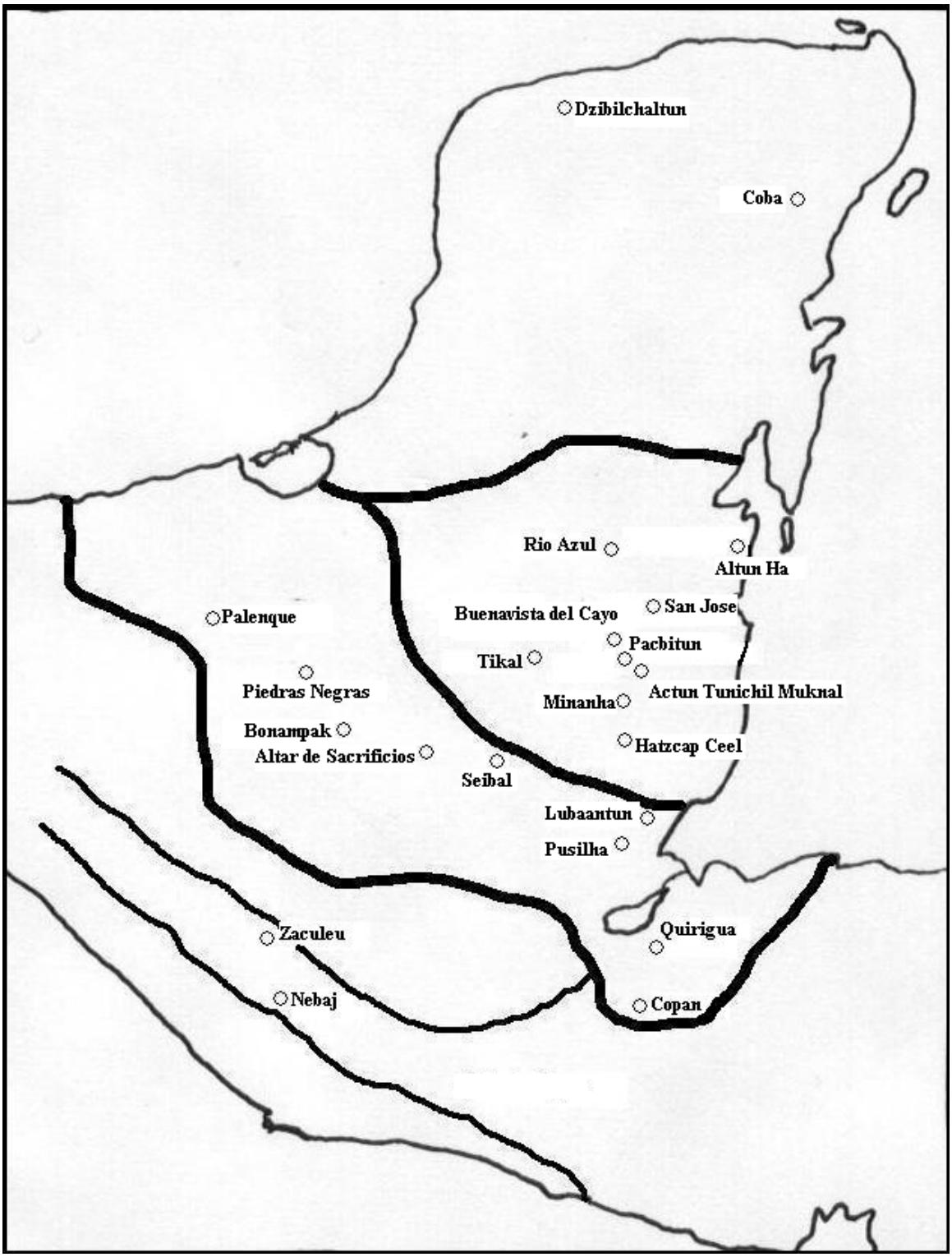


Figure 14: Sites with evidence for mirrors dating to the Late Classic period (adapted from Braswell 2002a and Sharer 1994: 21)

specimen is conjectured to have been part of the entombed individual's costume, "and its dark surface is associated with the night sun and the underworld, so that it could have had an important magical or divinatory significance" (Alejandro Tovalín, catalogue entry #203 in Schmidt et al. 1998: 569).

Piedras Negras: A variety of iron-ore objects have been unearthed at this site. Those which can be dated with relative certainty all come from the Late Classic period. These include two Olmec-style "solid discs" of pyrite (Coe 1959: 42-43, Figure 43h; from Cache J-6-5 and Burial 5), one "mosaic plaque" of pyrite "on a shale backing" (Coe 1959: Figure 42f; from Burial 5), a pair of pyrite "fillets…each composed of a series of rectangular and round pyrite pieces" found with the skeleton of a middle-aged male (Coe 1959: Figure 42g; from Burial 5), three worked (polished) and two unworked bits of hematite (Coe 1959: Figure 43l-n; from Cache's J-1-1 and O-16-1), along with an assortment of inlaid teeth (Coe 1959: Figure 69; from Burials 2 and 5), and three pyrite "miscellaneous objects" (one each in Caches O-13-3, O-13-14, and O-13-15). Other iron-ore artifacts found at Piedras Negras cannot be dated and are discussed in the "problematic specimens" section.

Altar de Sacrificios: Along with the Protoclassic pyrite disk discussed earlier, three mirror backs found at Altar have been dated to the Late Classic period. The first (Cat. No. 58-144) was found at the feet of the skeleton of an adult female in "rich burial No. 128" (Figure 15) and consisted of "at least four, and perhaps more, separate pieces of slate which had been joined together along carefully bevelled and fitted edges" (Willey 1972: 142). Associated grave goods include "polychrome and carved pictorial ceramics with glyphic texts…pottery earplugs…unworked shell," a pottery mask, mother-of-pearl,

26 stingray spines, flakes of obsidian and various jade, shell, and ceramic beads/jewellery (Coe 1988: 223-225, Figure 6.1c; Smith 1972: Figure 49a). The other two backs, one of grey sandstone and another rectangle of grey slate, were found in the refuse fill of mound structures (Willey 1972: 142).

Lubaantun: The fragmentary remains of four shale mirror "backing-disks" and six "pieces of hematite plaques" (2 fragmentary) were discovered in the 1970 and 1971 excavations at this site in South Toledo district of Belize (Hammond 1975: 355, 357; Figure 139). The first mirror back specimen (L220) was found in fill below Plaza IV between Structures 100 and 101 with one whole and two fragmentary hematite mosaic pieces still attached to its surface (Hammond 1975: 211-212). The second specimen (L182), with the "remains of pink and light blue painted stucco ornament in a now undecipherable design" was unearthed from the "masonry/rubble fill" of Structure 44 (Hammond 1975: 159, 355). The third mirror back fragment (L66) originated in the upper regions of a midden discovered in a unit dug at the southeast corner of Plaza XIV along with three whole mosaic pieces associated within the same midden (Hammond 1975: 196). The fourth mirror back fragment was found in a midden buried deep under the floor of Plaza II, a unit located "1 m S of Str. 4e" (Hammond 1975: 142). The ambiguous use of the terms "hematite" and "pyrite" in the Hammond (1975) text (and many other reports) frustrates attempts to explicitly assess the type of iron-ore in question. In a much less detailed publication, "two or three small polygonal plates of pyrites, exactly similar to the mosaic elements of" mirrors found at the nearby site of Pusilha (see below), are reported from excavations at Lubaantun in 1927 (Joyce 1929: 449-450).

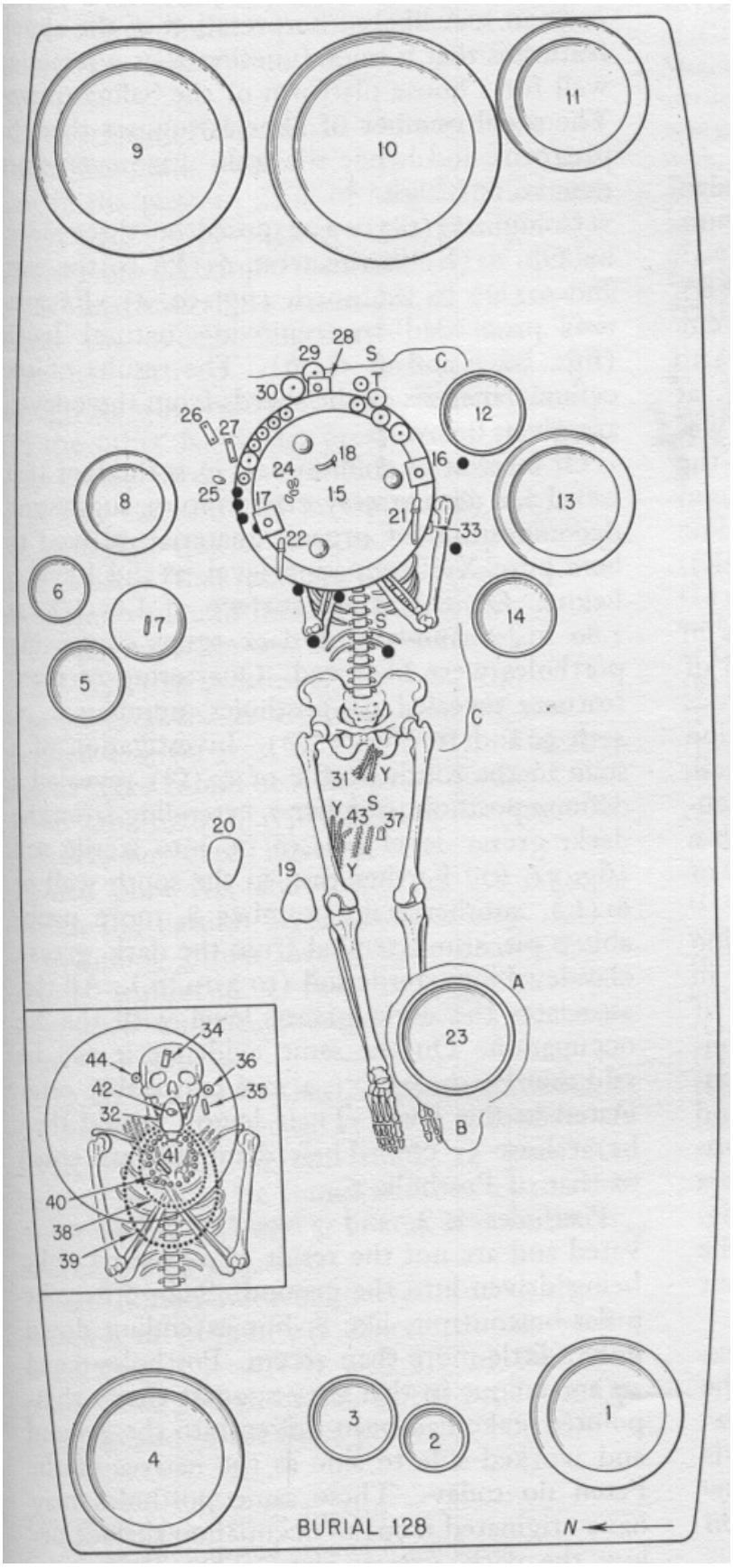


Figure 15: Map of Burial No. 128, Altar de Sacrificios (Smith 1972: 141, Figure 49a; mirror is #23)

Pusilha: Excavations at this site, located immediately southwest of Lubaantun, recovered all of the deliberately broken fragments of two exquisite mirror specimens with intact pyrite polygons attached to their slate backing (Joyce 1929: 449-450; Plate XLVI, Figs. 1 and 2). Paralleling Woodbury and Trik's (1953: 232) later assessment, Thomas Joyce describes the mirrors as "masterpieces" of technical achievement: "The accuracy of the jointing of the mosaic, and the evenness and high polish of the surface, constitute a triumph over a refractory material on the part of an artizan who had no metal tools" (Joyce 1929: 449). Both mirrors were found in tomb contexts located within what are termed the "Big Tree Mounds;" one associated with a burial in Mound A, along with a small jadeite mask, a jadeite bead, and some pottery, while the other mirror was found with a burial in Mound B, along with a jadeite figurine pendant, a pair of jadeite ear-flares, a jadeite bead, and some pottery.

Palenque: An unidentified number of mirror specimens are documented in the *Exploraciones Arqueologicas en Palenque: 1953-1956* (Ruz Lhuillier 1958: 263, 291, 293; Plates 46 and 51 [cited in Willey 1972: 143]). A different citation refers to records in Ruz Lhuillier (1958: 287) of six mosaic pieces of pyrite and one "highly polished convex…cartouche shaped" mirror made of one piece of hematite associated with Late Murcielagos/Early Tepeu II (Late Classic) Tomb 2 of Temple 18A at this site (Carlson 1981: 130-132, Figure 40).

Seibal: One of two specimens found at Seibal can be securely dated. This "small (2.5 by 1.1 by .3 cm) trapezoidal piece" of iron-ore (S-2722) associated with Late Classic material in "Temple 7527" is considered to be a "mosaic piece from a mirror face" (Willey 1978: 96).

Copan Rural Hinterland: In a curious discrepancy, compared to the overwhelming majority of mirrors associated with elite contexts, a pyrite mirror was unearthed along with an obsidian eccentric and one tiny fragment of jade from Mound 7D-3-1 located in the Copan periphery (Gonlin 1994: 192). Moreover, Mound 7D-3-1 is considered one of "the lowest-ranking Rural Region Copan households" so its possession of a presumed status symbol such as this mirror is very peculiar.

Quirigua: A Late Classic cache (SD 8) from this site's Acropolis "contained shell, two pieces of worked jadeite, about 1700 small fragments of jadeite and about 100 pieces of pyrite" (Ashmore et al. 1983: 58). Furthermore, "a set of hematite hexagonal disks" were found in one of the inner doorways of Structure 1B-2 alongside "a polychrome vase in the form of a grotesque human head" (Looper 2003: 64-65; see also Morley 1935: 136-137).

The Central Lowlands

Tikal: The remains of numerous Late Classic mirror specimens were recovered from Tikal. Two "incomplete" shale mirrors come from Problematical Deposit 43 in Structure 5D-2-1st (Coe 1990: 632). With an adult male in Burial 196 of Structure 5D-73 were the remains of "3 pyrite mosaic plaques with slate backings, decayed face-up and W of body…a fourth disintegrated specimen lay at locus 54" (Coe 1990: 643). Moreover, "6 mirror-surfaced hematite fragments, and 2 matched but fragmentary pyrite disks" were unearthed from what is presumably a Late Classic context in Cache 1 buried at the base of the "re-used upper portion" of a stela in the Stela 23 group (Coe and Broman 1958: 44).

One of the most famous royal tombs ever excavated in the Maya subarea, that of Ruler A (Burial 116) interred within Tikal's Temple I (Structure 5D-1-2nd), yielded the remains of three slate mirror backs "fitted with mosaics of jade, pyrite, and shell" amidst a luxuriant collection of grave goods. The artifactual accompaniment included 20 painted vessels, "sixteen and one-half pounds of worked jade…a jade mosaic cylinder vessel with lid…stingray spines and bone imitations of these…bone tubes, slivers, and 'awls' (perforators?)" (Coe 1988: 233). A closer examination of the individual items associated with this tomb reveals a wealth of now-famous carved and painted artifacts of bone and pottery that provide a rare window into how the ancient Maya viewed the journey of the soul after death (Trik 1963; see also Coe 1990: 605).

Actun Tunichil Muknal: Meaning "Cave of the Stone Sepulchre" in Mayan, an unknown number of "pyrite plaques from a mosaic mirror" were found among "more than one hundred whole and fragmented Late Classic period pottery vessels, several *metate* and *mano* fragments, small pieces of jade…chipped stone tools, and the skeletal remains of fourteen individuals" (Awe et al. 2005: 224-225). Indeed, the ritual connotations of caves for the ancient Maya are generally acknowledged by Maya scholars (Stone 1989) and reinforce an identification of iron-ore mirror specimens found in caves as ceremonial paraphernalia.

Hatzcap Ceel: This site, near the Mountain Cow water hole in Belize, yielded the remains of two iron-ore mirrors, both with ceramic backings. The first specimen consisted of a 5.4 cm square mirror back, and was discovered associated with jade beads, a jade ear-plug and jade figurines, shell beads, a shell figurine, and a piece of coral, in Votive Cache 2 interred within the temple of Pyramid M. The second mirror, found in

Votive Cache 3 in the lower temple of Pyramid F, originally consisted of 22 fitted squares of pyrite mosaic pieces. It was associated with jade and shell beads, figurines, and the remnants of four cephalopods (molluscs) (Thompson 1931: 274-276).

San Jose: In addition to the assembly of Terminal Classic-Postclassic period mirrors from this site, which are discussed below, a small hematite disk was found with Burial A7. This specimen dates to the San Jose III-IV transition phase, corresponding to the Late Classic period (Thompson 1939: 176).

Minanha: Within a large unit (43L-1) cut into the elite residential Structure 43L at this site, "a fragment of a slate mirror backing was found with "a relatively large ceramic bulk lot…a small lithics bulk lot…a number of obsidian chipped stone blade fragments,…small raw slate pieces,…and two quartz crystals" (Paauw 2004: 40-41).

Excavations of grave-chultuns at Minanha yielded three "hematite mosaic pieces" in Burial 112-B/1 of Chultun M1 amidst Middle and Late Classic period ceramic material (Gyles Iannone, Minanha database, 2007). Standard elite grave goods associated with this iron-ore fragment, such as stone, bone, and ceramic artifacts accompanied by forty jadeite beads, indicate that this is the burial of "an individual of elevated social status" (Turuk et al. 2005: 53, 60). It is conjectured that "an interesting round depression (ca. 10 cm)" carved into the smooth face of the capstone of Chultun M1 indicates that "an object, such as a hematite mirror, was originally mounted in this depression" (Turuk et al. 2005: 59). Moreover, two hematite "mosaic pieces" were derived from Chultun M2, along with a jadeite earflare and other standard elite grave goods; one associated with Burial 113-B/1 and another "groundstone mosaic piece" found within Level 5 of the chultun (Turuk et al. 2005: 57). The provenience of these two hematite fragments are said to "suggest an

elevated social status for some, if not all of the members in the chultun" (Turuk et al. 2005: 59-60).

Pacbitun: A "flat, drilled slate plaque (mirror back)" was found at this site "intentionally broken into two pieces at interment" (but still partially intact) associated with half of another intentionally broken round mirror back in Burial 4-1, a crypt that contained the remains of an adult female (Healy 1990: 259, Figure 8; Healy et al. 1995: 341, Figure 2). Other Late Classic mirror backs from Pacbitun include fragments of one round slate specimen found with an adult male individual in crypt Burial 4-2 and a square ceramic mirror back found in Burial 2-1 associated with an iron-ore mosaic polygon piece (see Appendix C; Paul Healy, fieldnotes: 4, 10, 15, personal communication, 2006). Another slate mirror back found on the pelvis of Burial 1-9 (Figure 16), the crypt of an adult male individual within Structure 1. This burial, presumably that of "an important Pacbitun lord, and quite likely a Late Classic-period site ruler" (Healy et al. 2004: 235), was accompanied by other grave goods including iron-pyrite pieces (see Appendix C), "19 painted vessels, about one quarter polychromes, the remainder monochrome… polished jade and iron pyrite beads (3 jade, 1 pyrite tube), a matching pair of circular shell earflares, five hollowed bone tubes…[and] a large marine (*Spondylus americanus*) valve with an eroded painted symbol on the inside surface." Furthermore, Burial 1-9 was "one of only four elaborate burials at Pacbitun to display residues of red ochre, or cinnabar…the pigment had been liberally sprinkled over the entire body but was especially evident on the head and chest areas" (Healy 2004: 231-237, Figure 14.1). The raw material for these slate mirror backs was "fairly abundant at Pacbitun and can be quarried today from Slate Creek, only about 3 km from the center" (Healy 1990: 259).

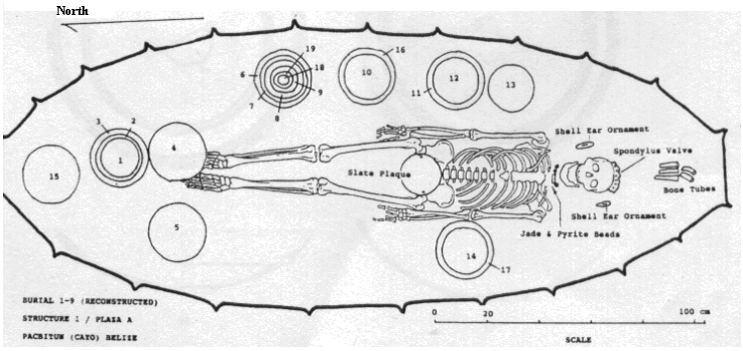


Figure 16: Position of slate mirror back found in BU 1-9, Pacbitun (Healy et al. 2004: 230, Figure 14.1)

Buenavista del Cayo: The remains of "a mosaic mirror of polished crystalline hematite" were found "placed at the head" of an elite young adult male in Burial 88B-11 at this site; accompanied by "another large rectangular mosaic object of jadeite, shell, and polished hematite" placed at the right knee (Taschek and Ball 1992: 494). Associated grave goods include stingray spines, shell, a "packet of red ochre," and the famous Buenavista "Jauncy Vase" which sports a hieroglyphic reference to the Naranjo ruler Lord *K'ak'-Til* whose "gift of this exceptionally fine vase to the lord of Buenavista is the material reflection of an important political connection for Naranjo" (Reents-Budet 1994: 305).

Altun Ha: Fragments of more than four mirrors have been found at Altun Ha in excavations by David M. Pendergast. A section of a slate disk with one lamina of crystalline hematite still attached was recovered from a cache in the refuse deposit (RP-595) of Structure A-8 and another "laminae of crystalline hematite" composed of 174 mosaic pieces was associated with Tomb (RP-440), Structure A6-1 (Pendergast 1979: 138, 180). In addition, a Late Classic sandstone mirror back was unearthed from the Sun God's Tomb in Str B-4/7 (Figure 17), located amongst several ceramic vessels just beyond the top of the skull (RP-364) (Pendergast 1969: 18, Figure 10/35). Although

Pendergast (1969: 10) states that the skeleton in the Sun God's Tomb "is unquestionably that of a male," it has been pointed out that:

> …the osteological evidence is based exclusively (and dubiously) on skull characteristics, not on the pelvis. I raise the question because of the absence of stingray spines and the presence of three bones, eyed needles among the offerings, which suggest to me that this was a woman. Bloodletting is implied, however, by an antler-sliver pin with bird on top; women did let blood, but not with stingray spines (Coe 1988: 232-233).

This instance of ambiguous gender identification is illustrative of a common problem faced in mortuary studies of the ancient Maya, in that even when skeletal or artifactual remains suggestive of gender are present, the precise sexing of the individual in question may be debatable.

Baking Pot: Parts of two mirrors from the Late Classic period were recovered from rich burials associated with Structure II-A at this site. They were associated with painted ceramics, jewellery, bone tools, shell figurines, and obsidian tools. In Burial 5 was discovered a "square slate tablet incrusted with a mosaic of thirty-eight polygonal plates of pyrites or marcasite, and surrounded by a composite bone frame composed of eight bone splints and fifteen bone 'flares'" (Figure 18; Bullard and Bullard 1965: 13, 62, Figure 16). The remains of a second mirror were found in Burial 1, consisting of "nine disk-shaped and twenty-five polygonal mosaic elements of pyrites or marcasite" (Bullard and Bullard 1965: 31-34, Figure 16, 34).

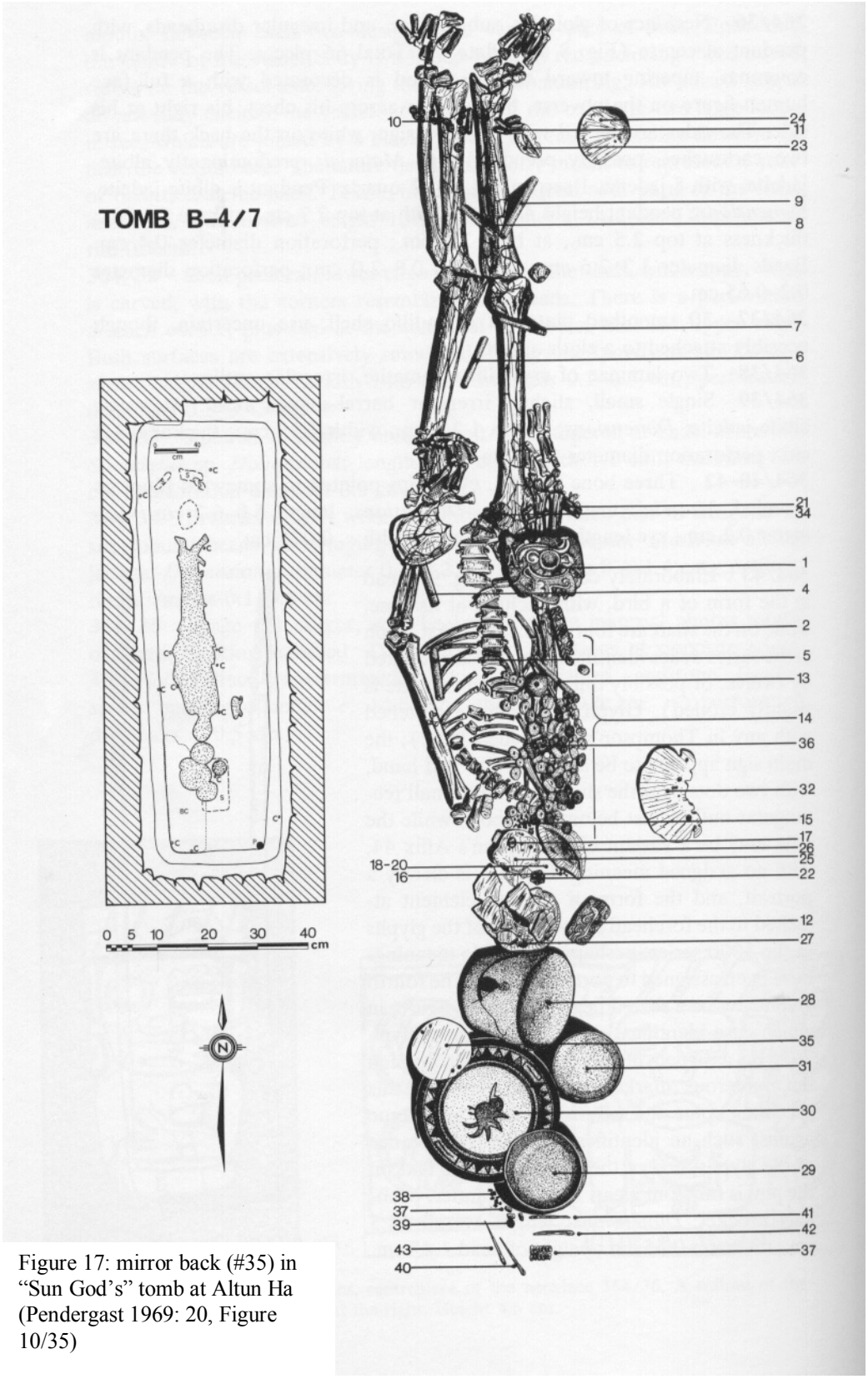


Figure 17: mirror back (#35) in "Sun God's" tomb at Altun Ha (Pendergast 1969: 20, Figure 10/35)

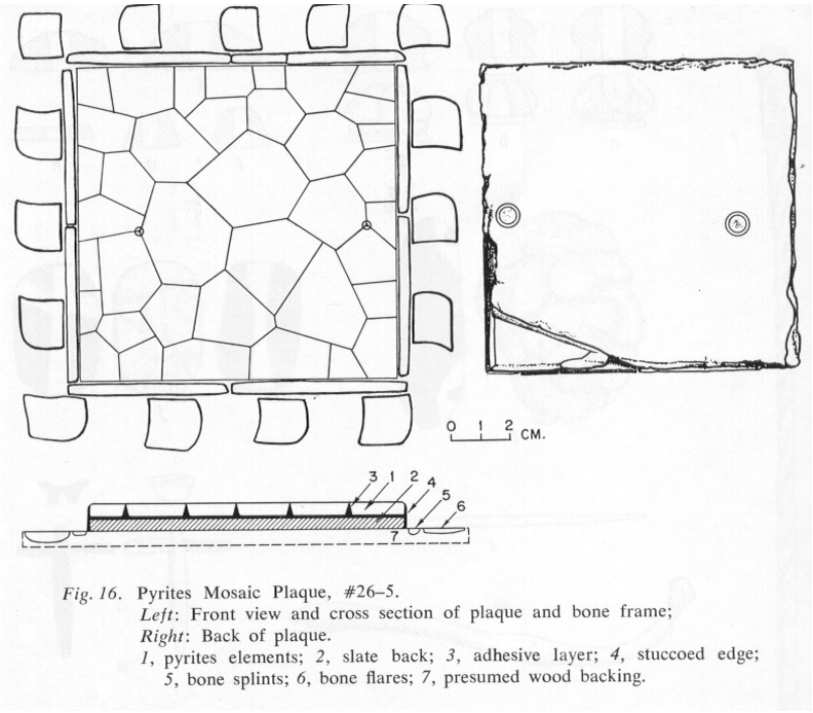


Fig. 16. Pyrites Mosaic Plaque, #26–5.
Left: Front view and cross section of plaque and bone frame;
Right: Back of plaque.
1, pyrites elements; *2*, slate back; *3*, adhesive layer; *4*, stuccoed edge; *5*, bone splints; *6*, bone flares; *7*, presumed wood backing.

Figure 18: Square mirror with bone frame, from burial at Baking Pot

The Northern Lowlands

Dzibilchaltun: Evidence for mirrors at this northern Yucatan site is manifested in the discovery of numerous mosaic inlay pieces. All of them date to the Copo 1 and Copo 2 phases, which correspond to the early and late stages of Late Classic period respectively. Jennifer Taschek's (1994: 96-99, Figure 27p,q) treatment of the finds distinguishes between "'Mirror' Inset Elements" and "Mosaic-Inlay Elements," both made of crystalline hematite, "based primarily on the thickness of insetting stones, distinguished also by greater size and persistent symmetry."

The report identifies three complete inset elements. Of these, two were uncovered in a "probable" Late Classic context near the Cenote Xlacah and one was found in a burial in Structure 57's east room associated with "a weaving pick, shell mosaic elements, shell beads, and unmodified whole shells." On the other hand, 20 mosaic inlay elements were discovered from contexts at the opposite end of the site:

> Distribution is restricted to Copo 1 cache contexts in the Temple of the Seven Dolls Complex. Fourteen specimens were included in Cache 1, Str. 1; two occurred in Cache 1, and four in Cache 2, Str. 5. Associated artifacts include jadeite and shell beads, pendants, mosaic-inlay elements, profile-head adornos, insetting stones, miscellaneous worked and unworked shell, and fish bones (Taschek 1994: 99).

The burial and cache contexts are typical of mirror elements found throughout the Maya subarea, but the association with the cenote at Dzibilchaltun further supports the ceremonial importance of mirrors: "the cenotes are a major geographic feature of the northern lowlands, and for people focused on entrances into the 'Otherworld' beneath the earth, these caves and water holes became centers of social gathering and the enactment of ritual" (Schele and Freidel 1990: 61).

Coba: Excavations at this site's core district located a "circular offering box…near the center of the ball court" containing "jade and shell offerings" along with "two snails, a pearl, and objects of hematite, obsidian, and pyrite" (Benavides 1976, cited in Folan 1983: 71).

THE POSTCLASSIC (A.D. 900 – 1530; Figure 19)

The Southern Highlands

Nebaj: Not surprisingly, the substantial corpus of mirrors excavated from this site includes a number of specimens dating to the Postclassic period, all of which were located within the structural components of Mound 2. These include two found in Tomb 8, three from Cache 15, one from Cache 19, and two from Cache 4 that are tentatively dated to the Early Postclassic (Smith and Kidder 1951: 46).

Zaculeu: The Early Postclassic mirrors found at this site correspond to what is termed the Qankyak phase (Wauchope 1955). The smashed remains of a complete slate mirror back were found with an adult female in Grave 12-1 and "the only instance

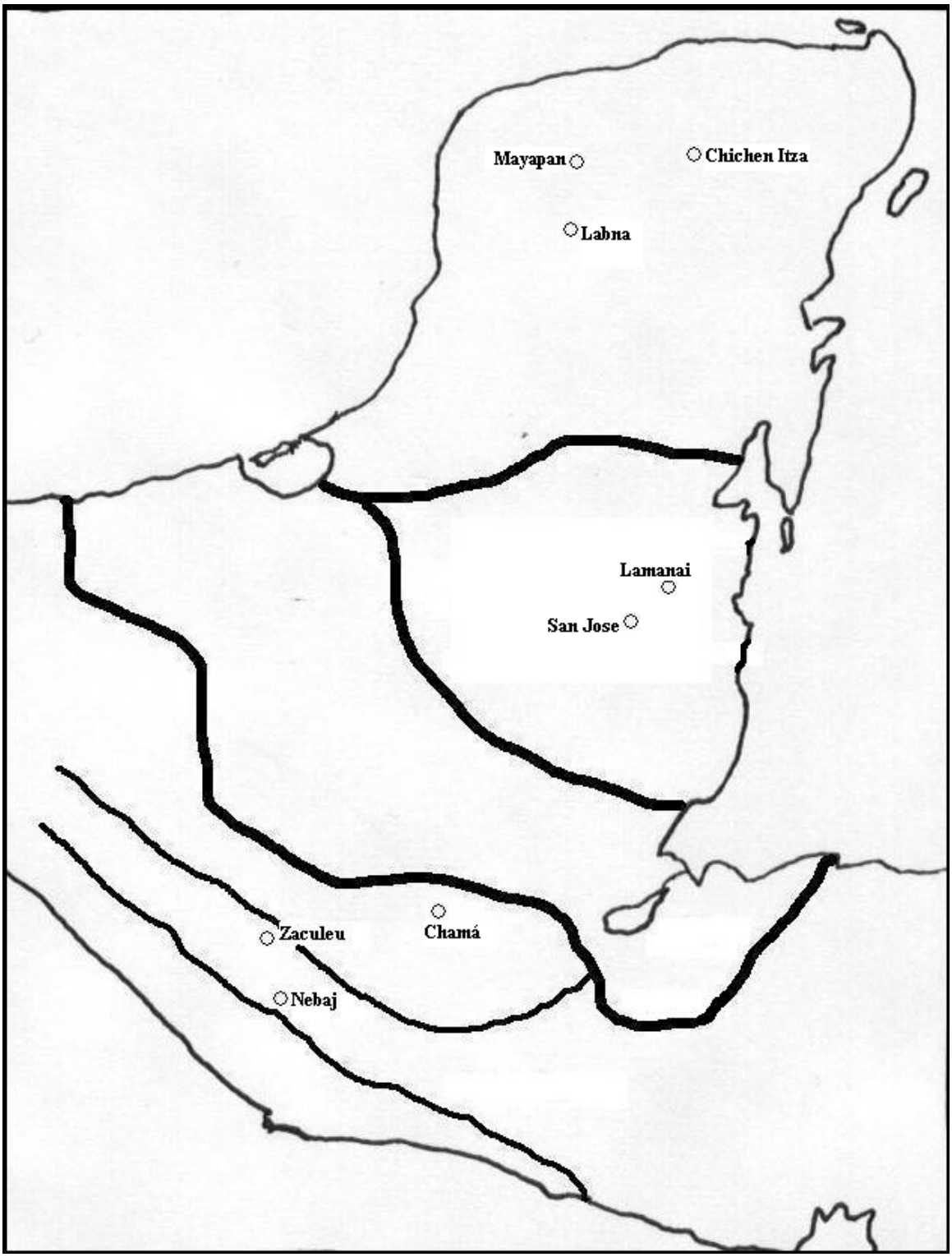


Figure 19: Sites with evidence for mirrors dating to the Postclassic periods (adapted from Braswell 2002a and Sharer 1994: 21)

recorded of decomposed pyrite of red rather than yellow" (Woodbury and Trik 1953: 236-238). Other Postclassic specimens include a pair of sandstone disks found in Grave 13-23, one on each shoulder of the skeleton of what is presumably an adult male. Originally, on the disk associated with the left shoulder, the authors believe that a "magnificent painted copper eagle head had apparently been mounted" because "the two were in such a position in the ground that no other arrangement is likely." Furthermore, mirror back remains dating to the Postclassic at this site include a disk of burned and warped sandstone from Grave 12-1-B (a subadult female skeleton), and num erous other mirror back fragments from the fill of Structures 4, 13, and 16.

The Northern Highlands

Chamá: Since the original publication is in German (Dieseldorff 1893), I refer to a subsequent review of the evidence:

> …round plaques…found in offertory deposit above grave. [Mary] Butler, personal information. Thirty-seven ceremonially (?) broken plaques, round and square…found with late, i.e. plumbate period, burial under stairway Mound I, Plaza Group (Kidder et al. 1946: 132).

The association of the "thirty-seven ceremonially (?) broken plaques" with plumbate-period materials suggests that these specimens can be dated to the Early Postclassic period at Chamá, a site near Coban, Guatemala (Wauchope 1947: 65).

Kixpek: Well preserved mirrors dating to the Early Postclassic at this site are documented in two sources (Kidder and Samayoa Chinchilla 1959; Mason 1927). The remains of four pumice/tufa mirror backs, three round and one square, were found in an unidentified grave associated with a badly decomposed skeleton. To varying degrees, the pyrite polygons making up the reflective surface are intact; with 50-80 polished mosaic

pieces fitted and adhered to each mirror back; some polygons are as large as 5.1 cm wide and 5.7 cm long!

The Central Lowlands

San Jose: Other than the one hematite disk dating to the Late Classic, all other iron-ore objects found at this site date to the Terminal Classic or Early Postclassic period. The chronological ambiguity stems from Thompson's San Jose dating sequence, where San Jose IV lines up roughly with the Late Classic period and San Jose V corresponds approximately to the Early Postclassic (Iannone 1993: 70, 72). For the sake of consistency, all late San Jose IV dates will be considered equivalent to the second half of what is called the Terminal Classic (A.D. 900-1000), therefore falling within the boundaries of what has been designated the Postclassic period in this thesis.

Iron-ore objects excavated at San Jose, imprecisely dated to either the end of San Jose IV or San Jose V, include mosaic No. 188900 from Cache A1 with a pottery backing, and an unlabeled piece from Cache C2 with a sandstone backing (Thompson 1939: 176-178, pl. 28,b,4). Moreover, No. 960, "a hexagonal piece… was in Cache C6" and "a mirror made of a single iron pyrite nodule (189621; Thompson 1939: pl. 28,b,3) was with Cache C1" with a slate backing (Thompson 1939: pl. 28,b,6). A small disk of hematite (180630; Thompson 1939: pl. 28,b,5) was discovered "in doorway of Room C, C5," dating to San Jose V. Pyrite specimens dated to San Jose V include a mirror from Room C,C5 (189588; Thompson 1939: pl. 28,b,1,2) and an "unnumbered pentagonal piece" found "outside the doorway of Room A, B4".

Lamanai: There are preliminary reports of the remains of three mirrors with backings of slate from the Late Postclassic period "Buk-phase" occupation of this large

site. The first is round and was found in an elaborate main burial, "with a copper bell, several gold sheet-covered objects, and other items." A second specimen is merely a fragment that was recovered from an unidentified grave context. The entirety of another mosaic mirror (Figure 20) was reconstructed from fragments strewn throughout Burial N10-4/3. This inhumation occurs within Structure N10-4, "a small platform at the east side of one of the areas of intense use in Postclassic times, but began life as a Preclassic structure, form unknown, and appears to have been modified several times before its last major revamping in the middle of the Postclassic." Associated objects include a necklace of marcasite/pyrite beads and the customary shell, stone, ceramic, and bone artifacts. Exceptional offerings from this burial of a subadult male include a 1-2 square cm "gold sheet object," two copper bells, and a series of small copper "clothing adornments." The mirror itself is comprised of multiple pieces of "pyrite (altered to marcasite)" attached to a backing of unidentified stone encircled by a ceramic frame (David Pendergast, personal communication, 2006).

The Northern Lowlands

Labna: A late 19th century publication by Edward Thompson (1897: 16), dealing with the investigation of chultuns at the Puuc site of Labna, lists "a small highly polished disk of iron pyrites" as part of the contents of Chultun No. 23. Although Thompson made no efforts to date the material in this chultun, the identification of this mirror with the Postclassic period follows from the notion that the Puuc states "were founded, grew, and prospered during this relatively brief period" (A.D. 800-1000) sometimes referred to as the Terminal Classic, overlapping with the Early Postclassic period, after A.D. 900 (Sharer 1994: 368).

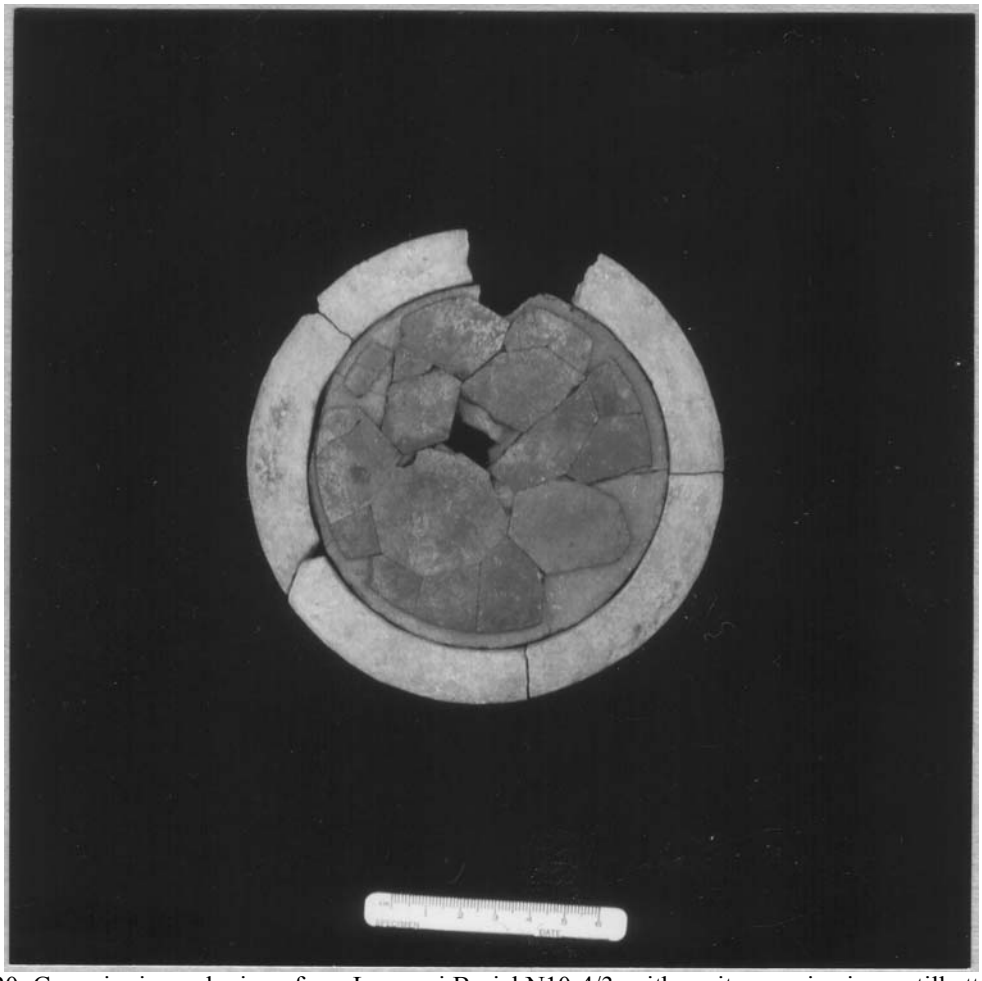


Figure 20: Ceramic rimmed mirror from Lamanai Burial N10-4/3, with pyrite mosaic pieces still attached (David Pendergast, personal communication, 2006)

Chichen Itza: The remains of a rare wood-backed mirror, with a mosaic of imported turquoise surrounding its once reflective surface (Figure 21), was found inside a large limestone container cached in the Temple of the Chacmool, an earlier building entombed within the now visible Temple of the Warriors (Bernal 1968: 144-145, Ill. 113; Morris et al. 1931: frontpieces, Figure 119; Schele and Freidel 1990: 393-394, Figure 10:11; Sharer 1994: 397, Figure 7.14). Although wood backings are rarely recovered, there is the distinct possibility that a large proportion of Maya mirrors once resembled this one, acting to form "the nucleus of a much larger plaque of wood, copiously adorned" (Morris, et al. 1931: 185; see Taube 1983: 112).

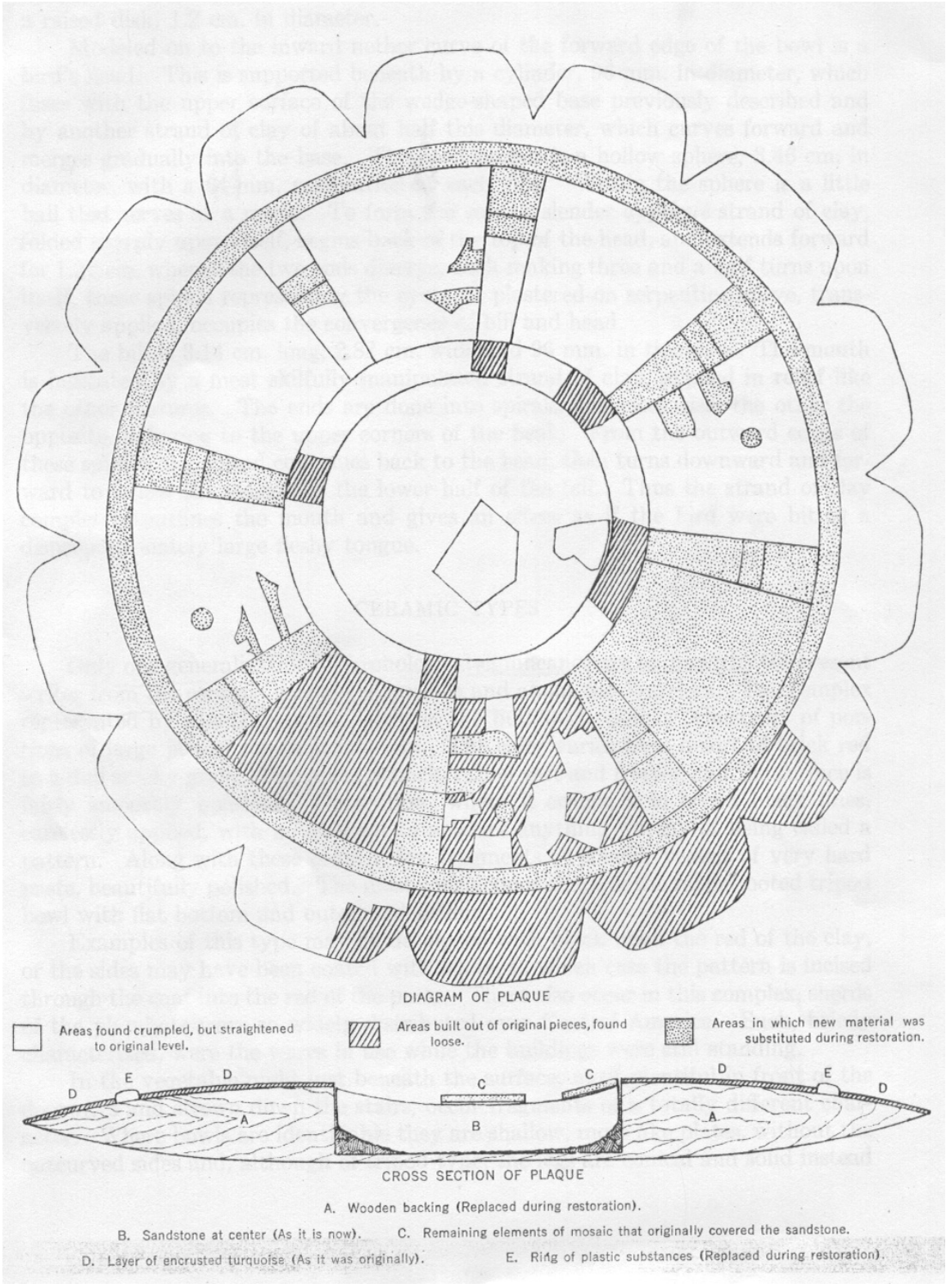


Figure 21: Drawing of a wood-backed mirror from a cached limestone container in the Temple of the Chacmool, Chichen Itza (Morris et al. 1931: frontpiece)

This same type of mirror was found on the back of the Red Jaguar Throne, in another buried temple within the bowels of the Castillo (Sharer 1994: 394, Figure 7.8). The magnitude of foreign influence at Chichen during the Postclassic period is demonstrated in the Red Jaguar Throne, which faces a chacmool sculpture, in that the ruler would have sat "on its turquoise-studded *tezcatcuitlapilli*, a Toltec mirror back known from Central Mexico" (Miller 1999: 146, Figure 126; see González de la Mata and Andrews 1998: 460-461; Taube 1983). This Toltec-style mirror-back portends the importation of exotic ideologies. A visible example of this is the Itza rulers' innovation of the idea that "the principle image of kingship was not the living king, but a dead king sitting on his sun disk" where "his image could be replaced by a mirror, another ancient symbol of kingship from the Classic period" (Schele and Freidel 1990: 393).

The remains of four sandstone disks, quite possibly mirror backs, are documented with proveniences connected to the Temple of the Warriors at this major Early Postclassic site. They were discovered associated with caches buried in the NE corner, NW corner, and North colonnade of this monumental structure that lies in the immediate vicinity of the main plaza at Chichen (Morris et al. 1931: 181-185; Figs. 115-117).

Mayapan: Excavations at this important Postclassic site did not produce any indications of artifactual mirrors or mirror backs, but two squares of iron pyrite were found. Proskouriakoff (1962: 354, Fig 26,k) is cautious in her interpretations and states that "there is no indication of their manner of use."

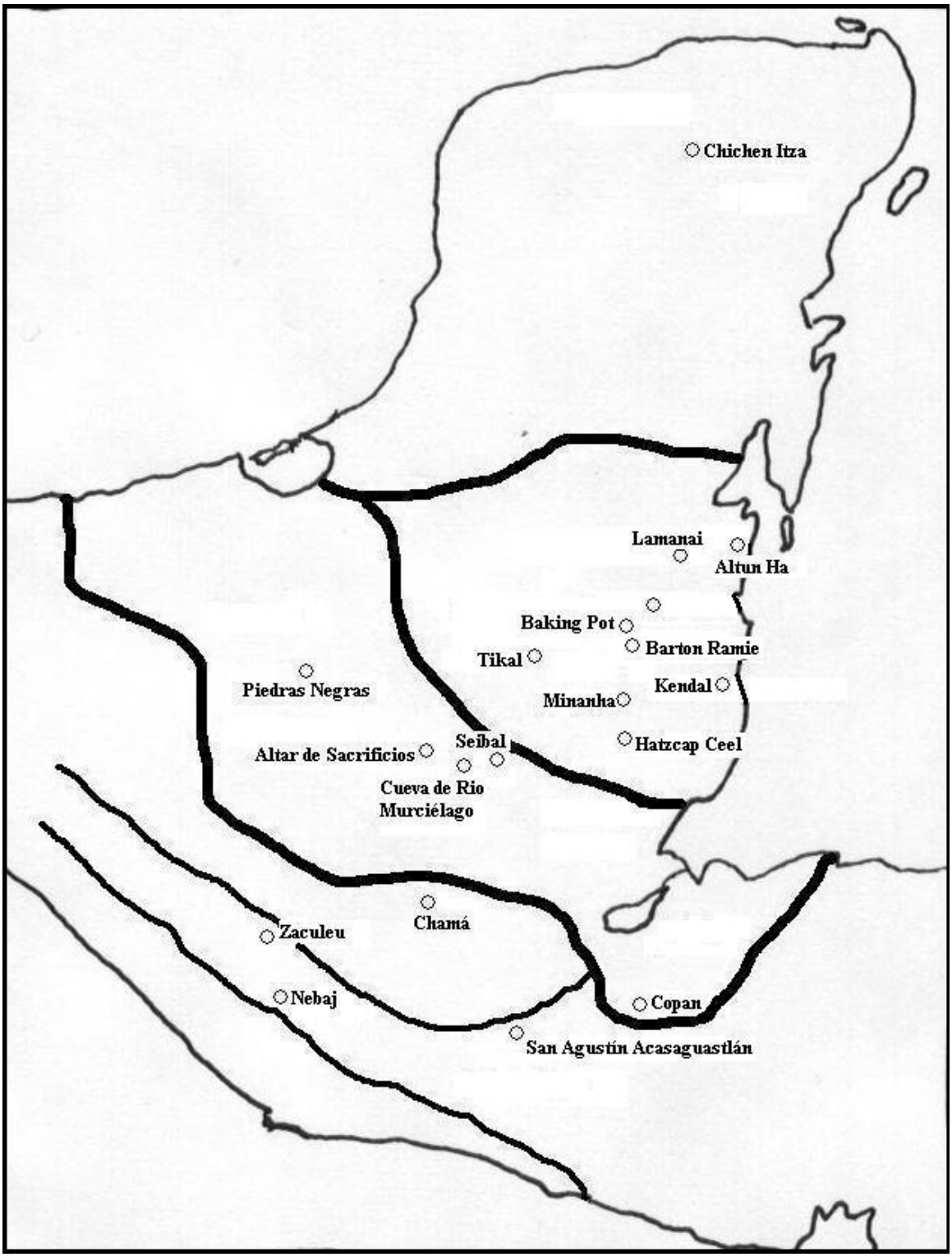


Figure 22: Sites with evidence for mirrors from undatable proveniences (adapted from Braswell 2002a and Sharer 1994: 21)

PROBLEMATICAL SPECIMENS (Figure 22)

The following list of sites identifies mirrors that have been found archaeologically *in situ* at a Maya site, thus fulfilling the spatial aspect of their identity, but for which we lack a secure dating to locate them temporally. This uncertainty is indicated by a [?] in the chronology column of Appendix A. Looted and other unprovenienced specimens known from museum collections, lacking both a spatial and temporal identity, but nevertheless expressing stylistic and assemblage elements certifying them as authentic artifacts of the ancient Maya, will be addressed at the very end of this section on "problematic specimens." The analysis of "problematic" mirrors will act to shore up the patterns and trends established from the larger corpus of mirrors that have secure chronological and spatial contexts.

The Southern Highlands

Nebaj: A considerable proportion of the large mirror corpus at this site cannot be assigned an accurate date since 19 were found in general excavation and one is listed as found under the plaza floor at the base of an unidentified mound structure (Smith and Kidder 1951: 46).

Zaculeu: Undatable mirror remains from this site include circular slate plaques; one whole specimen from Grave 1-10, one fragment from the mixed fill of Structure 6, and 12 fragments from the mixed fill of Structure 13. Another whole slate disk with a diameter of 25cm and a back surface that "has traces of white stucco overlaid by red pigment," was recovered from the mixed fill of Structure 13. Furthermore, other remains include one sandstone fragment from the fill of Structure 1 near Grave 1-11, two slate fragments from Structure 13 mixed fill, and one slate fragment from each of Structure 1

mixed fill and the surface debris of Structure 9. Moreover, two rectangular plaques, one of slate, one of "sandy slate or shale," were found in the mixed fill of Structure 13 (Woodbury and Trik 1953: 236-239).

San Agustín Acasaguastlán: Among the "remains of 37 badly decomposed skeletons" in Tomb III of Structure 24 at this site, five complete and two fragmentary mirror backs were associated with 13 pyrite mosaic pieces and other grave goods. While six of the mirror backs were made of "fine-grained sandstone," the other one was made of slate. Other materials found with the mirrors in Tomb III include "one small piece of sheet copper," red pigment, "twenty-six pottery vessels, of which many were polychrome…shells, shell beads, a few jade beads and odd pieces of jade, many obsidian lancets, and several scoop-like objects made from the halves of large pottery jars (Smith and Kidder 1943: 127, 166, Figure 57). Givenn the presence of copper, some of these mirrors might be of Postclassic date (Paul Healy, personal communication).

The Northern Highlands

Chamá: In what is designated the "lower" pyramid of this site "on the left bank of the Salba," Dieseldorff (1893) found "small disks of iron pyrites, and disks of a sort of slate" along with a "small polyhedral slab of iron pyrites" in a pyramid on the "right bank of the river Salba" (Seler 1904: 87). We refer to an English translation of the original German text:

> Under central marker of ball court, Plaza Group, many very badly crushed plaques, a ceremonial (?) deposit. Other plaques from Chamá collected by [Robert] Burkitt in University of Pennsylvania Museum (Kidder et al. 1946: 132).

All of the abovementioned specimens are undated but with further review of their detailed characteristics, one might be able to correlate them with the 37 specimens dated to the Postclassic at this site.

The Southern Lowlands

Altar de Sacrificios: What is described as a "pyrite bit, about 2.0 cm in diameter…comes from Structure A-III in a context that cannot be easily dated" (Willey 1972: 142).

Cueva de Rio Murciélago: In a general discussion of the artifacts typically found in caves, Brady (2005: 122-123, Figure 6.4, footnote #9: 7 other caves listed in obscure sources) states that "polished hematite plaques, which probably formed parts of mirrors, are another imported item found both on the surface and in caves." He notes the occurrence of six hematite mosaic pieces found alongside a slate mirror back inside this cave in the Petexbatun region of Guatemala. There is no reason given as to why these mirror remains are considered imported items, or whether the author considers them imported from another Maya site or from outside the Maya subarea. According to the current study (see Chapter 5), there is no reason to suspect that iron-ores were inaccessible in the Maya subarea; although there is the high likelihood that raw iron-ore and/or finished mirrors were exchanged within the Maya subarea originating from regions with ready access to the materials.

Piedras Negras: A variety of iron-ore objects unearthed at Piedras Negras have eluded efforts to be dated. Classed under "miscellaneous mosaic elements," two undatable pieces of pyrite polished on only one side were discovered in general excavation. An "oval object" was found in "the drain of Structure J-2" with a length of

1.9 cm and a thickness of 0.15 cm. Also, one of three unworked fragments of hematite, described as a "nodule," was found in an undatable context "in the surface debris of Structure O-7" (Coe 1959: 42-43).

Copan: Extensive excavations at Copan's "residential zone" uncovered seven or eight mirror backs and mirror fragments (Willey et al. 1994: 251-252, Figure 193a-d). Two mirror backs (Cat. No. 1-625 and 1-842) are made of "mudstone or siltstone" and derive from Plaza Group CV-43, Level 1, and Plaza Group CV-44, Level 1, respectively. The mirror back status of a smoothed fragment of tuff (Cat. No. 1-973) also from Plaza Group CV-44, Level 1, is less certain. Another uncertain specimen from Plaza Group CV-16, Level 1 (Cat. No. 1-1097) "is a highly polished (both surfaces) piece of black slate" The idiosyncratic nature of what is presumed to be a mirror back fragment made of "dark, red-brown silicified tuff" (Cat. No. 1-88) was found associated with Plaza Group CV-20, Level 1, and is characterized by its pressure-flaked edges and polished concave surface. Two small pyrite segments (Cat. No. 1-1274) are presumably from the same "ovate-rectangular" mirror associated with Plaza Group CV-43, Special Find 166, with Special Find 57. These two pyrite bits are linked in the catalogue since they each have "two tiny drilled pits on the polished surface near the edge, and each of these pits is connected to the edge by a little groove." Another "tiny piece of pyrite, trapezoidal in outline" (Cat. No. 1-252) found in Plaza Group CV-48, Level 4, with Special Find 50 is thought to have either been part of a mosaic mirror or "it may have been inset into wood, stone, or bone as some kind of decorative inlay."

Seibal: One of the two iron-ore objects excavated at this site is undatable, catalogued as S-1033. This "probable mirror back…of red-gray slate" had curious cross-hatched series of scratches on its face:

> It is surmised here that this scoring was for the purpose of holding the adhesive substance (a vegetal gum?) more securely to the surface. The mosaic pieces of the mirror or reflecting surface were then set in this gum. *The round back of the object might then have been set in wood* (Willey 1978: 96-97, italics added).

The Central Lowlands

Tikal: One undatable "pyrite mosaic plaque element" was found associated with the skull of an adult male with Burial 8 of Structure 5D-34 (Coe 1990: 489). Other chronologically problematic specimens were found in "Collapse debris:" pieces of an unidentified number of "shale plaque backings" were found associated with Structure 5D-23-1st (Coe 1990: 430) and "a couple of shale mosaic plaque backings" were found with Structure 5D-33-1st (Coe 1990: 550). Yet more undatable evidence for mirrors at Tikal is represented by the "10 oxidized pyrite mosaic elements" and "1 corroded" specular hematite element" contained in the elaborate cache buried at the "broken base of reset" Stela P1 (Coe 1990: 738).

Barton Ramie: Fragments of two mirror backs, one made of "brown-grey" slate, and another of "very dark grey" slate, were found in Structure BR-123, but cannot be securely dated. Additionally, BR-123 yielded a small fragment of pyrite that was highly polished on one side, but it is also from an undatable provenience (Willey et al. 1965: 474, 490-491; Figure 295 j and k).

Hatzcap Ceel: What is presumably the sandstone backing of an undatable mirror was found in Votive Cache 1 of Pyramid Q at this site, otherwise known as Mountain

Cow. The almost complete backing was found with a rich assortment of associated materials (Thompson 1931: 273; Plate XXXI-13).

Baking Pot: Willey et al. (1965: 491) report the procurement of a "flat metal polygon," highly polished on one side and measuring "4.5 cm in diameter and 0.5 cm in thickness" which he identifies as the mineral *pyrrhotite* (magnetic pyrite). This metallic fragment was found indiscriminately in the course of general excavation and cannot be dated accurately.

Kendal: Gann (1918: 90-92) reports the occurrence of "a circular disk of iron pyrites" in Mound No. 11 at this site located in eastern Belize.

Minanha: Two undated mirror backs were recovered from the first level in Unit 105V-1 of Structure 105V. Furthermore, individual mosaic pieces of hematite came from Level 2c in Unit 40J-1 of Structure 38J; Unit 74S-1 of Structure 74S; and Unit 105V-1 of Structure 105V (Gyles Iannone, Minanha database, 2007). An additional remark must be made regarding the dozens of "raw hematite" pieces found throughout this site; these materials may well represent sources of hematite in its unworked state before it was worked into mosaic polygons.

Altun Ha: One undatable mirror back made of sandstone was contained in Subfloor Cache 2 of Structure B-4/7 (Pendergast 1969: 32; 1982: 70).

The Northern Lowlands

Chichen Itza: The dredging of the Cenote of Sacrifice yielded two "mosaic plaque backing" fragments (Moholy-Nagy and Ladd 1992: 101-102; Figs. 5.5, 5.6, 5.7). Moreover, 12 "pyrite mosaic elements" were recovered, some of which still adhered to

one of the mirror back fragments when they were initially found (E. H. Thompson, personal communication cited in Moholy-Nagy and Ladd 1992: 101).

Although dating methods were not sufficiently advanced at the time, excavations at the West Trench of the Caracol's Lower Platform yielded one "piece of pyrite (marcasite) mosaic 1.9 cm long" and 12 "pieces of sandstone disk which had a diameter of approximately 12 cm" (Rupert 1935: 36, Figure 37 d and k).

DISCUSSION

The corpus of ~500 mirrors reviewed above and in Appendix A represents the first attempt at organized documentation of all such specimens recovered to date from the Maya subarea. Appendix A is intended to facilitate a comparative assessment of pertinent qualities of mirrors from different sites. The features of mirrors from each site are tabulated into categories which include the sum-total number of mirrors recovered from each site. This is followed by records of the individual mirrors charting a concise "type" description, measurements, material compositions of the mirror back and reflective surface, archaeological context, number of drill holes, edge diagnostics, chronological status, and literature citation.

It is clear that patterns of redundancy inherent in the proveniences of these artifacts, such as their repeated presence in elite graves and caches, present an opportunity for interpretation pertaining to their cultural functions. Using the archaeological data noted above, the following discussion seeks to offer plausible hypotheses to better comprehend the roles iron-ore mirrors may have once played in the political, ideological, and economic dynamics of ancient Maya life.

It is impossible to be certain concerning the emic significances of iron-ore mirrors. All explanations furthered in this and other chapters of the thesis are hampered by the fact that the archaeological contexts of mirrors are often incomplete, and can be inhibited by chronological and cultural gaps that separate the modern researcher from the ancient agents. Not only are archaeological proveniences largely devoid of organic materials that have long-since vanished due to decay, but the precise details of burial, cache, and other contexts can be mired in obscurities resulting from structural collapse as well as various human and non-human intrusions.

A significant dearth of data exists with regard to the sex of individual skeletons associated with artifactual mirrors. This is due to both the fact that some site reports do not state the gender of associated skeletons, and extensive decomposition of organic matter in the Maya subarea means that the aging and sexing of skeletons is often impossible. Only the rare occurrence of mirrors found where soil conditions have not eroded the skeletal remains, such as at Altar de Sacrificios, Altun Ha, Buenavista del Cayo, Copan, Kaminaljuyu, Lamanai, Pacbitun, Piedras Negras, Tikal and Zaculeu, can the gender of the associated individuals be determined. In spite of this, the few gender identifications that have been provided demonstrate that mirrors were found with both males and females. The lack of strict gender differentiation regarding mirrors (22 with males, 6 with females) may result from the small sample size, or due to the ancient Maya not distinguishing between the status of men and women, at least in elite contexts:

> In response to the efforts of some houses to transform temporary advantages of power and status into permanent ones, members of other houses resisted by continuing to assert their own privileges. Women became a center for this struggle, and houses increased their efforts to control the women who were the labour force, the holders of special knowledge and titles, and the means through which alliances could be

> forged…By representing female figures in common ritual action, Classic Maya rulers presented noble women as part of a unified ruling house, supporting the common claims to power of that house (Joyce 2000: 89).

Consequently, archaeologists find luxury items such as iron-ore mirrors, objects seemingly associated with high-status and kingship, with the burials of elite males *and* females as a statement of their membership (or leadership) in a particular dynasty. If mirrors were symbolic emblems of the royal dynasty, it makes sense that their entombment with members of the royal court is more prevalent with, but not restricted to, sovereign males. Before extending any interpretive discussion, however, it is imperative that specific burial contexts are scrutinized; what follows is a detailed analysis of those interments with the most secure data concerning the associated skeleton and grave goods.

The data pertaining to mirrors from burial contexts with accurate sexing of the skeletons are informative when considering the mirrors and other grave goods with which these bodies are associated. As mentioned above, of these 28 instances where accurate sexing is possible, 22 (approximately 79%) occur with males (one of which is undatable) and 6 (approximately 21%) occur with females. The females associated with mirrors are evenly spread across time, with two each dating to the Early Classic, the Late Classic, and the Postclassic periods respectively. When compared to the males buried with mirrors, however, there is a general increase in the percentage of females relative to males through time, with 12 males (86%) to two females (14%) in the Early Classic, six males (75%) to two females (25%) in the Late Classic, and an even split of 2 males (50%) to 2 females (50%) in the Postclassic.

Although this is not enough of a corpus upon which to explicitly identify an increasing association between females and mirrors over time, it is nevertheless evident

that the contexts we do have suggest that this is so. The contents of the vast majority of these burials infer that the occupants were elite individuals (Coggins 1998), with recurring grave goods listed in rank order (most to least prevalent) as painted/incised pottery; various objects of jade (earflares, carved pectorals, beads); shell objects (pendants, beads, large marine shells); red ochre or powderized hematite; worked stone/obsidian; stingray spines; and, rarely, objects of copper (Postclassic period Lamanai) and the remains of organic textiles (Copan). In fact, excepting the infant interred in Minor Grave 1 of Kaminaljuyu, these burials with mirrors, and individuals whose gender can be identified, represent some of the most elaborate burials in the Maya subarea, including Burial 128 at Altar de Sacrificios, the Sun God's Tomb (B-4/7) at Altun Ha, Burial 88B-11 at Buenavista, the Margarita Tomb at Copan, Tombs from Mounds A and B at Kaminaljuyu, Burial 1-9 at Pacbitun, and Burial 116 at Tikal. While we cannot rule out the possibility that the mirrors occasionally passed to members of the lower classes, it can be asserted with confidence that the artistic and technical skill required to make the most elaborate mirrors means they were probably restricted to nobles who had the power to commission such objects from royal artisans.

Considering the remarkable feats of technical skill that were required to construct the iron-ore mirrors, it may seem, at first, to be curious that some mirrors, such as specimens from Pacbitun, Pusilha, and Chamá, hint at intentional breakage. Healy (personal communication, 2007) reports that "one specimen from Pacbitun (in Burial 1-9) showed that someone attempted (unsuccessfully) to break it in two—resulting in it being bent only." There is the initial difficulty of determining whether mirror remains are broken because of taphonomic processes or because they were ritually destroyed.

Although the former possibility cannot be ruled out, the practice of ceremonially breaking otherwise functional objects is a standard action associated with termination rituals (Garber 1989: 9; Schele and Freidel 1990: 103). Indeed, just as caches were deposited within important buildings and monuments to inaugurate them in dedication rites, these sacred spaces, along with artifacts that were normally cached, were purposely damaged in termination (Mock 1998). In addition, the archaeological evidence is supplemented by epigraphic and iconographic evidence where "the Classic texts and images make it clear that the supernatural agents these shamanistic rituals were designed to access were precisely the lineage ancestors" (Freidel and Schele 1989: 242).

Impossible as it may be to establish the exact role that the breaking of mirrors played in termination customs, it has traditionally been explained as a process whereby ancient Mesoamericans "ritually 'killed' certain material manifestations" (Miller and Taube 1993: 163-164). This is reasonable, especially since there appears to be continuity of *animistic* ideology (Harvey 2006) among modern Mesoamericans who seek to imbue what Westerners would see as inanimate objects with a soul-force (Stross 1998). When considering the dedication/termination ceremonies and the connection to ancestor-worship, perhaps a more appropriate analysis, would proceed according to what is known about some shamanistic cosmologies:

> The peoples of North Asia conceive the otherworld as an inverted image of this world. Everything takes place as it does here, but in reverse…And everything that is inverted on earth is in its normal position among the dead; this is why objects offered on the grave for the use of the dead are turned upside down, *unless, that is, they are broken, for what is broken here below is whole in the otherworld and vice versa* (Eliade 1964: 205, italics added).

Broken mirrors or mirrors simply placed in the mortuary crypt of a deceased holy-lord may indicate the emic presumption that these objects would be available for use in the Otherworld. If Michael D. Coe is correct in his assertion that "as the *u nen cab*, 'the mirror of the community,' a great Maya ruler or lord would naturally be accompanied by one or more mirrors on his way to the Land of the Dead," then their inclusion in regal burials is also indicative of their likely functions while the sovereign was alive (Coe 1988: 227-228; see Schele and Miller 1983: 20).

Following the remarkable consistency found in the contexts of mirrors described in site reports, this thesis endorses the view that "as to the functional contexts of the objects, it seems certain that these mirrors or plaques were valuable ceremonial objects" (Willey 1972: 142). Before evaluating their functional nature, however, it is imperative that the material commonalities shared by the majority of Maya mirrors be addressed in order to contextualize the discussion.

The recurring stylistic character of ancient Maya mirrors is marked by the mosaic of fitted iron-ore pieces, the attached backing that supports the reflective mosaic, and the curious bevels and drilled holes which are frequently found as elements of physical specimens. The customary configuration of the fitted mosaic pieces can best be described as a *Voronoi Diagram* arrangement (Figure 23): "The partitioning of a plane with *n* points into convex polygons such that each polygon contains exactly one generating point and every point in a given polygon is closer to its generating point than to any other" (Weisstein 1999). While the consequences of this correlation between the Voronoi Diagram and ancient Maya mirror mosaics could be coincidental, archaeological inquiries are nevertheless occurring:

> The mirrors are composed of several pieces that were intelligently fit together to form a complicated geometrical structure. This structure can be represented as a planar embedding of vertices, edges, and faces that closely resembles a graph structure called a Voronoi diagram. Using several different methods, it can be approximated how close the mirror is to an actual Voronoi diagram, and how far the vertices would have to be moved to match the structure exactly. The concept of a Voronoi diagram gives insight into how the mirrors might have been constructed (Winges 2005).

Although the complex mathematics involved in the Voronoi Diagram exceed the goals of this thesis in Cognitive Archaeology, future studies might offer interesting appendages to Eric Winges' suggestion that the mosaic pattern on ancient Maya mirrors implies a purposeful achievement of geometrical virtuosity. Furthermore, the mosaic might be associated with objects of jade tesserae, conceived by the ancient Maya as "kernel[s] of maize," relating to the budding state of the youthful Maize god (Miller 1999: 166).

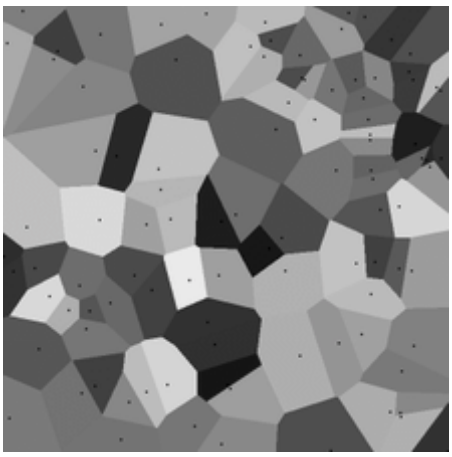


Figure 23: Example of a Voronoi diagram (www.Wikipedia.org 2007)

The added modifications of drilled holes and bevelled edges exhibited on a large number of the archaeological mirrors present another problem. Whereas the "suspension holes" are usually set in a parallel juxtaposition – supposedly to optimize symmetry when a cord was passed through the holes for purposes of "attachment to the person" – it is noted that "their backs, which would have been invisible had the plaques habitually been worn as ornaments, were often elaborately ornamented" (Kidder et al. 1946: 130). It is

suggested that "the perforations that served for the attachment of the Nebaj plaques were normally drilled from the back or unincrusted surface, by means of a rather bluntly conical instrument" (Smith and Kidder 1951: 45). The purpose of the frequently cited bevelling of mirror backs is unknown, leaving open yet another avenue of future research and discussion. This lack of explanation for bevelling is largely due to the fact that bevels do not fit into any of the functional interpretations put forward so far, including those advanced in the current thesis.

Trends in mirror construction over space and time appear in different degrees, from relatively perceptible to simply absent. These categories, whose tabulation in Appendix A reveals that some variables shift spatiotemporally while others appear evenly spread, include number of suspension holes, the direction of bevelling, the shape and size of mirrors, and the materials composing both mirror backs and reflective surfaces. Of the ~443 mirrors with chronological designation (thus, discounting the 69 listed as problematic [undatable] specimens), one dates to the Middle Preclassic period, 38 (8.6%) date to the Late Preclassic period, 253 (57.1%) are from the Early Classic period, 79 (17.8%) date to the Late Classic period, 72 (16.3 %) are from Postclassic period contexts.

A review of Appendix A reveals that the dominant form of ancient Maya iron-ore mirrors from the Preclassic to the Postclassic periods was round, with only a small proportion being square or rectangular. These angular specimens are restricted to the Central Lowlands in the Late Classic period (Altun Ha, Baking Pot, Hatzcap Ceel, and Pacbitun) and the Highland regions in the Postclassic period (Chamá and Zaculeu). Of the 284 whole mirrors with documented shape, 276 (97.2%) are round/circular, eight

(2.8%) are square/rectangular. Mirror remains whose shape can not be determined include 44 that are are fragmentary and 33 that are represented only by mosaic pieces.

Most archaeological mirrors are accompanied by, or only composed of, a mirror backing. From Appendix A it is apparent that of 73 whole mirrors with documented dimensions, diagonal measurements range from 5.6 to 29 cm, with an average of 15.1 cm; of the 73, 17 have a measured thickness, ranging from 3 to 72 mm with an average of 12.3 mm. When there is no backing and only the mosaic pieces are left, as at Buenavista (Taschek and Ball 1992: 494-495), or in regions where we find few mirrors, such as the Usumacinta territory and Western Maya sites, there is a high probability that wooden supports were being used for mirrors. In fact, the majority of iconographic representations of mirrors on polychrome ceramics are painted brown (see Chapter 4; discussion of K6341, Houston et al. 2006 272-273, Figure 8.26), so if the mirror face was of pyrite (which decomposes easily when contacted by water) and the backing of wood, these entirely degradable specimens might be lost to the ravages of time.

The material used for mirror backings is overwhelmingly slate (hard shale), with limited non-slate backings appearing in the Central Lowlands, at Tikal in the Early Classic period, and at Altar de Sacrificios, Altun Ha, Bonampak, Hatzcap Ceel, and Pacbitun in the Late Classic, followed by wooden specimens recovered from Postclassic period contexts at Chichen Itza. Although the possibility that now-decayed wood backings were more common in earlier eras cannot be discounted, the Chichen Itza specimens may be linked to the arrival of Toltec-style *tezcatcuitlapilli* into the Maya subarea in the Postclassic. Of the 156 mirrors with documented backing material, 113 (72.4%) are slate/shale (the overwhelming preference), 22 (14.1%) are sandstone, six

(3.8%) are shell, six (3.8%) are ceramic, four (2.6%) are pumice or tufa, two (1.3%) are tuff, and one is limestone.

The vast majority of references in the literature identify pyrite as the material composing the mirror's reflective surface. In fact, pyrite mosaic pieces are present across the Maya region from the Preclassic to the Postclassic. Hematite mosaic pieces, on the other hand, occur mainly in the Lowland regions, but also occur across time in the Preclassic period (Cerros), the Early Classic period (Dos Hombres, Uaxactun), the Late Classic period (Altun Ha, Buenavista, Minanha, Palenque, Piedras Negras, Quirigua, San Jose, and Tikal), and the Postclassic period (San Jose). The geological data pertaining to mirrors will be discussed in Chapter 5. Of the 192 instances where the reflective surface material is identified in Appendix A, 155 (80.7%) are pyrite and 37 (19.3%) are hematite.

As discussed above, the archaeological proveniences of mirrors occur in a variety of contexts. Of the 175 distinct contexts in which mirrors have been found, 64 (36.6%) are burials, 46 (26.3%) are caches, 19 (10.9%) are fill, six (3.4%) are listed as surface finds, and 40 (22.9%) are from "miscellaneous contexts" (caves, mounds, plazas, features, chultuns, general excavation).

It is clear from Appendix A that Woodbury's (1965: 172) proposed trend from Early Classic specimens with two pairs of "suspension holes…near opposite edges" to a prevalence in the Late Classic of "a single central pair of holes" is at best restricted to his dataset from the Highlands regions. The number of suspension holes appears to have varied across space and time, which probably means that different numbers of holes denote different manners of suspension rather than a spatiotemporal trend. Of the 240 whole mirrors listed with drill holes, one (<1%) has eight, 192 (80%) have four, one

(<1%) has three, 32 (13.3%) have two, four (1.7%) have one, and 10 (4.2%) have no evidence of drill holes.

The information about bevelling, which became a conventionally cited feature in the literature following its emphasis in the early publications, seems now to be more of an arbitrary characteristic. Of the 371 mirrors with reported edge forms, 228 (61.5%) are "bevelled away," 74 (19.9%) are bevelled "towards face," 36 (9.7%) are bevelled "towards rear," 16 (4.3%) are simply "bevelled," eight (2.2%) are "rounded," two (0.5%) have a "straight" bevel, one has a "lobed" edge, and one has a "squared" edge.

Grave and cache goods associated with the remains of iron-ore mirrors listed in site reports represent the most direct evidence, aside from iconography, for their connection with individuals of noble status. The repeated occurrence of mirrors alongside other exotic materials known to have been closely linked to of members of ancient Maya royal courts positions mirrors as "part of the infinitely elaborate ritual paraphernalia used by the priests or leaders in whose graves they have been found" (Woodbury 1965: 175). The richness of the tombs and caches in which most iron-ore mirror remains are found, not to mention the typical location of these burials within substantial structures near or within the epicentre of sites, suggests that these are elite inhumations. Some rare exceptions to this trend are the pyrite mirror unearthed from a mound in the rural hinterland of Copan (Gonlin 1994: 192), and those found in Minanha's periphery (Gyles Iannone, personal communication, 2007). Both the amount and regal quality of jewellery associated with complete mirrors in funerary contexts, including beads and pendants of jadeite, obsidian, shell, bone, as well as ear flares and copious decorated ceramics (Miller and Taube 1993: 105), further support the notion that

mirrors were elite objects. The caches also indicate the esteem with which mirrors were held in the ritual traditions of ancient Maya religion. Indeed, it has been argued that cache deposits should not be distinguished as a separate category from burials, but that both should be considered as manifestations of similar cosmological principles guiding the "sacralization" of space (Kunen et al. 2002: 197; see also Becker 1988, 1992).

The ostensible relationship between iron-ore mirrors and ancient Maya elite classes demands an evaluation of how such mirrors figured in the social milieu of the royal court. The precise placement of mirrors within pictorial scenes of ancient Maya painted pottery will be reviewed in Chapter 4, acting to supplement the archaeological information considered here. In an effort to unveil the relative obscurity that exists between remains of the architecture of ancient Maya royalty and the actual proceedings of daily life that once pervaded the now dormant rooms and corridors, the editors of a recent two-volume set seek to "uncover the royal court to modern gaze" (Inomata and Houston 2001: 3). The contributors to *Royal Courts of the Ancient Maya* endeavour to contemplate the once-living occupants of the palace compounds that now constitute the dominant edifices of archaeological sites. Unfortunately, the differences between "royal" and "elite" architectural space is still "poorly understood" (Webster 2001: 161). With the disclaimer that much of this reconstruction of palace life is speculative, Inomata (2001: 28) asserts that "the Maya court probably consisted of numerous individuals who were responsible for…polity administration, adjudication, diplomacy, ritual and ceremonial activities, artistic and scribal production, and attending to various needs of the royal family, ranging from food and clothing to entertainment." This conjecture is not unwarranted, as the regulation of the basic domains of commerce, ceremony, domestic

and foreign relations, aesthetics, and judicial matters require corresponding offices and bureaucrats as fundamental political mechanisms.

Iron-ore mirrors can be identified within such a setting as possibly analogous to a sovereign's sceptre, a bishop's mitre, or a mayor's ceremonial chain; tangible symbols of authority. Moreover as this thesis contends, the possession of iron-ore mirrors further justified the power of the king and the members of his court, indicating their designation as extraordinary beings with abilities that surpassed those of the average person:

> The theory of vital essences, amply documented in ancient and modern sources, serves symbolically as the ultimate naturalization of power. Such force comes from the ruler yet entails no special will or effort on his part…It is imagery more than text that depicts active and socially integrated rulers. To this conception of royal power-from-presence can be added another: the court as both arbiter and embodiment of an aesthetic theory of rule…For the Maya and other Mesoamerican peoples, the ruler was clearly held to be more poetic, fragrant, and refined than others and thus well deserving of tribute and obedience. Again the most effective system of rule is one in which rulers and ruled predicated their relations on shared precepts (Houston and Stuart 2001: 55-56).

It has been posited that "the Pre-Classic Maya adopted their royal institutions and symbology from western cultures, principally those known archaeologically as the Olmec and ethnically as Zoques" (Clark and Hansen 2001: 3). This raises the possibility that the iron-ore mirrors from the Olmec region were the precursors of the later Maya versions, suggestive of the first use of reflective stones as symbols of royal authority.

In transitioning from the interpretations forwarded in the discussion above and those of the next chapter, it is important to note the importance of the mirror backs with inscribed Maya hieroglyphs found in Costa Rica (Figure 24). The translations of these texts, carved onto the slate backings found distant from the Maya subarea, provide direct evidence of the association of mirrors with ancient Maya royalty and political power.

Not only were these Maya mirrors clearly traded over large distances to reach Costa Rica from the Central Lowlands, but their allusions to an unknown Maya "king or lord" indicate that these mirrors were royal objects.

One text mentions the birth of "the place seven-black-precious yellow…from the carapace of the turtle *uaxaktun* [Uaxactún emblem glyph]" and that "he harvested from his tongue its sacred substance [he let blood]" (Juan Vicente Guerrero Miranda, catalogue entry #433 and #434 in Schmidt et al. 1998: 628-629). If this translation is correct, it correlates very well with the interpretations of similar texts mentioning the "Seven Black-Yellow place," or *Wuk Ek'-K'anal* where "beneath the glyph for this place yawns the mouth of the White-Bone-Snake…the bony monster that represented the portal to the Otherworld" (Freidel et al. 1993: 269). The emergence out of a turtle-carapace is a recurring iconographic theme, stemming from the first apotheosis of the Maize God in the *Popol Vuh* (Tedlock 1996; Zender 2006), and was probably an event of hierophany that was re-established every time the sovereign let blood (see Eliade 1964: 32; Schele and Miller 1986). This primordial portal of the *Wuk Ek'-K'anal* was supposedly linked with the "crack in the turtle's back," ball courts, and black liminal surfaces (*Ek'-Way*) (Freidel et al. 1993: 350-355, 372).

Figure 24: Mirror backs from Costa Rica with Mayan hieroglyphs carved into the back (Juan Vicente Guerrero Miranda, catalogue entry #433 and #434 in Schmidt et al. 1998: 628-629)

Incidences of iron-ore mirrors (or their disintegrated remains) span virtually the entire Maya subarea and demonstrate a chronological breadth extending from the Middle Preclassic period to the Postclassic period. In general, the spatiotemporal distribution of mirrors across the Maya subarea throughout these chronological periods parallels the shifting power base of ancient Maya civilization; from a Preclassic period hub of major ceremonial centres in the Highlands, the focal point moved to the Southern and Central Lowlands in the Classic period, before transferring to the Northern Lowlands in the Postclassic period (Sharer 1994). This paired relationship between the occurrence of mirrors and shifting political power again implies the association of mirrors with the elite members of the ancient Maya royal court.

Chapter 4: Iconographic, Epigraphic, and Ethnohistoric Evidence

INTRODUCTION

The archaeological contexts of ancient Maya iron-ore mirrors alone do not supply sufficient explanation of their emic significance. Fortunately, this physical evidence is supplemented by a rich corpus of references to Maya mirrors from pictorial, hieroglyphic, and ethnohistoric sources. This chapter reviews and scrutinizes these sources as they pertain to each other and the archaeological data discussed in the previous chapter. Through this analysis, it is anticipated that the employment of the revived conjunctive approach, Cognitive Archaeology, and the phenomenon of shamanism (all discussed in Chapter 2) can inform a comprehensive interpretation of the meaning of iron-ore mirrors as conceived by the ancient Maya. Through interactive comparison, the following chapter assesses what can be termed secondary or indirect archaeological evidence. This designation recognizes iconography, epigraphy, and ethnohistory as aspects of the cultural record which augment the implications of excavated materials. Such indirect incidences of iron-ore mirrors include their portrayal on painted pottery, their possible identification as the *nen*/*lem*/*-il* hieroglyph T24/T617, and select citations from early historical documents penned by post-conquest explorers who recorded their dealings with Contact-period Maya. In addition, ethnographic information is consulted here for any insights these accounts might afford to the present study.

Iconographic evidence can help to reveal ideational principles, particularly aspects of ancient Maya cognition such as religious and political worldviews, that are of interest here; a disclosure that mimics the symbolic force of "prestige goods" in what has

been termed the "materialization of ideology" (Blomster 2004: 9). For the purposes of this study, ancient Maya ideology will be defined as:

> …the interconnected, fundamental ideas held by elite and commoners alike about the order of the cosmos and everything it contains. Through these ideas, Mayas explained to each other existing patterns and dynamics in the natural and supernatural worlds by means of causal relationships between phenomena. Maya ideology was further a guide to ritual practice, in which people participated in these causal relationships between phenomena—people, things, spiritual forces, natural forces—to achieve certain ends (Freidel 1992: 116).

The following discussion will consider what I term the ancient Maya *reflective surface complex*, within which iron-ore mirrors performed a key function as an important part of the larger "set of interrelated ideas that provides the members of a group with a rationale for existence" (Demarest 1992: 135). Thus, when a mirror occurs in art or hieroglyphs, it can be viewed not as just an inert object, but possibly as a holy artifact that once played an active role within Maya ideology. In this way, its conceptualization is not unlike that of the cross in Christianity or the Star of David in Judaism; these symbols manifest hierophany because they are imbued with sacred meaning in their respective contexts.

ICONOGRAPHIC MIRRORS

Regarding ancient Maya iron-ore mirrors, their most prominent occurrence beyond those excavated archaeologically arises in their depiction in artistic works, particularly on polychrome-painted ceramics. The most helpful resource for painted representations of mirrors is Justin Kerr's online Maya Vase Database (Kerr 2006), an extensive collection of rollout photographs adapted from his six volume *Maya Vase Book* (Kerr 1989, 1990, 1992, 1994, 1997, 2000). A common theme of images on painted Maya ceramics displays the royal palace as "an active locale—a stage—for the rhetorical and performative processes of governance" (Reents-Budet 2001: 225). The online

database yields 53 hits for the search term "mirror" (54 total with K2695 eluding the search), and provides an ample sample of vessels whose illustrated scenes include mirrors depicted in a variety of forms and circumstances. Curiously, there are no instances of mirrors being worn as adornments. Kerr's online corpus is easily the most extensive and user-friendly resource for exploring ancient Maya painted polychrome ceramics. Moreover, its success is founded upon 30 years of scholarship by art historians establishing a coherent approach to the iconography of these rare accomplishments of New World visual expression.

Recent History of Ancient Maya Iconographic Studies

Present-day approaches to the iconography of ancient Maya polychrome vessels originated in the work of Coe (Miller 1999: 199; Schele 1994: xiii). With the publication of *The Maya Scribe and His World* (1973) and *Lords of the Underworld: Masterpieces of Classic Maya Ceramics* (1978), Coe emphasized the contextual repercussions of religious imagery found on painted polychrome vessels from elite burial contexts. His initial arguments that all Maya painted pottery was intended as funerary ware and that the hieroglyphic *Primary Standard Sequence* (PSS) frequently found on these vessels was a "phatic mantra" to be read logographically have been supplanted over the years. Nonetheless, he succeeded in reorienting the view of these artworks to a more religiously informed interpretation, mostly based on the narrative of the Quiché Maya holy book *Popol Vuh* (Coe 1992; Coe and Van Stone 2001; Montgomery 2002a: 258; Reents-Budet 1989, 1994: 108; Tedlock 1996). Coe's work in the 1970's led to the refinement of art historical approaches to ancient Maya painted pottery so that, today, there is a sizable

array of theories and methods to accompany the huge corpus of specimens that make up the iconographic record.

Coe's efforts stimulated a generation of researchers interested in studying the ancient Maya from standpoints that had previously been considered unworthy of archaeological inquiry. Traditionally non-archaeological pursuits such as art-history, religious studies, and epigraphy suddenly became inextricably bound to the archaeology of ancient Maya painted ceramics as new museum exhibitions were accompanied by published texts. Perhaps the most successful and important of these texts were Schele and Miller's (1986) *The Blood of Kings* and Reents-Budet's (1994) *Painting the Maya Universe*, both of which built on the emic priorities set in motion by Coe.

Before delving into an explicit analysis of the depictions of mirrors on painted ceramics, it is important to consider the theoretical and interpretive impact of the two major museum exhibition texts mentioned above. The publication of Schele and Miller's accompanying text for Kimbell Art Museum's exhibition was a milestone for the study of Maya iconography alongside the pursuits of archaeology and epigraphy. As can be seen by its frequent citation in bibliographies concerned with ancient Maya art, the interpretive methods of this book presented an art historical approach for deciphering the complex iconographic narratives of carved rock and painted pottery:

> In Maya thought certain points and substances in the natural world may have supernatural force that was manifested symbolically in art. These symbols represent categories of phenomena, much as we use the generic term *man* to refer to all human beings. Cave, tree, water, blood, cloud, vision, lightning bolt, maize, water-lily, body parts and emanations—all of these could be manifested as animator persona. Sometimes the properties of two objects or substances were conceived to be structurally analogous: blood is to the human body as sap is to the tree; smoke is to fire as breath is to humans; blood is to humans as water is to earth. Symbols representing structural categories with similar appearances were also freely

> interchangeable. For example, flames, smoke, mist, breath, flowing blood, clouds, farts, belches and new maize sprouts were all represented by the same double scroll. The precise meaning of such a scroll can only be distinguished from the context, and the double entendre was probably intentional (Schele and Miller 1986: 43).

This interpretation of ancient Maya art, arguably shamanistic in outlook, emphasizes some essential aspects of the metaphysic governing the artists' minds and will come to define the rationale employed in the search for an emic interpretation of iron-ore mirrors. In particular, the acknowledgment that the ancient Maya merged the view of different entities into symbols of a single notion reveals emic intent; in the case of the iron-ore materials constituting the surface of mirrors (to be elaborated upon in Chapter 5), they seem to have been conceptually lumped with other substances thought to manifest "liminal space." Related materials occur in caches "that remade the Primordial Sea under the floors of their buildings: jades, *spondylus* shells from the sea, the red pigments cinnabar and specular hematite, mercury, eccentric flints, obsidian" (Freidel et al. 1993: 234, see also Mathews and Garber 2004). Schele and Miller's (1986) exposé launched a new model for the emic interpretation of the ancient Maya archaeological record, utilizing the conjunctive approach, Cognitive Archaeology, and the belief-system of shamanism, which are adopted as the core theoretical guide to the current thesis.

Building on this earlier research, Reents-Budet (1994) was free to expound on more specific themes in the decade that followed. Her publication for an exhibition of ceramics organized by the Duke University Museum of Art advanced the study of ancient Maya pottery art immeasurably. Most notably, the book repeatedly highlights the social value of painted pottery vessels, particularly masterpieces with a glyphic signature of

renowned master-artists such as *Ah-Maxam* and *Tubal Ajaw*, lending the item significant esteem; what might be termed "authenticity" (Appadurai 1986: 44).

A carefully selected sample of catalogued artifacts comprised the exhibition, with specimens that are also found in the Kerr online database, but with a priority given to vessels that had "been chemically sampled by the Maya Polychrome Ceramics Project, Conservation Analytical Laboratory, Smithsonian Institution" (Reents-Budet 1994: xix). This highlighting of chemical analysis follows from an awareness among postprocessual researchers of the need to respond to more processual norms that "relegated the study of the imagery and writing to the netherworld of the 'unscientific'" (Schele 1994: xiv). Although most of the artifacts in the Duke Museum exhibition are problematic, lacking a documented archaeological context, they nevertheless can be shown to be chemically legitimate examples of ancient Maya art even though many have been acquired via looting and subsequent black-market transactions. As will be noted in the discussion that follows, the Reents-Budet text is an invaluable resource that grounds inquiries into the iconography of ancient Maya painted polychrome vessels, and provides a unique cross-reference for illustrations of iron-ore mirrors therein. As will become clear below, the movement towards an art historical analysis of the painted polychrome ceramics has broadened the researcher's ability to tap the minds of ancient artisans in an effort to better comprehend the intricate meanings underlying the complex imagery.

Types of Iconographic Mirrors

In the corpus of 54 vessels in the Kerr online database referred to earlier, there are a number of intriguing patterns in the physical appearance of the mirrors that are depicted. Since the majority of the vases are unprovenienced, we cannot be sure if

differences between types of depicted mirrors denote the preferred style of individual artists from particular regions or if characteristic illustrations represent differences between actual types of mirrors. Furthermore, a small number of the 54 vessels identified as yielding images of mirrors are questionable as to whether the iconographic elements labelled as mirrors by Kerr are actually mirrors; as opposed to most of the illustrations which have distinctive black mirror surfaces depicted. These disputed specimens will be discounted in the following discussion, but are referenced along with more certain depictions of mirrors in Appendix B. What can be accomplished, however, is a primary typology of mirrors from these painted polychromes derived from the Kerr database. Appendix B provides a detailed analysis of each vessel in the current sample. The following discussion, however, refers only to traits of individual mirrors that exhibit features distinguishing them as such.

With / Without Flared Backing

Since it is clear that ancient Maya mirrors required a backing of either wood, ceramic, or stone to which the iron-ore mosaic could be attached, the mirrors depicted on painted vessels can be categorized according to the shape of their backing. All of these mirrors have backings, but some have relatively simple ones that conform to the surface of the mirror itself while others have longer flared-out appendages that resemble the "gently outcurving pairs of volutes" so commonly used to depict smoke, fire, blood, sounds, smell, and sight (Houston et al. 2006: 178; Houston and Taube 2000: 289). Examples of mirrors without flared backings include Kerr #'s 787, 1453, 1454, 1728, 1790, 2695, 3203, 5110 (an incised unpainted vessel), 5418, 6341, and 7288. Mirrors with flared backings can either curve immediately back dorsally (see Kerr #'s 559, 764

[Figure 25a], and 2914) or extend ventrally before folding back into a flare (see Kerr #'s 625 [Figure 25b] and 4338). Since we do not see these elaborate backings in the archaeological record, it is possible that some mirrors were originally attached to large wood frames such as those depicted in these scences on painted pottery. Of the five instances, three (60%) are curved dorsally and two (40%) extend ventrally, then dorsally.

(a)

(b)

Figure 25: (a) K764 (b) K625 (Kerr 2006)

Embedded / Protruding Mirror Surface

The representation of mirrors usually emphasizes the black surface of what is presumably the iron-ore mosaic. This can be accomplished by either showing what is a cross-section of the backing where the mirror (in black) appears to be embedded within the backing (see Kerr #'s 787 [Figure 26a], 1454, 1728, 1790, 2695, 2914, 4338, 5418, 6341, 7288, 8220, 8652, and 8793), or by accentuating the mirror on top of the backing so that the black surface protrudes out (see Kerr #'s 530, 559, 764, 1463 [Figure 26b], 2929, and 5944). Unfortunately, some of the objects that are labelled mirrors lack the distinctive black surface that helps to confirm this designation, although they do exhibit a typical mirror-back shape (in profile) and are often held by attendants just as mirrors are usually portrayed (see Kerr #'s 505, 1651, 1669, 2025, 2026, 3813, 4479, 5416, 5545, 5764, 6666, 7265, and 8926). Of the 19 instances, six (31.6%) are protruding and 13 (68.4%) are embedded.

With / Without Curious Protuberances

Numerous vessels boast painted representations of mirrors with odd little protuberances jutting from either the mirror's surface or that of the exposed anterior side of the backing (see Kerr #'s 505, 787, 2929, 4338 [Figure 27], 5944, 7265, and 8926). The identity of these protuberances is difficult to ascertain except for two significant lines of evidence. It was a common Mesoamerican custom from the time of Teotihuacan (Taube 1993) until the Spanish Conquest (Tozzer 1941: 89) for mirrors to "function as ornaments of dress" (Miller and Taube 1993: 114). There is also the conspicuous detail emphasized by the artist of Kerr # 787 where tiny lines have been drawn from the point where the protuberances meet the face of the mirror three-quarters of the way through the

(a)

(b)

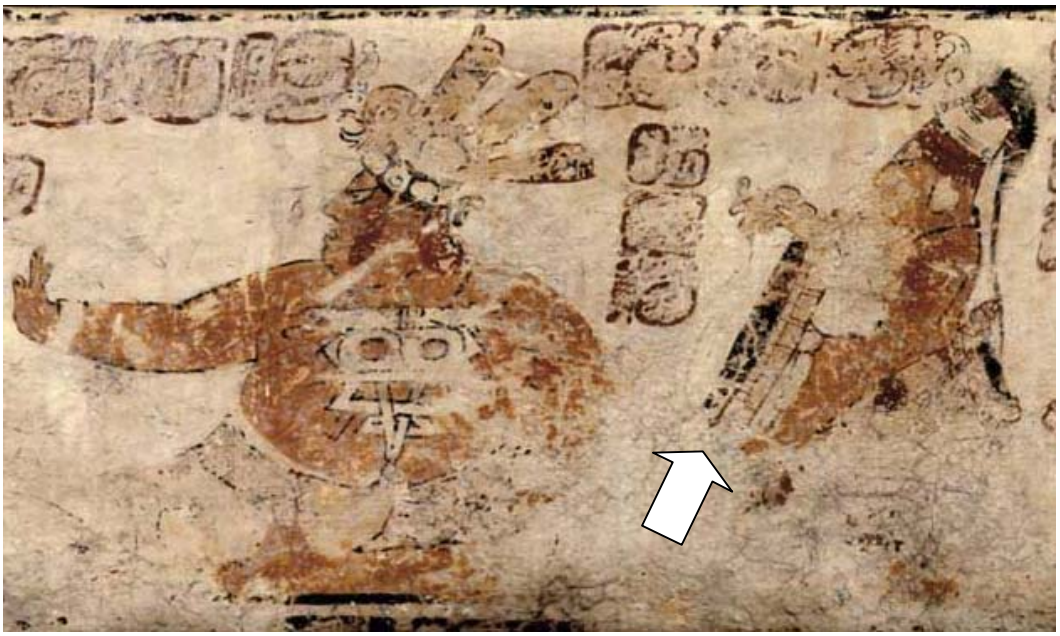


Figure 26: (a) K787 (b) detail of K1463 (Kerr 2006)

protuberance. This has the effect of portraying a folded material, most likely a cord tied through holes in the backing of the mirror so that it can be fastened to the body as part of royal costume. Another possibility is put forward by Taube (1983: 170; Figure 21b) who calls them "projecting elements" that represent "pins to fasten [the] mirror plaque to [the] bowl." This suggests that the main reflective surface and corresponding backing may

have functioned as a detachable implement, capable of being fastened to different frames or costumes depending on the occasion. There are a total of eight instances where mirrors depicted on painted pottery appear with these protuberances.

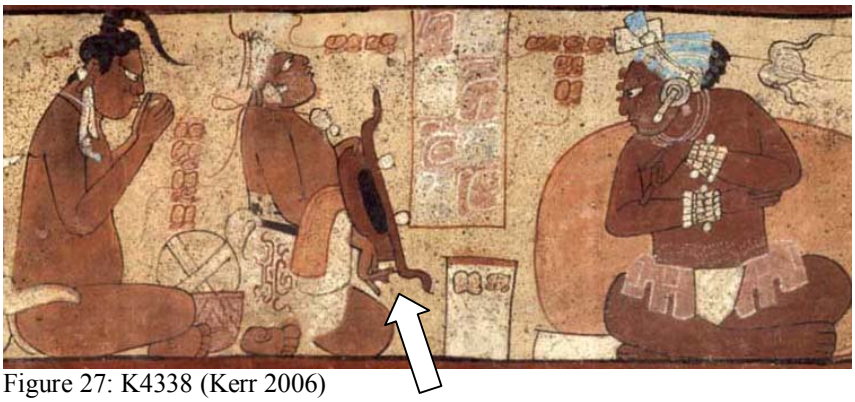


Figure 27: K4338 (Kerr 2006)

Stand / Assistant as Support for Mirror

The mirrors in some painted polychrome images require a support so that their surface can be gazed into. Thus, we find that other than those mirrors that are being held by the very personality that is looking into them (see Kerr #'s 505, 8652 [Figure 28a]), mirrors are most often depicted as supported by either a ring-like stand (see Kerr #'s 625, 2026, 2711, 2914, 2929, 3203 [Figure 28b], 5233, 5418 [eccentric, non ring-like], 5764, 6315, 6437, 6666 [upright bar stand], 7265, 8790, and 8793), or by an assistant of some kind. Interestingly, this assistant is sometimes a dwarf character (see Kerr #'s 530, 764, 787, 1453 [dwarf] [Figure 28c], 1454, 1463, 1790, 2025, 2695, 4338, 5110 [dwarf], 6341, 7288, 8220, and 8926). Of the 32 instances, two (6.2%) are held/supported by the viewer, 15 (46.9%) are held/supported by an assistant, and 15 (46.9%) are supported by some type of stand.

(a)  (b)  (c) 

Figure 28: (a) detail of K8652 (b) detail of K3203 (c) detail of K1453 (Kerr 2006)

With / Without Woven Basketry Support

There are a few instances of mirrors with peculiar backings that seem to serve the same function as the more popular ring stand. At first glance, these stands look like woven baskets, but as Kerr (2006) points out on his database website, these mirror backs could represent "either a basket or a ceramic painted to imitate a basket." Three examples of these "basket" form mirrors can be found, occurring on Kerr vessel #'s 559, 5944, and 6315 (Figure 29a). The curious sack or bag backing of K2695 (Figure 29b) exhibits perhaps another alternative to the woven support.

(a)  (b) 

Figure 29: (a) detail of K6315 (b) detail of K2695 (Kerr 2006)

Active / Passive Function in Depicted Scene

One of the most important qualities regarding mirrors depicted on ancient Maya polychrome vessels is the manner of their employment in the illustrated scene. When serving an active function, mirrors are almost always held before a primary (ruler?) figure who stares into the face of the mirror (see Kerr #'s 625, 764, 787, 1453, 1454 [Figure 30a], 1790, 2026, 2695, 4338, 5764, 5944, 6437, 6666, 7288, 8220, 8652, 8793, and 8926), indicating that he is engaged in what might be described as the "divinatory scrying" function of mirrors (Besterman 1965; Miller and Taube 1993: 114; Taube 1993: 170). All other active functions occur in what are termed "supernatural scenes," to be discussed below.

In a passive function, mirrors are relegated to the periphery of scenes that portray royalty (see Kerr #'s 559, 1728 [Figure 30b], 2711, 7265, and 8790) although, as ensuing discussions will suggest, the effort to include them may be indicative of their Preclassic and Classic period function as symbols of kingship (Saunders 1988; Sharer 1994: 58). Of the 30 instances, 23 (76.7%) play active roles in the scene, while seven (23.3%) play passive roles.

Natural / Supernatural Backdrop of Scene

The vast majority of painted scenes that include mirrors show social interaction taking place between human actors, usually members of the royal court occasionally flanked by servants. Of particular interest are those idiosyncratic scenes depicting what are probably supernatural beings partaking in ritual behaviours that are, for the most part, esoteric and beyond the reach of modern understanding (Figure 31). It is possible, however, to piece together approximate details about the images of agents and their

(a)

(b)

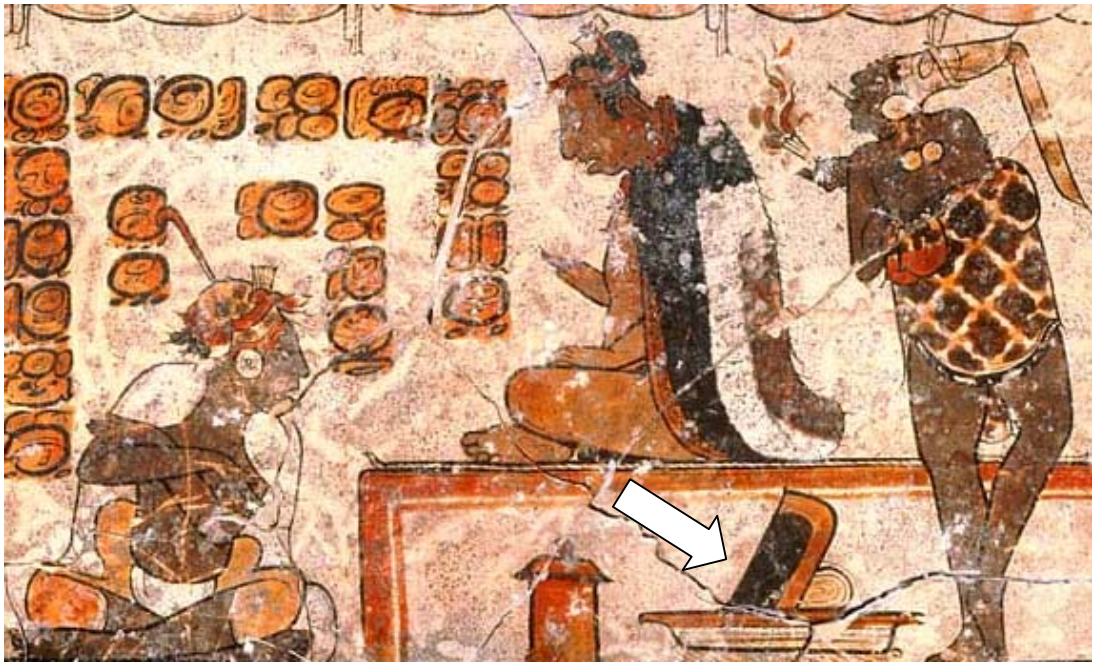


Figure 30: (a) K1454 (b) detail of K1728 (Kerr 2006)

actions from what is currently known about the characteristics of specific deities and myths of Maya religion. A total of six are designated below as supernatural scenes.

Notable Polychrome Specimens

K505: A monkey with a scribal headdress dances while looking into a mirror that he holds in his hand; juxtaposed by a dog-scribe staring blankly into the dark cavity of a

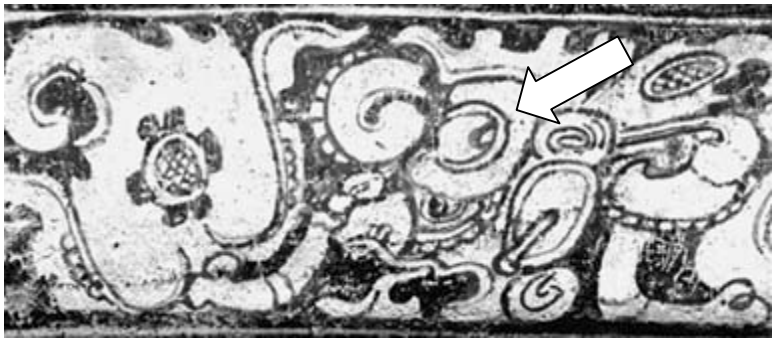


Figure 31: K4354 shows the face of the god K'awil with a mirror in the forehead (Kerr 2006)

large olla jar (Figure 32). Reents-Budet (1994: 50) describes the "pictorial manipulation, pictorial composition, hieroglyphic writing and historical and religious knowledge" evident in the remarkable works of Maya masters, indicating that the master artist or *its'at*  "was truly a savant, a literate person in command of Maya history, cosmology, and religious knowledge." In this way, K505 can be seen to be the artist's personal contemplation of light and dark, or life and death, such that the mirror becomes a powerful symbol of life and light (see Blainey 2005, 2006a).

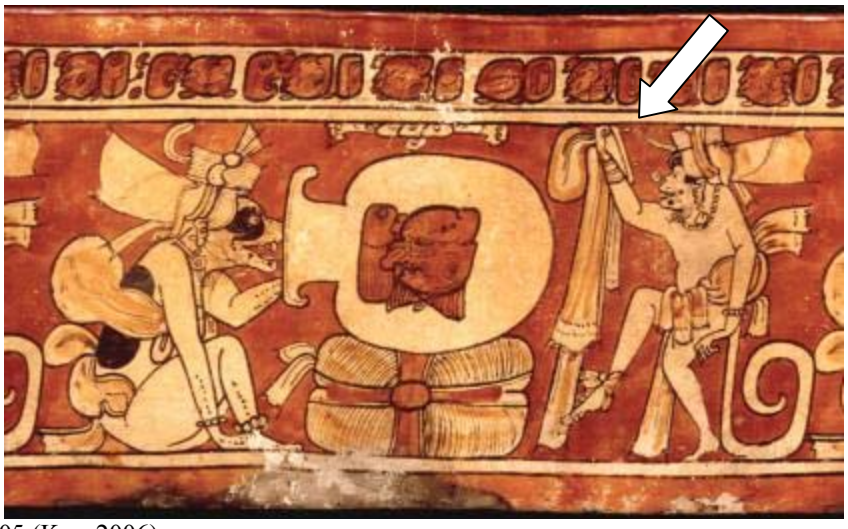


Figure 32: K505 (Kerr 2006)

<u>*K530*</u>: The scene (Figure 33) is described as follows: "4 toothless old deities prepare for a ceremony to *Itzamná*…2 will take enemas, 1 is inhaling drugs, and the last puts on makeup, all [to] the accompaniment…[of]…musicians" (Kerr 2006). The one

who is applying black makeup to his face appears to be using the mirror that is being held by a female assistant as a vanity aid. This depiction of the practical use of mirrors (which as mosaics would have produced a multiplied image) stands out against the majority of the iconographic scholarship stressing the divinatory and symbolic functions of mirrors. It must be pointed out, however, that the painting of the face, particularly the same black as the face of the mirror (seen also on K2345 and K7288), may have served some ritual metamorphosis function that the mirror facilitated: "The foregrounding of skin as a subject in some images makes clear that it was conceptualized as a bodily boundary, a site of conjunction of bodily identity, and a medium for transformation from one state to another" (Meskell and Joyce 2003: 49).

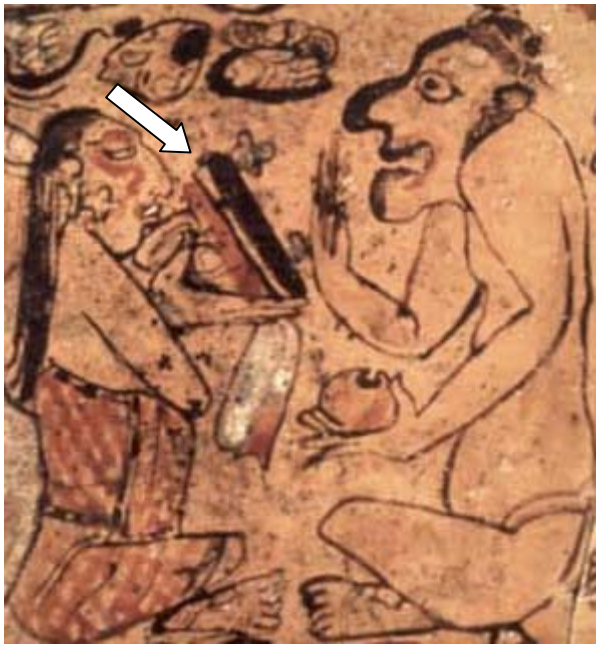


Figure 33: detail of K530 (Kerr 2006)

K559: On the left of the rollout photograph (Figure 34), one sees "the Moon Goddess giving birth to the rabbit" while on the right there is Goddess O nursing the newborn rabbit (Kerr 2006). There is much disagreement whether Goddess O is the cosmic midwife god (see Kerr #'s 501, 559, 5113, and 6020) synonymous with the Aztec

Omecihuatl, but what is clear is that the Moon Goddess *Ixchel* is giving birth to a rabbit, a symbol of the moon, onto (or in front of) a mirror situated directly where the cosmic World Tree grows (Miller and Taube 1993: 127, 142; Schele and Miller 1986: 143-144).

Figure 34: K559 (Kerr 2006)

K2929 & K5944: These images are very revealing in terms of the functions of ancient Maya iron-ore mirrors. It is important to note that ancient Maya iconography utilizes *synaesthesia* where "the modality of sight gleans signs that are intended to carry meaning, sound, and scent" (Houston and Taube 2000: 263). In K2929 (Figure 35a), the mirror partitions a human figure and an anthropomorphic jaguar. The latter character can be interpreted as a common Maya *way* spiritual co-essence (Calvin 1997; Grube and Nahm 1994; Houston and Stuart 1989) with which the human figure is communicating via the mirror. The mirror appears to act as a bridge between two normally divided worlds! This notion of the mirror as a communication device between the human realm and the spiritual Otherworld is strengthened by the fact that the *way* jaguar is emitting "speech scrolls" (see Evans 2004: 271; Houston et al. 2006: 139; Houston and Taube 2000: 275; Meskell and Joyce 2003: 46) above and across the mirror towards the human

figure. K5944 (Figure 35b) depicts a similar situation, but with a water-bird *way* replacing the jaguar *way*. An unnumbered vessel from the Sacred Cenote at Chichen Itza also portrays a mirror dividing two conversing actors, inside what is interpreted as a palace context (Houston et al. 2006: 238, 242, Figure 7.14b)

(a)

(b)

Figure 35: (a) detail of K2929 (b) detail of K5944 (Kerr 2006)

<u>*K2970*</u>: This vessel (Figure 36) portrays an image of God K, known as *K'awil*. Depicted in a variety of forms, the significance of the glyphic mirror that appears on the head of *K'awil* will be addressed in succeeding discussions of the T24/T617 grapheme.

<u>*K5764 & K7265*</u>: These scenes imitate the familiar palace setting, but with godly actors replacing the more customary mortal figures. Both scenes involve *Itzamná*, identifiable by his headdress with overhanging front tassel (Freidel et al. 1993: 40; Miller and Taube 1993: 100), interacting with animal spirits. In K5764 (Figure 37a), he sits

Figure 36: detail of K2970 (Kerr 2006)

before *Ta Hol*, one of the many names for the vulture deity connected with Maya kings or *ahau'ob* (Schele and Miller 1986: 325), who presents a bundle to the supreme deity. In K7265 (Figure 37b), *Itzamná* sits with a dog, an animal customarily associated with the Underworld in Mesoamerican belief (Reents-Budet 1994: 275; Evans 2004: 215; see also K505). A mirror is present in both scenes suggesting that if deities also possess and use mirrors, that the surfaces of these Otherworld mirrors are merely the reverse side of the same mirrors that are used by rulers in the human realm. These scenes may illustrate what the ancient Maya believed was taking place on the other side of their mirrors.

THE *REFLECTIVE SURFACE COMPLEX* IN EPIGRAPHY

The ancient Maya are unique among Pre-Columbian New World peoples for many reasons, not the least of which is the development of their complex writing system. Optimizing symbolic standardization with the ability for creative licence, the Maya script represents a colossal achievement of cultural ingenuity, spanning the entire Maya subarea as it flourished during the Classic period. Along with Mesopotamian cuneiform, ancient Egyptian hieroglyphs, and the scripts of the ancient Chinese and Indus River Valley civilizations, Mayan hieroglyphs are one of only five "original, fully functional systems of writing…that all other written forms of language evolved from or were inspired by" (Montgomery 2002a: 1).

(a)

(b)

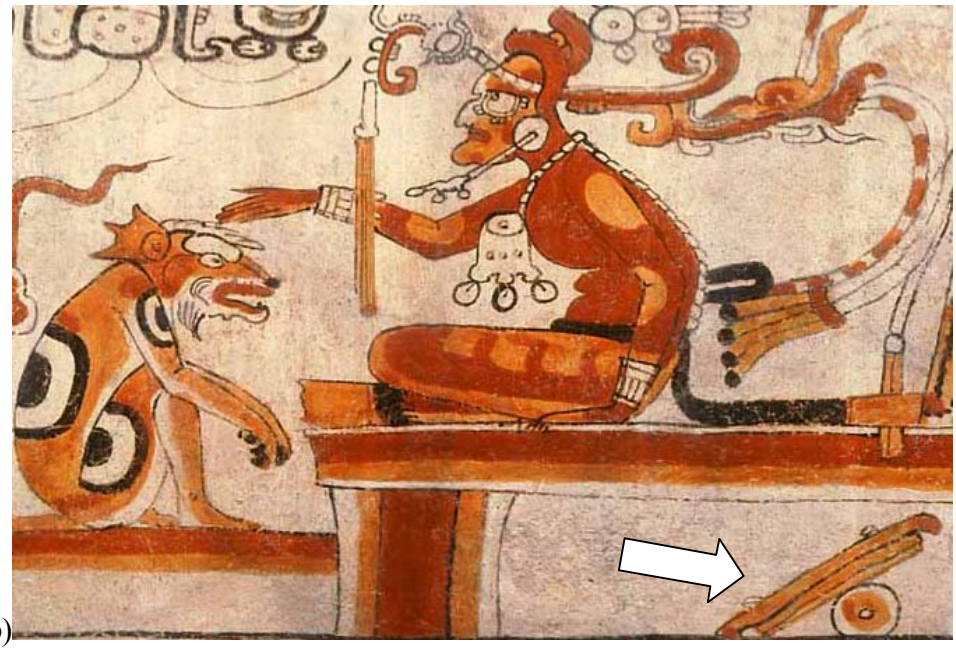


Figure 37: (a) detail of K5764 (b) detail of K7265 (Kerr 2006)

Although the discipline of Maya studies experienced some growing pains, with symbols previously dismissed as unreadable and irrelevant suddenly becoming comprehensible and groundbreaking (see Coe 1992), the present status of glyphs is as a "traditional" aspect of the archaeological record (Golden and Borgstede 2004: 3).

Presuming that the correct translation of Mayan hieroglyphs allows modern researchers to peer "into the minds of ancients" (Houston 2000), the following discussion is aimed at critically parsing out the instances of what epigraphers have construed as mirrors, or at least symbols indicative of "shininess." This analysis will aid in the larger pursuit of an understanding of the emic functions of iron-ore mirrors within ancient Maya society.

The *nen*/*lem*/*-il* Grapheme T24/T617

Originally assigned two different "T-numbers" in Thompson's (1962) *Catalog of Maya Hieroglyphs*, the elliptical glyph encapsulating one, two, or three curved bands appears as both a supplemental affix  (T24) and as a full logograph  (T617). With curved bands either empty or crosshatched, it appears most frequently in its T24 affix role, often as part of a logograph whose meaning is not immediately related to mirrors. Nevertheless, the glyph is consistently taken as the representation of a mirror (Montgomery 2002b: 95; Schele and Miller 1983; Schele and Miller 1986: 49), perhaps signified by the curved lines as shafts of reflected light. Recently reclassified with the codes 1M1-1M5, the glyph has been interpreted more generally as symbolizing a "celt" or "reflective stone" in Macri and Looper's (2003: 273-275) *New Catalog of Maya Hieroglyphs*. The polyvalent nature of the Mayan script, however, makes an assessment of this glyph's exact meaning difficult to pin down. This problem arises in the apparent use of T24/T617 to indicate the notion of "shininess," where its occurrence can also denote, for example, obsidian blades (Schele and Miller 1986: 176), celts (Houston et al. 2006: 72-73; Iannone 1993: 238, 240), or even shell "tinklers" (Gyles Iannone, personal communication, 2005; Kidder et al. 1946: 145-148).

In spite of the difficulties inherent in the interpretation of the T24/T617 grapheme, there is an explicit association between mirrors and other shiny, reflective surfaces. As the Mayan script in general reveals, the ancient scribes who utilized these symbols were erudite members of the royal court, well schooled in the intellectual principles governing the cosmos (Reents-Budet 1994: 47-50). When these artist-scribes (*its'at*) used a single glyph to designate seemingly disparate entities, one can assume that they were well aware of the ideological connections that the Maya viewer would naturally draw. Modern researchers can also make these connections, as it appears that the T24/T617 glyph portrays mirrors as one piece of a wider complex of reflective surfaces, all manifestations of powerful forces controlling the photoreceptive capacities of the human eye.

This correlation between surfaces that reflect light and the human eye that perceives them appears to have been a pivotal conception in the ancient Maya view of human being-in-the-world. This becomes apparent in the fact that the T24 phonetic version of the "mirror" glyph stands for the syllable *-il* or sometimes *li*. This matches the morpheme *il* (Houston et al. 2006: 139), represented by  or  as the logogram for "to see," showing the cross-section of an eyeball with lines of vision radiating from the inner chamber. The past-tense version is *ilaj*, "was seen"  , and provides an overt connection with the flared out mirror-back seen in the painted pottery scenes discussed above (Montgomery 2002b: 95-97). These examples suggest that the ancient Maya regarded the shiny surface of the human eye as the human body's equivalent to a mirror; perhaps an acknowledgement of both entities as liminal thresholds partitioning separate

realms. Even more, the T24 phoneme was also used as a suffix to denote where something "exists as an inalienable part of something else…for example, bark bears an inextricable relationship to the tree, and a door relates to its building [*U-pa-si-il yo-OTOT-(ti)*] in such a way that a door by itself makes no sense" (Montgomery 2002a: 147; see Houston et al. 2006: 66-67). As the notion of the T24/T617 grapheme is explored in further examples below as indicative of a *reflective surface complex*, the totality of evidence pertaining to iron-ore mirrors will be charged with an empathic awareness of ancient forms of thought that only visual and linguistic expressions can reveal.

Incidences of T24/T617

The significance of the T24/T617 grapheme was elaborated upon in an influential work by Schele and her colleague Jeffrey H. Miller (1983). Although the original interpretations put forward by the authors are now quite dated (Mary Miller, personal communication, 2005), they nevertheless succeed in conveying the iconographic prominence of the grapheme. Building on their 1975 collaborations at the Segunda Mesa Redonda de Palenque, Schele credits Miller as the originator of the notion that T24/T617 represents a mirror (Schele and Miller 1983: 1). It is worth mentioning their Mayan translation of T617 as "*nen* in the Western languages and *lem* in the Eastern languages" (Schele and Miller 1983: 12). On the other hand, T617 is not recognized as such in Montgomery's *Dictionary of Maya Hieroglyphs* (2002b), nor is this reading "well-attested, other than, maybe, a spelling at Copan (with [ne] suffix), and on a mirror from Topoxte, in *Courtly Art*, p. 46 (there with [na] syllable)" (Stephen Houston, personal communication, 2006; Martin et al. 2004).

Perhaps the most insightful passage concerns the linguistic concepts in the different variants of Mayan where *nen* or *lem* demonstrate significant ideational principles that inform the current discussion. In reviewing multiple dictionaries of Conquest-period and modern Mayan dialects, Schele and Miller (1983: 12-14) extract multiple examples where *nen* and *lem* function "as the root for 'lightning,' 'gleam,' and 'shine.'" They discover that variants of *nen* and *lem* also refer to the concepts of "rulers and persons of importance as 'the reflection of the world'… 'succession in office'… 'to think,' 'to imagine,' 'to contemplate,' and 'to meditate.'" All of this linguistic data acts to fortify the current proposition that artifactual mirrors served to function within a broader ideological construct encompassing all reflective surfaces found in the natural and manmade worlds. This ancient Maya *reflective surface complex* continues to appear as one observes the occurrence of T24/T617 in epigraphic contexts in which it appears conflated with other elements.

 The PSS "Initial Sign": the first glyph in the Primary Standard Sequence (PSS) found on many painted polychrome ceramics frequently has a T24/T617 grapheme inset as the upper right element. This glyph here, reading *ay-a* or "came into being" rather than "mirror," is called the "initial sign" and "there are several other signs that substitute for the mirror in this hieroglyph, notably the heads of the god GI and the Loincloth Apron God who is the personification of the mirror" (Reents-Budet 1994: 124). It has also been translated as *alay*, meaning "here, this (one)" (Boot 2003, 2005). Mayan glyphs commonly have multiple variants (Coe and Van Stone 2001; Montgomery 2002a), but nevertheless, the mirror infix in this variant is revealing. If we consider that reflective surfaces were meant to be looked *through* instead of looked *at*, then the glyphic

symbol takes on more ethereal connotations. Like the mirror upon which the rabbit falls as it emerges from the womb in vessel K559, the T24/T617 in the "initial sign" may denote a creation event that occurs at the emergent interface between non-existence and existence.

 *Ch'ab* (T712): This glyph, representing "an obsidian lancet," has a very flexible meaning (polyvalence) and is listed as signifying "'do penance, sacrifice'… 'to pierce with a lance,' 'lancing;' when used in parentage relationship statements may have the meaning 'to create'" (Montgomery 2002b: 72; see Houston et al. 2006: 130-132). Like the PSS "initial sign," the T24/T617 element in *ch'ab* can be construed as an allusion to "creation" and the perforation of the threshold separating between two realms in space or time; a manifestation of cosmic liminality or hierophany (see Blainey 2005: 8; 2006a; Eliade 1964: 32). The connection of the shiny obsidian lancet to the "piercing" act in bloodletting rituals is suggestive of the *reflective surface complex* and breaches in the liminal skin that separates the inside and outside of the body of the atoner. This aperture created by the piercing act of bloodletting, turning a once fixed boundary into a permeable membrane, aids as a possible evocation for the emic functions of iron-ore mirrors to be expounded upon in the concluding chapter.

 : Identified as a glyph marking a Maya lord's accession to the royal throne by Schele and Miller (1983), this glyph, allegedly found only on inscriptions at Palenque, is synonymous with other "accession expressions" (Montgomery 2002a: 169). It consists of the phonetic elements wa-K'AL-NEN-ni or *k'al-nen*, which would loosely translate as "bound/tied/wrapped" the mirror (Montgomery 2002b: 145), which suggests a possible

function of "suspension holes." If mirrors were official symbols of kingship, it is possible that this variant of the accession expression functioned much like the more common rite of *k'al sak jun* (bound/tied/wrapped the white headband), where a white "scarf…would be tied to the forehead" (Martin and Grube 2000: 14). In fact, the *k'al sak jun* glyph appears directly associated with the headband-tying ceremony on the Yaxchilan Hieroglyphic Stairway 3, Step III: D11-D13, on Quirigua Stela J: H4-H7 (Houston et al. 2006: 62), and on one of the incised mirror backs from Costa Rica (Juan Vicente Guerrero Miranda catalogue entry #433 in Schmidt et al. 1998: 628-629). Considering the pre-eminent status of the king as divinely-sanctioned mediator between the natural and supernatural realms (Blainey 2005; Martin and Grube 2000; Schele and Freidel 1990: 65; Schele and Miller 1986; Sharer and Golden 2004: 32), it is understandable that the glyph describing their acquisition of power illustrates their role as custodian of objects with reflective surfaces:

> In essence, the Maya ruler was the supreme shaman for the society he governed, and as such was responsible for the prosperity, health, and security of all his subjects. In ancient Maya society, therefore, kings were both political leaders and priests, and the ruling elite thereby came to direct all community activities—the *giving of tribute*, the building of temples and palaces, the maintenance of long-distance trade, the launching of military expeditions, and the performance of the complex of rituals that nourish and placate the gods—all as ordained by the cosmological order (Sharer 1994: 70, italics added).

This controversial issue of the rulers' degree of control over economic interaction will be discussed in Chapter 5, but it is nevertheless interesting to note the possibility that iron-ore mirrors were exchanged as tribute, a practice of trade that is supposedly illustrated on well over 100 painted pottery specimens in Justin Kerr's Maya Vase Database.

If indeed the accession to office made the new ruler the foremost shaman of his polity, then the inclusion of the T24/T617 grapheme in the Palenque accession glyph is plainly intended to convey the new king's responsibility for presiding over the liminal "portals of communication opened between the human and divine" (Freidel et al. 1993: 317). It must also be mentioned in advance of the imminent discussion of god K'awil's forehead-mirror that the *k'al-nen* glyph is comparable to T1030e  . This glyph, from the T1030a-q series of K'awil associated glyphs, translates as *ch'am K'awil*, "to receive K'awil" (Montgomery 2002b: 75).

 *B'a* (T501): This glyph, allegedly symbolizing a water lily and functioning phonetically as *ba'*, as in the royal title *b'akab'*  , also represents the nouns "head," "self," and "being" (Montgomery 2002b: 39). It appears that the Classic Maya believed that the nexus of the individual agent convened in the *bah*. They perceived a person's skull, including all its contents and the face, as the locus of interaction with the external world and the place where the totality of senses converged as a single event experienced by the *bah* (Houston and Stuart 1998: 77; Houston et al. 2006: 60-72; Meskell and Joyce 2003: 27). Regardless of whether the *b'a* glyph represents a water lily, which would make it a blatant reference to the liminal surface of shiny bodies of water, its correlation with the human head accounts for the appearance of the T24/T617 grapheme. If the inside of the head is responsible for experiencing the world outside, then the field of vision provided by the mirror-like eyes is the window to that world.

 *tz'i-b'a* (*Tz'ib*): This glyph is a significant exception that violates the "principle of synharmony" of Mayan phoneticism, a normative rule of epigraphy holding that "terminal vowels are silent and that vowels in consonant-vowel syllabic signs agree with each other when spelling out words" (Montgomery 2002b: 124-125, 251). Instead of the anticipated *b'i* syllable that usually follows *tz'i* in the phonetic spelling of the Mayan word for "writing" or "painting," the author of this glyph apparently took creative licence in underscoring the role of the *b'a* in what the hand creates. This makes emic sense, since for the Maya "writing was a sacred proposition that had the capacity to capture the order of the cosmos, to inform history, to give form to ritual, and to transform the profane material of everyday life into the supernatural" (Schele and Freidel 1990: 55). Accordingly, the mirror grapheme once more appears in the context of an interface between existence and non-existence, this time in reference to the human capacity to be creative.

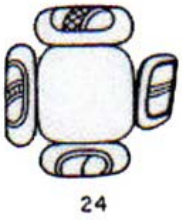
 Mirror Maize-ball: Much like the *K'an*  sign for the "fourth day of the Maya *Tzolk'in* calendar…probably represents a grain of maize" (Montgomery 2002b: 147), the images of balls of maize dough identified by Taube are an example of how "the association of the mirror sign with maize is pervasive" (Taube 1989: 46-47). A plausible explanation of this pairing of mirrors and maize incorporates the *Popol Vuh* myths of maize's origin. Here, Seven Hunahpu, the father of the Hero Twins, is reassembled and resurrected by his sons. Taking the form of the ancient Maya maize god, the Hero Twins "left him at the Place of Ball Game Sacrifice" (Tedlock 1996: 141). Since for the Maya, "the ballcourt was not only a place of sacrifice; it was an entry

portal to the time and space of the last Creation" (Freidel et al. 1993: 352), it appears that this initial portal between the human Middle realm and spiritual Underworld was associated with the emergent apotheosis of the maize god. We see this notion illustrated clearly in painted images of the maize god emerging from a cleft in the cosmic turtle's back, flanked by his Hero Twin sons, Hunahpu and Xbalanque (see Kerr #s 731 and 1892; Zender 2006: 9). Thus, the affiliation of the mirror grapheme with maize provides yet another connection between reflective surfaces and liminal portals.

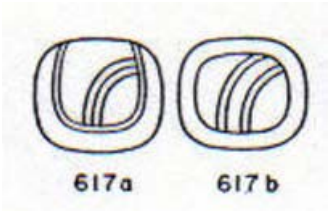
Phonetic Elements with Infixed T24/T617: There are numerous phonetic glyphs that contain elements equivalent to the T24/T617 grapheme. These can be found in the constantly evolving modern chart of phonetic glyphs, called the Mayan "syllabary," including phonetic variants for the syllables *i*, *b'a*, *je*, *ji*, *il*, *ma*, *pu*, *ta*, *te*, *tzi*, *tsu*, and *wa* (Coe and Van Stone 2001; Montgomery 2002a: 132-133). Since these are phonemes and not morphemes, it is impracticable to attempt an interpretation of the significance of the T24/T617 infix. Nevertheless, one can venture an informed guess that whatever these strange glyphs represent, the mirror grapheme's presence connotes some sort of relationship with light or reflection.

T24/T617 Grapheme Associated with Deities: As summarized by the leading Mayanist iconographers and epigraphers of today, there are abundant examples of the mirror grapheme's linkage with deities, particularly their eyes. They note the frequent depiction of mirrors embedded in the foreheads or headdresses of sculptured deities, including a spiral icon that they propose symbolizes a mirror (Houston and Taube 2000: 285; Houston et al. 2006: 170-171; Schele and Miller 1983: 8; Figure 38). This "spiral mirror" grapheme correlates to the distinctive curl-eyes found on many representations of

deities and the group of glyphs T574-T579. None of these spiral glyphs has been reliably deciphered, except for T579, which translated as *jub'*  , meaning "shell," "shell trumpet" or the verb for "war," can also be spelled phonetically to include the *ba'* element discussed above as a subfix (Montgomery 2002b: 121-122).



a)



(b)

(c)

Figure 38: (a) T24 *il* phonetic affix, (b) T617 *nen* logogram, from FAMSI.org
(b) stucco head of Sun god, Palenque (Schele and Miller 1983: 8)

 : Among the ancient Maya assemblage of deities, it is the god K'awil that has the closest ties to mirrors and the *reflective surface complex*. First labelled "God K" in the Schellhas (1904) system of deity classification, and specifically referred to as GII at Palenque, this god "was identified with lightening, fire, and dynastic descent" (Miller and Taube 1993: 146-147). Distinctive features of God K include a zoomorphic/serpent face complemented by one serpent-headed foot, an anthropomorphic body, and a forehead mirror that is perforated by either a "flaming axe" (Schele and Mathews 1998: 152), "a celt, a smoking celt, a smoking cigar, a smoking torch or a ceramic torch holder" (Schele and Miller 1986: 49). He is also associated with conventional symbols of kingship, such as the K'awil "Manikin Sceptre" (Figure 39) and the Double-Headed Serpent Bar, suggesting that he is a deity associated with kingship and royal lineage (Blainey 2005; Clancy 1994; Freidel et al. 1993: 195-196; Miller 1999; Schele and Freidel 1990: 78, 414). The most revealing aspect garnered from artistic illustrations of

K'awil is the fact that his forehead mirror is penetrated by some instrument of which we can only see half, because the other half is presumably located on the other side of the mirror.

Figure 39: head of K'awil Manikin from Palenque Temple XIV (Drawing by Linda Schele, FAMSI.org)

Other Instances of T24/T617: In closing this section on the occurrences of the mirror grapheme in ancient Maya artistic and hieroglyphic contexts, there is an assortment of examples where T24/T617 is plainly used to denote the reflection of light, or shininess, rather than as an indication of a mirror. These include what are termed "god markings," the bark of the Cosmic World Tree, and pendants hanging from the belt of kings whose images appear on stone stelae.

Similar to the *nen* glyph, the icon translated as "darkness" (*akb'al*) is subject to polyvalent meanings and is found in multiple contexts (Figure 40). The *akb'al* sign is frequently found as a marker on the arms and thighs of characters and objects depicted in Classic Maya art, and its common occurrence in association with the *nen* grapheme has prompted the designation of these glyphs as "dialectical counterparts" (Agurcia Fasquelle 2004: 110). Schele and Miller's (1986: 43) analysis of these markers interprets them as denoting a positive (*nen*) or negative (*akb'al*) nature of the labelled article. In an alternative possibility, they represent surface consistency, where the *nen* markings "show hardness and sheen" while the *akb'al* label occurs "to indicate a black, carapace-like surface" (Houston et al. 2006: 17). I have recently put forward a third hypothesis that

these markers signify the labelled entity as either visible (*nen*) or invisible (*akb'al*) (Blainey 2006a). Whatever the function is of these god markings, it is evident that the mirror grapheme played a key role in the contextualization of deities.

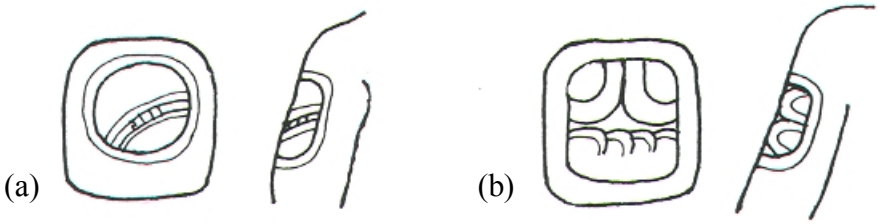


Figure 40:
(a) *Nen* / Mirror body marking, wrapped around arm
(b) *Akb'al* / "Darkness" body markings, wrapped around arm (Schele and Miller 1986: 43)

The Cosmic World Tree is one of the most recognized shamanistic motifs linking the indigenous worldviews of the region spanning from Eurasia to South America:

> Several religious ideas are implied in the symbolism of the World Tree. On the one hand, it represents the universe in continual regeneration, the inexhaustible spring of cosmic life, the paramount reservoir of the sacred…on the other, it symbolizes the sky or the planetary heavens…But it is important to remember at this point that in a number of archaic traditions the Cosmic Tree, expressing the sacrality of the world, its fertility and perenniality, is related to the ideas of creation, fecundity, and initiation, and finally to the idea of absolute reality and immortality (Eliade 1964: 271; see also Vastokas 1977).

The ancient Maya iconographic corpus leaves us with a rich array of World Tree images (Figure 41). Dubbed the *Wakah-Chan*, an ambiguous term meaning either "six-snake," "six-sky," or "raised-up-sky/snake," the ancient Maya revered the Cosmic World Tree as the center of the universe (*axis mundi*), a conduit whose sap carried ancestors' souls, the Milky Way, the first portal of creation, and as the mundane Ceiba tree (Freidel et al. 1993). The mirror grapheme can be found adhered to the bark of the World Tree on both painted polychromes and limestone tablet carvings. It is difficult to discern the significance of these World Tree mirrors but they are most likely meant to function either

like god markings, or as signifiers of the permeability of the cosmic conduit. The latter explanation implies the ritual tapping of *ch'ul* / *ch'ujul*, the ectoplasmic essence of the universe that "incorporates a visual and conceptual analogy between blood and the soul" (Montgomery 2002b: 81).

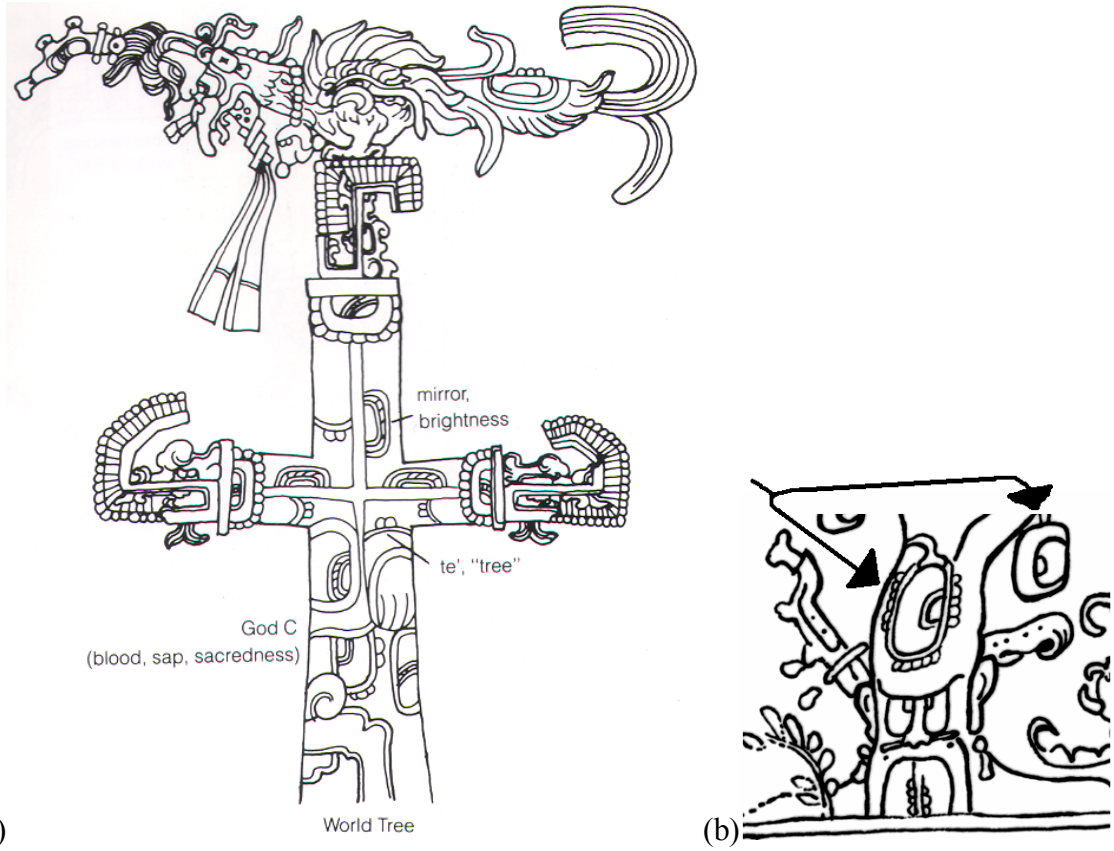


Figure 41: (a) World-tree from Pacal's Sarcophagus lid (Schele and Miller 1986: 283) (b) God C face at base of World Tree, large *nen* signs in fruit and above eyes, Kerr vessel # 1226 (Kerr 2006)

Finally, there is the curious inclusion of the mirror grapheme in a limestone depiction of ancient Maya rulers (Figure 42). Suffice it to say that there are a plethora of examples where the rulers are shown wearing elaborate regalia, with T24/T617 pendants hanging from their belts as a redundant theme (Blainey 2005; Schele and Miller 1983: 15). A convenient interpretation of these pendants would hold them to be iron-ore encrusted plaques, but there is no corresponding archaeological evidence from burials to

corroborate this supposition. Alternative interpretations, supporting the case for a *reflective surface complex*, consider this instance of the mirror grapheme as indicative of general shininess, construing the pendants as marine shell "tinklers" (Gyles Iannone, personal communication, 2005; Kidder et al. 1946: 145-148) or jade 'danglers" in the mode of the Leiden plaque. The shell notion is intriguing, since the image of marine shells was used to symbolize the concept of zero (an ideal point of liminality) and are represented in the Cacaxtla murals to designate the aqueous world that lies beneath surfaces of water (Evans 2004: 223, 370; Miller 1999: 182-183; Montgomery 2002a: 58-59; Reents-Budet 1994: 276). Although a clear reading of the T24/T617 grapheme as a royal pendant is elusive, it is yet another example of the symbol's connection with ancient Maya kingship.

Figure 42: T24/T617 grapheme on pendants hanging from ruler's belt on Dos Pilas Stela 1 (from Schele drawing collection #7301, FAMSI.org)

Segueing into the final aspect of "indirect" incidences of the mirrors, it is interesting to evoke Schele and Miller's (1983: 12) allusion to the Motul Dictionary where the phrase *nen* "describes the title holder as the 'mirror of the world' and 'the mirror of the pueblo (or people)'" (Ciudad Real: 669-670). This interpretation has been used to rationalize what have been interpreted as mirrors (T24/T617) worn on headdresses in the depiction of Yaxchilan's kings (Tate 1992: 103). The *nen* phrase in

the Quiché Dictionary is listed as "related to the Yucatec title as a term for 'succeed in office'" (Edmonson 1965: 78; Vienna Dictionary 1972: 99r). Considering the connotation of these linguistic references relative to the iconographic and epigraphic evidence discussed above, as well as the ethnohistoric sources addressed below, the enigma of the T24/T617 grapheme and ancient Maya iron-ore mirrors in general might be rectified by perceiving them from an emic standpoint.

ETHNOHISTORIC REFERENCES, THE POPOL VUH, AND ETHNOGRAPHY

Narrative accounts involving mirrors, written either by the Conquest period Maya or the Spaniards who documented the foreign incursion, offer an enlightening analogue for the ancient Maya versions that are of interest in this thesis. Indeed, "myth, like art, seems to have as its hidden agenda the problem of coming to terms with the terrible dilemmas of the human condition" (Duff 1975: 57). In outlining these literary references to mirrors, the following section is intended as a buttressing device accentuating the more inert evidence for ancient mirrors with the descriptive accounts of once living agents.

Ethnohistoric sources: Bishop Diego de Landa wrote his *Relación de las Cosas de Yucatan* while on "his sojourn in Spain in the 1560's" in between appointments as a Franciscan friar and Bishop of Mérida (Barrus 1973: 147; Tozzer 1941: vii). He mentions that "all the men use mirrors while the women had none; and to call each other cuckolds, they said that the wife had put the mirrors in the hair at the back of their heads" (Tozzer 1941: 89). This reference implies that by the time of the Spanish conquest, mirrors were no longer considered luxury items denoting prestige, as they seem to have been during Pre-Columbian times. Whenever iron-ore was not readily available it seems that the Maya resorted to other purveyors of reflective surfaces: "among many contact

period Mesoamerican peoples, including the Yucatec Maya, Aztecs, and Tarascans, the reflective surfaces of bowls filled with water were also used for divination, and it is possible that this is an especially old tradition, perhaps even dating from before the manufacture of stone mirrors" (Miller and Taube 1993: 114). Ethnographic records document the use of "water-filled medicine bowls" among some Pueblo peoples, such as "the Hopi (Parsons 1939) and the Tewa (Ortiz 1969)," and Taube (1983: 132, Figure 21) even identifies what have been considered elaborate mirror backs herein as mirrors submerged in bowls of water for "water-scrying."

The writings of Diego Durán (1964: 220-221) on the Aztec include a story about the coronation of Moctezuma II made analogous to "a mirror in which we will be reflected" and "the torch which is to illuminate Mexico has been lighted and today we have been given a mirror to look into." These statements match the meaning implied by the portrayal of Maya rulers as "the mirror of the world/people" cited earlier (Ciudad Real: 669-670; see Schele and Miller 1983).

"Seated Human Figure Bowls," a sculptural tradition of the indigenous populations of the American Northwest Coast area, provide an informative correlate for the Mesoamerican practice of water-bowl scrying. Numerous examples of stone effigy bowls have been recovered from this region, implying a Pre-Columbian continuity with what Franz Boas observed as the bowls' shamanic function in religious ceremonies (Boas 1890). Wilson Duff (1975: 53) considers the actual bowl portion of these sculptures as representing a "rattlesnake mouth," a metaphor related to a dominant effigy theme of the specimens with strong connections to female puberty and the birth canal. The serpent reference conjures up a recurring theme in Maya stone sculptures, which portrays an

awestruck human king engaged in uncanny conversation with a phantasmal ancestor who emerges from a portal represented by the jaws of a "vision serpent" (Freidel et al. 1993; Figure 43). More specifically, the serpent-(mirror/bowl) connection is directly observable with regard to the snake heads depicted on the "turquoise mosaic with a pyrite mirror" found in Chichen Itza's Temple of the Chacmool (Schele and Freidel 1990: 394-395).

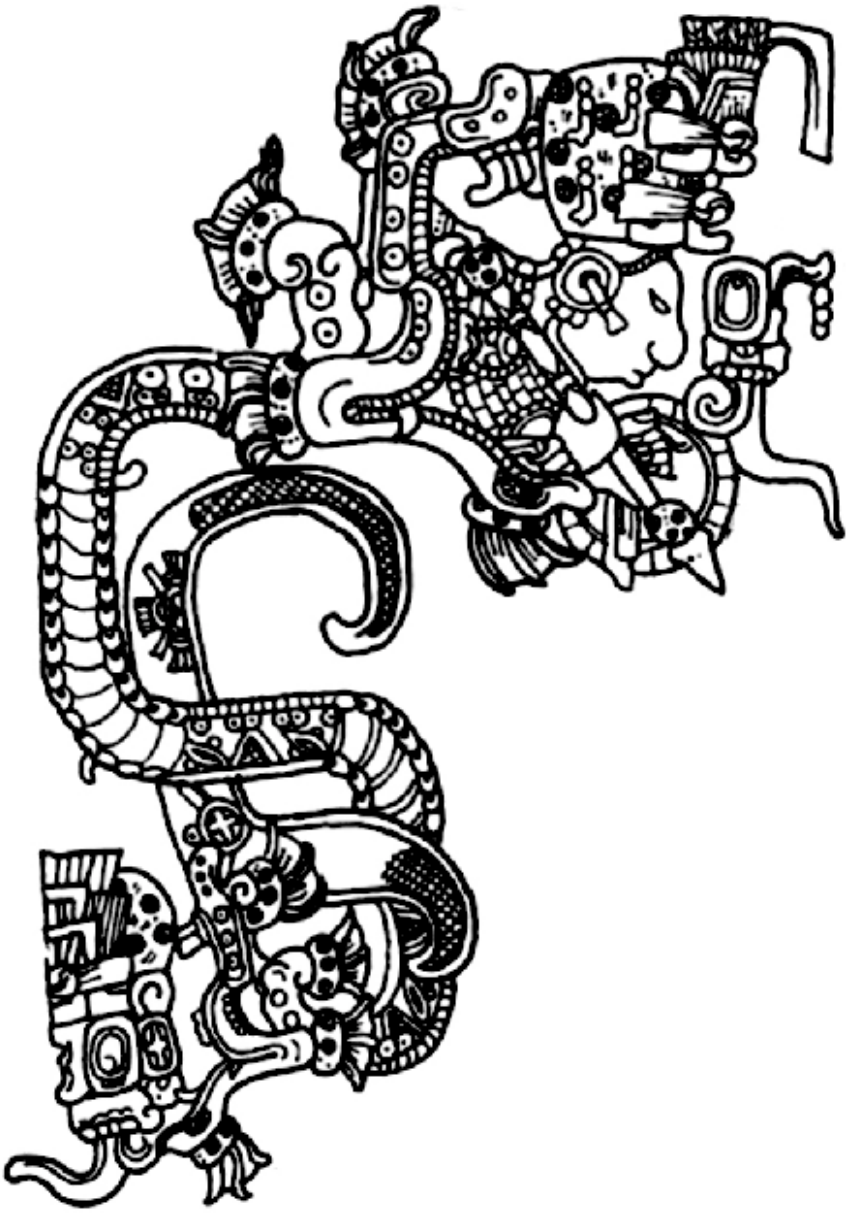


Figure 43: Vision serpent from Lintel 25, Yaxchillan (from Schele drawing collection #3542, FAMSI.org)

All this is suggestive of the possibility that whatever conjuring rituals were being performed with mirrors were an expansion of a larger religious tradition that has been referred to herein as the *reflective surface complex*. This ethnohistorically documented use of bowls of water indicates that to Pre-Columbian Maya, the *reflective surface complex* may also have been a part of non-elite ceremonies as well.

Popol Vuh: The Quiché Maya holy book has provided an incomparable gateway into Pre-Columbian Maya thought over the years, undergoing multiple translations culminating with the now standard English version by Dennis Tedlock (1996). Although it is widely confirmed that the first part of the *Popol Vuh* is based on Post-Contact Christian influences, the text as a whole is considered by many to be "the most important single native-language text in all the New World" (Tedlock 1986: 77).

One of the most significant passages in the *Popol Vuh* describes the belief that there were inborn deficiencies of human vision, stemming from an initial alteration performed on the original human beings by the creators. The origins of Maya rulers, as "mediators between 'mere' human beings and the divine" is explained as the gods being unhappy with the first lords' divine capacities, seeking "to correct it by chipping their eyes…and thereby having their vision and understanding restricted" (Hendrickson 1989: 138):

> They were *blinded as the face of a mirror is breathed upon*. Their vision flickered. Now it was only from close up that they could see what was there with any clarity.
> And such was the loss of the means of understanding along with the means of knowing everything, by the four humans. The root was implanted (Tedlock 1996: 148, italics added).

Based on Pre-Columbian traditions of the Quiché Maya creation story, this passage directly asserts that human actions proceed according to the underlying ontological assumption that what appears as empty space was "not hollow or vacant, as we might understand them from an occidental perspective" (Houston and Taube 2000: 281). Instead, human beings were created to witness only a fraction of a monistic reality, thus manifesting a superficial dualism between what could and could not be "seen" by the naked eye. There is an additional, but more obscure, reference to mirrors in a creation myth recorded in *The Book of Chilam Balam of Chumayel* speaking of Hebones, "the only son of God." It is stated that "like a mirror he was borne astride on the shoulder of his father, on the stone of his father" where apparently "stone" means stela (Roys 1967: 109-110).

Ethnography: As Tedlock (1993: 11) states in his ethnographic study of modern Maya diviners, *Breath on the Mirror*, the visual deficiency bestowed upon the first humans rendered them totally dependent on what the gods provided: "once vigesimal beings could no longer see everything under the sky and on the earth just by turning their heads, they wandered around in darkness, in the cold before the sun first rose, somewhere in the east." Tedlock's emic reading of the *Popol Vuh* myth about the partial blinding of the original humans is informed by his experience working with modern Maya "day-counter" diviners and, in fact, he has even trained to become one of them. From the first creation of human beings, the gods ensured that there were day-counters, called "motherfathers," among the human population who "became the first human diviners of the kind called 'those who look into the middle,' reaching beyond the time and place where they were by gazing into water" (Tedlock 1993: 10). Barbara Tedlock (1982: 54;

cited in Taube 1983: 113) records a modern Quiche shaman's testimony that "a lake is like a mirror, not moving until one's day comes and then it begins to move with the lightning." It also must be noted that among the modern Huichol of Nayarit, Mexico, "circular glass mirrors are considered to be supernatural passageways, as well as being conceptually related to the sun, moon, faces, eyes, and flowers" (Miller and Taube 1993: 115).

These examples further corroborate the suggestion above that the reflective surface of water was used as a surrogate mirror for the purposes of conjuring the unseen realm that humans lost direct access to in primordial times. Indeed, in Vogt's (1969: 302) study of the Tzotzil Maya, he documents ethnographically the belief that "any opening in the form of a cave or limestone sink or waterhole constitutes a means of communication" with the Earth Lord. I have argued elsewhere (Blainey 2006a: 6) that the totality of iconographic, epigraphic, and ethnohistoric evidence indicates that the ancient Maya metaphysical worldview was simultaneously monistic and dualistic; the Maya view of the universe encompassed an interdependent whole where the seen aspects of the human Middleworld balanced with "the parallel unseen Otherworld into which the Maya kings and other shamans could pass in ecstatic states" (Schele and Freidel 1990: 66).

For the purposes of the current discussion, the intriguing point involves the use of a mirror-face fogged by breath as an analogy for hindered vision. This connection with the eye and sight harmonizes with the iconographic and epigraphic evidence above, which also supposes a connection between eyes, vision, and mirrors; heralding a strong probability that from an emic perspective, the ancient Maya can be said to have viewed a

function of mirrors as comparable to that of eyes for the human agent. So either iron-ore mirrors were used by elites as facilitators of their own vision, or the mirror itself was acting as an eye for something else that was looking out on the human world from the Otherworld. Of course there is the possibility that both the former and latter were functions of mirrors.

MIRRORS IN ANCIENT MAYA COSMOLOGY

In summation, it is necessary for this above review of iconographic, epigraphic, and literary occurrences of mirrors to be put into context relative to scholarly elaborations about the larger cosmological perspective of the ancient Maya. It may seem to some that "the obvious conclusion is that individual perceptions are largely unknowable in archaeology and this approach should be restricted to ethnographic studies in which such perceptions are accessible" (Earle and Preucel 1987: 510). On the other hand, the last two decades has seen a relentless series of credible interpretations of ancient cognition advance the notion that "particularistic approaches that equate prediction and explanation are no longer adequate to account for the diversity in the archaeological record" (Bruce Trigger, comment in Earle and Preucel 1987: 523). The following discussion attempts to encapsulate the work of various Mayanist iconographers and epigraphers over the last two decades. These scholars have made inroads into the alien outlooks of ancient Maya metaphysicians who, through images and text, conveyed their views on the nature of existence.

The evidence presented in this chapter covers all known instances of mirrors in the cultural remains of the Pre-Columbian and contact period Maya, including brief allusions to ethnographic explanations of these ancient references. The following

selection consists of a series of excerpts pertaining to interpretations of the ancient Maya cognitive framework in the broadest cosmological scale. It can be stated that the current era of Maya iconographic studies began with Schele and Miller's (1986) coalescence of art and hieroglyphs in *The Blood of Kings*:

> For the Maya, the World was a complex and awesome place, alive with sacred power. This power was part of the landscape, of the fabric of space and time, of things both living and inanimate, and of the forces of nature—storms, wind, mist, smoke, rain, earth, sky and water. Sacred beings moved between the three levels of the cosmos: The Overworld which is the heavens, the Middleworld where humans live, and the Underworld or Xibalba, the source of disease and death. The king acted as a transformer through whom, in ritual acts, the unspeakable power of the supernatural passed into the lives of mortal men and their works. The person of the king was also sacred…*supernatural power was focused in the objects manipulated by the king, which seemed to accrue sacred energy through their use in ritual* (Schele and Miller 1986: 301, italics added).

Such a concise breakdown of the ancient Maya view of the universe establishes a credible reading of the evidence, to be tested and refined over and over again, against an ever expanding iconographic and epigraphic record.

Schele led the charge towards refinement of the above statement, collaborating to produce three more major works exploring an incredibly extensive, yet suitably representative cross-section of ancient Maya art and hieroglyphic texts (Freidel et al. 1993; Schele and Freidel 1990; Schele and Mathews 1998). All three works emphasize how artistic remains indicate the ancient Maya preoccupation with the opening up of liminal portals to the Otherworld through shamanistic ritual:

> The sculptural record also shows the shamanistic nature of Maya kingship, central to the Classic conception of the cosmos, by depicting the divine ahau as a conductor of ritual…This ritual was most likely a public affirmation of his ability to open a portal to the supernatural realm (Freidel and Schele 1990: 87).

Although the term "supernatural" has its pitfalls when used to describe the ideologies of non-Western peoples, so long as the etic and emic definitions of the supernatural "are distinguished, the supernatural concept both clarifies a scientific position on a major source of religious behaviour and improves our ability to understand religious worldviews" (Lohmann 2003: 176).

Advances in the last two decades, pioneered by Schele and refined by others, have resulted in the present state of Maya studies where researchers can appeal to reliable sources on a variety of topics which claim to penetrate deep into the ancient Maya psyche. These include "How to" books for reading Maya hieroglyphs (Coe and Van Stone 2001; Montgomery 2002a), dictionaries of the ancient Maya hieroglyphic script (Montgomery 2002b), and symbology (Miller and Taube 1993), a detailed catalogue of the names and lives of ruling elites from eleven of the most prominent ancient Maya sites (Martin and Grube 2000), and increasingly sophisticated portrayals of ancient Maya phenomenological metaphysics (Houston 2000; Houston et al. 2006; Houston and Stuart 1998; Houston and Taube 2000; Meskell and Joyce 2003). At the turn of the Millennium, Mayanists' bookshelves are now augmented by the inclusion of multiple trustworthy databases that compensate for the fact that in many ways "the ancient Maya world was a world of Maya art" (Miller 1999: 8).

These developments promise to proliferate in the coming years, adding to the overall understanding of how the ancient Maya conceived of the human condition and further supplementing interpretations of the direct archaeological evidence. It is hoped that these future innovations will likewise refine the current thesis' claims and interpretations, thus providing a better reconstruction of the emic significance of the

political, economic, and ideological significance of ancient Maya iron-ore mirrors. It is the second of these perspectives that comprises the next chapter, for the archaeological and iconographic records can only gain from appeals to the disciplines of geology and economics to inform hypotheses regarding how iron-ore was procured and exchanged across the ancient landscape.

Chapter 5: The Economic Geology of Ancient Maya Iron-Ore Mirrors

INTRODUCTION

Aligned with and accompanying the crucial political and ideological factors discussed in previous chapters, the role of iron-ore mirrors and their owners within the ancient Maya economic milieu presents the researcher with a third concern. Although numerous attempts have been made to describe how the economic apparatus operated within ancient Maya politics and ideology (see Cioffi-Revilla and Landman 1999; Fash 1994; Haviland 1966; Marcus 2003a; Rathje 1971; Willey 1980), there is still ambiguity about the nature of socioeconomic hierarchy and interaction between individual polities as segmentary, centralized, or dynamic (Chase and Chase 1996; Fox and Cook 1996; Marcus 1998; Martin and Grube 1995). Indeed, "there is distressingly little that is securely known about the relationship of Maya sociopolitical organization to economic production," since the nature of archaeological data makes it difficult to infer the processes involved in the control and movement of materials prior to final deposition (Rice 1987: 76-77). The current thesis seeks neither to critique, nor review, past treatises on ancient Maya social organization. This chapter is intended as an account of the economics of iron-ore mirrors. I seek to locate iron-ore mirrors and the source deposits of the raw materials required for their manufacture within the broader context of their possession and use by ancient Maya nobility:

> Economic exchange creates value. Value is embodied in commodities that are exchanged. Focusing on the things that are exchanged, rather than simply on the forms or functions of exchange, makes it possible to argue that what creates the link between exchange and value is *politics*, construed broadly (Appadurai 1986: 3).

The following discussion will expound on the socioeconomic and political ramifications of raw iron-ore and the shiny "mirrors" that are assembled from it.

IRON-ORE IN THE MAYA SUBAREA

The Geology of Iron-Ore

In order to approach the issues surrounding iron-ore mirror production, it is necessary to gain an understanding of the geographical, geological and geomorphological composition of the land that makes up the Maya subarea. As mentioned earlier, there is evidence of long-range trade of iron-ore mirrors between the Valley of Oaxaca and the Olmec region (Flannery 1968; Pires-Ferreira 1975), and certainly trade and cultural relations between Teotihuacan and Late Preclassic/Early Classic Maya sites such as Kaminaljuyu, Altun Ha, and Tikal (Braswell 2003d; Coe 1972; Miller 1983; Sanders and Michels 1977; Schele and Freidel 1990: 159; Spence 1984: 106). Furthermore, evidence for interaction between the Olmec and the Preclassic Maya also portends further influences from beyond the Maya realm (Andrews 1986; Healy and Awe 2001). The precise sourcing of particular compositional strains of iron-ore is beyond the scope of this study. Nevertheless, such research presents intriguing possibilities for future research. The current study demands brevity regarding iron-ore exchange networks that extend outside the Maya subarea. Suffice it to say that the economics of iron-ore mirrors analyzed herein recognizes the potential contribution of foreign trade networks to the corpus of mirrors in the Maya subarea.

Mirrors were constructed in Mesoamerica exploiting a range of iron-ores, including pure and mixed varieties of pyrite, hematite, magnetite, and ilmenite (Carlson 1981: 120; Heizer and Gullberg 1981: 114) and sometimes knapped and polished

obsidian (Reents-Budet 1994: 322). Maya forms of iron-ore mirrors were created by adhering fitted pieces of iron-ore, polished on one side, to a stone, wood, or ceramic backing. In the majority of archaeological site reports documenting the excavation of iron-ore mirrors, it is not apparent whether the designated iron-ore was tested scientifically in any way, or whether the researchers simply identified them based on experience. The exact identification of the iron-ore mineral is often fruitless anyway, since it is common for the deposits to occur with two or more ores mixed together (Ixer 1990). It appears from the analysis thus far that the molecular structure of the mineral was irrelevant to the ancient Maya for whom the capacity of providing a reflective surface was the most important property. The *reflective surface complex* of ancient Maya ideology, so vital for the manipulation of light and as a physical rendering of the sacred liminal portal, relies on the physical properties ingrained within a normally hidden world, too small to see with the naked eye. This atomic realm is revealed to us today by modern scientific techniques that help to classify minerals for comparison (see Appendix C).

Minerals have traditionally been identified in geological science using the *Mohs scale*, a reference tool developed by Friedrich Mohs purportedly as a test for the relative hardness of a specimen using "scratch resistance" (Mohs 1825). Since its inception over 175 years ago, the Mohs scale has given way to countless improvements (see Chandler 1999) and modern "nanoindentation techniques." However, its usefulness as a relative measurement for a mineral's scratch resistance has remained (Broz et al. 2006). The minerals used in ancient Maya iron-ore mirrors, reviewed individually below, all have a Mohs hardness number of between 5.5 and 6.5, "about the same as glass" (Woodbury 1965: 172). Since there are ten common minerals on the scale, each with a number

indicating its relative scratch resistance (Talc = 1 and Diamond = 10), the iron-ores fall in the middle range, corresponding roughly with Mohs' designation of the mineral Orthoclase as #6 (Hurlbut and Sharp 1998: 67). Two types of iron ores have been identified in archaeological reports (usually by archaeologists, not geologists) as the materials composing the reflective surface of Maya mirrors. In 2007, "analysis was undertaken of two specimens of shiny surface material from mirrors in elite burials at Pacbitun. Analysis was conducted using X-ray Diffraction (XRD). These tests indicated, definitively, that one specimen was pyrite, and the other was hematite. The analysis was conducted by SGS-Lakefield Mineral Services (Appendix C)" (Paul Healy, personal communication, 2007).

Pyrite (FeS2): More popularly known as "fool's gold," iron disulphide is "the most common, as well as the most striking, sulphide mineral" (Hurlbut and Sharp 1998: 163). Pyrite is identified by its "light brass-yellow colour together with a brilliant, metallic lustre" and is difficult to distinguish from its chemical twin, *marcasite*, whose "slightly paler yellow" appearance prompts its alias as "white iron-pyrite" (Miller 1906: 65-66). Pyrite "is such a common mineral that its presence is almost universal in veins carrying metallic sulfides" occurring in a variety of geometric crystal shapes, including cubes, pyritohedrons, and octahedrons "the faces of which usually show fine lines or striations parallel to one pair of edges only" (Hurlbut and Sharp 1998: 164-165, Figure 7-27—7-32). Its natural occurrence is described as deposits of "spheroid nodules two inches or thereabouts in diameter" (Mason 1927: 203).

Pertinent to the current study, it must be noted that although pyrite was "the favoured material for stone mirrors" of the ancient Maya, it is known that:

> …unlike the ores used for the concave Olmec mirrors, iron pyrite is not a stable mineral and quickly oxidizes. For this reason, the surfaces of ancient pyrite mirrors tend to be poorly preserved, and now often appear no more than a reddish or yellow colouration upon the slate backing (Miller and Taube 1993: 114).

It is true that the mirrors found archaeologically are usually in this decayed state, indicating that the material was probably pyrite, but some preserved mosaic pieces still affixed to whole mirrors from Kaminaljuyu, Zaculeu, Nebaj, Pacbitun, Baking Pot, and Lamanai demonstrate that pyrite was used and can be identified under exceptional conditions of preservation. However, these well-preserved specimens might merely be the result of exceptional preservation conditions. In essence, without chemical analysis, it is difficult to identify the precise geological composition of remaining iron-ore mosaic pieces simply according to whether they are decomposed or not since pyrite polygons:

> …some cut from thin sheets of crystalline masses, and some cut from thin sheets of matrix overlaid by a layer of pyrite crystals. When mosaic of the latter type decomposes, as all pyrite does quite rapidly, the polygons of matrix remain with a layer of soft yellow powder in the place of the crystalline pyrite. When mosaic polygons without matrix decompose they leave only the underlying adhesive. The rotted and incomplete state of most plaques is due to the fact that iron pyrite produces sulphuric acid when moisture is present. It is only an occasional chance combination of circumstances that has preserved any of these plaques from destruction by chemical action and earth pressure (Woodbury and Trik 1953: 236).

So although there is a tendency to label specimens as specifically pyrite, the examples of preserved polygons may indicate a mixture of iron-ores mentioned earlier (Ixer 1990). Essentially, and particularly with regards to mirror documented in older publications, "correct material identification is undetermined" (Taschek 1994: 96).

Hematite (Fe_2O_3): With a name derived from the Greek for "blood," this mineral is found in rhombohedral crystals, and represents the most common source of the world's iron and steel. It is also frequently the basis of ochre pigments employed in the creation

of red paint (Hurlbut and Sharp 1998: 177-178). Hematite occurs with two distinctive appearances where "at times it is compact and possesses a black or grayish black colour and brilliant metallic lustre" while "much of the hematite worked as an ore is, however, loose and earthy in form and red in color" (Miller 1906: 78).

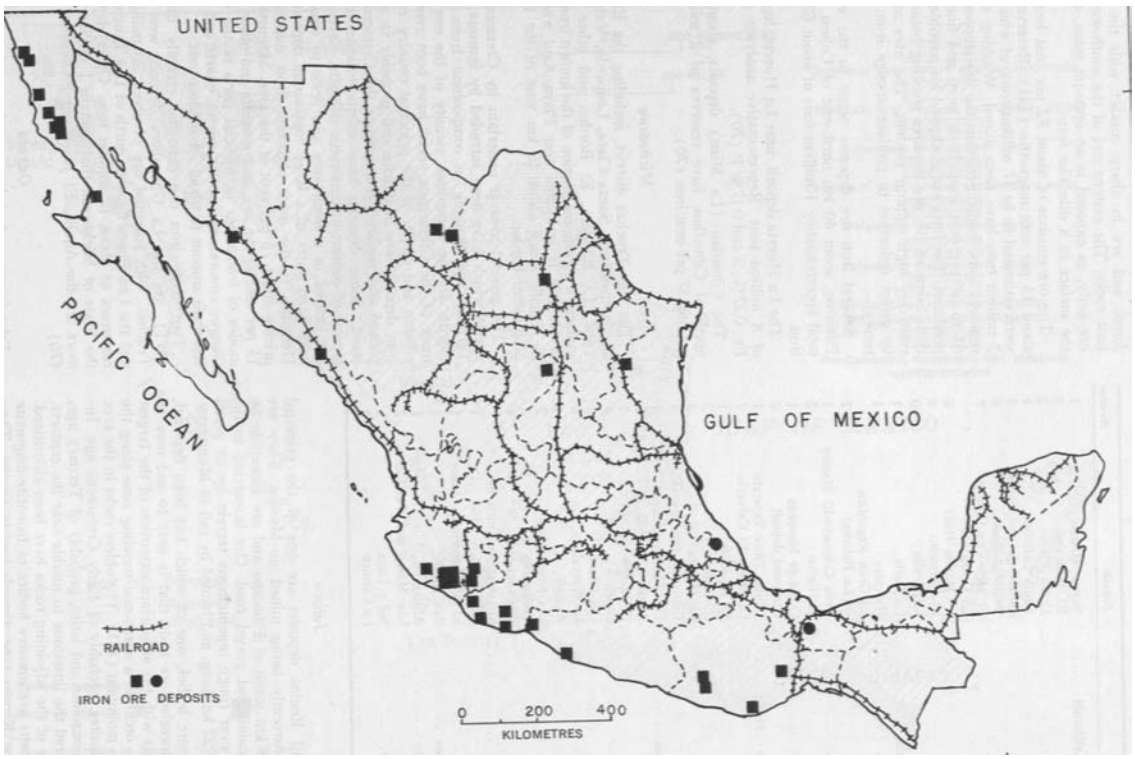
Possible Iron-Ore Source Deposits Exploited for Mirror Manufacture

Since geologists rarely if ever have archaeological considerations in mind when they design and execute regional surveys of mineral deposits, the precise and complete databases of the locations and size of iron-ore sources in Mesoamerica that would ideally inform the current thesis are not as extensive as one might hope. Much of the data that is available lacks exactitude in that the few references that do allude to iron-ore deposits in the Maya subarea ambiguously refer to general regions where unidentified varieties of these minerals occur (Figure 44). For instance, Adams (1999: 218) mentions in passing that "pyrites were imports" to Rio Azul "probably from the Guatemalan highlands where they occur in mines in northern Quiché in the Cotzal Valley." Nevertheless, the following discussion presents an overview of what is currently known about iron-ore source deposits available for ancient Maya consumption.

This appraisal is intended as a promotion for the tackling of questions that will ensue pertaining to the possible economic functions of iron ore within ancient Maya society. Such questions include: Was the control of iron-ore source deposits as politically important as was that of sources of other materials such as jade and obsidian? Does the spatiotemporal distribution of ancient Maya settlement reflect any obvious desire to be near sources of iron-ore? What does the availability of iron-ore portend about its emic

value compared to other exotic resources? What can the physical properties of iron-ores divulge regarding how it might have been perceived within ancient Maya ideological and

(a)



(b)

Figure 44:

(a) detail of map in Weyl (1980: 299, Figure 183), iron-ore source deposits southern Mesoamerican, focussing on Guatemala and Honduras

(b) detail of map in United Nations (1970: 446, Map 13) "showing major iron ore deposits" in Mexico

cosmological worldview? What is knowable about the process of manufacturing iron-ore mirrors? From where was the slate for mirror backs procured? How do the answers to the above questions coalesce with the larger focus of the current thesis as a whole? These queries and their derivatives will be addressed below in an attempt to formulate the first, albeit nascent, examination of iron-ore deposits possibly exploited by the ancient Maya for the manufacture of reflective mosaic mirrors.

Geologists designate the Maya subarea as "Northern Central America," incorporating the geology of Belize, Guatemala, Honduras, El Salvador, Northern Nicaragua, and the southeastern sections of Mexico stretching west to the Isthmus of Tehuantepec. This regional classification follows from geological rationale where "because its structure consists of a Paleozoic crystalline basement and a superjacent continental to epicontinental series of strata, northern Central America was contrasted with the younger southern Central America which did not come into existence until the Cretaceous" (Weyl 1980: 22). In the interest of forming a comprehensive picture of iron-ore sources possibly utilized by the ancient Maya, the iron-ore outcroppings of the northern Central America region seem the most obvious source. However, the regional partition established by geologists does not have to constrain the archaeological pursuits because by the time the ancient Maya inhabited these lands, most iron-ore deposits in southern Central America (Southern Nicaragua, Costa Rica, and Panama) had long-since become terrestrially accessible. Considering the evidence for Maya mirrors moving as far as Costa Rica, the regions immediately west and southeast of the Maya subarea must also be considered.

Guatemalan Massive deposit: Like the residual iron-ore deposit discussed below, this known source, located just west of the Honduran border in the Guatemalan Departamento Chiquimula and listed as under 100 million tons, is classified as "potential," as opposed to "known" reserves, denoting:

> Ore masses which, to be exploitable, demand more favourable technological, economic, or local conditions than those existing. The term 'potential ores' should refer only to mineral masses in entire districts, regions and even countries, or to ore bodies whose tonnages have been estimated on the basis of broad statistical and geological generalization, or to the more thoroughly investigated deposits of low grade or poor location. Estimates are based on broad economic trends and possible changes in transportation and technology (United Nations glossary 1970: 478).

The characterization of this deposit as "massive" is based on the fact that is occurs as a large bulk of "veins" that can be extracted directly (Gross 1970: 25-27; Klemic 1970: 447-449). The deposit's location in Chiquimula means that it was immediately accessible to the ancient Maya sites of Copan, Quirigua, Guaytan, Ixtepeque, El Portón, El Chayal, and Kaminaljuyu (Sharer 1994: 21).

Guatemalan Residual deposit: Listed as "residual," this source of iron-ore occurs where significant erosion of the original deposit has taken place (Gross 1970: 27-29), leaving under 100 tons of material. It is located near the border between the Guatemalan states of Izabal and Zacapa (Klemic 1970: 448-449) which makes it accessible to the same sites as the Guatemalan "massive" deposit, but perhaps additionally the ancient Maya centres at Nito, Sakajut, and Chamá.

Chixoy Polochic Fault Zone: Outcroppings called "peridotite/serpentinite massifs" occur sporadically along this fault line that runs east-west across the centre of Guatemala, where numerous ancient Maya settlements are located, including Nebaj, where the largest collection of excavated iron-ore mirrors occurs. Alongside the

dominant proportions of chromite and nickel deposits situated in the region around the fault are significant deposits of hematite (Weyl 1980: 75, 85, 306).

El Quetzal mine: In this antimonite mine in Departamento Copán, a state in western Honduras where the archaeological site of Copan is located, significant clusters of pyrite have been found (Weyl 1980: 303).

Mochito mine: This mixed iron-ore mine is situated just west of Lake Yojoa in Departamento Santa Bárbara, the Honduran state just northeast of Departamento Copán and just southeast of the Guatemalan Departamento Izabal, where the ancient Maya site of Quirigua is located. Considering its proximity to the eastern Maya polities, this mine's pyrite beds could have been easily exploited (Weyl 1980: 303).

Agalteca: This "contact-metasomatic iron ore deposit" is named after the adjacent modern village on the northern rise of the Honduran Montes de Comayagua, in Departamento Francisco Morazán, where the modern capital of Tegucigalpa is located. The scattered deposits, located to the southeast of the Maya frontier, are said to consist "of a large number of irregular-shaped ore bodies of magnetite which has locally been transformed into hematite" (Weyl 1980: 303-304). Pyrite is documented as "a minor constituent of the ore" (Klemic 1970: 447).

El Salvadorian deposits: The United Nations' Department of Economic and Social Affairs report (Klemic 1970: 449) states that "there are no data on the potential iron ore resources of El Salvador." It must be noted, however, that later accounts refer to sporadic occurrences where "gold and silver are bound to pyrite and chalcopyrite on quartz veins in the Tertiary volcanic rocks." In particular, pyrite has been documented at the San Sebastian mine (Weyl 1980: 317).

Northern Nicaraguan deposits: Iron-ore sources in the northern Central America section of Nicaragua are plentiful but were most likely forbidden territory for ancient Maya miners. This does not leave out the possibility, however, that Maya polities carried out mercantile exchange with the foreigners to the east just as they traded with the Teotihuacanos to the west (recall the Maya mirror-backs found in Costa Rica mentioned in Chapter 3). Deposits yielding iron-ore include Monte Carmelo (magnetite and hematite), La Luz (magnetite, hematite, and pyrite), and Bonanza (pyrite), the latter two designated as "gold deposits" (Weyl 1980: 305). The Monte Carmelo deposit, listed as a "massive reserve," is the most well known and occurs:

> …in fourteen places on low hills 200 to 300 m high…Analysis of samples from several of the deposits showed 54 to 67 per cent iron. Iron-rich quartzite contains 27 per cent iron. Fourteen ore bodies ranging in size from 10,000 tons to 2.5 million tons are estimated to contain over 3 million tons of hematite ore and about 5 million tons of magnetite ore (Klemic 1970: 447).

Such a huge reserve deposit implies that Pre-Columbian peoples in the area, and quite possibly trading cultures in adjacent lands, might have been aware of this region as a source of iron-ore.

Coastal-Shore deposits: Weyl (1980: 320) states that "heavy mineral sands with concentrations of titanomagnetite are widespread on the coasts of Central America." Since titanomagnetite is a common variety of magnetite "where Ti^{4+} has substituted for some of the Fe^{3+}," (Hurlbut and Sharp 1998: 174) there is an excellent possibility that these coastal sand deposits were exploited for the collection of iron-ore fragments used in ancient Maya iron-ore mirrors. Moreover, the "iron-rich black sands along the Pacific coast of Guatemala contain magnetite and titanium minerals" and are purportedly

deposited in amounts so large, that they would be economically profitable for modern purposes (Klemic 1970: 449).

Belizean and Yucatan deposits: Although the Maya Mountains in Belize have yielded tiny amounts of hematite (Weyl 1980: 88), the United Nations report states that "the iron ore potential of this country is unknown" (Klemic 1970: 449). This lack of information is probably due to the fact that the Yucatan Peninsula is largely a karst "limestone shelf" (Evans 2004: 394) and therefore, lacks the more pronounced geological formations that are found further south. Accordingly, the Mexican states that make up the western and northern boundaries of the Maya realm (Yucatan, Quintana Roo, Campeche, Tabasco, and Chiapas) are likewise devoid of iron-ore deposits (Klemic 1970).

Musings on sources of iron-ore in this region began with Thompson (1939: 178), who asserted that deposits of pyrite "exist in the Cockscomb Mountains;" an alternative name for what are now more commonly known as the Maya Mountains. Pyrite has been documented in the Maya Mountains where it occurs alongside slate deposits:

> While slate debitage, and occasional fragmented slate objects, are found in both refuse and structural fill, the majority of finished slate artifacts are associated with the Maya elite and found predominately in royal funerary contexts. The most widespread are flat backings for ornate mosaic plaques (sometimes called 'mirrors'). Usually circular, and sometimes quadrangular, these were encrusted with cut and highly polished pyrite polygons; mosaics of jade and shell (or combinations of all of these materials are known). Iron pyrites frequently occur with slates in a natural state, and the association in composite artifacts may be based on this geological linkage (Healy et al. 1995: 340).

Furthermore, at the southern limits of the Maya Mountains, Hammond (1975) speculates on the source of hematite used in the manufacture of mirrors found in the Toledo District of Belize:

> The source of the hematite is not known, but small nodules are present in the Toledo limestone and the earlier plaques could have been made from this. None of the nodules seen in the 1970 geological survey was large enough to produce the later large plaques (Hammond 1975: 357).

Moreover, Mason (1927: 206) noted early on the fact that pyrite "is most frequently found crystallized on schistose or slaty stone." This acknowledgment of the geological association of iron-ores with slate and limestone implies that the Maya Mountains are a possible source zone for slate and pyrite/hematite used by sites of the Central Lowlands.

Mexican deposits outside the Maya Subarea: If ancient Maya trade with Teotihuacan was on as large a scale as suggested, then Teotihuacan's easy access to lucrative iron-ore deposits throughout central and western Mexico indicates yet another possible source of the iron-ore used in ancient Maya mosaic mirrors. Significant iron-ore deposits are located in Baja California, Chihuahua, Coahuila, Durango, Guerrero, Jalisco, Michoacan, Oaxaca, Sinaloa, Sonora, Tamaulipas, Veracruz, and Zacatecas (Klemic 1970: 441-447), all of which, except perhaps Baja, were loosely involved in the Teotihuacan sphere of influence (Evans 2004: 280-290).

Implications of Iron-Ore Deposit Locations for Ancient Maya Mining

It is unfortunate that this archaeological inquiry regarding the location of iron-ore deposits must rely so heavily on geological reports. These reports are narrowly concerned with deposits that are economically viable today for large-scale extraction by modern mining corporations. Ancient Maya miners lacked the multimillion dollar machines that are employed in modern mining techniques and, therefore, must have had a much lower standard for what constitutes a profitable iron-ore deposit. Consequently, if smaller outcroppings of iron-ore that are too small to be appreciated by modern economies are strewn throughout the countryside, such as along the Chixoy Polochic

Fault Zone or Maya Mountains discussed above, then these hypothetical micro-deposits must also be considered as possible sources of iron-ore exploited by the ancient Maya.

The ancient Maya probably utilized raw materials readily available within their own regional boundaries. It is less clear whether particular Maya polities regulated access to preferred sources, as surmised for Kaminaljuyu's "direct control of one of the most important obsidian quarries in the highlands, at El Chayal (20 km to the northeast)" (Sharer 1994: 95; see Coe and Flannery 1968). This designation of Kaminaljuyu's control over El Chayal is disputed, however, by alternative chronological evidence (Michels 1975; Sheets 1975). Such control seems unlikely given the desirability of obsidian for its utilitarian sharpness, compared to the purely aesthetic qualities of polished iron-ore commandeered by elites for its reflective qualities. The notion of political sanctions placed on iron-ore source deposits by individual polities can never be ruled out. Nevertheless, even if this was the case, polities denied access to iron-ore sources would be free to trade with foreign peoples to the east and west.

Although the nature of ancient Maya relations with cultures to the south and east, in the scantily researched region of Lower Central America, remains hazy (Paul Healy and Carrie Dennett, personal communication, 2006), the archaeology of the regions to the north and west of the Maya subarea provides ample documentation of cross-cultural interaction. With regard to iron-ore exchange, a traditional trade-network involving iron-ore was implicated in surveys conducted in the 1960s and 1970s, which found that:

> ...during the latter part of the Early Formative period, magnetite mirrors produced at San José Mogote in the Valley of Oaxaca were made from ore obtained at several different local sources, and that mirrors or ore lumps from these sources were exchanged at least as far as the Valley of Nochixtlán, the Valley of Morelos, and southern Veracruz. The Oaxacan mirror industry seems to have disappeared around 800 B.C., and was

> followed by the development of localized Gulf Coast concave mirror production which utilized primarily ilmenite and hematite ores. We have tentatively identified the Cerro Prieto, Niltepec hematite source as the raw material for two La Venta mirrors and have shown that two others (as well as a third from Las Choapas, Veracruz) were made of ore from a single, as yet unidentified, ilmenite source (Pires-Ferreira 1975: 65).

This capacity to source particular iron-ore specimens, using a geological technique called Mössbauer spectral analysis (Pires-Ferreira 1975: 37; Pires-Ferreira and Evans 1978), would be ideal for future surveys of iron-ore mirrors from the Maya subarea. This spectral analysis is unfortunately beyond the scope of the present thesis, but would go a long way in responding to the interpretive problems cited by Kidder et al. (1946: 132) regarding the Maya iron-ore mirror "industry:" "When more data are at hand it may be possible to locate the region of its origin, to trace its spread, and to determine whether there were few or many centers of manufacture." Instead, the current discussion is concerned with the emic perception of these objects within ancient Maya economics. Thus, a treatment of the manual processes presumably involved in the manufacture of ancient Maya mosaic mirrors is in order.

Inferences on Manufacturing Techniques

Prior to expounding on the evidence for the economic significance of iron-ore mirrors within the structure of ancient Maya trade networks, it is necessary to understand how iron-ore was manipulated to produce these objects of elite status. Although the most thorough analysis of the manufacturing processes involved in the chiselling and polishing of iron-ore have been restricted to specimens from the Olmec area, there is no doubt that the same artistic dexterity was required to achieve the intended results. The mosaic composite faces of Maya specimens are undoubtedly more intricate than those of the Olmec fashioned from a single mass of mineral, so plausible conjecture suggests that they

denote advancement in craftsmanship. Accordingly, it would seem that the "virtuosity represented by the grinding and finishing" of Olmec mirrors (Heizer and Gullberg 1981: 115) would apply even more to the mirrors from the Maya subarea. Described as "masterpieces of the stoneworker's craft…on the few undecayed plaques found the pieces of pyrite are so perfectly shaped and fitted that the joints are almost invisible, a result of long and careful grinding of each bit of pyrite" (Woodbury 1965: 172; Figure 45).

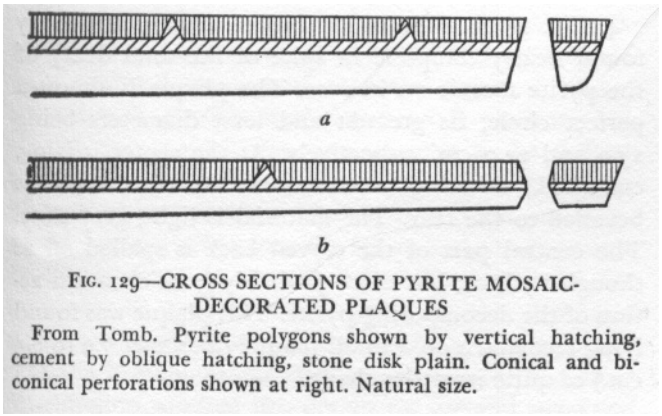


FIG. 129—CROSS SECTIONS OF PYRITE MOSAIC-DECORATED PLAQUES
From Tomb. Pyrite polygons shown by vertical hatching, cement by oblique hatching, stone disk plain. Conical and bi-conical perforations shown at right. Natural size.

Figure 45: Side view of bevelled edges and fitted polygons (Woodbury and Trik 1953: 233, Figure 129)

The method of sectioning off fragments to be fitted into the mosaic must have been considerably more demanding than the "Olmec Mirror Lapidary Technique" demonstrated in experimental archaeology research conducted by John Carlson (1981: 122-123). The remarkably well-preserved specimens from Nebaj provide a unique glimpse at the skilled placement of the mosaic because the corpus at this site yields totally intact mosaics as well as disintegrated specimens where "former arrangement [is] indicated by marks in adhesive that rose between their bevelled edges" (Smith and Kidder 1951: Figures 64-67). Smith and Kidder (1951), elaborating on previous suppositions that the iron-ore polygons were "sawn or split in half" (Mason 1927: 203), describe the possible manufacturing implications of the mirrors they unearthed:

> These objects were marvels of painstaking craftsmanship. Much time must have been required to produce their remarkably even-surfaced stone backings, in most cases so almost perfectly circular as to suggest the use of some compass-like device. But this was as nothing compared to the work of cutting and grinding to exactly equal thickness, and of bevelling for accurate edge-to-edge fit, the many polygonal plates of refractory pyrite crystals with which the face of each was incrusted. One hesitates to guess at the amount of labour that went into the making of even one such plaque (Smith and Kidder 1951: 44).

These commonsense suppositions are consistent with the assessment of mirrors excavated at Kaminaljuyu:

> Pyrite, with a hardness of 6.5 and with no natural cleavage planes to facilitate subdivision of the crystals, could not have been other than most difficult to work. Yet every plaque was mounted with dozens or scores of plates cut to precisely the same thickness and shaped to fit exactly. The polygons seldom had less that four and some possessed as many as nine sides, each so bevelled that only the very edge came into contact with that of its neighbour. Nothing produced in aboriginal America seems to us to rival these plaques in the matter of skilled and meticulous craftsmanship…It is to be supposed that they were turned out by members of guilds like those of the jade-, feather-, and gold workers which existed among the Aztec (Kidder et al. 1946: 131).

Woodbury and Trik (1953: 232) echo these thoughts, presuming that "it required enormous skill and patience to shape and fit the many small pieces that decorate each disk." In addition, Ekholm (1973: 134) describes his personal experiences working with these matierals, gained by experimention:

> …that of attempting to make one of these mosaic mirrors. I have been unsuccessful so far in making a complete mirror, mainly because I have not been able to duplicate the fine polish one sees on well-preseverved ancient examples. Even working with modern lapidary tools, however, I have obtained rather full appreciation of the skills and care required to make such mirrors.

Thus, it is established that iron-ore mirrors exhibit the harnessing of expert human labour, probably that of royal artisans (*its'at*). It is from this perspective that they must be

situated within the larger trade economy, both within the Maya subarea and in dealings with foreign peoples.

MIRRORS AND THE ANCIENT MAYA TRADE ECONOMY

Comprehensive understanding of the framework of ancient economies is a fundamental pursuit in all archaeological surveys. The literature concerning ancient Maya trade, including such considerations as production, consumption, and distribution of a plethora of goods, exceeds the mandates of the current thesis, but nevertheless provides a background into which the lesser known economic role of iron-ore mirrors can be incorporated. It is already well established that the ancient Maya engaged in the organized long-distance trade of sporadically available commodities such as salt (Andrews 1980, 1983; McKillop 2002), ceramics (Fry 1979, 1980, 1989; Fry and Cox 1974; Rands 1967; Simons and Brem 1979), cacao (Hammond 1978; Pyburn 1989: 340), slate (Healy et al. 1995), and stone tools (Aoyama 1999; Ford and Olson 1989; Gibson 1989; McAnany 1989; Mitchum 1991; Shafer and Hester 1991).

In particular, the exchange of obsidian has been well documented (Dreiss 1989; Dreiss and Brown 1989; Fowler et al. 1989; Hammond 1972, 1976; Healy et al. 1984; Hurtado de Mendoza 1978; Jackson and Love 1991; Johnson 1976; McKillop 1989a; Moholy-Nagy and Nelson 1990; Rice 1984; Sheets 1975; Sidrys et al. 1976) because of the exactitude with which specimens can be sourced to specific deposits through x-ray fluorescence (XRF) and neutron activation analysis (NAA) (Healy et al. 1996: 18). As mentioned earlier, no such research has ever been conducted for the Maya regarding the source deposits and distribution of iron-ore artifacts such as mirrors, so the current study must rely largely on guesswork. In inferring the arrangement of hypothetical iron-ore

exchange among the ancient Maya, it is essential that subsequent interpretations be framed within what is known about the trade networks in general.

Ancient Maya Economics and Trade

The need to conserve space constrains the degree to which the current thesis can assess the nuances of ancient Maya economics and trade. Therefore, a generalized overview of the basic nature of exchange networks within which iron-ore mirrors were enmeshed will have to suffice, while supplementary economic references will appear in the ensuing discussion pertaining to iron-ore mirrors specifically. It must be stated at the outset, however, that "our understanding of Maya economics in general, including the highly significant topic of long-distance trade, is frustratingly poor" (Martin and Grube 2000: 21).

In essence, the cultural and political transformations that mark shifts between chronological eras parallel shifts in the prevailing trade routes utilized in the movement of goods across the Maya subarea:

> The primary long-distance routes in Mesoamerica ran east-west, to the major consuming power centres in Mexico from the major source regions in the Maya subarea, *and beyond*. Specifically, the earliest routes, associated with the Middle Preclassic regional powers, appear to have been primarily land-based, radiating from the Gulf coast, Oaxaca, the Mexican highlands, the Maya highlands, and along the Pacific coastal plain, to tap resources within Mesoamerica *and beyond in Central America*. The Classic routes may have extended more directly eastward through the Maya lowlands, using both land and river-canoe transport, again to tap resources in the Maya highlands (via the Usumacinta drainage) *and beyond (via the Caribbean) into Central America*. The old Preclassic land route across the southern coastal plain appears to have been reduced to secondary importance during this period. Beginning in the Terminal Classic the Putun Maya, operating from a number of sites, including their greatest capital at Chichen Itza, maintained a diverse network of long-distance commerce. Their network included sea trade operating larger and more efficient canoes that expanded the water routes well around the Yucatan Peninsula (Sharer 1994: 457-458, italics added).

The major themes listed above can inform a hypothetical placement of raw iron-ore and finished iron-ore mirrors within the larger system of ancient Maya commodity exchange. Along with the spatiotemporal reconstruction of trade routes, issues of organized trade hubs, political control, and the exploitation of waterways by specialized merchants present further occasions to surmise the movement of iron-ore.

A principal consideration regarding the movement of goods into, out of, and across the Maya subarea during prehistoric times is the influence of large centres on the character of that movement. A simplified understanding of the structure of trade networks extending across the Maya landscape is exhibited by *central-place* models, whereby the distribution of larger centres, with jurisdiction over the movement of goods, is regularly dispersed so that these centres' territories of influence over smaller communities rarely overlap (Bullard 1960; Evans 2004: 198-199; Everson and FitzGerald 1971; Hammond 1974). These trading centers have been termed "ports of trade" denoting "intentionally neutral locales where representatives of political entities meet for the purpose of conducting commercial transactions" (Berdan 1978: 179; see also Chapman 1957). Presumably, there were different ranks of ports of trade, possibly reflected in the size of the population, which can be categorized in various ways such as between "minor ceremonial centres" and "major ceremonial centres" (Willey and Bullard Jr. 1964: 366-368). For instance, the Guatemalan Highland site of Kaminaljuyu can be labelled as a major ceremonial centre surrounded by a multitude of satellite minor ceremonial centres. The entire Valley of Guatemala where these sites are located is designated "a highland port of trade," portraying a template for the organized movement of trade goods (Brown 1977). Another form of trade-hub are the "trans-shipment

centres" proposed by Norman Hammond (1976) as smaller ports of trade established along seacoasts in an effort to regulate the transport of goods from oceanic routes to larger sites inland (see also Guderjan 1995: 7-8; Healy et al. 1984; McKillop 1989b: 1). Regardless of one's conception of the precise workings of the arbitrative "dynamic model," which argues for temporal oscillation between centralized and segmentary states among the ancient Maya (Marcus 1998), it "now seems clear that a number of the strongest were capable of establishing dispersed and rather dynamic hegemonies" (Martin and Grube 2000: 18). Hence, Maya trade networks cannot be fully comprehended without reviewing the amount of regulatory power wielded by ruling elites over economic interactions.

The extent to which ancient Maya elites held sway over the movement of commodities within their hegemonic sphere is "poorly understood at best" (Sharer and Golden 2004: 37). The nuanced variations of segmentary and centralized models that are reconciled by the merely passable dynamic model demonstrate the "tremendous contemporary and temporal diversity within Maya culture" (Chase and Chase 1996: 804). For instance, the value of materials appears to have been subject to regional variation depending on their local availability. While jade was always prized by elites as a rare commodity that was difficult to procure, obsidian was only sporadically considered a marker of status since "the degree to which it marked social stratification was related to its local availability" (Hoopes 1985: 146). A material's identification with status marked the amount to which it was incorporated into the processes of "political economy" defined as "a societal condition principally affected by the requests and demands of an

elite – an implicit emphasis on top-down decision making with interpretive licence to assess relationships developing from the bottom up" (Scarborough et al. 2003: xiv).

Possession and public display of prestige goods was an essential tool of ancient Maya elites as indicators of their divine right to power. The most notable prestige items regarding inter-polity trade are the exquisite painted ceramic vessels that have occasionally been traced from a burial provenience to a faraway origin. Used by rulers as "social currency" bequeathed by larger centres to the subordinate sites under their control, "the more recognizable the painting style, the more socially valuable and politically efficacious is the object; that is to say it behoves both givers and receivers to manipulate vessels painted in highly distinctive and easily recognizable styles so that the object can better function as a signifier of social identifications and political bonds" (Reents-Budet 1994: 92). Although our knowledge of elite influence on economic interaction is limited, it is probably safe to assert that the movement of "luxury items" was regulated by ancient Maya royalty in an effort to uphold existing social and political hierarchies.

The movement of goods across the landscape is a predominant issue in any consideration of economic exchange and trade networks. Although land-based transport was undoubtedly employed when the need arose, movement of goods via bodies of water by canoes and rafts facilitated both the amount that could be hauled and the ease with which space could be traversed (Hammond 1981; McKillop and Healy 1989; Thompson 1949; Figure 46). Indeed, the dominant means of transport appears to have changed over time, with an abundance of trade along coastal routes in both the Preclassic and Postclassic periods, broken up by a reliance on terrestrial trade routes during the pinnacle

of interior Lowland civilization of the Classic period (McKillop 1989b; McKillop and Healy 1989). The fluctuating nature of Pre-Columbian Maya trade over time on the island of Cozumel was examined by Rathje and Sabloff (1975), recognizing the dynamic interplay between geography, demographics, and fluctuations in supply and demand.

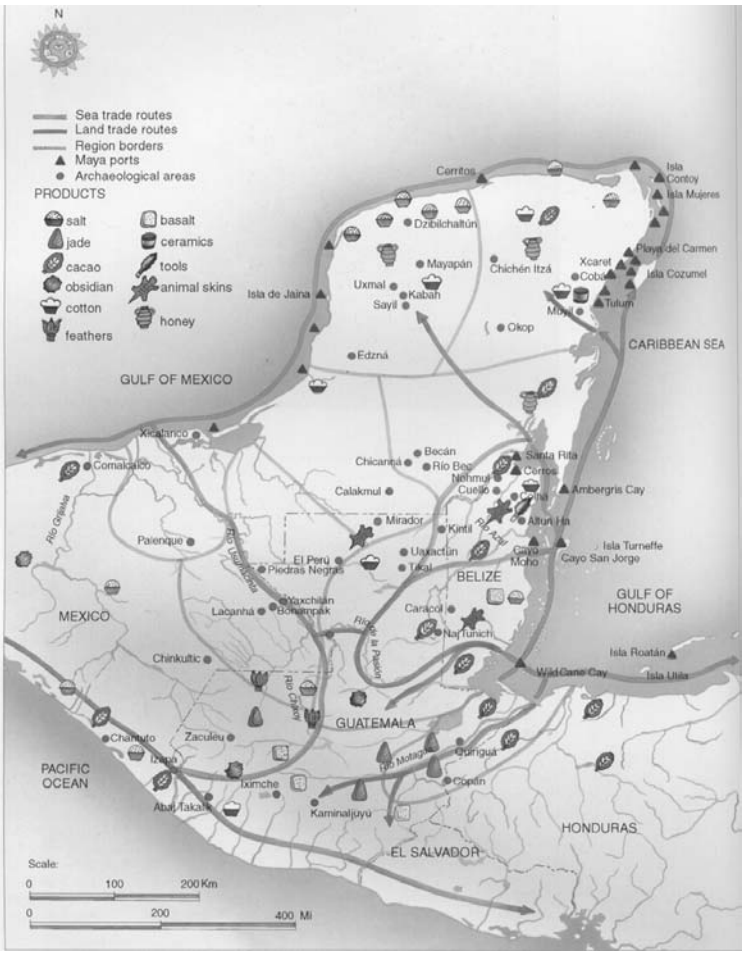


Figure 46: Proposed map for ancient Maya trade routes (González de la Mata and Andrews 1998: 458)

There is a highly convenient, albeit conjectural, theory contending that goods were distributed by a class of ancient Maya professional merchants, much like the Aztec *pochteca* (Evans 2004: 464-465); a group whose increasing effectiveness may have contributed to the Classic period collapse by watering down centralized hegemonies and the central role of religion (Chapman 1957: 134-135; Guderjan 1995; Sabloff and Rathje 1975a; 1975b). This synchronizes with the general observation that:

> The very close historical links between rulers and traders (whether of complicity or antagonism) might partly stem from both parties being claimants for the key role in the social regulation of demand. The politics of demand frequently lies at the root of the tension between merchants and political elites; whereas merchants tend to be the social representatives of unfettered equivalence, new commodities and strange tastes, political elites tend to be the custodians of restricted exchange, fixed commodity systems, and established tastes and sumptuary customs (Appadurai 1986: 33).

It is impossible to attribute the exchange of commodities to a specific method of transport, but "we have come to realize that we must view Maya civilization in its entirety; inland sites were inextricably linked to coastal sites through trade, religion, art, ideology…and vice versa" (Healy 1989: 163). While land transport by foot was certainly utilized, the hypothetical repercussions of materials being rapidly moved by canoes bearing merchant sailors along rivers and/or seacoasts infer a relatively straightforward rationale for the extensiveness of the ancient Maya economy.

The Place of Iron-Ore and Finished Mirrors within the Trade Economy

In imagining the most plausible economic rendering of the subject of this thesis, it is important to distinguish between the potential movement of raw iron-ore and that of complete mirrors resulting from copious person-hours. While unprocessed pieces of iron-ore presumably required little effort in extracting them from their source deposits, the finished mirrors represent rare creations of master artisans, or *its'at*, whose unique gifts were combined with years of training and practice. Therefore, considering the dearth of information regarding the sources of particular iron-ore artifacts, the nature of the movement of raw iron-ore is most suitably linked to that of raw obsidian, while the exchange of finished mirrors is most appropriately associated with that of painted polychrome vessels. Considering what is known about the value and movement of other commodities, it is implied that the social importance of raw iron-ore was relative to a

site's proximity to source deposits while finished mirrors were always items signifying prestige.

Although obsidian and iron-ore are discrete geological materials with different physical properties and dissimilar utilitarian functions, there are a number of reasons that obsidian acts as a fitting correlate for iron-ore in speculating on the latter's stance as a trade good. For instance, obsidian is a volcanic glass that "served as a substitute for 'steel' because of its superb fracturing qualities and extremely sharp cutting edges" (Healy et al. 1996: 15). While these qualities contrast greatly with the awkward brittleness of raw iron-ore, I would argue that both obsidian and polished iron-ore have a characteristic sheen that ties the two materials together when considering how the ancient Maya conceived of the *reflective surface complex* discussed in earlier chapters. This emic view is bolstered by an iconographic instance of the T617 "reflective surface" glyph on the blade of an obsidian bloodletting lancet depicted as the "Perforator God" (Schele and Miller 1986: 176). Unlike modern geological classification, which differentiates between iron-ore and obsidian, it is much more likely that the ancient Maya fondness for materials with reflective properties resulted in a conceptual relation that perceived the two materials as different manifestations of the same ethereal entity.

Complete mosaic mirrors are comparable in labour-intensive prestige, iconographic prevalence, and contextual association with elite burials, to jade and all other items considered as symbols of royal status. In fact, mirrors are explicitly linked with the trade of other "rare and exotic items" such as gold, tumbaga (alloys of gold and copper), an alabaster bowl from Tikal, quetzal feathers, cotton, and jaguar skins. In particular, the quetzal feathers are said to be indicative of "trade in luxury goods between

Tikal and the Highlands early in the Early Classic" (Hoopes 1985: 156-157). If quetzal feathers are moving from the highlands into the lowlands, perhaps the abundant iron-ore deposits and mirror specimens discovered in the highlands denote a similar direction of exchange regarding iron-ore mirrors. This movement of goods and elite ideology might be explained by a hypothetical scenario:

> One can only suggest that there must have been an understanding throughout the southern lowlands that certain intellectuals and even artists were permitted to travel freely from court to court, as we know was the case in medieval and Renaissance Italy. One thinks also of Asia during the first millennium, with Brahman gurus and Buddhist monks traveling widely across political frontiers to bring their respective messages to courts highly receptive to new knowledge and doctrines (Coe 2001: 276).

There is a notable Oaxacan precedent that recalls the ancient Maya use of painted pottery as "social currency," where "mirrors or lumps of Oaxaca ores were traded toward the northwest, possibly as a form of exchange between elites" (Pires-Ferreira 1975: 60). This complementary Mesoamerican case of iron-ore mirrors implicated as elite trade goods buttresses the general association proposed herein between mirrors and ancient Maya royalty. It can be safely concluded that as status objects brandished by kings, mirrors represented an important economic symbol in cross-polity exchange of goods and ideas.

THE ECONOMIC GEOLOGY OF MAYA MIRRORS: FUTURE PROSPECTS

At present, it is unfortunate that the Mössbauer spectroscopy technique has yet to be applied to Maya iron-ore specimens in an effort to source them to potential deposits. A recent analysis of iron ore mirror fragments from Pacbitun using XRD shows that this test has potential as well (Appendix C). Any future developments in regard to sourcing specific specimens would supplement the already sizeable corpus of studies relating to the movement and exchange of obsidian, jade, ceramics, and other materials commonly

traded throughout the Maya subarea and beyond. Although the above discussion suggests possible parallels between the known trade routes of other commodities and the unknown transfer of iron ore, these remain awkward speculations until more objective studies can either corroborate or contradict the tentative model.

Until advanced geochemical sourcing is carried out, questions will continue to swirl around the economic character of iron-ore in the ancient Maya subarea. What was the nature of procurement and exchange of raw iron-ore? What frequency of mirrors were manufactured from locally available iron-ore? How, and for what reason, were mirrors traded intra- and inter-regionally? In many ways, these questions hinge upon some of the larger unsolved quandaries facing contemporary Maya archaeology: "'Who supplied all the labour for transport and building?', 'Who supplied the labour for long-distance movement of goods over land and over water?', 'Were there migrant agricultural labourers?", and "What was the role of slavery?'" (Sabloff 2004: 18). Even if the elites were controlling the movement of labourers and goods, the framework of the ancient Maya economy in its entirety will continue to elude researchers because of the lingering doubts about non-elite "beliefs and practices that formed reciprocal bonds with Maya kings" (Sharer and Golden 2004: 42). The difficulty with answering the questions posed above lies in the indeterminate nature of hypothetical models suggested as explanations for the archaeological record of the ancient Maya.

Elizabeth Brumfiel and Timothy K. Earle (1987) classify the different construals of the relationship between those in power and the general population of the governed region, each of which acts as a filter for the manner in which modern scholars reconstruct the degree of political influence on the ancient economy being scrutinized. The place of

iron-ore mirrors as luxury items in the ancient Maya economic milieu is dependent upon whether one ascribes to one of three different appraisals of the degree to which royal elites held sway over economic interactions. The "Commercial Development" model assumes a large variety in the division of specialized labour, envisioning a system of the movement of goods that is equally oriented to all levels of the social hierarchy and an economic network that operates apart from the choices of the political elite. The "Adaptationist" model supposes that elites interfere with the economy because they have the power over systems of exchange. The reasons behind their decision are based on their co-dependent interests of self-aggrandisement and the health of the regional economy (where the latter shapes the attitude of the people whose approval elites need to legitimate their power in the first place). The "Political" model also suggests the vital role played by political elites in making economic choices but unlike the Adaptationist model, this viewpoint holds the intentions behind those decisions to be primarily self-interested. In this third scheme, the elites manipulate the economy for the purposes of their own desires (Brumfiel and Earle 1987).

The need to locate iron-ore mirrors within the larger framework of the ancient Maya economy outstretches the capacity of the current thesis' stated goals. Nevertheless, there have been some promising developments lately in the broader discourse of Mayanist scholarship that portend a resolution of the debate. It has been argued that the lingering uncertainties about the interface between political hierarchy and the economic structure of the ancient Maya can only be resolved if the researchers work towards a "third way" integration of elite-centric and commoner focussed paradigms. In a recent exposition on the "Blind Spot" that currently exists between studies of the elite and non-

elite, Marcello Canuto and William Fash (2004) refer to the site of Copan in asserting that this gap can be closed by increasingly focusing on different notions of "community." They argue that different applications of the ecologically-inclined "paradigm of Natural Community" and the more ideational "paradigm of Constituted Community" can be tested to account for the ways in which ancient Maya people of all hierarchical status perceived their place within the larger society.

Marcus' (1998) "dynamic model" is one of the main paradigms used to describe the spatiotemporal discontinuity in the evidence relating to how the ancient Maya political structure waxed and waned over time between centralization and balcanization. The reach of individual rulers' power over their respective polities oscillated over time and varied from region to region. Iannone (2002: 68) has proposed an innovative augmentation of the dynamic model, claiming that the theoretical tenets of "Annales, or 'French Structural' history" can aid in explaining why this change over time is observed. In amending how Mayanists approach history, he divides the past into three perspectives:

> A critical assessment of the dynamic model has led to the conclusion that cycles of decentralization and centralization are promoted by ever-present tensions between long-term and medium-term organizational structures. Events are considered evidence for the short-term efforts to work out these contradictions. Hopefully, the guiding principles that have been presented herein will be of use in structuring future research and analysis, as well as in the reassessment of current data. It is only through the thorough examination of microregional, regional, and macroregional developmental sequences that the full range of long-term structures, medium-term cycles, and short-term events may be elucidated. Only after this research endeavour has been active for many years will we be in a position to fully appreciate the fluidity of ancient Maya sociopolitical interaction (Iannone 2002: 76).

The spatiotemporal fluidity of "medium-term organizational structures" clashes with the evidence for iron-ore mirrors, which appears to suggest that the desire for these luxury

items was a persistent theme of rulership from the Middle Preclassic until the Postclassic across the entire Maya subarea. It is quite possible that objects of prestige, such as mirrors, were incessantly commissioned by royalty, regardless of the sociopolitical atmosphere, in the long-term effort to maintain the legitimacy and symbols of courtly authority. Thus, even though the range of elite control over economic networks adjusted over time, the production of elite status-markers most likely remained a constant because royals always needed these items as verification of their rank.

As the discipline continues to advance towards ever better renderings of the ancient Maya political climate, it follows that the economic relationship between political elites and non-elites will likewise be clarified. A precise account of the economic functions of iron-ore mirrors within the economy is difficult to acquire, however, because of the pervasive uncertainty that still exists regarding ancient Maya political mechanisms in relation to the economy itself. All interpretations are therefore conjectural, until a general consensus can be reached concerning the degree to which economic interactions were administered by the political elites.

In essence, it can be argued that iron-ore mirrors were pre-eminent symbols of the greater *reflective surface complex* of the Maya, and desired by royal elites as validation of their status. The evidence surveyed above indicates that, no matter what degree of centralization or segmentation an individual polity was experiencing, the royal court constantly sought to possess prestige/luxury goods. Mirrors, as well as jade, marine shell, polychrome pottery, jaguar skins, quetzal feathers and various jewellery, were acquired in the concerted effort to sustain its reputation as the supreme mediator between the human world and the Otherworld.

Chapter 6: Summary and Conclusions

Previous speculations by Mayanists concerning the functions of iron-ore mirrors, based on small samples, have been largely corroborated in the course of this more comprehensive study. Although earlier interpretations of iron-ore mirrors are reasonable, they tend to overemphasize the religious role played by iron-ore mirrors in ancient Mesoamerica. This displays the lack of scholarly attention paid to these artifacts in that they have been largely dismissed solely as ambiguous "ritual" objects.

The previous chapters have sought to rectify these oversights by not only elaborating upon the ideological importance of iron-ore mirrors to the ancient Maya, but also by supplementing this fractional explanation with a detailed analysis of the political and economic implications of these mirrors. While their possible use in "divinatory scrying" is acknowledged in the literature on ancient Maya religion (Miller and Taube 1993: 114), their wider social significance to the ancient Maya has been heretofore ignored. Thus, in forwarding the hypothesis that iron-ore mirrors represent a vital aspect of a larger *reflective surface complex*, the above analysis has ventured to both refine the ideological understanding of mirrors while also locating their emic functions in ancient Maya politics and economics.

Cognitive Archaeology, Shamanism, and the Conjunctive Approach

In addressing the interpretive problems inherent in the variety of datasets relating to ancient Maya iron-ore mirrors, Chapter 2 asserted that the current study must first outline its theoretical perspectives and methodological priorities. It is contended that the nature of the research goal of offering explanations for the emic significance of mirrors within ancient Maya culture would best be achieved by implementing three distinct but

interrelated schemes. The collaborative application of the subfield of cognitive archaeology, the phenomenon of shamanism, and the revamped conjunctive approach provides an appropriate three-pronged perspective.

Cognitive Archaeology

The standard and controversial issues emerging in the only subfield of archaeology exclusively concerned with ancient cognition were reviewed and assessed. It is evident that there are divergent views concerning how Cognitive Archaeology might be employed most effectively. However, there exists a common acknowledgement that the thoughts and behaviours of prehistoric agents can be satisfactorily reconstructed, as long as there are sufficient cultural remains. It is argued that the ancient Maya, along with other complex civilizations of the past with rich archaeological collections, represent an ideal subject of study in Cognitive Archaeology, since they left modern researchers with such a large corpus of physical, artistic, and sometimes textual specimens from which to extrapolate.

The Archaeology of Shamanism

Shamanism is a religious category with a complicated past that received its best-known scholarly exposition with Eliade's (1964) work, *Shamanism: Archaic Techniques of Ecstasy*. Since then, its status as an interpretive category among archaeologists has been both heralded and admonished. Regardless of an individual's stance on the matter, it is clear that a wide variety of human cultures exhibit a penchant for altered states of consciousness and beliefs in a readily accessible spiritual Otherworld. The current thesis refers to established tenets of Maya archaeology where numerous authors are cited characterizing ancient Maya religion as shamanistic. Although shamanism for the Maya

will remain a debateable issue, it is clear that the "polished, gleaming" qualities of iron-ore mirrors, being both "dark and light at once" (Joyce 2002: 149), evoke the liminal connotations of its reflective surface. It is argued herein that these affiliations with liminality, combined with their depiction as communicative devices in iconography, advocate an emic explanation of mirrors as instruments of shamanistic divination.

The Revived Conjunctive Approach

A rejuvenation of the multidimensional aims of Taylor's (1967 [1948]) revolutionary "conjunctive approach" to archaeological practice has its origins in Maya scholarship. The various authors who have made conjunctive research a priority are referenced to demonstrate the wide appeal that conjunctive research holds for Maya scholars. Because Mayanists are faced with a complex variety of dataset types (archaeology, iconography, epigraphy, ethnohistory), it is imperative that experts in different areas communicate their findings across subdisciplinary boundaries. Particularly with regard to endeavours in Cognitive Archaeology, evidence from all evidential spheres is paramount. It is reasonable to presume that studies seeking insights into the emic nature of ancient Maya worldview benefit from multiple datasets expounding on different aspects of the archaeological record. The current thesis is intended as a demonstration of conjunctive research, employing multiple perspectives in elucidating the cultural significance of iron-ore mirrors.

Archaeological Distribution in Space and Time

Chapter 3 presented the facts and figures pertinent to iron-ore mirrors excavated in archaeological contexts. In reviewing the evidence acquired from site reports over the last century of Maya archaeology, approximately 500 mirrors are documented and

sourced to nearly all subdivisions of the Maya subarea. Only the southern region, the Pacific "Coastal Plain and Piedmont," is excluded from the present study because of the lack of specimens discovered during the accumulation of data.

There are a number of discernable trends regarding the spatiotemporal distribution of some characteristic features of ancient Maya iron-ore mirrors. These include an observed occurrence of mirrors with both males and females in elite burials, although more occur with males in the admittedly small sample of gender-identified human remains. "Round" or "circular" mirrors are the dominant shape of ancient Maya mirrors; there is a minor occurrence of square/rectangular shapes in the Late Classic Central Lowlands and the Postclassic Highlands. The overwhelming majority of ancient Maya mirror backs are carved from slate, while there are slight increases in the proportion of non-slate backings (sandstone, limestone, ceramic, wood) beginning in the Early Classic period. The material composing the reflective surface of mirrors is usually pyrite across the Highlands and Lowlands and spanning the Preclassic to the Postclassic. However, hematite mirror faces do occur in the Preclassic and Early Classic periods, and then peak in the Late Classic period, before declining in prevalence in the Postclassic period. On the contrary, the data collected demonstrates a random spatiotemporal distribution of suspension holes and edge bevelling, recommending that these recurring themes of ancient Maya mirrors are probably inconsequential to the main objectives of this thesis.

The materials associated with mirrors in archaeological contexts reviewed in Chapter 3 reveal discernable patterns. Listed in rank order from most to least common they are: painted/incised pottery; various objects of jade (earflares, carved pectorals, beads); shell objects (pendants, beads, large marine shells); red ochre or powderized

hematite; worked stone/obsidian; stingray spines; and rarely objects of copper and organic textiles. The consistency with which mirrors occur with these objects, all of which are recognized as indicative of higher social status (Coggins 1998), supplements the iconographic evidence in signifying mirrors as elite objects wielded by ancient Maya nobles in conjunction with other traditional paraphernalia.

As can be discerned from the Maya subarea maps that introduce each chronological section of Chapter 3, the spatial distribution of iron-ore mirrors follows a pattern roughly analogous to the shifting heartland of Maya civilization. Hence, with the first Preclassic period flourishing of complex stratification in the Coastal Piedmont and Highlands regions, it was the Highland ceremonial centres led by Kaminaljuyu that ultimately developed into the first Maya superpowers (Sharer 1994). The contrast between the large numbers of mirrors found in the Maya Highlands, especially at Nebaj, and the lack of mirrors cited from the Coastal Piedmont may be indicative of the respective degrees of success the elites of these regions had in manipulating symbols (such as mirrors) to authenticate their power. If Highland elites were indeed in control of iron-ore procurement and made possession of mirrors exclusive, their claim to be special mediators of the *reflective surface complex* would be validated by displaying such iridescent devices. Accordingly, the distribution of sites with mirror remains shifts during the Early Classic period from the Highlands to an even scatter across the Highlands and Lowlands. Later, distribution of mirror remains match the respective shifts in power and influence to the Southern and Central Lowlands in the Late Classic period and the gradual movement towards the Northern Lowlands in the Terminal Classic period. By the Postclassic, the development of the Northern Lowlands as the new focal

point of ancient Maya civilization is paralleled by a greater frequency of mirror specimens at archaeological sites in this area.

The connection of mirrors with the ancient Maya nobility is predicated on the frequent occurrence of mirror remains in elite burial and cache contexts located in monumental architecture of site epicentres. It is evident from the paired relationship between the spatiotemporal distribution of mirrors and the shifting of the regional concentration of ancient Maya civilization over time that there is a general correlation between these two phenomena. Consequently, this archaeological correlation offers considerable support to the notion that mirrors were items associated with the larger costume of royal paraphernalia. As an element of the royal court's special relationship with the liminal space between the human realm and the spiritual Otherworld, iron-ore mirrors can be construed as symbols of the *reflective surface complex*.

Iconography

Chapter 4 aimed to encapsulate the different forms of "indirect" evidence of iron-ore mirrors, as opposed to the analysis of "direct" evidence unearthed in archaeological investigations. The images on ancient Maya painted polychrome ceramics demonstrate iron-ore mirrors functioning as principal objects in the royal court. This classification of iron-ore mirrors as mainly elite objects accords with the interpretation garnered from their archaeological prevalence occurring in high-status burials and special/ritual caches in elite structures. As for their more precise functions within this elite context, the iconographic evidence overwhelmingly suggests that the mirrors were at times meant to be gazed into, but what this gazing indicates is a much more elusive consideration. It is argued herein that in order to decipher the ambiguity surrounding the emic purpose of

ancient Maya iron-ore mirrors, the archaeological and iconographic evidence must be cross-referenced with the ethnohistoric, epigraphic, and ethnographic incidences of the *reflective surface complex*.

Epigraphy, Ethnohistory, and Ethnography

The objects that are the subject of this thesis are not vanity mirrors like those found in modern Western culture; even though they could have been used as such, it seems they had religious and rhetorical associations with the larger ideological principles of a *reflective surface complex*. This ancient Maya *reflective surface complex* is theorized as the physical manifestation of liminal space corresponding to the concept of hierophany, "a radical ontological separation of some object from the surrounding cosmic zone…by the mere fact that *it reveals that it is sacred*" (Eliade 1964: 32). Referring to the T24/T617 hieroglyphic grapheme as an icon of the *reflective surface complex*, it may represent a mirror or any other shiny surface which the ancient Maya would have understood to be indicative of liminal thresholds. Ethnohistoric records report contact-period Maya still using mirrors as parts of costume, but it appears that bowls of water were more common as devices of divinatory scrying. This use of water bowls is reported for Pre-Columbian and ethnohistoric populations of North America, and may well have been a prevalent rite among ancient Maya non-elites. Furthermore, ethnographic accounts corroborate the beliefs espoused in the *Popol Vuh* depicting human vision as blinded to unseen forces "as the face of a mirror is breathed upon" (Tedlock 1996: 148).

Geology and Economics

The third crucial facet of this foray into the emic functions of iron-ore mirrors in ancient Maya society concerns the procurement of raw iron-ore and the purported

economic status of finished mirror specimens resulting from the skilled labour of artisans commissioned by nobles. Chapter 5 looked at how previous research concerning the hypothetical exchange of other materials among the ancient Maya, such as obsidian and painted polychrome ceramics, might allude to the economic standing of raw iron-ore and finished mirrors respectively.

At the outset, it was necessary to assess the morphological properties of iron-ore, followed by a review of the geological data pertaining to known iron-ore sources in the Maya subarea. It was established that there are a plethora of massive iron-ore deposits both within and adjacent to the Maya subarea, although there is the probability that numerous micro-deposits, unacknowledged by modern geological surveys, lay scattered across the landscape. It was shown that some deposits overlap with previously identified sources of slate, the most common material used for mirror backs. Unfortunately, without systematic sourcing of particular iron-ore specimens through Mössbauer spectral analysis (Pires-Ferreira 1975), any identification of their sources is purely conjectural. Furthermore, previous speculations were reviewed regarding how finished mirrors might have been manufactured by elite craftsman attached to the royal court as aesthetic capital employed by the nobility.

Based on this informed speculation, mirrors are considered as "luxury items;" a designation that situates iron-ore mirrors as instruments of the elite; a symbolic mainstay, even through the dynamic waxing and waning of polity centralization and segmentation. There is much debate about the degree of control held by individual ancient Maya rulers over networks of economic exchange. It is asserted in this chapter that regardless of the

extent of royal authority, mirrors, and the raw materials required to produce them, were constantly desired by elites to legitimate their rule and enhance their privileged status.

Conclusions: Mirrors as Portable Portals for Ancient Maya Nobles

Chapter 1, the introduction to this thesis on ancient Maya iron-ore mirrors, began with a series of questions. The primary archaeological and secondary iconographic evidence provides some answers to the questions posed at the outset:

(1) When and where do Maya iron-ore mirrors occur?

These objects were found to occur across the greater breadth of the ancient Maya chronology, stretching from the Middle Preclassic period to the Contact-period, and almost all regions of the Maya subarea. With reference to the data collected regarding these mirrors, it appears that their usage peaked during the Late Classic Period in the Southern and Central Lowland regions. Although spatiotemporal patterns are nebulous, a pattern that roughly parallels the movement of the peaks of Maya civilization over time can be hypothesized.

(2) In what types of contexts do mirrors occur in the archaeological record?

Mirrors occur most often in elite burial and cache contexts, usually within the monumental architecture of site cores. Although there are a small number of examples of mirrors (mostly fragments) recovered from structural fill and surface contexts, their regular association with sumptuous interments along with jade, decorated pottery, and jewellery of bone, shell, and stone, situates mirrors with elite proveniences. It is argued that the redundancy perceived in the archaeological proveniences of iron-ore mirrors that these objects were closely tied to the political, ideological, and economic workings of the ancient Maya royal court.

(3) What does the depiction of mirrors in visual art and texts portend?

The synthesis of the iconographic, epigraphic, ethnohistoric, and ethnographic evidence for mirrors in Maya culture suggests possible divinatory functions. It appears that iron-ore mirrors, as elaborate versions of the water bowls used for spiritual conjuring by Contact-period Maya and theoretically by Pre-Columbian commoners, acted as communication devices providing access to the spirit world. Much like telephones connect distant people in today's world, many scenes on polychrome ceramics depict royal personages using mirrors to engage in otherworldly consultation, perhaps while under the influence of shamanistic "techniques of ecstasy."

(4) What steps were involved in the manufacture of mirrors?

Previous treatments of these objects have admitted the difficulties with positing the procedure involved in the production of these mirrors. The procuring of the raw materials is envisioned as a process of tapping one of the multitude of iron-ore deposits known to exist in and around the Maya subarea. The current study has been hampered by the lack of precise geological information on iron-ore source deposits in the Maya area, and future studies of ancient Maya mirrors would greatly benefit from a general assessment of specific sources of iron-ore in the region, probably using Mössbauer Spectral Analysis. The manufacture of finished mirrors requires some experimental archaeology to confirm the speculation that iron-ore mosaic pieces were formed by "cutting and grinding" (Smith and Kidder 1951: 44). Nonetheless, it is certain that mirrors were the result of very advanced technical knowledge and skill; probably restricting the capacity to produce one of these 'masterpieces" to the artistic caste of artisans (*its'at*), whose works were presumably commissioned by the royal court.

(5) What were the emic roles of mirrors within ancient Maya society?

The shamanistic basis of ancient Maya religious worldview is purported in many scholarly sources (Freidel et al. 1993; Reilly 2002; Schele and Freidel 1990; Sharer 1994). Thus, the analysis of the emic functions of iron-ore mirrors is best served by the theoretical perspective of Cognitive Archaeology and the methodological priorities outlined by the new "conjunctive approach." From the archaeological occurrence of mirrors in often elaborate burials of elite individuals and in monumental architecture of site cores, it is evident that they may have served as consecratory devices for high-status inhumation rites and quite possibly the dedication/termination rituals of elite structures as well; indeed, some show clear signs of being intentionally broken or "killed" in termination rites. Future research is required to determine sources of the iron-ore used in mirrors, but for now, their consistent, multidimensional association with ancient Maya royalty portends that they were a prized commodity of elites.

A synthesis of the data surveyed in this M.A. thesis recommends a final interpretive outcome rendering iron-ore mirrors as pre-eminent examples of what has been proposed herein as the ancient Maya *reflective surface complex*. In this way, ancient Maya elites manipulated the symbolic force of these mirror objects, which manifest a hierophany in their mimicking of other shiny liminal surfaces, such as eyes, polished jades, and the surface of water. It is incontestable that elites required the loyalty of the common masses. In order to secure political authority, ancient Maya nobles likely co-opted cosmological principles and religious practices that were shared by the lower classes. It is possible that what they saw in the reflective surface of the mirror was

considered to be revelatory of the future, or as a window on the Otherworld opened by divining rituals, perhaps as a way to acquire advice from the spirits of ancestors.

Just as their subjects might have been conjuring the portal to the Otherworld opened by scrying with a bowl of water, the sophisticated iron-ore mirrors wielded by royalty summoned a more regal cosmic aperture. Iron-ore mirrors, as artistic masterpieces produced by skilled noble craftsman (*its'at*), embodied the power to breech the boundary between the human and spiritual realms in a permanent and portable form. Unlike water and eyes, mirrors authenticate their possessor as mediator over the permeable membrane separating the two worlds, thus making this individual uniquely capable of communication across the cosmic divide incarnate in reflective surfaces.

APPENDICES

APPENDIX A

Table 1: Ancient Maya Iron-ore Mirrors by Site

Sites with Mirrors	Minimum # of Mirrors	Type	**Size (cm=dimensions mm=thickness)**	Backing Material	Surface Material	Archaeological Context	Holes?	Edges	Date	Reference
Actun Tunichil Muknal (Belize)	1	?	?	?	pyrite	Cave, main chamber, w/ burials	?	?	Late Classic	Awe et al. 2005: 224
Altar de Sacrificios	5?	-1 circular -1 fragmentary -1 fragmentary -1 mosaic piece -1 mosaic piece	-26cm/7mm -16cm/4mm -11cm x 6cm -3.2cm/1mm -2.0cm diameter	-slate w/ red pigment -gray sandstone -gray slate -N/A -N/A	-pyrite? -? -? -pyrite -pyrite	-Str A-III/Burial#128 ♀ -Mound 25 -Str A-III fill -Sub-altar Cache 7 -Str A-III	-4 -? -4 -N/A -N/A	-bevelled away -bevelled -? -bevelled away -bevelled away	-Late Classic -Late Classic? -Late Classic? -Proto-Early Classic -?	-Willey 1972: 141-143, Fig. 125; Coe 1988: 223-225, Fig. 6.1c; Smith 1972: Figs. 49a
Altun Ha	>4	-fragments -angular fragments -1 round -1 round	-? -? -14.6cm/6mm -9cm/5mm	-slate -slate -sandstone -sandstone	-crystalline hematite (1 piece) -crystalline hematite (174 pieces) -pyrite? -pyrite?	-cache in Str A-8 refuse deposit (RP-595) -Tomb (RP-440), Str A6-1 -Tomb in Str B-4/7 (RP-364) ♂ -Str B-4/7, Subfloor Cache 2	-? -some -4 -at least 1	-? -? -? -?	-Late Classic -Late Classic -Late Classic -?	-Pendergast 1979: 138 -Pendergast 1979: 180 -Pendergast 1969: 18, Fig. 10/35 -Pendergast 1969: 32; 1982: 70
Baking Pot	4	-1 polygon -1 fragmentary? -1 square -34 mosaic elements	-4.5cm /0.5mm -? -10.8 x 10.8cm/9mm -9-14mm	-? -? -slate, with bone frame -?	-pyrite? -pyrite -38 pyrite polygons -pyrite (marcasite)	-surface find -Mound G, Group I: Burial 15 -Burial 5, Str II-A -Burial 1, Room 1, Str II-A	-0 -0 -? -?	-bevelled -? -bevelled -?	-? -Early Classic -Late Classic -Late Classic	-Willey et al. 1965: 491 -Ricketson 1929: 17 -Bullard and Bullard 1965: 31, 34, Fig. 16, Pl. 21

Barton Ramie	4	-1 round fragment -1 round fragment -1 round fragment -1 small polygon	-16cm/7mm -5mm thick -3mm thick -1.1cm/1mm	-brownish-gray slate -brown-gray slate -dark gray slate -?	-? -? -? -pyrite?	-BR-1 -BR-123 -BR-123 -BR-123	-0 -0 -1 -0	-rounded -bevelled -bevelled -N/A	-Early to Late Classic -? -? -?	Willey et al. 1965: 490-491; Figs. 295i, j, & k
Bonampak	1	1 round mirror with 59 mosaic pieces completely intact	25.5cm/3.4mm	sandstone and polychrome stucco	pyrite	mortuary offering at feet of elite individual interred in a large burial	4	?	Late Classic	Alejandro Tovalín, catalogue entry #203 in Schmidt et al. 1998: 569
Buenavista del Cayo	2	1 group of mosaic pieces (backing decayed) and 1 rectangular back	?	?	crystalline hematite	Str Bv-1, Burial 88B-11 ♂	?	?	Late Classic	Taschek and Ball 1992: 494, Fig. 3
Cahal Pech	3?	-1 round mirror back fragment -1 mirror back fragment -1 mosaic polygon	-10cm?/8mm -?cm/5mm -3cm (2.3x1.5cm)/1.5 mm	-slate -slate -?	-? -? -pyrite or specular hematite	-Str B4/8th fill -Str 1 fill -construction fill, below Plaza B, Floor 3c	-2 visible -1 visible -?	?	-Middle Preclassic -Late Preclassic -Late Preclassic	Awe 1992: 302-304, 306, Figs. 91a, b, c
Caracol	3	-fragment -2 remnants	?	?	-pyrite -?	Both in Str A6-2nd: -Special Deposit (S. D.) C8B-5 -cache (S.D. C8B-1)	?	?	Late Preclassic	Chase and Chase 2006: 51-53

Cerros	>18?	-Special Finds SF-163, SF-164, SF-165, SF-166, SF-167, and SF-168 are shell disks that may have been mirror backs -Special Find 148: 86 mosaic pieces; 6 round disks; 5 round disk fragments -SF 985: 12 mosaic pieces -SF1113: 2 mosaic pieces -SF 1420: 11 mosaic pieces -all other SF's (1076, 1115, 1165, 1174, 1175, 1321, 1778, and 1784) contained only one mosaic piece	-SF-985 "fit together to form incomplete mirror, which is 3.5cm by 1.8cm" -specular hematite pieces "are very fragile and are less than 1mm in thickness…most are less than 1.0cm in length and width"	-disks that are suggested as possible mirror backs are made of shell	specular hematite	-Cache 1, Str. 6B -Cache 9 in Str 5C-1st -Feature 1A -Burial in Feature 1A -SF 1778 and SF 1784 from Feature 2A; all the rest are from Feature 1A	-1 to 5	?	Late Preclassic	Garber 1989: 67-68, 90-92, 131; Appendix B-61
Chamá	>37	-round and square -broken and crushed fragments	?	-slate?	-pyrite?	-under stairway of Mound I, Plaza Group -in pyramids and under ballcourt marker	-4 -2 and 4	-common trend of bevelling toward face	-Postclassic -?	Dieseldorff 1893; Kidder et al. 1946: 132; Seler 1904: 87

Chichen Itza	8?	-1 turquoise mosaic plaque -4 sandstone disks -fragments of one sandstone disk with 1 mosaic piece -2 round mirror back fragments and 12 mosaic elements	-24cm diameter -25cm/10mm, 29cm/11mm, 15.9cm/50mm, 11.1cm/72mm -12cm diameter and 1.9cm long -14cm/12mm, 16cm/13mm, pieces range from 1.3-2.8cm long and 2-3mm thick	-sandstone base in wood backing -sandstone -sandstone -dark gray, sandy-textured, friable stone (burnt sandstone?)	-pyrite -pyrite? -pyrite -pyrite	-Altar Cache, Temple of the Chac Mool -caches, NE corner, NW corner, North colonnade of Temple of the Warriors -West Trench of Lower Platform, The Caracol -dredged from Cenote of Sacrifice	-? -4, 2, and one with 2 aborted beside 2 finished -? -1 central	-14 lobes around rim -bevelled -? -1 bevelled, other rounded	-Postclassic? -Postclassic? -Postclassic? -?	-Morris, Charlot and Morris 1931: frontpiece, 181-185; Figs. 115-117 -Rupert 1935: 36; Fig. 37 d & k -Moholy-Nagy and Ladd 1992: 101-102; Figs. 5.5, 5.6, 5.7
Coba	1?	?	?	?	hematite and pyrite	in an offering box found near the center of a small ball court	?	?	Late Classic	Benavides 1976, cited in Folan 1983: 71
Copan	11?	-1 fragment -1 fragment -1 round -1 fragment -1 semicircular fragment -1(2?) pieces of pyrite -1 tiny pyrite piece _____ -1 whole -2 round, carved mirror backs -1 mirror	-first 3 = range from 2cm x 4cm/5mm to 4 x 6cm/6mm -4.5 x 3.5cm/3 to 4mm -7.5 x 3.5cm/15mm -both pieces 2.5 x 1.4cm/2mm -1cm/1mm _____ -? -? -?	-mud/siltstone -mud/siltstone -tuff -black slate -dark, red-brown silicified tuff -? -? _____ ? -slate -slate	-? -? -? -? -? -pyrite -pyrite _____ -pyrite -pyrite -pyrite	-Plaza CV-43, Lev. 1 -Plaza CV-44, Lev. 1 -Plaza CV-44, Lev. 1 -Plaza CV-16, Lev. 1 -Plaza CV-20, Lev. 1 -Plaza CV-43, Special Find 166, with Special Find 57 -Plaza CV-48, Lev. 5, Speical Find 50 _____ -Rural Region Group 7D-3-1 -"Margarita" Tomb--Bur 93-2, Acropolis ♀ -Bur V-6, Str 10L-26 ♂	-? -? -? -? -? -5? -? _____ -? -4 -?	-bevelled -bevelled -smooth and rounded -? -rounded by pressure-flaking -bevelled away -bevelled _____ -? -? -?	-? _____ Late Classic -Early Classic -Early Classic	-Willey et al. 1994: 251-252 _____ -Gonlin 1994: 192 -Bell et al. 2004: 139-141, Fig. 8.5 -Bell et al. 2004: 155

Cueva de Rio Murcielago	1?	-1 mirror back -6 polished mosaic pieces	?	slate	hematite	in cave	-2 -?	?	?	Brady 2005: 122-123, Fig. 6.4, footnote #9: 7 other caves
Dos Hombres	1?	mirror fragments	?	?	hematite	in an undesignated tomb in an unspecified platform structure	?	?	Early Classic	Sullivan and Valdez 2006: 75-76
Dzibilchaltun	3?	-3 mosaic inset elements -20 mosaic inlay elements	-range: 0.8-1.6cm/2-5mm -range: 0.5-1.05cm/ 0.5-5mm	?	hematite	-2 uncovered near Cenote Xlacah; one in burial in Structure 57's east room -Temple of the Seven Dolls Complex: 14 in Cache 1 of Str 1; 2 in Cache 1 and 4 in Cache 2 of Str 5	?	?	Late Classic	Taschek 1994: 96-99, Fig. 27p,q
El Porton	9	-7 mirror backs -1 mirror back -0.5 mirror back	?	?	?	All from Str J7-4: -Cache 11 -Cache 19 -Cache 22	?	?	Late Preclassic/ Protoclasic	Sharer and Sedat 1987: 63, 69, 263-264; Table 14.2
Hatzcap Ceel	3	-1 mirror back -1 mirror back, some mosaic pieces -1 round mirror back	-5.4 cm square -6.5 cm square -7.5 cm diameter	-ceramic -ceramic -sandstone	-pyrite? -pyrite -?	-Votive Cache 2 interred within the temple of Pyramid M -Votive Cache 3 in the lower temple of Pyramid F -Votive Cache 1, in Pyramid Q	-0 -0 -0?	-? -? -bevelled	-Late Classic -Late Classic -?	Thompson 1931: 273-276; Plate XXXI-13, Fig. 8
Holmul	1?	fragments	?	?	pyrite	Skeleton 12	?	?	Early Classic	Merwin and Vaillant 1932: 86-87; Plate 32, aa

Kaminaljuyu	>40	-1 or 2 mirror back fragments with mosaic piece; 2 or 3 smashed mirror backs, and two mosaic pieces; one oval mosaic piece _____ -29 "normal type" circular plaques -1 plaque with central disc -5 compound plaques	-fragments unknown, mosaic pieces are 1cm/7mm, 3x3.5cm/5mm, and 1.3x3cm/5mm; oval is 3.5x1.8cm; diamters range from 7.5-25cm; 20cm _____ -20cm/7mm; 20cm; 25cm/3mm; 14cm; 23.5cm -? -19cm	-ceramic; slate or shale; slate _____ -slate; some slate and wood; some with stucco on back	-pyrite; oval is hematite _____ -pyrite -pyrite -pyrite?	-Tombs 1 and 2, Mound E-III-3 _____ -Tombs A-1 (3 mirrors) ♂; A-II (2)♀; A-III (6)♂; A-IV (2)♂; A-V (1)♂; A-VI (3)♂; B-I (6)♂ & subadult; B-II (4)♂; B-III (4)♂; B-V (2)♂; B-VI (1)♂; Minor Grave 1 (1)infant	-?; pairs of 2 and 4; 4 _____ -2 or 4	-? _____ -bevelled towards face	-Preclassic _____ -Early Classic	-Shook and Kidder 1952: 116 _____ -Kidder et al. 1946: 126-135, 234-238, Fig. 53c
Kendal	1	circular disk	8cm/5mm	?	pyrite	Mound No. 11	?	?	?	Gann 1918: 90 92
Kixpek	4	3 round, 1 square; mirrors have 50-80 polygons, some as large as 5.1 cm wide and 5.7 cm long...up to 9 edges	9.5 cm (dia.); 10.2 cm; 15.2cm; 12 x 12cm	pumice or tufa	pyrite	found in a row at the end of a grave, in front of (?) the decomposed body (no other details)	?	?	Early Postclassic	Mason 1927; Kidder and Samayoa Chinchilla 1959
Labna	1	1 disk	?	?	pyrite	Chultun No. 23	?	?	Late Classic	Thompson 1897: 16
Lamanai	3	-1 round mirror back, 1 mirror back fragment -1 round mosaic mirror	-? -?	-? -stone backing, ceramic frame	-pyrite -pyrite	-graves -burial N10-4/3 ♂, Str N10-4	-? -?	-? -?	Late Postclassic	David Pendergast, personal comm., 2006

Lubaantun	>6?	-1 mirror back fragment, 1 whole hematite piece and 2 hematite mosaic fragments -1 mirror back fragment with painted (pink & blue) stucco back -1 mirror back and 3 whole hematite pieces -1 mirror back fragment _____ -2 or 3 mirrors	-estimated at a range of 10 to 30cm/3 to 7mm _____ -?	-shale _____ -slate?	-variable use of "hematite" and "pyrite"? _____ -pyrite	-under Plaza IV in between Strs 100 and 101 -masonry/rubble fill of Str 44 -midden discovered in unit at southeast corner of Plaza XIV -under floor of Plaza II located 1 m south of Str 4e _____ -general excavation?	-1? -0 -1? -0 _____ -2?	-rounded bevel -straight bevel -straight bevel -rounded bevel _____ -?	-Late Classic _____ -Late Classic?	-Hammond 1975: 355, 357; Fig. 139 _____ -Joyce 1929: 449-450
Mayapan	1	square mosaic pieces?	?	?	pyrite	?	?	?	Early Postclassic	Proskouriakoff 1962: 354, Fig 26k

Minanha	10?	-1 mirror back fragment -3 mosaic pieces; depression for mirror? _____ -2 mosaic pieces -1 circular mirror back 1/4 fragment -2 mirror backs? -1 mosaic hexagon fragment -1 mosaic hexagon fragment -1 mosaic piece	-? -max. 1.9 x 1.2cm/12mm; c. 10cm in diameter _____ -? -7 x 4.5cm/5mm -? -2.6 x 1.5cm/3mm -2.1 x 1.9cm/3mm -2.1 x 1.7cm/1mm	-slate -? _____ -? -slate -? -? -? -?	-? -hematite _____ -hematite -? -? -hematite -hematite -hematite	-Unit 43L-1, Str 43L -Burial 112-B/1 of Chultun M1; face of Chultun M1 capstone _____ -Burial 113-B/1 and Level 5 of Chultun M2 -Str 43L, unit 43L-1, Level 2 secondary domestic slump -Str 105V, unit 105V-1, secondary domestic humus -Str 38J, unit 40J-1, level 2c, secondary ceremonial slump -Str 74S, unit 74S-1, secondary domestic humus -Str 105V, unit 105V-1, secondary domestic humus	-? -? _____ -? -? -? -? -? -?	-? -? _____ -? -? -? -? -? -?	-Late Classic -Late Classic _____ -? -? -? -? -? -?	-Paauw 2004: 41 -Turuk et al. 2005: 48-63 _____ -Minanha master artifact list, Gyles Iannone 2007
Nebaj	c. 212 total	196 complete, assorted circular styles: approximately -164 -20 -8 -20	diameters range from 8cm to 26cm, thicknesses range from 3mm to 8mm	slate or mudstone	pyrite?	-Tombs/Burials /Caches in Mound 1 and Mound 2 -Tombs/Caches in Mound 2 -Tombs/Caches in Mound 2 -general excavation	-4 (pair on opposite edges) -2 (near center) -? -?	bevelled away	-Early Classic -Late Classic -Early Postclassic -?	Smith and Kidder 1951: 44-50; Figs. 12-14 & 64-67; Tables 3 & 4

Pacbitun	5	-1 round mirror back w/ 2 iron-ore pieces -1 round mirror back & 1 round mirror back fragment -1 round mirror back fragment -1 square ceramic mirror back w/ iron-ore polygon	-13.5cm/3-6mm -10.5cm/3mm & 11cm/3mm -11.5cm/2mm -?	-slate -slate -slate -pottery	pyrite, hematite	-Str. 1, Rich tomb (Burial 1-9) ♂, Lot 327 -Str 4, Bur. 4-1 ♀, Lot 179 -Str 4, Bur. 4-2 ♂, Lot 195 -Burial 2-1 ♀	-'drilled' -4 -2 -1	-bevelled towards face -grooved -bevelled towards rear -grooved	Late Classic	-Healy 2004: 231-232, Fig. 14.1 -Healy 1990: 259, Fig. 8 & Healy et al. 1995: 340-341, Fig. 2 -Paul Healy, fieldnotes pgs. 4, 10, 15
Palenque	2?	-6 mosaic pieces -1 convex mirror in "cartouch shape"	-<2cm/2mm? -3.6 x 2.5cm/1mm	?	-pyrite -hematite	Tomb 2, Temple 18A	-? -0	-? -damaged by chipping	Late Classic	Ruz 1958: 263, 287, 291, & 293; Plates 46 & 51, cited in Willey 1972: 143 & Carlson 1981: 130-132, Fig.
Piedras Negras	8?	-2 "Olmec-style" solid disks -1 mosaic plaque -2 mosaic fillets -5 (3 worked, 2 unworked) mosaic bits -3 miscellaneous (mosaic?) objects -2 miscellaneous mosaic elements -1 oval object -1 "nodule"	-5.8cm/16.5mm & 7.2cm/9mm -24.4cm/45mm -<43cm long/10-20mm -c. 1cm/1-2mm -? -5mm thick -1.9cm/15mm -?	-none -light gray shale -"pliable"? -? -? -? -? -?	-pyrite -pyrite -pyrite -hematite -pyrite -pyrite -pyrite -hematite	-Cache J-6-5 & Bur. 5 -Skeleton B, Burial 5 ♂ -Niche 1, Burial 5 -Caches J-1-1, O-16-1 -Caches O-13-3, O-13-14, O-13-15 -general excavation -drain of Str J-2 -surface of Str	-0 -0? -0 -0 -? -? -0 -0	-slightly bevelled -bevelled -? -? -? -bevelled & double-beveled edge -none -none	-Late Classic -Late Classic -Late Classic -Late Classic -Late Classic -? -? -?	Coe 1959 42-44; Figs. 42 & 43
Pusilha	2	-1 complete (smashed) mirror -1 complete (smashed) mirror	?	slate	pyrite	Burials in the "Big Tree Mounds" -Mound A -Mound B	-2 -2	?	Late Classic	Joyce 1929: 449-450; Plate XLVI, Figs. 1 & 2

Quirigua	4?	-100 mosaic pieces -broken mirror back? -bits (from mosaic?) _____ -a "set of...hexagonal disks	-? _____ -2.5cm/1.6mm	-? -shale -? _____ -?	-pyrite -? -pyrite _____ -hematite	-Special Deposit 8, Acropolis -SD 16, Group A, associated with Monument 21 -SD 21, Str 3C-14 _____ -inner doorway of Str 1B-2	-? _____ -?	-? _____ -rounded	-Late Classic -Early Classic -Early Classic _____ -Late Classic	-Ashmore et al. 1983: 58-59 _____ -Looper 2003: 64-65; Morley 1935: 136-137
Rio Azul	5?	-"remains," two with incised hieroglyphs -one round mirror back	?	-? -ceramic	-pyrite -?	-elite tombs (Burial types 1, 2, 3, & 4) -Tomb 4	?	?	-Early Classic -?	-Adams 1999: 217-218 -Hall 1987: 143-144
San Agustin Acasaguastlan	6?	5 complete mirror backs, 2 mirror back fragments, 13 mosaic pieces	-6 round specimens: diameters are 8.5, 10, 12, 13, 17.5, 19.5cm/ thicknesses range from 5-8mm E37 -one square plaque is 8x8cm	six are sandstone, one is slate	pyrite	Tomb III, Str 24	all but one have pair of central holes	5 are bevelled away, one has a squared edge and one other has a rounded edge	mixed chronology of tomb prevents accurate dating	Smith and Kidder 1943: 127, 166; Fig. 57
San Jose	7?	-small disk -small disk -4 round mirrors -2 pieces	-? -? -one is 14.5cm/5mm -4.9 x 3.5cm/5mm	-? -? -ceramic, slate, sandstone -?	-hematite -hematite -pyrite -pyrite	-Burial A7 -surface, Room C, C5 -Caches A1, C2, C1, and top of bench in Room C, C5 -Cache C6 and outside Room A, B4	-0 -0 -1, 2, & 3 -0	-? -? -bevelled -none	-Late Classic -Early Postclassic -Terminal Classic to Early Postclassic -Terminal Classic to Early Postclassic	Thompson 1939: 176-178; Plate 28b

Seibal	>1?	-1 small mosaic piece -one round mirror back(?) fragment	-2.5 x 1.1cm/3mm -10cm/40mm	-? -red-gray slate	-pyrite? -?	-Operation 105(D)1, Temple 7527 -Operation 31(B)4, Str D-30	-0 -?	-bevelled inward -?	-Late Classic -?	Willey 1978: 96-97; Figs. 102-104
Tikal	>26	-1 disc -1 plaque -2 fragments of 1 plaque -2 incomplete backings -4 plaques -1 plaque element -?# plaque backings -2 plaque backings -11 mosaic elements _____ -6 mosaic pieces; 2 fragmentary discs -3 plaques	-large -? -? -? -? -? -? -? -? _____ -?; diameter 1.3cm -?	-limestone -sandstone -shale -shale -slate -? -shale -shale -? _____ -? -slate and decorative colouring	-pyrite -pyrite -pyrite? -pyrite -pyrite -pyrite -? -? -10 pyrite, 1 hematite _____ -6 hematite, 2 pyrite -pyrite	-Cache 79, Str 5D-26-1st -with Skeleton A ♂, Burial 10, Str 5D-34 -Cache 98, Str 5D-33-2nd -Prob. Dep. 43, Str 5D-2-1st -Burial 196 ♂, Str 5D-73 -Burial 8 ♂, Str 5D-34 -Collapse debris, Str 5D-23-1st -Collapse debris, St 5D-33-1st -Cache beneath Stela P1 in Great Plaza _____ -Cache 1, in Lot 12, Stela 23 group -Royal Tomb of Ruler A (Burial 116) ♂, within Temple I (Str 5D-1-2nd)	-? _____ -drilled -?	-? _____ -grooved edge -?	-Early Classic -Early Classic -Early Classic -Late Classic -Late Classic -? -? -? -? _____ -Late Classic -Late Classic	-Coe 1990 _____ -Coe and Broman 1958: 44 -Coe 1988: 233; Trik 1963
Uaxactun	4?	-3 finds of mosaic pieces: 75; "several;" 2 -2 small mosaic pieces	-75 cover an area 6cm square, range from 0.2-0.3cm x 1.5-2.5cm/1mm -?	-? -?	-hematite -hematite	-Burial A-20; Cache B-2; Cache B-8 -cache under Stela 4, Group B	-? -?	-? -?	-Early Classic -Early Classic	-Kidder 1947: 52 -Ricketson and Ricketson 1937: 159-158, 197; Plate 67, e, 13, 14

Zaculeu	>50	-33 whole/fragmented circular backs and 3 fragments -1 circular plaque -1 circular plaque, pair of circular plaques; 3 circular disks, 2 circular plaque fragments, 1 rectangular plaque fragment -2 whole circular plaques, 17 fragments of circular plaques and 2 rectangular plaque fragments	-mean diameter 15.7cm -7cm/4mm -5.6cm, 7.2 and 7.8/7mm; 7cm/5mm, 14cm, 5cm -some unknown, 25cm, 15cm, 14cm/7mm, 14cm/4-5mm, 4cm/6mm, 3cm/4mm	-light to dark gray slate -slate -slate, sandstone sandy slate or shale? -slate?	-pyrite -pyrite -pyrite -pyrite	-tomb in Str 1 and Str 1 fill -Str 1 fill -Graves 3-4, 12-1 ♀, 13-23 ♂?, 12-1B ♀, Str 4 fill, Str 13 fill, Str 16 fill -Grave 1-10, mixed fill of: Strs 6, 12, 13, 1, and surface debris of Str 9	-0 holes (4), 4(17), 8(1), 1(2) -4 -either 1 or 2 -various	-bevelled toward back -bevelled toward back -some bevelled toward back, some toward front -various	-Early Classic -Late Classic -Postclassic? -?	Woodbury and Trik 1953: 232-239, 448; Figs. 129-134, 282a,b,d
Obtainable TOTALS and Proportions	> 500	of 361 whole mirrors with documented shape: -276 (76.5%) are round/circular -8 (2.2%) are square/rectangles -44 (12.2%) are fragmentary (shape N/A) -33 (9.1%) are represented only by mosaic pieces	of 73 whole mirrors with documented dimensions: -Diameters range from 5.6 to 29cm with an average of 15.11cm -of these, 17 have registered thicknesses, ranging from 3 to 72mm with an average of 12.3mm	of the 156 mirrors with documented backing material: -113 (72.4%) are slate/shale -22 (14.1%) are sandstone -6 (3.8%) are shell -6 (3.8%) are ceramic -4 (2.6%) are pumice or tufa -2 (1.3%) are tuff -1 is limestone	of the 192 instances where the reflective surface material is identified: -155 (80.7%) are pyrite -37 (19.3%) are hematite	of the 175 distinct contexts in which mirrors have been found: -64 (36.6%) are burials -46 (26.3%) are caches -19 (10.9%) are fill -6 (3.4%) are surface finds -40 (22.9%) are from miscellaneous contexts (caves, mounds, plazas, features, chultuns, general excavation)	of the 240 whole mirrors listed with drill holes: -1 has eight -192 (80%) have four -1 has three -32 (13.3%) have two -4 (1.7%) have one -10 (4.2%) have zero	of the 371 mirrors with identifiable edge forms: -228 (61.5%) are "bevelled away" -74 (19.9%) are bevelled "towards face" -36 (9.7%) are bevelled "towards rear" -16 (4.3%) are simply "bevelled" -8 (2.2%) are "rounded" -2 (0.5%) have "straight" bevel -1 has "lobed" edge -1 has "squared" edge	of the ~512 mirrors with chronological designation: -1 is Middle Preclassic -38 (7.4%) are Late Preclassic -253 (49.4%) are Early Classic -79 (15.4%) are Late Classic -72 (14.1%) are Postclassic -69 (13.5%) are problematic	/

APPENDIX B

Table 2 : Iconographic Mirrors from Kerr Online Database of Maya Polychrome Ceramics

http://research.famsi.org/kerrmaya.html

X = attribute is present, / = attribute is not applicable to specimen in question

Kerr #	Flared Backing?	Mirror Surface	Protuberances?	Stand or Assistant	Basketry Support?	Function in Scene or Glyphic Reference	Additional Comments (*from Kerr database entries*)
505		/	X	held by viewer		active	"Dog looks into large olla, monkey dances with and looks into a mirror. Both wear scribal reeds in headdress."
511		/		/		T24/T617 in text	"The Princeton Vase. The court of the other world with God L and the Twins as magicians, Supernatural Palace"
530		protruding		assistant		active	"4 toothless old deities prepare for a ceremony to Itzamná. 2 will take enemas, 1 is inhaling drugs, the last puts on makeup, all [to] the accompaniment...[of]...musicians."
559	curved dorsally	protruding		/	X	passive	"The Moon Goddess giving birth to the rabbit. Goddess O helps the rabbit nurse."
625	extend ventrally, then dorsally	/		ring stand		active?	"Palace scene with ruler looking into mirror. Offerings of cloth and food under the throne."
631		/		/		T24/T617 in text	"Palace scene with cacao tree. The individual using the metate is probably grinding chocolate pods into powder or paste."
717		/		/		T24/T617 in text	"Scribal workshop."
731		/		/		presence of mirror is debatable	"Red background with Young Corn God coming out of split carapace or serpent bar and canoes and paddlers."

764	curved dorsally	protruding		assistant		active	"Ruler being painted on backside while looking into mirror held by attend. One woman holds mask or trophy head, second woman looks on. Palace. If the woman is holding a death mask, then it is possible that the ruler is dead and being prepared for his burial."
787		embedded	X	assistant		active	"A palace scene. A ruler looks into a mirror as he dresses for war. war scene."
1453		/		dwarf assistant		active	"Palace drunken party. Ruler watches as a dwarf drinks from gourd."
1454		embedded		assistant		active	"Palace. Ruler being dressed, Giant Animal headdress."
1463		protruding		assistant		active	"Palace. Fat cacique wearing war badge."
1651		/		/		T24/T617 in text	"Offerings of bundles of cloth, feathers, and vessels. One individual holds feathers in hand."
1669		/		/		T24/T617 in text	"A lord sitting on throne makes offerings."
1728		embedded		/		passive	"Palace"
1790		embedded		assistant		active	"Palace.Three levels of activity. Presentation to ruler of artist's headgear?"
2025		/		assistant		active	sacrifice?
2026		/		ring stand		active	"Dave Kelly suggests the rabbits are phases of the moon leading to an eclipse. D. Stuart reads the text as 'There are rabbits, there are no rabbits.' "
2345		/		/		T24/T617 in text	"Kneeling man with black face and hand prints on body ties a bundle."
2695		embedded		assistant	bag?	active	"Ruler dressing, Mundo Perdido, Tikal" (Houston et al. 2006: 272-273, Fig. 8.26)
2711		/		ring stand		passive	"Throne scene with cloth presentation. The ruler has an Ah Ku title."

2783		/		/		T24/T617 in text	"Palace scene"
2784		/		/		T24/T617 in text	"Palace scene"
2794		/		/		T24/T617 in text	"Supernatural palace with Old god (Itzamná) dying - women with deer."
2914	curved dorsally	embedded		ring stand		active	"Ruler with attendants, Maybe marriage negotiation. Dwarf oversees tribute in lower register, mirror, three bags of beans, cloth, and salt? Two woman behind partition."
2923		/		/		T24/T617 in text	"Palace scene"
2929		protruding	X	ring stand		supernatural	ruler conversing with *way* character across mirror?
2970		/		/		supernatural	"God K with elaborate flare from his mirror headdress."
3203		/		ring stand		passive	"Tribute is brought in the form of feathers and bundles."
3813		/		/		presence of mirror is debatable	two scenes of elites interacting with mirror[?]
4338	extend ventrally, then dorsally	embedded	X	assistant		active	"Ruler looking into mirror with vase on his right."
4354		/		/		supernatural	"Head variants of God K. Note mirror in forehead and reduced flare."
4479		/		/		active, supernatural?	"Dressing Scene. Hun Hun Ahpu sits on monster dais being shown the mirror. Hun Ahaj at end of dais. heavy over-painting."
5110		/		dwarf assistant		active	"A dwarf holds a mirror in front of a ruler."
5233		/		ring stand		active?	"A ruler dances while looking into a mirror. He is accompanied by two musicians who play a friction drum and a rasca."
5416		/		/		passive	"2 views of a Palace in which a ruler or lord prepares for war. He is shown his battle-standard (the round object being held aloft) and offerings of tamales are present."

5418		embedded		spotted[?] stand		active	"Eroded vase from IK site Pink Glyph school, artist's name."
5545		/		/		presence of mirror is debatable	two scenes of elites interacting with mirror[?]
5764		/	X	ring stand		active, supernatural	"Itzamná and Ta Hol"
5944		protruding	X	/	X	active	"A ruler with waterbird and Och Chan, the bearded dragon."
6020		/		/		T24/T617 in text	"Vomit ritual conducted by Goddess O. A math scribe overlooks scene with scribe in upper resister."
6315		/		ring stand	X	active?	"A palace scene. A bearded ruler has an audience with visitor wearing a bird headdress accompanied by twin attendants in black wearing feather headdresses. The mirror is in either a basket or a ceramic painted to imitate a basket."
6341		embedded		assistant		active	"A palace scene. A ruler dances looking into a mirror Warriors with shields look down at the scene."
6437		/		ring stand		active?	"Thin figure style, ruler holding smoking tube? facing mirror, vase, and bearded figure who also has smoking tube. Text suggests he is visitor from the west. Attendant standing in wings. Light beige with orange borders and throne platform."
6575		/		/		presence of mirror is debatable	"Mirror images of God L on Pedestal vase. 2 examples of the vase have been excavated."
6666		/		upright bar stand		T24/T617 in text	"Conversation in the palace."
7265		/	X	ring stand		passive, supernatural	"Itzamná talks to a dog. Compare with 4548 and 8076."
7288		embedded		assistant		active	"Ruler wears peccary headdress as war chief talks to 3 warriors."
8220		embedded		assistant		active	"A ruler is shown the mirror by an attendant."

8652		embedded		held by viewer		active	"Ruler holding mirror and looking into it."
8790		/		ring stand		passive	"Palace scene from Ik site."
8793		embedded		ring stand		active?	"A ruler with close cropped hair sits on a throne painted with glyphs. He holds a wand or a smoking tube."
8926		/	X	assistant		active	"A ruler wearing a very large jaguar costume stands astride a double jaguar throne. He is being shown a mirror by an attendant and a guard with battle standard is behind him."
TOTAL 54	of the 5 instances: -3 (60%) are curved dorsally -2 (40%) extend ventrally, then dorsally	of the 19 instances: -6 (31.6%) are protruding -13 (68.4%) are embedded	Total instances = 8	of the 32 instances: -2 (6.2%) are held/supported by the viewer -15 (46.9%) are held/supported by an assistant -15 (46.9%) are supported by some type of stand	-3 with "basket backing" -1 with "bag"[?] backing	of the 30 instances: -23 (76.7%) are active -7 (23.3%) are passive _____ -a total of 12 painted vessels have the T24/T617 grapheme in the text -a total of 6 are designated as supernatural scenes -4 are highly debatable as to whether it is a mirror that is represented or not	/

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