BIRDS AND ENVIRONMENTAL CHANGE IN THE MAYA AREA

by

Peter Stuart

Hampshire College
with contributions by David Stuart, University of Texas, Austin

A Division III Thesis in Partial Fulfillment of the Requirements for Graduation at Hampshire College
May 2015

Division III Committee Co-chairs:
Alan Goodman; Professor of Biological Anthropology
Brian Schultz; Assoc. Professor of Ecology and Entomology
ABSTRACT:

The objective of this study was to identify bird species and subspecies in ancient Maya art and to search for patterns related to geography, time period and environment which could give information about changes in climate and ecology in the Maya area of Guatemala, Honduras and Mexico. This study found the most complete data in the Maya lowlands of Peten, Guatemala.

I created The Stuart Database of every available image of a bird in Maya art, and identified each one possible. An examination of birds in The Stuart Database in relation to recent environmental studies of changes in the Maya lowland bajos supports a model of the drying up of ancient lowland Peten lakes. The majority of ornithological images in ancient Maya art are of waterbirds whose habitat would have been lakes which no longer exist in the area where the art is found. Recent ornithology demonstrates localized species loss as compared with the apparent geographical distribution of birds found in the ancient art.

Many images in the art formerly thought to be mythical birds are demonstrated as natural depictions of real species by the current study. Several previously unrecognized bird species are identified in the art by the present study. Several corrections of formerly misidentified birds are made. At least one bird depiction found in the current study may represent an extinct species unknown to modern ornithology, though this is unlikely, as the identification is based upon color, which can degrade over time in ancient Maya art.
TABLE OF CONTENTS

Abstract........................................................................................................................... 1
Preface............................................................................................................................ 3
Initial Project Goals....................................................................................................... 5
Retrospective................................................................................................................. 6
Chapter 1: The Basics on the Ancient Maya.............................................................. 8
Chapter 2: A Brief History of Related Research...................................................... 17
Chapter 3: Overview of the History of Ornithology in the Maya Area.................... 22
Chapter 4: The Stuart Database of Birds in Ancient Maya Art.............................. 28
Chapter 5: Water Birds and Water Imagery............................................................. 31
Chapter 6: Statistical Analysis of the Stuart Database......................................... 81
Chapter 7: Water Imagery in Maya Art................................................................. 85
Conclusion..................................................................................................................... 93
Bibliography............................................................................................................... 95
Appendix A: Background to the Imagery............................................................... 106
Appendix B: The Stuart Database......................................................................... 111
Preface

This project began as an undergraduate independent study in my junior year at Hampshire College. For most of my life I have been fascinated by birds. I also have been immersed in Maya archaeology since childhood. Later I took courses at Hampshire on environmental subjects, including one in which I did a study of meta-data on changes in bird migration related to climate change, another on animal behavior, and another on water issues in the environment. I traveled several times to Maya sites in Guatemala and Mexico, and my fascination with the birds down there became a question: how had the environment changed since the times of the ancient Maya, and how had this affected bird populations in the Maya area? Was there any way of telling from the depictions of birds the Maya had left behind, any answers to these questions? I came up with the idea of trying to figure out if ancient Maya art could tell us anything about the effects of climate change or the effects of human populations on bird populations in the areas where the ancient Maya used to live.

The first step in getting that kind of information was to identify as many birds as possible in ancient Maya art.

In my Division II work at Hampshire College, I created a database of every bird in the Maya Vase database of Justin Kerr, with species identifications of each one that could be identified (Peter Stuart 2014). Kerr is the noted photographer and developer of a "rollout" photographic technique for Maya vases, which allowed us to view the images on the vases in one continuous rectangle as they were painted. He published these images (which included many birds) in several volumes (Kerr 1989-2000) and provided one of the greatest tools for Maya scholarship. Later he put all these images online, and it was mostly from his online database that I worked to make my sub-database. (www.mayavase.com)
In consultation with David Stuart at the University of Texas-Austin, I developed the current project.
Initial Project Goals

My goals were initially as follows:

1. To expand the database entries to include every known image of birds in ancient Maya art, on every type of artifact rather than just the vases in the Kerr database. I wanted this to be as comprehensive as possible. (In the future, I will develop forms to crowd-source further contributions to the database online, which I will curate for accuracy, but that is beyond the scope of the current project.)

2. To identify every bird image to the extent that it could be identified and to record this for the work of other ornithologists or Mayanists.

3. To learn more about Maya area ornithology, the Maya area environment and its history.

4. To find out what the images, history or ornithology can tell us about how the ancient Maya interacted with the natural environment and how that might have changed the environment.

5. To fit that information into what we know about ancient Maya culture and beliefs and figure out how the culture influenced what the artists depicted when they showed birds in their work.

6. To try to analyze the data for patterns that might suggest unexpected or expected avenues of research.

7. To write a monograph on the subject. I was going to co-author this with my father, David Stuart, a Mayan epigrapher.
Retrospective

As my write up will show, some of the initial goals have changed. I spent a long part of my Division III reading about ancient Maya mythology and culture, and I then spent much time writing about it. But as I wrote this, I began to realize this should probably not be the focus of my paper. This is because when I began the research, I didn't really think my database and identifications could contribute all that much to the scientific understanding of the ancient Maya environment. Then as time went on, the data I was getting made me change my mind.

Because all the archaeologists who studied bird imagery in the past had placed them in a mythological context, I initially thought it would perhaps be better to look at my results from an art historical perspective. As led to believe by these past studies, I thought most of the birds I found in the art would be mythical supernatural demons incorporating parts of different bird species or even different animals altogether, or that the majority would be found in fantasy mythological settings that did nothing to further knowledge about the ancient natural world. Thus, I assumed I would learn more about mythology from this study than about the real ancient Maya environment. But as my work progressed over the past year I came to believe that initial idea was wrong.

As I will elaborate on later, I discovered that although some of the bird depictions are definitely of mythical beings, many of the birds that had been identified as mythical were not. Why? Because most of the scholars who commented on the art simply did not recognize the identifying characteristics of naturalistic bird depictions when they saw them. They had assumed some of the more fantastic bird depictions must be supernatural because of their outrageous colors, plumage or markings; but in fact many real birds in the Maya area are flamboyant and
vivid in both appearance and sound. Thus, many of these "mythological birds" were in fact accurate portrayals of more or less identifiable taxonomic categories of birds.

I realized that as a consequence of this, no matter what setting a bird was depicted in, mythological or real, the art had something to contribute in a more scientific way than I first assumed.

Some interesting points emerged which provide support to ideas of environmental degradation related to human settlement and agriculture in the fragile rainforest zones of the Guatemalan Peten where the ancient Maya once lived and their descendants live today. And some of my discoveries are just interesting or thought-provoking tidbits about a long-gone culture and the birds they lived among, some of which they hunted almost to extinction.

Thus, I have decided to write this paper as an ornithological and environmental study, which puts the science into an art historical context, rather than the other way around. This means that my co-authorship of the upcoming monograph, The Avian World of the Ancient Maya, will take place after completing of my Division III, after graduation. My collaborator David Stuart will add his work to mine at that point, although I have not edited out all of his contributions to this paper in the form it is in at this time. Then the focus of the work will become art-historical, with hieroglyphic context.
Chapter 1

The Basics on the Ancient Maya

Who and what were the Maya? The answer lies in the remnants of a lost civilization in the territory researchers call Mesoamerica. This area gave rise to many cultures, including not only the Maya but also the Mexica Aztec, Olmec, Toltec, Teotihuacanos and Zapotec. The Maya dwelt in parts of what are now southern Mexico, Belize, Guatemala and northern Honduras.

There, in the tropical environments, they developed an urban culture that lasted for some two thousand years before the arrival of the Spanish in the sixteenth century brought disease and final destruction of their civilization. One can still visit the ruins of many great ancient Maya cities: vast temples and courtyards laden with inscriptions and scenery carved into the walls telling stories of dynasties, rulers and sacrificial scenes, some of which have until very recently been lost to history. What they left behind in their abandoned cities are some of the most fascinating artworks and hieroglyphs of the ancient world.

<table>
<thead>
<tr>
<th>Period</th>
<th>Time Period</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archaic</td>
<td>Before 2000 BC</td>
<td>Initial Foragers</td>
</tr>
<tr>
<td>Early Preclassic</td>
<td>2000 BC - 1000 BC</td>
<td>Pioneer Farming Settlements</td>
</tr>
<tr>
<td>Middle Preclassic</td>
<td>1000 BC - 300 BC</td>
<td>Expansion Across Lowlands</td>
</tr>
<tr>
<td>Late Preclassic</td>
<td>300 BC - 250 AD</td>
<td>N. Belize Centers Reach Height</td>
</tr>
<tr>
<td>Early Classic</td>
<td>250 AD - 600 AD</td>
<td>Power Shifts to the Interior</td>
</tr>
<tr>
<td>Late Classic</td>
<td>600 AD - 900 AD</td>
<td>Height of Maya Civilization</td>
</tr>
<tr>
<td>Terminal Classic</td>
<td>900 AD - 1000 AD</td>
<td>Collapse of the Classic Maya</td>
</tr>
<tr>
<td>Early Postclassic</td>
<td>1000 AD - 1250 AD</td>
<td>Re-focus of Populations</td>
</tr>
<tr>
<td>Late Postclassic</td>
<td>1250 AD - 1521 AD</td>
<td>Competition among Centers</td>
</tr>
<tr>
<td>Spanish Invasion</td>
<td>1521</td>
<td>Disease and Depopulation</td>
</tr>
</tbody>
</table>

From Maya Chronology, Mesoamerican Research Center  
http://www.marc.ucsb.edu/research/maya/ancient-maya-civilization/maya-chronology
The Maya as a civilization began to develop its identifying characteristics in what is now called the Middle Preclassic era, around 1000 B.C. (Table 1). During the Preclassic era, major cities such as El Mirador arose in the lowlands of the North of Guatemala, and the great cultures of Tikal and Uaxactun (in the Peten region in the lowlands of Guatemala) were in their early stages (Figure 1). Temples were built decorated with “masks” and cosmological signs symbolizing gods or kings, which were said to have been borrowed from the mysterious Olmec civilization that lived thousands of years earlier (Hansen 2001). Artistic evidence found at the San Bartolo site in 2001, which depicts mythological creation scenes and rich scenes of ancient life, confirms that the Preclassic Maya were indeed flourishing at a stronger rate than previously thought (Saturno et al. 2006). Around this time, Teotihuacan, a vast yet little-understood city in the Valley of Mexico, was reaching the peak of its influence, and evidence can be seen in the architecture of the aforementioned cities. What this influence was, and how Teotihuacan accomplished it is still a mystery (Stuart 1998).

City-states such as Copan, Tikal and Uaxactun grew and flourished into the Classic Period, which is divided into the Early, Late and Terminal Classic. Perhaps largely due to a combination of environmental reasons (such as loss of water sources and soil degradation) and political strife, many of the great cities of the central lowland region were abandoned around A.D. 900, in what is popularly called the Maya “Collapse”. Other centers in other regions rose and continued on for centuries longer, up to and beyond the time of European conquest in the 1500s (Coe 2011). (Figure 1)

Scholars long wondered how Maya culture was able to develop as rapidly and as successfully as it did in the challenging rainforest environment, where in spite of the rich jungle growth, soil is thin and poor. Beginning around thirty years ago, a number of archaeologists
realized that the early Maya were excellent at adapting to the tropical world around them, developing techniques of intensive agriculture that could potentially support far larger populations than historically were known to live in the area.

*Figure 1*

*A map of the Maya world. Ancient sites are marked in red. Source: www.latinamericanstudies.org*

During the Classic period, much evidence of the stories of city-states and dynasties exists, telling of conflict between rulers and territories. The Maya’s elaborate hieroglyphic writing system was developed, and a large trade network was established with other peoples such as the Zapotec in the distant Valley of Oaxaca in Southwestern Mexico, and with the inhabitants of the great site of Teotihuacan in Central Mexico. Jade, obsidian, salt and cacao were among
the main exports. Artworks depict rulers participating in such ritual scenes as bloodletting (Fig. 2), dance, and divine encounters. The Maya also developed a distinctive numbering system where long bars, stacked on top of each other, were multiples of 5, and round circles on top were multiples of 1. They even had a separate hieroglyph for zero, making them among the earliest to develop the concept. The number system was a base-20 (vigesimal) system, which meant that numbers in the second place value were 20 times the value of the number, which made it easier for them to construct numbers with larger values.

*Figure 2*

*Lintel 1 at Yaxchilan, showing a ruler performing a bloodletting ritual, in garments and headdress adorned with feathers (likely quetzal feathers). Source: Corpus of Maya Hieroglyphic inscriptions.*
By the time of the Late Classic period (A.D. 250-900), the lowland cities of Yaxchilan, Calakmul and Tikal were starting to decline, and highland cities in Yucatan including Uxmal, Chichen Itza and Kabah rose to power. At Chichen Itza in particular, the influence of the Toltecs, a Mesoamerican culture that flourished in Tula in southeastern Mexico, were ubiquitous, and the image of the feathered serpent deity (k’uk’ulcan) is more prominent there than elsewhere (Fig. 3).

Figure 3

*Carved heads of the serpent deity at Chichen Itza. Feathers are likely intended to be scales.*

The Maya were a literate people, and they used a special hieroglyphic writing system to record events on stelae, temple walls, and vessels. For many years, scholars struggled to figure out how to read it: the majority believed that it only consisted of word signs and dates. In 1952, a Soviet philologist named Yuri Knorosov discovered that the writing system of the Maya is
entirely phonetic, spelling out words in syllables. Tatiana Proskouriakoff also discovered that the
dating system ranged far wider than previously thought: individual stelae [freestanding stone
monuments] were carved sometimes with complete histories (Proskouriakoff 1960).

The astronomical beliefs of the Maya were highly advanced for the time, for they kept
records that accurately tracked the cycles of celestial bodies like the sun, moon, the planet
Venus, and even eclipses. This cyclical perspective also shows up in their calendar. The Maya
did not use just one calendar; rather, they had several “counts” of different lengths: one, called
the tzolkin, counts 260 days, and the 365-day version (the solar year) was called the haab’. The
Long Count calendar was the longest, identifying a date by counting the number of days that
have gone by since a certain creation date (corresponding to August 11, 3114 BCE according to
Thompson (1935)). The cyclical nature of this calendar is what led to the “December 21, 2012”
phenomenon: that was the calculated date where the Long Count calendar was scheduled to
restart; it did not predict the end of the world as some people believed. (Stuart 2011)

The Maya Environment

The natural environment the Maya lived in consisted of two main ecological settings: the
rainforested lowlands and the less extreme environment of the southern highlands. The
highlands consist of a chain of volcanoes (some extinct) that range from southeastern Chiapas, in
Mexico, down through Guatemala to the rest of Central America. Rainfall is fairly regular
(around 30-60 inches per year), though the rainy season technically lasts from May to November.
The soil of the highlands, due to its volcanic nature, is very rich and therefore optimal for the
cultivation of crops such as coffee. In contrast, the lowlands are flatter than the highlands.
Unlike in the highlands, there is little surface water, mostly occurring in cenotes and swamps.
The lowlands consist of the Yucatan peninsula in Mexico, Belize and northern Guatemala, where the majority of great Maya cities reside. The climate is hotter than in the highlands, but the rainy season is equally long; however, this is not as predictable or reliable and there is less rain overall. The lowlands may have had forest at some point, but the clearing of forests over thousands of years have turned the majority into a savanna. The soil is karst and not optimal for agriculture; even though agriculture continues to be practiced there, ranching is also a common practice.

Figure 4

A physical map of Guatemala. Source: Griscom 1932

As mentioned before, the major Maya centers of the lowlands all fell into decline and were abandoned between 800 and 900 A.D. The reasons for this collapse of ancient Maya civilization has long been one of the great mysteries in all of archaeology (Webster 2002).
Nobody knows exactly why or how this happened: excessive conflict, changing environmental conditions or overpopulation have been suggested by different scholars over the decades. However, much of the most recent research has emphasized the historical and scientific evidence of excessive drought as a reason for the large-scale abandonment of Maya cities (Gill 2000; Luzzadder-Beach, et. al., 2012). As a specific example, new research from Yok Balum cave in Belize shows evidence of severe drought conditions that may have triggered societal collapse (Kennett et al. 2012).

The effects of this drought were apparently most strongly felt in the central area of the Maya lowlands, in the area known as the Peten in northern Guatemala. This area has few rivers, and during the Preclassic and Classic periods it was far wetter than today, with many seasonal and permanent lakes. With so much water, the Peten was able to support extensive populations and urban areas, nearly all of which were abandoned by 900 A.D. Scientific evidence (Beach et al. 2006, Lentz et al. 2014, Gill 2000) from core samples of the soil shows that at the end of the Late Classic period, these water sources--mostly lakes--dried up and transformed into the low-lying forested areas now known as bajos (low areas). The bajos turn into almost impassable mud flats during the rainy season.

*Birds Reflect Environment*

This recent focus on environmental change is potentially very important for looking at the patterns of bird representations in ancient Maya artworks, most of which date to the end of the Classic period. As I will demonstrate, the majority (over 52%) of all natural (non-mythical) birds represented on Maya vase paintings are aquatic bird species, such as herons, egrets, cormorants, and so forth. Moreover, the majority of these images in turn (77%) were produced in
exactly the area where paleoecologists and archaeologists are now documenting severe drought and disappearance of water resources. 83% of the images of aquatic birds in the database date from the Late Classic Period, the time scientists give for the attested drought. I believe that what we are seeing in many of these vase depictions is probably a reflection of the drought, the changing environment of the time. This “ecological art” should be considered in the wider picture of evidence of environmental change that led up to the noted Maya "Collapse" in the ninth century A.D.

In addition, recent work by ornithologists at Cornell University has shown that there have been drastic reductions or disappearances of species from this area that used to be plentiful. Birds can be hunted to disappearance or they can be decimated by environmental change, or both. Knowing which species appear often in the art in early times, and how they are faring today in the Maya area, can potentially help others in their research.
Chapter 2

A Brief History of Related Research

Archaeo-ecology

One of the themes underlying the study of ancient bird imagery is a concept that might be called historical ecology (Yeakel et. al. 2014) or, perhaps better, “archaeo-ecology.” Normally the study of ancient environments and human impact has been done through a variety of scientific methods, for example paleo-botany, soil research, archaeological studies of diet and so on. The present study introduces a different aspect of this larger research on environmental change and human-nature interaction that focuses on the cultural perception and representation of nature and ecology.

Recently a similar method of employing ancient visual culture to discern patterns of environmental change has been employed in the study of ancient Egyptian ecology (Yeakel et al. 2014). Ancient Egyptian art depicts several animals that do not exist in Egypt today, such as lions, hartebeest, and even the giraffe. Egypt today is a desert country, with very little rainfall. However, in the late Pleistocene era, the landscape was different, with cooler climate and more frequent rainfall. According to Yeakel et al., desertification, beginning some time after the end of the African Humid Period (14,800-5,500 y B.P.) and coinciding with the first major human settlements in Egypt, seemed to have played a major role in the rise and fall of dynasties and kingdoms, including the falls of the Akkadian empire and the New Kingdom. The gradual worsening of the aridity led many species shown in Egyptian artworks to become locally extinct.

While the time-depth and species are different in the case of Maya artworks, the same general methodology used by Yeakel and his colleagues might also be applicable in looking at patterns of representation of the Maya natural world. At the very least we know from
sophisticated archaeological and environmental research (e.g. Gill 2000; Beach et al 2002, 2009, 2011; Medina-Elizade 2010; Denommee et al 2014) that the Maya area, especially the rainforested lowlands, underwent dramatic ecological and environmental transformations throughout their history, especially as a result of human settlement, agriculture and deforestation (this evidence will be discussed in detail later on). Recent work has shown beyond doubt using core sampling that the Maya lowlands was susceptible to repeated droughts that had major effects on the ancient human inhabitants of the region, especially in the central Peten region of the lowlands, near the famous archaeological sites of Tikal, Uaxactun, Naranjo and Xultun (Gill 2000). At Tikal in particular, the use of irrigation systems came with a price of over-reliance on annual rainfall and the landscape’s reduced resilience in the face of urbanization (Lentz et al. 2014).

I will argue that the focus on water, and especially water birds, in the art of the Late Classic period should be understood in the context of an ancient changing environment.

In many ways this project is related to the approaches to Maya art pioneered by Puleston and Schele in their early research in the 1970s. Their work, done separately, revealed new ways of discerning ecology and the environment through ancient art, linking common images of waterlilies, fish and aquatic birds to larger outside concepts and activities -- agricultural production in Puleston’s case (Puleston 1977), and rulership in Schele’s (Schele 1974). This ancient Maya concern with water imagery seems to have had its conceptual basis in the wetland ecology of the central Maya lowlands -- an environment that is far different and more arid today than it was fifteen centuries ago. The representation of birds was an important part of that water-world imagery that they defined. Later, Schele’s and Puleston’s work was expanded by Hellmuth (1987) and most recently by Finamore and Houston (2010).
This study must take into account some of the same agricultural aquatic themes that Puleston first considered. But this project emphasizes one particular subset of natural imagery, depictions of birds, trying to uncover the reasons behind their representation. There was little attempt in these earlier studies to discern particular species of birds in the art. To do so is a natural step forward, not just as a matter of art historical interest, but also in an environmental one.

It's fair to assume that the depiction of certain birds on objects and monuments should give some indication of the ancient environment in which the Maya artists lived. The realistic representations are tiny windows into the lost world of ancient Maya ecology, perhaps giving small clues about how the environment changed over time.

Bird Concepts of the Present-Day Maya

Life in the landscape of the lowland Maya rainforest is constantly accompanied by squawking from parrots, bellowing from howler monkeys, and the chirping and buzzing of insects. It could only have been more so in ancient times. Insects and jaguars present a constant danger. Heat and moisture attack the skin, clothes and housing. Karl Taube (2003) has argued that the ancient and contemporary Maya viewed the tropical forests they lived in as a land of darkness and disorder; a land where mysterious entities dwelt, as opposed to the harmony and order of the bound milpa (an agricultural farming plot planted with maize, beans and squash) which was the basis for Mesoamerican communities.

For instance, Taube claims the forest and its animal inhabitants disregard the boundaries set by the milpa, wandering with no direction. This type of aimless wandering is considered a great moral deficiency in general Mesoamerican thought, characterized by the ancient Aztec of
Mexico in the couplet “the way of the rabbit, the deer” (Burkhart 1986:113). Taube points out that the Maya were said to have feared the forest and to this day make offerings to the deities and spirits of the ancient peoples said to dwell within. The forest was sometimes seen as the gateway or even the embodiment of the underworld: Hanks (1990) has noted that the modern Yucatec Maya speak of passing through the forest as going “underneath” it. Forest spirits called “ways” were said to live there, in the bodies of birds like owls or animals such as the spider monkey, tapir, peccary, snake, or coati mundi (Houston and Stuart 1990; Grube and Nahm 1994). When you consider these beliefs, it’s important to remember that the Maya of the ancient lowland cities were more connected with nature than we are today, but they were still urbanites. They built roads through the forests and spent their time in city-focused activities or agriculture.

As I have observed myself on numerous visits, at night in the Peten jungle there are birds that sound out eerie calls, including owls, nightjars and potoos. Their sounds are so ever-present that it is easy to understand why so many birds have given rise to superstitious beliefs. Owls in particular are the subject of many legends by the modern Maya due to their perceived ability to abduct people (especially children) in the night (Hull & Fergus 2009). This aligns with ancient Aztec beliefs attributing omens to owls (Anderson & Dibble 1959-1982: Volume 5) Many superstitious beliefs on certain bird species are still shared among some groups of Maya today (Hull & Fergus 2009, 2011), including the belief among the Chontal in Tabasco, Mexico that the great-tailed grackle provides medicinal value, and that owls are in league with sorcerers. The Ch’ol of Chiapas (also in Mexico) believe that the squirrel-cuckoo (Piaya cayana) is a positive sign of approaching rain (ibid 2011). These beliefs are echoed in ancient times among the Aztec of Mesoamerica, who attributed many supernatural associations to several different types of
birds in the natural world as told in the Book of Omens in the Florentine Codex (Anderson & Dibble 1959-1982: Volume 5).

It is clear that the above are real birds credited with supernatural powers by the present-day Maya. So it makes sense that the ancient art would also depict, at times, real naturalistic birds in supernatural settings, perhaps doing supernatural things. This supports the idea that identifying these birds may be of use to scientific studies.
Chapter 3

Overview of the History of Ornithology in the Maya Area

Early History: The Florentine Codex

The earliest sources of information about birds in the Maya area are, of course, the ancient art and glyphs I have been looking at for this project.

As is generally known but also pointed out by Sharpe (2007), the next earliest source we have of information about birds in the Maya area comes from the mid-16th century. It is called the Florentine Codex and it was compiled from native accounts by a Spanish friar, Fray Bernardino de Sahagun. An English translation by A.J.O. Anderson and Charles Dibble of the original Aztec language documents is available in 13 volumes from the School of American Research (Anderson & Dibble 1950). Even though it is a work about the Aztec of Central Mexico, the Aztec were not only aware of many birds in the Maya lowlands, they had active trade with the Maya area for the feathers of such birds as the quetzal and the cotinga. Therefore, their indigenous descriptions of the birds are of interest to my current study.

The main parts of the Florentine Codex that are useful here are Book 5, “The Omens”, and Book 11, “Of Earthly Things”. Book 5, “The Omens” tells about different folk beliefs regarding different birds, which might give us hints about how these birds were regarded throughout Ancient Mesoamerica including the Ancient Maya. In a simple example, the hooting of the great horned owl was an omen of death.

Book 11, “Of Earthly Things” is an amazing list with colored drawings and descriptions of all kinds of natural items, including birds. Many of the birds I focus on in this paper are included here, and in some cases, the descriptions tell of areas where the birds used to live that they no longer do in modern times. The lovely cotinga, for instance, is described as inhabiting
the Valley of Mexico, and the Scarlet Macaw was said to have lived in Cuextlan [actual location unknown, likely somewhere in eastern Mexico].

The descriptions of some of the birds I have seen in Maya artworks have some interesting tidbits in the Florentine Codex. The anhinga (*Anhinga anhinga*) was regarded as the “heart of the water” (Book 11, Chapter 2, paragraph 3) and was described as rare. Hummingbirds, when eaten, were said to cure pustules (ibid., paragraph 1). The pelican was described as the “ruler, the leader of all the water birds” (ibid., paragraph 3) alongside the anhinga. The accompanying illustration might identify it as an American White Pelican (*Pelecanus erythrorhynchos*). A myth is described surrounding the pelican: if hunters have not successfully captured it within four days it will summon the wind to sink their boat.

The black vulture, a species common in Maya art and perhaps even more so in Guatemala today, is given a very brief description in this codex: “All its food is what has died—stinking, filthy.” (ibid., paragraph 4)

The great-tailed grackle (*Quiscalus mexicanus*), interestingly, is said not to have lived in central Mexico in ancient times. The codex states that the ruler Auitzotl commanded that the grackles be brought from the provinces of Cuextlan and Totonacapan [parts of eastern Mexico which include modern-day Puebla and a part of Veracruz], and that when they came to the Valley of Mexico, “they scattered, they traveled everywhere, they ate everywhere” (paragraph 4). This voracity combined with its aggressive temperament has caused the great-tailed grackle to invade settled areas throughout most of the midwestern United States, Mexico and Central America, in some areas rivaling the common city pigeon (the Rock Pigeon, *Columba livia*) in familiarity. Looking at its range, we can see it has spread as far as the Panama-Colombia border.
Early Identification: Molina’s Dictionary

If you can read Spanish or Nahuatl, another document by a Spanish Friar from the 1500’s, Alonso de Molina, gives brief descriptions and native names of types of birds in the form of dictionary entries. (Molina 1555-1571; 1992) He used a similar system to Sahagun, asking native people for information and turning it into a dictionary so the Friars could learn the Aztec language, Nahuatl. It is unclear how useful these are for this study. However there are interesting things to be found, such as the term “Aztayohua: henchirse algun lugar o arbol de garzas.” (Molina 1992: folio 10 Recto) The translation is: “for a place or a tree to be full of herons.”

Figure 5

Herons in tree. Photo Credit: J.R. Compton
Early 19th and Early 20th Century Trail-blazers

Interestingly, some of the greatest ornithological resources available today are from early explorers and categorizers who made it their life’s work to find and catalogue avian species.

From the years 1879–1915, the dedicated naturalists Osbert Salvin and Frederick Godman, as mentioned before, published an immense encyclopedia on the flora and fauna of Central America called *Biologia Centrali-Americana*, in a total of 63 volumes, based on their extensive work and years of travels. The information on birds in this encyclopedia still provides today an excellent insight on what bird species occur or have occurred in Central America, Guatemala in particular.

In 1932, the ornithologist Ludlow Griscom compiled a volume of information on birds in Guatemala specifically, sorting the birds by their range and also providing updated information on birds spoken of in Osbert and Salvin’s encyclopedia, including the ones I will talk about in Chapter 5. Up until the 2000's, less than three hundred bird species had been sighted in the field in all of Guatemala, and most of these birds were from Salvin and Godman's expeditions back in the 1800's. Unfortunately, the great Salvin and Godman included very few illustrations of birds in their works, and none showing aquatic birds; mostly passerines such as thrushes, finches, jays, and flycatchers--significantly harder to identify in Maya artworks (when they do appear).

By contrast, the work of Robert Ridgeway published in 1910 as part of a multi-volume work with Herbert Friedmann, “The Birds of North and Middle America: a descriptive catalogue of the higher groups, genera, species, and subspecies of birds known to occur in North America, from the Arctic lands to the Isthmus of Panama, the West Indies and other islands of the Caribbean sea, and the Galapagos Archipelago” is a detailed ornithological explanation of every
last detail about bird specimens collected in the area, including illustrations. I have excerpted the relevant bird details and included them as appendices to my current project.

These early catalogues are valuable not only for their complete level of detail. There is great value in knowing what the avian populations looked like after the ancient Maya exhausted the environment with urbanization and agriculture, but before modern logging, population growth and civil war made other permanent changes in the Maya area. We are lucky to have sources like these to compare to what we find in the ancient art. They provide an intermediate step between the ancient/colonial sources and modern observations of both birds and the environment, mentioned in the next sub-section.

**Recent Ornithological Work**

One of the most valuable and comprehensive modern sources available that I consulted is the work of Eisermann (Eisermann 2001a, Eisermann 2003a, Eisermann and Avendano 2004). His work also pointed me to the quarterly reports of Jones on birds in Central America which have been available since 2000. Jones works on monitoring species populations through bird counts and collecting data from bird observers with an eye to preservation and protection of species.

In addition, the work of the Ornithology Lab at Cornell University on bird populations in Guatemala (www.ebird.com) provided the missing link for my database work. By looking at the results of extensive bird counts done by observers they trained in the Peten area of ancient Maya settlement over the past 10 years (2005-15), I was able to narrow down some possible identifications of the birds I saw in the ancient art whose identifications I had previously been uncertain about. While I have confirmed the identification of such species as the Black Vulture,
Scarlet Macaw and Resplendent Quetzal, waterbird identifications are discussed further in chapter 7.
Chapter 4

The Stuart Database of Birds in Ancient Maya Art

The main focus of my research has been the comprehensive database of every available image of a bird I could find in ancient Maya art, which I have named The Stuart Database of Birds in Ancient Maya Art, or The Stuart Database, “SD”. (Appendix B) Even though I have included purely mythological depictions of birds in my database, I will not include them here since they are not relevant in an ornithological context.

In order to collect the maximum number of images, I used many sources, as found in the bibliography. I searched in books that accompanied museum exhibitions, in online databases (particularly the Kerr one), and I also consulted the Mesoamerica Center to search for additional images. During my recent trips to Guatemala, I photographed some vessels that weren’t included in any previous database that happened to be on display in museums (e.g. Stuart Database 99, 100).

Identification and Media

The vast majority of images I found were painted on vases. It’s a complicated question as to why.

Many vases in the Kerr database from which I took many of my examples, were preserved archaeologically inside tombs. The tombs were raided by looters, and the vases were then taken and sold on the global antiquities market. One museum in Guatemala City which I have visited, called the Museo Popol Vuh, from which many of the Kerr vases come, has displays consisting almost entirely of looted Maya pots. Justin Kerr photographed other vases from the collections of private owners in the U.S. and elsewhere.
The looters destroy archaeological context, but they preserve the vases well because that is how they make their money. Thus, the vases are both protected from weather and vegetation by their location in tombs, and then they are carefully preserved by the looters for the art market, which accounts for how many good examples I have found of this form.

By contrast, I found very few identifiable bird images on stelae (the standing stone tablets of the ancient Maya). Erosion of the stela images is a huge problem, because the stones were usually set up as public art outside buildings. After centuries of standing in the jungle under the weather and vegetation, details disappear. (See the Corpus of Maya Hieroglyphic Inscriptions for many examples in each volume.) In addition, there is a higher proportion of mythological birds found on stelae than on pots or vases. (See Figure 36) Why would that be?

The difficult stone carvings on stelae were often commissioned art for Maya rulers or temple elites (Stuart 2015). The carving was done by specialists, who were so prized for their skill that there are records of them being kidnapped from one city-state by another (Miller 2001). So the subjects of the art on stelae were more political or religious, having to do with important events in the lives of those who commissioned the art works, often put into mythological settings or witnessed by supernatural beings like K’uk’ulcan, the bird-snake, or the Principal Bird Deity [Itzamnaaj the creator god’s avian form]. There were also birds incorporated into the clothing and headdresses of monarchs, nobles and religious practitioners in these images, as seen for example in Figure 3. There isn’t a single instance of a simple depiction of nature for the pleasure of passers-by on an Ancient Maya stone stela, so the contexts of these birds on the stelae would tend to fall more into the realm of the mythological than the real.
Painted vases, by contrast, were often done by incredible artists but they were still less effort than chipping out a stela. Thus the subjects were more varied and included natural scenes as well as supernatural ones.

Paper images from the Classic Period have not survived, and the vast majority of the codices [folding books written on bark cloth] were burned by the Spanish during their conquest of the Maya. Only four are known to exist today, and their subjects range from divination, astrology and mythological subjects. Birds and other animals have been found in the codices, of which Tozzer and Allen did a comprehensive study in 1910. It is very likely that there were a number of wooden objects carved by the Maya which have not survived the jungle climate, as well as imagery painted upon boards, none of which are known to have survived.

The Maya were known to have painted murals as well, although very few survive to this day. The best-known examples are from the Late Classic site of Bonampak in Chiapas, Mexico, and the Preclassic site of San Bartolo in the northern Peten region of Guatemala. The latter has many images of birds which I have catalogued in my database (e.g. Stuart Database 6, 14, 67).

The Maya also managed to create objects made from jade. These were usually meant for decoration, mostly for masks, belts, and pendants. Flint was also used, mainly for weaponry. However, during the Classic period, several so-called “eccentric flints” were made for unknown purposes, likely ceremonial. These are carved in the forms of mythological concepts and deities.

Small ceramic figurines from Jaina Island off of Campeche, Mexico depict not only mythological deities, but scenes of daily life and of the elite. One is a whistle carved in the form of a quail, likely used for hunting (Stuart Database 50).
Chapter 5

Water Birds and Water Imagery

*Water Birds*

In my research I have discovered that no type of bird is more frequently found in Maya art than water birds (see table 1). Among these are cormorants (*Phalacrocoracidae*) and anhingas (images of the two are often difficult to distinguish due to their anatomical similarities), herons, egrets, and the white ibis (*Eudocimus albus*).

*Table 2*

![Graph of bird species by time and region. Most commonly occurring are aquatic birds during the Late Classic period.](image)

*Graph of bird species by time and region. Most commonly occurring are aquatic birds during the Late Classic period.*
Why this emphasis on water birds? Perhaps the Maya’s frequent artistic depictions of water birds may indicate a preoccupation with an unstable and crucial water supply. It is also clear that when there was more water in the lowland area to support water birds, they were more abundant. In addition, as pointed out by Brian Schultz (personal communication 2015) birds on open water are easier to see than birds who hide in the forest canopy and who can often only be located and identified by the sounds they make. This alone would be a logical reason to depict them more in the art.

Aquatic Bird Patterns in The Stuart Database

What water birds specifically occur in Maya art? Most commonly occurring are birds in the shape of cormorants and anhingas, as well as ones that resemble wading birds such as egrets and herons (see table 1). Do these same aquatic birds I identified commonly occur in the Peten area today? To answer this question I gathered data of sightings on eBird.com recorded over the past 10 years (2005-2015) of these birds.

These modern-day observations have yielded some striking results: out of the birds I have seen in the artwork, a total of 2457 Neotropic Cormorants (*Phalacrocorax brasilianus*) were sighted in the Peten area. The total number of Great Egrets (*Ardea alba*) was 658, and that of Great Blue Herons (*A. herodias*) was 272. Unexpectedly, only 182 anhingas were recorded, and only 1 white ibis was ever seen. To my surprise, I found that no scarlet macaws or quetzals were ever sighted in Peten over the last 10 years! No American White Pelicans were found either, although the total of Brown Pelicans numbered 71. This contrasts sharply with their abundance
in Maya artworks, showing that they have indeed become locally extinct in the area. As I will explain further on, their habitats have become more restricted.

Another surprising result of my data findings was the fact that the most sightings of the cormorants, anhingas and other waterbirds were not at Tikal or any other Maya city, but around Lake Peten. This might give us a clue to the existence of large bodies of water similar in size and scope to Lake Peten in the past, around where the ancient Maya cities were. These lakes would have been optimal habitats for cormorants, anhingas, white ibises, herons and any bird found around the area--all destroyed by the environmental degradation that occurred before the Maya collapse. It is fortunate that these waterbirds are not extinct.

I have found other birds which appear to be aquatic, but I cannot confirm any specific identifications for them, mostly due to preservation issues, or lack of detail and color in the art.

Cormorants (family Phalacrocoracidae) are in general medium to large-sized coastal sea birds, however, a certain type of cormorant called the Neotropic (P. brasilianus) occurs inland. They prey on fish, frequently diving underwater to catch them. After they finish going underwater, they roost ashore and spread their wings out to dry. Birds resembling cormorants are the ones I have most frequently encountered in Maya art so far, with the vast majority of the birds on painted vases, sculptures and wall carvings containing often wild and unearthly representations of cormorants, judging by a hooked beak in most cases. Cormorants, specifically the Neotropic, were the most commonly encountered waterbird I saw during my recent observations at Peten.

The Anhinga (Anhinga anhinga) is a large, cormorant-like bird with a snake-shaped neck and a long, thin bill. Despite its cormorant-like appearance, it is a member of the darter family, differing from cormorants in that it can swim with its neck well out of the water, which
resembles a snake from a distance, hence the nickname “snake bird”. It feeds on fish by spearing them with its bill, then tossing them into its mouth. The anhinga also does not dwell on coasts; instead, it is located inland in shallow warm waters. This fact raises a question: could the Maya, who rarely settled on the coasts, have meant the cormorant-like birds they drew to be Anhingas? This is possible, since Anhingas can also dive underwater, and they also have much longer feathers—especially in the tail—than cormorants, which might form the basis for the “shaggy” appearance in some artworks (e.g. SD #51, 60). The Maya never showed landscapes surrounding these birds, and most of the vessels with cormorants/anhingas on them were also looted, so without knowing if the site of origin was on the coast or inland, it may not be possible to know precisely.

Figure 6

*A neotropic cormorant. Source: birds.audubon.org*
**Figure 7**

A male anhinga. Note the longer tail, the S-shaped neck and more slender bill. Source: birds.audubon.org

**Figure 8**

An example of the many cormorant/anhinga-style water birds appearing on many vessels and carvings. Source: SD #10
A common representation of these cormorant/anhinga-like water birds is in a row. Source: SD #164

White Ibis

The White Ibis is a small wading bird found on Atlantic coasts down from North Carolina to Central America. It also is known to reside in marshes and shallow pools well inland from the coasts -- environments that would have been fairly common in certain areas of the central Maya lowlands. A common species, it has white plumage, a scarlet face and bill, and dark markings on the wing feathers. All of these diagnostic features can be seen on SD#156 (Fig. 11). What special significance the ibis might have held for the Maya is unknown, although it may have been seen as a supernatural intermediary and possibly as a food source.
Long-legged wading birds such as herons and ibises make an appearance in Maya artworks. In the Kerr Archive, the image K4358 (Fig. 11, also SD #156) shows an accurately represented White Ibis (*Eudocimus albus*), a rarity since Mayan artists usually took creative liberties with their bird drawings, rendering precise identification difficult or impossible. Birds resembling the White Ibis are also shown in other images (SD# 91, SD #139).

As one can see in Figure 12, there is an unmistakable representation of a White Ibis on the lower left. The vessel is in the style of others from the Late Classic period in the central Peten (Tikal region), and shows a mythological scene that is difficult to interpret, but according to David Stuart, it includes an image of the Maize God as well as the merchant god Ek Chuah,
paddling in a canoe. The ibis is located directly in front of the canoe, where it helps to show that the canoe is oceangoing.

Muscovy Duck

Figure 12

An image of a Muscovy Duck’s head for a lid handle atop a cosmos-themed bowl. Photograph from “The Fiery Pool” (Houston and Finamore 2010)

The Muscovy Duck (Cairina moschata) is a large black and white duck with a small bill and wattles around its face. Originally native to Mexico, Central and South America (no association with Russia despite its name), it has been domesticated for centuries, even in pre-Columbian times, due to its tasty meat. It has even been introduced to parts of the US, particularly Florida, as a game bird. Subsequent local population expansion in Florida has
rendered it a pest in the state. Domestic variants are more variable in plumage than the wild version, although among both domestic and wild this varies with each individual.

One particular vessel from Tikal (Fig. 12) represents the cosmos: the sky by a bird (on top of the lid), the earth by a turtle which makes up the vessel’s body, and the waters by a painted wavy pattern bordering the turtle’s “shell”. The bird has been suggested by Houston & Finamore (2010) to be a limpkin (*Aramus guarauna*). The limpkin is a swamp-dwelling wading bird resembling a large rail, but is anatomically closer to cranes. Though the limpkin is found in Maya lands, the colors and the beak shape of the bird on the pot’s lid do not correspond to that of the limpkin. The beak here is not a curving line like a limpkin’s, but short and knobbed on both ends with black and orange colors. The plumage is also plain, uniform blackish-brown, and not streaked like on a limpkin. However, the wild form of the Muscovy Duck (Fig. 13) has these very features, making it clear that the limpkin identification should be discarded in favor of the Muscovy Duck.

*Figure 13*

*A wild Muscovy Duck. Source: zoochat.com*
Pelicans (family Pelecanidae) are unmistakable birds found in aquatic environments, easy to distinguish by their unusual appearance, with a disproportionately long, pouched bill used for scooping up fish to eat. There are two species of pelican found in modern Mesoamerica: the Brown Pelican (Pelecanus occidentalis) and the American White Pelican (P. erythrorhynchos). The Brown is a seashore dweller, distinguished by its brown plumage and its feeding habits: it dives into the water from up high in the air to capture the fish it eats. The White, on the other hand, dwells inland during the breeding season, and is occasionally seen on coasts during the winter. Unlike the brown pelican, it does not dive underwater.

Images of pelicans are rare in Maya artworks, but one notable example appears as a three-dimensional sculpture (Fig. 14) discovered at the ruins of Comalcalco, Tabasco (Finamore and Houston 2010: 56). This is a plaster representation far larger than life size, almost surely some sort of architectural decoration. Many of the temples and palaces of Comalcalco were adorned with complex scenes in relief and three dimensional sculpture, and it is probable that this was a part of a larger naturalistic representation of sea life. I have noticed first-hand that Brown Pelicans are extremely common on the gulf coast of Campeche and Tabasco, just a short distance from the inland site of Comalcalco, where they skirt the coastline in search of food. Brown Pelicans would never venture inland as far as Comalcalco. Without surviving paint on the sculpture, I can’t say whether SD#2 is a migrating White Pelican that could have been seen at the site, or a Brown Pelican seen by the artist at the coast and sculpted here.
A pelican sculpture from Comalcalco, Mexico. Source: Houston & Finamore 2010 (SD#2)

One vase image (Fig. 15) in the Kerr Archive, K9111 (SD#47), shows a white bird with a long beak, a curved neck and large wings. The body suggests a white pelican, although due to white in several cases being a faded color on other vases, it is hard to confirm.
On one Late Classic vessel (ca. 750 A.D.) from northern Guatemala (Fig. 16), a long-legged pink wading bird is shown with a deity, likely God N (an earth deity), emerging from its chest. This bird depiction was mentioned by Houston and Finamore in *The Fiery Pool* (Houston and Finamore 2010:104) and was also mentioned by Reents-Budet (1994:244-51). Glyphs resembling *pet* (“island”) are shown in a pattern of small and large circles, signifying water. Houston and Finamore state that this bird is a cormorant judging by the “consistent treatment” of waterbirds in Maya art, but this bird is not a cormorant due to its pink coloration, which originally led me to believe that it might be a Roseate Spoonbill (*Ajaia ajaja*). This bizarre-looking species is a wading bird which has a garish pink body, a white head and neck, and a long, spoon-shaped bill which it uses to “shovel” and scoop small food items from the coastal waters in which it dwells. It is found in tropical America, including the coasts of the Yucatan Peninsula and extreme southern Guatemala. However, looking closer at the vase, the bird shown is lacking the spoonbill’s telltale spoon-shaped bill, nor is there any white on the head and neck--
the pink coloration is present all over the bird, and not only on the lower body. These characteristics disqualify it from being a spoonbill.

However, there is another candidate, currently not found in Guatemala, but in the upper Yucatan peninsula of Mexico: the American Flamingo (*Phoenicopterus ruber*). This species feeds similarly to the spoonbill, scooping food from the ocean or pond floor. Unlike spoonbills, flamingos are highly sensitive to disturbance, which might be a clue that there were far more around in ancient times prior to environmental degradation and loss of water habitat.

I therefore propose this depiction may possibly be a flamingo. If so, then this is either evidence that flamingos had a much wider range in ancient Maya times, or I can’t rule out the possibility that the Maya who made this depiction had simply seen the flamingo in a different area and decided to depict it for whatever reason.

If there were in fact flamingos in this area in ancient Maya times, then whatever major climate change events occurred after the Late Classic period that exacerbated the Maya’s decline may have also decimated the flamingo population of lower Mesoamerica. Perhaps during colonial times, as the human population grew and habitats were destroyed, the decimation of the flamingo in the region accelerated. This could be confirmed by the lack of any recent flamingo sightings in Guatemala in the Cornell database (ebird.com). Even Osbert and Salvin (vol. 3, pg. 196) never saw flamingoes in Guatemala, only on the northern coast of Yucatan in Mexico--and this was in the 1800s, which might imply these birds vanished from the region shortly after the Maya collapsed, though they could have disappeared for other reasons since the time of the Collapse.
A vessel showing a pink bird, possibly a flamingo. Source: Houston & Finamore 2010 (SD#4)
Unidentified passerines at San Bartolo

San Bartolo is a Preclassic Maya site in the Peten area, northeast of the Tikal site. In 2001, a team led by William Saturno of the Peabody Museum of Archaeology and Ethnology, discovered murals in one of the pyramids dating back to as early as 100 B.C., making them the oldest known.

On a section of the west wall of these murals, there is a drawing of two gray birds with yellow legs flying around (Fig. 17). They appear to be passerines with large bodies. The large size and the gray color raises the possibility that these are American Dippers (*Cinclus mexicanus*).

Figure 17

Two as-yet-unidentifiable gray birds from the San Bartolo murals.  
*From digital scan by William Saturno, Proyecto Arqueologico San Bartolo-Xultun.*
This is a stocky, dark gray songbird that has unique feeding habits: it is aquatic, unusual for a songbird, having the ability to dive (and even walk) underwater in streams to feed on insects. It is so named because while it feeds, it dips its head into the water multiple times. It has white feathers around its eyes, which might correspond to the white eye-rings on the birds in the murals. It is found primarily in western North America and parts of northern Mexico, but has a very local range in Mesoamerica, occurring only in mountainous areas such as southwestern Guatemala. An indicator species, it only occurs near unpolluted rushing waters, so it does not adapt well to environmental change. It is also a nonmigratory species, although sometimes it flies to unfrozen rivers in winter.

Although the birds shown are indeed large and gray, it is uncertain as to whether they are dippers or not; seeing as the design is stylized and the size is unusually large for a perching bird, larger than even the dipper itself. If the birds in the mural are dippers, could the fact that they are not currently found in the north of Guatemala, be a result of the extended droughts that might have influenced the decline of ancient Maya civilization? This is a possibility, since dippers are only found in the southern highlands nowadays, where there are plenty of mountain streams.

Given that the San Bartolo mural depicts these two birds flying around someone in a court scene, it might also be that these birds were captured from elsewhere, and taken to to the ruler of this court, as gifts.
Owls in the Stuart Database

Tozzer and Allen (1910) have identified some owl depictions, some of which represent the great horned owl, some of which are highly conventionalized, including a stucco ornament at House E at Palenque, House C at Tikal, and at the Temple of the Sun at Palenque. The aforementioned Madrid Codex appearance is the only instance of a horned owl found in the codices. They also argue that the great horned owl is not the mysterious moan (or muan) bird associated with death among the Maya, but the tropical screech-owl (Megascops choliba), which appears alongside God A in the codices.

One particularly compelling image of a mythological kuy owl comes from a vase (SD#120, fig. 17) where it is shown as a way demon, flying above the scene with other monstrous creatures. It wears a coiled snake around its neck, and has distinctive mottled markings on its feathers characteristic of owls. According to David Stuart, rather than being described as a particular type of owl, its label simply reads as ku-yu, perhaps indicating that simply being a kuy owl is enough to warrant a demonic status. Owls are problematic creatures in modern Maya lore, due to their obvious connections to the night-world and, by extension, the underworld. For example, Hull and Fergus (2009:27) have documented the belief among the Mopan Maya of Belize that if the Vermiculated Screech-Owl (Megascops vermiculatus) cries, children living nearby will perish.
Figure 17

A mythological owl (kuy) from vase K1211. Photograph by Justin Kerr (SD#120)

Other vases in the Kerr Archive (K4012 / SD#153, K4857 / SD#169), K8797 / SD#20) feature owls either at the very bottom of the picture, facing toward the viewer with a sinister look, or even behind someone’s back as if waiting for the person to die.

In the Popol Vuh, owls serve as servants and messengers for the rulers of the underworld. They are the ones who summon One Hunahpu and Seven Hunahpu to Xibalba, where they are sacrificed. This scene is quite common on vases (e.g. Coe 1973:92), although no owls are shown in this example.

Two words for owls are known from the hieroglyphic sources. One is ikim, written as the hieroglyph i-ki on page 95c of the Madrid Codex, directly above a representation of a great
horned owl (*Bubo virginianus*). The Ch’olan-Tzeltalan form of this word is *ichim*, although as yet no known hieroglyphs corresponding to this particular word have been identified. In historical and modern languages, *ichim* seems to be the common word for horned owl (Laughlin 1988). The other word for owl is *kuy*, which is attested in some personal names with the spelling *ku-yu*.

*Macaws (mo’)*

Among the largest parrots in the world, scarlet macaws (*Ara macao*) are fairly easy to discern in Maya art. The shape of the beak is distinctive, as is the overall form of the head, which often is shown tapering upward toward the top of the upper beak. Artists gave special attention to the bare skin on the macaw’s face, usually through the convention of a circle of dots around the eye. In painted representations their red coloring is hard to miss, as is the large size relative to other birds.

Unlike quetzals, which live in the cloud forests of the highlands, macaws are native to the tropical lowlands where Maya civilization was most concentrated. They must have been seen and heard by many in ancient times, in those areas where the forest was preserved. Macaws nest in the holes of tree trunks, and therefore require a pristine habitat in order to mate and raise their offspring. It is likely too that macaws were domesticated among ancient Mesoamerican cultures and even beyond, since macaw feathers and bones have been found as far north as the American southwest, at Anasazi sites, where they were ultimately traded from the tropical regions to the south (Minnis et al 1993). As with the quetzal, the macaw’s feathers were used as tribute, a
practice also used by the Aztecs. Thus it is likely that along with the quetzals, the macaws in this area were reduced in population over time.

Their status in Maya society was sacred: the Popol Vuh tells of the deity Seven Macaw, who considered himself the first great light in the world before the sun and moon existed. The macaw’s sky-blue wings and tail along with its bright red body might have been the basis for this myth. In Kerr’s database there exists an image (K5043) depicting the Hero Twins bringing offerings to a Scarlet Macaw, perhaps representing Seven Macaw. At the main ball court in Copan, several stone heads of the Scarlet Macaw are lined along the walls.

The Scarlet Macaw appears on several bowls and vases as well. The Kerr image 5043 (Fig. 18, SD #175) depicts a macaw headdress being used in a ceremony. In another Early Classic representation from the site of Balamku in Campeche, Mexico, a vivid image of a scarlet macaw adorns the exterior of a vessel, and it includes some unusual abstracted renderings of the body shape and feathers (SD #61, fig. 19).
**Figure 18**

Ceremonial offerings being given to the moon goddess, including a scarlet macaw (upper left).

*Photograph by Justin Kerr. Source: Kerr Archive (SD#175)*

**Figure 19**

An Early Classic (ca. 450 A.D.) bowl from the Balamku site. Source: Bridgeman Images, JPC452759 (SD #61)
Macaws live in high forest regions, making their nests in the hollow cavities of large tree trunks. They are therefore especially susceptible to population decline due to deforestation, poaching and the pet trade. Today, in fact, the Scarlet Macaw is a threatened species in some areas, including northern Guatemala. The aforementioned factors in their decline have virtually eradicated it from the Yucatan Peninsula and most of Guatemala, and it is therefore more common further south in Central America in countries such as Costa Rica. In fact, research from the Cornell University Lab of Ornithology from over the past 10 years in the Peten area (2005-2015) reported no macaw sightings whatsoever (www.ebird.com). Not even Osbert and Salvin sighted any in Peten (vol. 2, pg. 565); their sightings of the scarlet macaw in Guatemala were limited to the southern region of the country.

Other Parrots

A large parrot is depicted in the frescoes recently discovered at the site of Chilonche, Guatemala (Figure 20). It is shown in a somewhat confused arrangement of people, possibly perched next to a man who looks over his shoulder towards it. The coloration is blue with green tinting around the neck and chest area. The large size and blue and green coloration suggest to
me that it may be a military macaw (*Ara militaris*), the only macaw species native to Central America besides the scarlet macaw.  

---

*A supposed military macaw on a vessel from Chilonche, Guatemala. Source: Mesoamerica Center, UT-Austin (SD#65)*

One remarkably realistic representation of a parrot comes from a relief panel attributed to the site of Jonuta, Tabasco, but probably comes originally from the ruins of Palenque.

---

1 It should be noted that in their work “Animal Figures in the Maya Codices” (1910), Alfred Tozzer and Glover Allen misidentified *A. militaris* as a “blue macaw”. This may prove confusing as the more familiar blue-and-gold macaw (*A. ararauna*), also known colloquially as the “blue macaw”, is exclusive to South America. (Peter Stuart unpublished paper: Review of Tozzer and Allen (2013))
(Figure 21). It appears in a strange context, seemingly attached to the back of the head of a bearded man who was once (on the original full tablet) kneeling at the feet of a standing ruler. His identity is unknown. Due to its unusual position, it may be that the parrot is some sort of symbol or identifying device, but it is difficult to know. The lack of coloration in this representation also inhibits our ability to identify what type of parrot is being shown, but it should be noted that the bird is fairly large.
A Jonuta panel of a kneeling man with a parrot on his back. From the archives at the Mesoamerica Center, UT Austin.
Hummingbirds

Hummingbirds (family *Trochilidae*) need no introduction -- they are the smallest and among the most colorful birds in the natural world. They dart rapidly in the air feeding on nectar from flowers, hovering with the most rapid wingbeat in the bird world. There are an enormous variety of hummingbirds in tropical America, many of which have very similar plumage to each other. Due to this, and the fact that they move very fast and have no audible voices, it is very difficult to identify hummingbirds by species from a distance. Compounding the difficulty is the iridescent markings many species have, the identifying color of which can be only seen from an angle.

The word for hummingbird in nearly all Mayan languages is *tz'unun*. Its hieroglyph is a phonetic spelling of the word (*tz'u-nu*), known from a few examples on pottery vessels and stone inscriptions (Figure 22), where it refers to mythological creatures or to parts of personal names. In the art, hummingbirds are consistently depicted with a characteristic long narrow beak that runs through a flower hieroglyph (*nik*) (Figure 23). A rarely encountered logogram of *tz'unun* also exists.
Figure 22

The hieroglyph tz’unun ("hummingbird").

Figure 23

A humanoid hummingbird taking blood from a lord. Note the flower on the beak.

Source: Kerr Archive (SD #194)
Stone and Zender (2011: 209) have shown that the hummingbird is often depicted in mythological scenes alongside the creator deity Itzamnaaj, where he is seen bringing gifts to him. On the famous Hummingbird Vase at Tikal (Fig. 24), for example, an anthropomorphic hummingbird kneels in front of Itzamnaaj, and the glyphs tell some dialogue: “it [the gift, a jar of maize] is in front of you, my lord, said the hummingbird to Itzamnaaj.” A hummingbird also appears with both Itzamnaaj and Yax Baluun on page 7b of the Dresden codex. Perhaps the hummingbird was a messenger, with its role being the antithesis of the owl (see above): one of possible benevolence.

Figure 24

A rollout image of a vase from Burial 196 at Tikal. A hummingbird messenger speaks to the creator deity Itzamnaaj. Source: Kerr Archive (line drawing is SD#79)
The hummingbird may also have served as a symbol of procreation and sex, according to research done by Oswaldo Chinchilla Mazariegos (2010). Many works of Maya art show the recurring Mesoamerican myth of a guarded maiden being impregnated by a god in disguise, against the will of her parents. The maiden is commonly shown as a weaver, a traditional symbol of femininity in Mesoamerica. Generally, the myths tell of a god entering the maiden’s enclosure in the guise of an insect, or most prominently, a hummingbird--and piercing her, thereby impregnating her and setting forth a cycle of creation, resulting in such entities as the sun and the moon (Mazariegos 2010:46). Many variations of this myth exist between different Maya groups, and this myth was also told amongst other peoples--Aztec mythology has instances of prodigious impregnations, of which the sun god, Huitzilopochtli, was said to be a result (ibid:55).

*Turkeys (ak’ach)*

Another frequently appearing species of bird is the Ocellated Turkey (*Meleagris ocellata*), a species long hunted for food by the Maya even in modern times, which has contributed to its status as a near-threatened species today. Its plumage is striking, with a bare blue head, iridescent spotted tail feathers, and small orange bumps on its head. These bumps are the main identification feature for the turkey in Maya artworks. Many cooking pots and bowls carved in its image are known to exist (Figures 25, 126). Folklore scenes on vases often depict turkeys in demonic form alongside other animals (K1001, K1342, K2010).
Figure 25

An Ocellated Turkey (right) and a peccary (left). Source: Kerr Archive (SD#113)

Figure 26

Ocellated Turkey at right, with a monkey on the left. Source: Kerr Archive (SD #135)

Strangely enough, the Ocellated Turkey was not the only turkey the Maya were known to have domesticated: the oldest evidence of turkey domestication are bones of the Mexican Turkey (*M. gallopavo gallopavo*) found at El Mirador in 2012. It is unknown as to why the Mexican
Turkey has not been depicted in Maya art: does the Ocellated Turkey hold a more spiritual significance? Since it is not found locally in Mesoamerica, it may have been only used for trade.

In Maya writing we find spellings for two different words for “turkey”: *kutz*, and *ak’ach*. *Kutz* is a widespread lowland word for turkey, found throughout Yukatekan languages and also in Ch’orti’ and Tzeltal (there as *kotz*). Yuri Knorosov famously cited important examples of the *ku-tzu* spelling in connection with pictures of turkeys to support his case for syllabic writing. However, we know of no examples of the word outside of the Dresden and Madrid codices; to our knowledge no examples of *kutz* or a cognate form for “turkey” appear in the Classic inscriptions.

*Ak’ach* exists in several Mayan languages, including proto-Ch’olan, as a word for “turkey hen.” In this capacity it can occur as gender specific counterpart to *ajtz”, (“male turkey”), but such distinctions often seem to get lost, depending on the particular language. In some instances (in Ch’ol, for example) *ak’ach* seems a more generic word or “turkey,” roughly equivalent to Yukatekan *kutz*.

Two instances of *ak’ach* are known from the hieroglyphs. One occurs in the personal name of a child mentioned in the inscriptions of La Corona. Stuart (in Kerr, 1994) noted that references to this child included a turkey sign that in one case is substituted by the sequence *a-k’a*-“REPTILE.” The last sign may well be a rare variant of the syllable cha or chi, producing a direct substitution of the syllabic sequence a-k’a cha? by a logogram reading *AK’ACH*. The full name of the La Corona child was Chak Ak’ach Yuk. The combination a-k’a also appears
with turkeys depicted on some Maya vases, included depictions of male turkeys who are way beings. This would suggest that ak’ach was indeed applicable to Ocellated turkeys in general, not only females.

Given patterns in both the hieroglyphic sources and in the languages today, we suspect that ak’ach was the likely Classic Mayan term, equivalent to Yukatekan kutz. One was used in the earlier inscriptions of the southern lowlands, whereas kutz was restricted in its usage to the area where Yukatek was spoken.

**Vultures**

There are two species of vulture in Mesoamerica: the Black Vulture (*Coragyps atratus*) and the King Vulture (*Sarcoramphus papa*). Both species are present in Maya artworks, and both species also have different facial features: the King Vulture has a short beak with a large wattle at the beginning, round pale eyes, and two separate wattles on its cheeks. Its body is primarily white, except for its wings, which are black. The Black Vulture is entirely black except for a whitish hue on its wingtips, with a gray bare head and a long hooked beak. This near-uniformity in color makes the Black Vulture harder to distinguish despite its difference in beak shape, however, on Structure 1 at San Bartolo, there is a clear image of one identifiable by these features. Tozzer and Allen (1910) have identified King Vultures in the Dresden and Madrid codices being depicted as deities. They also argue that the Black Vulture, though difficult to
ascertain in drawing, is at best a symbol of death and destruction judging by its depictions as a foe to the harvest and as a bird of prey in the codices.

Vultures are surprisingly common in Maya hieroglyphic writing. They appear in two forms: (1) in writing the syllable ti (often corresponding to a preposition ti, meaning “in, at on, for,” etc.), and (2) in the writing of the title ajaw, “lord, ruler, noble” (Figure 27).

Figure 27

![Vultures in the form of the ti and ajaw glyphs.](image)

In 2014 an extraordinary inscribed vessel was excavated at the site of Caracol, Belize. The black-ware pot dates to the Early Classic period, perhaps to about 400-450 A.D., and is inscribed with some of the most elaborate hieroglyphs of that period. One of them features a full-figure vulture image. Here it stands for the syllable k’i in the spelling yu-k’i-bi, for y-uk’ib, “his drinking cup.” The usage of the full vulture is unique, for otherwise the k’i syllable is spelled with two wings spread out to the sides, or in later examples, as a single wing.
Quetzal (k’uk’)

A member of the trogon (Trogonidae) family, the Resplendent Quetzal (Pharomachrus mocinno), Mayan name k’uk’, was among the most important birds in the Maya world. The male is a bright emerald-green color with a scarlet chest, and two long tail coverts. These tail coverts were in such high demand that this bird’s plumage was exacted in tribute from conquered or subordinate lands (Reents-Budet 2001(212), Coe & Kerr 1998). According to Anawalt and Berdan (1997), trade in quetzal and macaw feathers attracted military incursions into the Maya area from outsiders like the Mexica, who wished to gain more of the feathers for themselves.

The Central Mexican Codex Mendoza, a document written by Aztec native peoples under the direction of Spanish priests in the mid-1500’s (but covering historical periods from as early as the 1300’s) illustrates an almost unbelievable amount of tribute in feathers. The province of Tochtepec alone delivered an annual tribute including “eighty bundles of prized quetzal feathers...four bundles of green and yellow feathers...8,000 little bundles of red feathers; and 8,000 little bundles of green feathers...identified as feathers of the lovely cotinga, scarlet macaw, and green or Pacific parakeet.” (Anawalt & Berdan 1997, II: 114) Trade in feathers initiated by the Central Mexicans is documented as far south as the Pacific Coast of Guatemala in the Maya area and probably extended even to the other coast (Berdan 2006). With numbers and scope like this, it’s no wonder the quetzal, the lovely cotinga and other birds hunted for their plumage have long since become rare or on the verge of extinction.
Why so much demand for quetzal feathers? We know that among the ancient Aztec, the feathers were used in special clothing, warrior garb, banners, headdresses, hair ornaments, cloaks, and even sandals. The feathers had similar uses among the ancient Maya. In Maya art, they often appear on the headdresses of rulers and gods (see Figure 2).

It is likely that the quetzal feathers of royal headdresses were used to symbolically evoke the great bird of Maya mythology, the so-called Principal Bird Deity\(^2\) – a fusion of many large and visually striking birds of the tropical region. Thus rulers used quetzal plumage as a symbol of divinity and power. In fact, the long tail feathers were a pervasive feature of kingly attire. Nearly all formal representations of kings and elites show elaborate headdresses with scores of long tail feathers, which clearly had to have been culled from numerous individual birds. We see this in some of the earliest representations of Maya kings in the Pre-Classic period and up to the time of the Spanish conquest. Tecun Uman, the last Kʼicheʼ Maya ruler who was slain by conquistador Pedro de Alvarado, wore quetzal feathers in his garb which Alvarado admired. To this day the legacy of the quetzal carries on through its recognized status as the national bird of Guatemala. The fact that quetzal feathers were so valuable, they were even used as currency in ancient times, is reflected in the fact that the basic unit of modern Guatemalan currency is called the “quetzal”.

The importance of quetzals went far beyond the Maya region. Elites from other Mesoamerican cultures used them as well, as the tribute documents of the later Aztecs made

\(^2\) In a mythological context, this was the avian form of the creator deity Itzamnaaj.
clear. In the Codex Mendoza, Additionally, the “feathered serpent” deity, occurring with several variants in Aztec, Maya and Teotihuacano civilization, may have been based upon myths created around the quetzal (though it has often been translated as “feathered serpent”, the Aztec god Quetzalcoatl’s name translates literally to “quetzal in the form of a snake”). Quetzal feathers figure prominently in the *Codex Mendoza* and the *Matricula de Tributos*.

Sadly, though not surprisingly, the quetzal is today a threatened species, no longer found in much of its former range, which may have included Mexico—in fact, according to the Florentine Codex, Book 11 (“Earthly Things”), quetzals were found as far north as Tecolotlan (now part of Jalisco) in west-central Mexico. As with the macaw, we suspect that the quetzals must have suffered major population declines in both modern and ancient times due to being hunted for its beauty.

In Maya art there are numerous quetzal representations (Figure 28). The most diagnostic feature of quetzals are of course the very long flowing tail feathers. Their beaks are generally short, and they show a large fluffy crest atop their heads. In the art this is shown as a crest pointing slightly forward toward the top of the beak.
The ancient Maya often depicted quetzals together with the other major colorful long-tailed bird species of the region, the scarlet macaw. The two are literally intertwined in some representations, most famously in the “crest” of the famous Copan ruler K’inich Yax K’uk Mo’ as depicted on the relief sculpture of his burial pyramid (Figure 29). It would seem that the Maya grouped these long-tailed birds together conceptually as well as visually. Both species were large forest-dwellers and of great economic importance as sources of divine status and prestige.
The crest of K’inich Yax K’uk Mo’, a ruler of Copan. From his burial pyramid, the Margarita temple at Copan, Honduras. A photograph can be seen in SD# 13.

Grackle

The Great-tailed Grackle (*Quiscalus mexicanus*) is one of the most commonly seen suburban birds in modern Mesoamerica. An intelligent and omnivorous species, it has adapted readily to human habitation. The male has iridescent purplish-black plumage and yellow eyes, whereas the female is brown with orange eyes; both share a mechanical, raspy, buzzing voice. It is currently found through most of Mexico and Central America, most of the southern Midwestern United States, and extends down into Colombia, where it is said to be expanding its range.
Two likely grackle images are known from ancient Maya art. One comes from an effigy vessel in the collections of the Denver Art Museum (Denver Art Museum 2005:208-09) (Fig. 30). The hieroglyph on the back of the head of the bird (Fig. 24) provided the name of the vessel, and reads **BAAK-la mu-ti**. This surely corresponds to the term *baakal muut*, “grackle” that survives in the Mayan languages of highland Chiapas, Tzotzil and Tzeltal. The effigy vessel is a shiny black-ware ceramic dating to the Early Classic period. Its surface may have been designed to evoke the shiny black feathers of a male great-tailed grackle. The fact that it is a drinking vessel might also be referencing the Great-tailed Grackle’s fondness for wet areas and low tolerance for dry seasons.

*Figure 30*

*A drinking vessel in the form of a grackle. Source: Reents-Budet 2001*
On the back of the head the glyphs read “BAAK-la-mu-ti”, corresponding to baakal muut, “grackle” in some Mayan languages. Source: Reents-Budet 2001

Another possible grackle image is found on a painted vase from the Late Classic period, represented in a more naturalistic way, with its head pointed upward and standing on one leg. Here it is shown as a silhouette below a ruler’s throne. Although hypothesized to be the artist’s
signature (Stuart and Stuart 1977:46-47), and while I don’t like to disagree with my grandparents, this picture of a grackle may be no more than that: a representation of a grackle, not a signature. The male great-tailed grackle is known to make unusual poses when displaying and/or sounding out his call, including pointing his head upwards and standing on one leg, exactly as the ancient Maya artist has shown on the vase.

Orioles

New World orioles are passerine birds in the family Icteridae, unrelated to the Old World orioles (family Oriolidae). They are widely distributed throughout the Americas. They have similar plumage; all consisting of black contrasting with orange or yellow, and some white markings on the wings. Their nests are long hanging pouches. Orioles living in areas with cold winters tend to migrate, while those in tropical environments remain put during the winter.

Among the many people depicted in Room 1 of the Bonampak murals is an official named Aj K’an Yuyum (Figure 25). His portrait, near the back corner of the chamber, is somewhat damaged and effaced. He seems to be a high-ranking noble, and he stands close by three elaborately dressed dancers on the center of the room’s lower register. In front of him is a similarly dressed man who bears the title sajal, often used for political and military figures of high elite status.
Aj Ka’n Yuyum, from the Bonampak murals. Source:

https://decipherment.wordpress.com/2014/04/17/a-glyph-for-yuyum-oriole-in-a-name-at-bonampak/

The hieroglyphs of his name caption are well preserved, and the first two glyph blocks of his name clearly read AJ-K’AN-na²yu-ma. The remaining glyphs of his caption are syllabic spellings but are more difficult to make out fully: AJ-2ch’a-ta? ?-ma-ni (see Miller and Brittenham 2013:Figure 145). Perhaps one or both give a title based on some unknown place name.
Beyond his role as a named spectator at Bonampak, little can be said about Aj K’an Yuyum and his position in the local royal court; no other references to him are known. Here we would like to concentrate on his personal name, especially the unusual word spelled with the doubled yu sign and the main-sign form of ma. This combination is probably an ancient attestation of yuyum, a word found in historical and modern sources for “oriole.” The noble’s full name would then be “Yellow Oriole,” conforming to a widespread pattern of personal names based on colors and animal terms.

Yuyum is a word for “oriole” in lowland Mayan languages, including in Yucatecan and Cholan. Its first known attestation is in Beltran’s 18th century list of Yucatec faunal names as “un ave parecida al oropendula,” referencing a species closely related to orioles (see Perez 1898). It appears in modern Yucatec as well as yáuyum, “oriole” (Bricker et. al. 1998:319). In Bruce’s vocabulary of Lacandon yuyum is simply attested as “cierto pajaro” (Bruce 1968). Importantly, we also find it cited in Aulie and Aulie’s dictionary of Ch’ol (1978: 214) as yujyum, “bolsero espalda amarilla (Icterus chrysater),” specifically referencing the Yellow-backed Oriole.

A number of oriole species are common in the Maya region. These include the well-known Baltimore Oriole (which winters/migrates through there), the Hooded Oriole, the Altamira Oriole, the Spotted-breasted Oriole, the aforementioned Yellow-backed Oriole, and the Streaked-backed Oriole. Whether all of these species were ever considered under a single term is difficult to know, given the vagaries of faunal classification in Mayan languages. Besides yuyum, there appear to be a number of more isolated words for different types of orioles: kubul in
Yucatec (Bolles 2001), *tzap’in* in Itzaj (Hofling 1997:633), and *kupulik* in Ch’orti’ (Wisdom 1940), for example. Yet the consistent gloss of *yuyum* and its cognates as “oriole” across both Yucatecan and Ch’olan makes for a reasonable case that the word may be old and widely diffused in the lowland region.

The only known representation of orioles in Maya art comes from another famous Maya wall painting, the Preclassic murals of San Bartolo (Figure 33). In the murals from Structure sub-1-A, we see depicted on the north wall a representation of a hanging nest surrounded by three small birds. This hangs from a tree that grows atop a cosmic mountain of emergence, associated with concepts of “flower mountain” in Mesoamerican mythology (Taube, et al. 2005:15-16). The small, engaging birds that flutter around the nest are yellow in appearance, with black bordering their wings and tails. Due to their coloration, and the fact that they do not have black on their backs like most Central American orioles, these are most likely Yellow-backed Orioles (*Icterus chrysater*), which are known to reside in the Maya area, and especially in higher elevations. Significantly perhaps, this is the very species given as the meaning of *yujyum* in Aulie and Aulie’s Ch’ol vocabulary, as noted earlier.
The Lovely Cotinga (*Cotinga amabilis*), Mayan name *yaxun*, is a striking turquoise-colored bird with a plum-colored throat and belly. It is found from southern Mexico (excluding the Yucatan Peninsula) to Costa Rica. An inhabitant of tropical forests, this bird is very rarely encountered due to its reclusive nature and lack of song, therefore little is known about its life cycle or its behavior.
According to the *Annals of the Cakchiquels*, written by Francisco Hernández Arana Xajilá in 1571, the feathers of the Lovely Cotinga were given as tribute to the rulers of Tollan by the Cakchiquels (Recinos and Goetz translation, 1953). Putting this in a wider Mesoamerican context, it is interesting to note that cotingas are prominently featured in the visual tribute tallies of the Aztecs, in pictorial documents such as the *Matricula de Tributos* and in the *Codex Mendoza*. Evidently the bright blue feathers of the cotinga were highly valued for elite costumes and in the production of fine artworks as were the quetzals. In fact, on one page of the Codex Mendoza, among the tribute being paid is 160 skins of a bird that resembles the lovely cotinga, and 4000 handfuls of feathers, some coming from the cotinga, the quetzal and perhaps the scarlet macaw (Fig. 34). As stated before, with numbers like these, it’s no surprise that the bird populations were drastically reduced.
Figure 34

A page of the Codex Mendoza cataloguing tribute being paid, including cotinga and quetzal feathers. Note the two dead cotingas in the picture: the text states 160 of these were paid. Source: http://www.mulino.it/edizioni/primopiano/foto/livi_bacci/livibacci_23.jpg

The description of “Yaxun” for the Yaxchilan king Yaxun B’alam on Yaxchilan Stela 12 has been interpreted by Bolles (2001) as a lovely cotinga. The word yaxun, a Yucatec word, also
suggests the K’iche’ raxon (“ave de plumaje azul celeste”, “un pájaro de pecho musgo y alas azules” (ibid)).

A Problematic Image

One of the images in the Stuart Database (SD 46) is a bowl of unknown origin. (Figure 18) Painted inside the bowl are a dark figure and two birds. One bird is on the figure’s headdress and the other on a branch being held by the figure. The bird held by the figure catches the eye since its tail is shown as long and flowing like a quetzal’s. Note, however, that the bird itself has a chestnut color and a long beak, none of which make a quetzal identification likely. At first I thought that this bird was a motmot, as the motmots (family Momotidae) are medium-sized birds with long beaks and long tails. Yet no motmots are monochromatic as in this depiction—they are usually multicolored and their tail feathers are straight, not curved.

In art of any kind, one cannot rely completely on the artist to be visually accurate in all details. Too many factors might have influenced this Maya artist for us to be sure that this is not in fact an image of a quetzal or a motmot colored in a way they would never appear in nature, for whatever reason. In addition, fading of the pigment on the bowl might be responsible for the puzzling coloration. It is for these reasons that the bird at the top of the picture (the one on the headdress) cannot be identified as there are no clear field markings, and the shape is not realistic.

Yet I kept on in my identification process, wondering if yet another bird could fit the image. There does exist a common species in most of Guatemala and the Yucatan Peninsula that
is chestnut-colored and has a long tail: the Squirrel Cuckoo (*Piaya cayana*). However, this can be ruled out in that the Squirrel Cuckoo has a straight, non-forked tail with black and white bars on its underside, whereas the bird in the image has a long, flowing quetzal-like tail. Also, the Squirrel Cuckoo’s beak is short, in contrast with the long beak in this image.

The bowl itself is also a mystery. The source from which I extracted it, the Kerr Archive, gives no information on the site of its origin, which indicates it was looted. Without this information I cannot determine what kinds of long-tailed birds inhabited that site. All things considered, could it be that this bird is a possible extinct species? With as little information on the bowl as there is, it’s not currently possible to say any more. Future attempts to get provenance for the bowl might yield results.
A bowl showing a painting of a figure with two birds, neither of which are identifiable.

*Source: Kerr Maya Vase Database*
Chapter 6
Statistical Analysis of The Stuart Database

An analysis I have recently undertaken has shown that out of all the birds I have encountered in Maya art that are currently in my database, the vast majority were on painted or carved bowls, and the most often-depicted birds were those that had a cormorant/anhinga shape (46 out of a total of 148 identifiable specimens). (Figure 36)

Figure 36

*Frequency of types of birds depicted in Maya art and the objects on which they appear. Notice there are far more depictions on bowls than on any other type of object.*
This raises an important question: why did I find only 4 duck images, despite the fact that ducks were undoubtedly very common in the ancient Maya area? The Maya couldn’t possibly have ignored ducks—they were and still are an important food source to them—so did the Maya make images of them that have been lost to history, on materials that did not survive the centuries? Looking at the distribution of images on the plot below (Figure 37) one can immediately see the striking contrast between the scant occurrences of ducks in the art, which are in fact quite rare by count in the Maya region with only 34 instances of the Muscovy Duck being sighted between the years of 2005-2015 (eBird 2015), and the much more numerous occurrences of, for example, cormorants/anHINGAs and ibises/herons which occur very regularly.

Figure 37

<table>
<thead>
<tr>
<th>Bird Species</th>
<th>Sample Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herons / Ibis</td>
<td>21</td>
</tr>
<tr>
<td>Cormorants / Anhinga</td>
<td>51</td>
</tr>
<tr>
<td>Ducks</td>
<td>4</td>
</tr>
<tr>
<td>Pelicans</td>
<td>2</td>
</tr>
<tr>
<td>Eagles</td>
<td>2</td>
</tr>
<tr>
<td>Vultures</td>
<td>10</td>
</tr>
<tr>
<td>Turkeys</td>
<td>8</td>
</tr>
<tr>
<td>Quails</td>
<td>1</td>
</tr>
<tr>
<td>Parrots</td>
<td>4</td>
</tr>
<tr>
<td>Macaws</td>
<td>15</td>
</tr>
<tr>
<td>Owls</td>
<td>5</td>
</tr>
<tr>
<td>Hummingbirds</td>
<td>6</td>
</tr>
<tr>
<td>Quetzals</td>
<td>8</td>
</tr>
<tr>
<td>Grackles</td>
<td>2</td>
</tr>
</tbody>
</table>

Number of examples of each bird species found in Maya art, not separated into subspecies.
Bird image counts sorted by date and provenance. The most images come from the Peten area in the Late Classic period.
Figure 39

<table>
<thead>
<tr>
<th>Period</th>
<th>Sample Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Classic</td>
<td>8</td>
</tr>
<tr>
<td>Early Classic</td>
<td>29</td>
</tr>
<tr>
<td>Late Classic</td>
<td>158</td>
</tr>
<tr>
<td>Post-Classic</td>
<td>2</td>
</tr>
<tr>
<td>Unknown</td>
<td>2</td>
</tr>
</tbody>
</table>

Bird images by time period.
Water imagery clearly had a special importance in Maya art and kingship. Throughout Maya art even the most casual scholar will notice much recurring aquatic imagery. Houston & Finamore (2010) have hypothesized that the Maya viewed water, especially the ocean surrounding the Maya region, as the main link to their world from the supernatural realm. If water was a conduit for the supernatural among the ancient Maya, they reasoned, then aquatic birds, who traveled freely between dry land, water and sky, were likely candidates for special status in ancient Maya belief.

The basic importance of water imagery in Maya art was explored by a number of early scholars. Thompson (1950, fig. 44) isolated several motifs in relief sculpture that he identified as streams. Robert Rands (1953, 1955) was the first to devote an entire study to water motifs in Mesoamerican art. These included water lilies, which are extremely common in royal art and sculpture. However, his study was curiously removed from considerations of environment and natural setting, and instead focused nearly exclusively on the identification of falling water and rain in artistic representations. Rands also was keen to argue against the prevailing view of the time that images of water lilies were evidence of southeast Asian contacts with Mesoamerica. The emphasis of work by Thompson and Rands was therefore on the simple identification of the substance of water as a visual element. As it turned out, some of their identifications are probably not of water at all, but a more specialized idea of precious liquid, including sacrificial blood (Stuart 1984).
Perhaps the most important insights on water imagery that lead up to the present study were those by the archaeologist Dennis Puleston, who in the 1960s and 70s was a pioneer in the study of ancient Maya ecology and agriculture. Puleston (1979), through his pioneering reconstruction of Mayan irrigation canals called *bajos*, found that the feces of the fish in the canals helped irrigate the soil to make it more fertile. Water-lilies had also sprung up in the canal, making it hard to row through. Puleston noticed this added new meaning to a complex of recurring aquatic symbols in Maya art such as water-dwelling birds, turtles, crocodiles, fish, shells and water-lilies.

Water-lilies, it turns out, are crucial to understanding the Maya perspective on their environment. Thompson (1950) had made a key identification of the “Imix” glyph as a depiction of a water-lily, thinking it conveyed an abstract notion of “abundance.” Puleston had accepted this basic identification, but he reconsidered and proposed that it served as a visual metaphor for the earth’s surface. Puleston also looked at water-lilies and aquatic birds -- the two are often paired in Maya imagery -- as visual references to an ancient Maya reliance on wetland intensive agriculture. Water lilies to Puleston were a sign of abundance of food and anything edible through agriculture (Puleston 1977). In an unpublished paper from 1979, the renowned Mayanist Linda Schele picked up on many of Puleston’s original points -- what she called the “Puleston hypothesis” -- and expanded the examination of water and water-lily imagery (Schele 1979).

Little work was specifically devoted to water imagery until Nicholas Hellmuth published his important study of what he called the “underwater world” in Maya representation (Hellmuth 1987). Hellmuth was not so much concerned with how art reflected agricultural and ecological realities, as Puleston and Schele were, but instead he focused on mythology as depicted on ancient Maya vases. In this Hellmuth was expanding on the influential work of his mentor
Michael Coe, who just over a decade earlier had proposed that the vast majority of painted polychrome ceramics found in tombs and funerary contexts centered on mortuary themes, specifically on the Underworld and the deathly realm of Xibalba, as featured in the Popol Vuh (Coe 1973). Throughout the 1970s and 1980s, at the height of the looting of archaeological sites in Guatemala, more and more Maya ceramics had appeared in the art market, and Hellmuth set out to document many of them. He immediately noted the recurring appearance of aquatic themes on many ceramics, and placed his interpretations of them within Coe’s earlier framework -- hence his notion of a “underwater world.” Hellmuth’s work is a great visual resource and included a great many images of aquatic birds, many of which we will turn to in this chapter.

The most recent work to emphasize the importance of water is Finamore and Houston’s *The Fiery Pool*, a major international art exhibition and book that examined the importance of the ocean in ancient Maya life and culture (Finamore and Houston 2010). Much of their work looks at water imagery in general, and builds on the fundamental insights that can be traced back to Puleston, Schele and Hellmuth. They also note a number of important images of aquatic birds. It is worth repeating here the earlier point that, despite the widespread acknowledged importance of birds in Maya water imagery, many of the specific species identifications made by these scholars remains vague. More often than not they were simply called “water birds.” Now, their specific species have been identified here, and future studies can incorporate the identifications I have made.
Drought and Environmental Change Among the Ancient Maya

Parts of this chapter were written with David Stuart (in red).

Waterbirds Need Water

Water is, of course, a central concern in any culture, as it is essential for survival. Unstable tropical climate could bring long years of flooding to this area, or alternatively many areas were subject to droughts in the Late Classic period, particularly in the lowlands where the majority of Maya sites are located. To add to the problem, much of the Yucatan lowlands have no perennial rivers, so in some areas like Uxmal, sinkholes (called cenotes) were the only source of fresh water. As mentioned before, there were also some lakes, long since dried up and transformed into so-called bajos. In ancient times, these lakes were used to provide water for agricultural use (Lentz 2014, Beach et al. 2009).

I believe that we should look at the imagery of waterbirds in Maya art in the context of these important environmental changes. Drought and climate change may be a key factor in understanding the emphasis on water ecology as depicted on on Maya ceramics. Many studies have been conducted to analyze what role climate change played in the demise of the ancient Maya civilization. As discussed below, the most evidence points to extended droughts occurring at the end of the Preclassic and Classic periods. Mismanagement of water resources, a growing population and increasing political instability was exacerbated by these droughts.
Evidence of Drought

In the last few decades Maya archaeology has made ancient environmental change a major topic of discussion, perhaps even as a primary cause of the ancient collapse of the eighth and ninth centuries.

Richardson Gill’s work, The Great Maya Droughts (2001) called to attention the fact that drought did exacerbate the situations, whatever they were, leading up to the “collapses” of many cities during different eras. Since then, much more evidence has been uncovered for droughts during Maya times.

Observation of a stalagmite from the Macal chasm in western Belize provides an incredible record of droughts during the time of the collapses of the Preclassic and Classic periods, including one which was said to occur around the time of the Preclassic (Webster et al. 2007). A second study (Kennett et al. 2012) examines another stalagmite from the Yok Balum cave, also in Belize. Dating from the stalagmite shows evidence of drought between 660 and 1000 A.D., around the time of the Late Classic period’s end.

However, according to a study by Medina-Elizade (2010), the Yucatan Peninsula did not simply succumb to one single long mega-drought, but instead very gradually to eight droughts over the course of 150 years (from 800 to 950 A.D.) when the Late Classic period was coming to a close. Drawing upon the record of a stalagmite from the northwest Yucatan Peninsula, these eight droughts lasted from 3 to 18 years each, but were enough to cause significant depopulation events, such as in the Puuc region and possibly Tikal and Calakmul.

A recent study by Nicholas Dunning and Timothy Beach (2012) focuses on core sampling of sediments and trees in the Chan Cahal and Birds of Paradise wetlands of northern Belize, which were important sites for agriculture (Guderjan 2009). Much of the landscape in
that area was formed by sedimentation, both from erosion and gypsum precipitation as well as canal excavation and maintenance. Evidence indicates filling of said canals (used by farmers during the Classic period) by the time of the Terminal Classic, indicating they were abandoned by the end of that era. Why these canals were abandoned are not known, but this might connect to the conclusions of a recent article by Dunning and Lentz (2014), which concludes the water management strategies used in the city of Tikal did not take long periods of drought into account—in other words, a heavy reliance on constant rainfall. Beach’s research (2012) also shows that the areas around the bajos were also the most vulnerable to drought, since they were away from rivers and were not perennial. The article also gives plenty of evidence that the Maya had hugely exploited the soil to accommodate for their intensive agricultural practices.

Another article from Beach (2006) goes into a more detailed explanation of how the landscape changed. Although evidence is still sparse, radiocarbon dating in wetland fields has shown four conceptual models on human-wetland interaction through the Preclassic to the end of the Late Classic. All were differently modeled, but they shared similar instances of abandonment and reclamation over specific time periods, often correlating with extensive droughts.

A more recent study in December of 2014 (Droxler et al. 2014) examined sediment deposits in Belize’s “Blue Hole,” a large underwater sinkhole popular with divers. Drilling cores in the sediment, they found that layers containing low ratios of titanium to aluminum corresponded with dry periods, as the titanium is “washed out” during wet periods. They found that droughts occurred not only between A.D. 800-1000, when the Classic period ended, but that another significant drought also occurred between A.D. 1000-1100, around the same time the Postclassic city of Chichen Itza met its demise.
Research from Tikal provides an example of how the Maya shifted in the Classic period to artificial reservoirs and irrigation in an increasingly drying world. A prolonged drought disrupted the small adaptations they were able to make to stave off population collapse and abandonment, but ultimately their efforts were not sustainable. As Lentz (2014) has shown, Tikal had constructed reservoir and canal systems to manage what little water was available to sustain a large population. This was successfully accomplished at first, but Tikal had apparently failed to take drought into account, as the speleothem data mentioned earlier shows that drought occurred around the 9th century A.D., around the same time Tikal was abandoned. To strengthen this theory, Medina-Elizalde’s article (2010) tells us that there is no evidence that violence and warfare had anything to do with the abandonment of Tikal, either.

Drought, as has been shown throughout history, has led to social and political unrest and even conflict, and the recent drought evidence shows that the Maya were no exception. The evidence discussed above indicates that a prolonged lack of rain during the ninth century led to the abandonment of major cities and population centers in the central lowlands of the Maya region, especially in the areas of the bajos near Tikal, Uaxactun, and other centers.

This was the very area where the vast majority of ceramics depicting aquatic birds were produced at the end of the Classic period. As we see back in Figure 38, 77% of the depictions of aquatic bird species come from the central Peten region. Of these, 83% are from the Late Classic period.

The vast majority of birds represented in Maya art, as we have seen, are aquatic birds adapted to shallow lakes and streams. As these lakes dried up and soil eroded from heavy agriculture and water use, the birds that lived in and around the lakes would have nowhere to thrive, so even though these water birds I have found are not endangered or extinct in general,
the picture is very different locally. The white ibis, for example, has been officially observed in Northern Peten only once in at least 140 years. The flamingos I believe I have found on Peten-area vases have, as I said before, never been officially observed to my knowledge since before Osbert and Salvin did their work in Guatemala in the late 1800’s, which means this is another species gone from the ancient Maya area. Several major waterbird habitats in Mesoamerica were definitely irrevocably changed due to these droughts and heavy soil exploitation.

During my recent visit to the Peten region of Guatemala, where the majority of artworks depicting water birds come from, I sighted several aquatic bird species along riversides, most commonly cormorants, egrets, herons and even an osprey, but no anhingas (likely due to them having already migrated, since this was in December). Around the Uaxactun area of Guatemala is a landscape consisting of many bajos, evidenced by the karst soil easily turning into deep mud during the rainy season, and I saw no water birds there, only non-aquatic species that likely became more common in the region after the Classic period ended such as the Brown Jay.
Conclusion

My study has resulted in the identification of several previously unidentified birds in Maya art. The study also gives art historical and ornithological support for the growing body of scientific evidence that there was great environmental change in the ancient Maya area.

The disappearances of many lakes (now they are *bajos*) in the Maya area—the consequence of prolonged droughts combined with heavy agriculture—decimated the local populations of many bird species. Almost all of the images compiled in the Stuart Database show birds of an aquatic nature, some of which are rarely seen or no longer occurring in or around the areas where the images were made.

From the data I have compiled and examined, the White Ibis, the Resplendent Quetzal and possibly the Greater Flamingo, once existed in the Peten area but have now vanished. As a consequence of water loss due to Ancient Maya manipulation of water resources for irrigation, silting up the ancient lakes, bird disappearances from the area, and even at least one possible extinction, are recorded in the art. Yet, environmental factors are not the sole cause of this population reduction: the Scarlet Macaw and the Resplendent Quetzal had towering reputations in Maya culture that led to overhunting.

Today, many of these species, such as the Military Macaw, are under the threat of extinction due to illegal trapping and stealing of chicks from nests for the pet trade, mostly for the U.S. market. Significant environmental degradation continues in the Peten jungle, and thus many bird species face loss of habitat and food sources.

For a modern example of how human intervention affects birds, the fate of the Atitlan Grebe (*Podilymbus gigas*), formerly endemic to Lake Atitlan in Guatemala, should be taken as a cautionary tale. The species went extinct within a 25 year period after the non-native smallmouth
bass was introduced to the lake. The bass subsequently destroyed the grebe’s food sources and even consumed the young (LaBastille 1990). Once human intervention sets extinction in motion, the extinction can happen very fast. Scarlet Macaws, for example, occurred frequently in ancient Maya art. Now these birds are scarce, and none exist in Peten. I believe that we will see the extinction of many iconic birds in Guatemala within our lifetime if no quick, decisive action is taken.

I hope my study will encourage further exploration of this important topic. I hope to inspire action here and in Guatemala to save not only the birds, but the many other elements of the Peten environment that will soon be irretrievably lost, and we cannot say for sure what the consequences will be, not only for birds but for humanity.
Bibliography


Adams, Richard E. W.

Anawalt, Patricia R. & Frances F. Berdan.

Aulie, Wilbur, and Evelyn W. de Aulie.
1978 Diccionario Ch’ol. Summer Institute of Linguistics, Mexico D.F.

Bailleul-LeSur, Rozenn.
2012 Between Heaven and Earth: Birds in Ancient Egypt. Oriental Institute, University of Chicago.

Bardawil, Lawrence W.

Bassie, Karen.

Blaffer Hrdy, Sarah.

Beach, T., S. Luzzadder-Beach, S., Dunning, N.
2011 Kax and kol: Collapse and resilience in lowland Maya civilization. PNAS 9(10), 3652-3657.


Brittenham, Claudia & Miller, Mary. 2013 The Spectacle of the Late Maya Court. University of Texas Press, Austin.
Bruce, Robert.
1968 Gramatica del Lacandon. Instituto Nacional de Antropologia e Historia, Mexico D.F.

Burkhart, Louise.


Chinchilla, Oswaldo


Christie, David A. & Ferguson-Lees, James.

Coe, Michael D.

Coe, Michael D.


Coggins, Clemency.

Cortez, Constance.

Davis, L. Irby.
Denommee, K.C., Bentley, S.J. and Droxler, A.W.  


Edwards, Ernest Preston.  

Emery, Kitty, ed.  

Fash, William L. & Kowalski, Jeff K.  

Fields, Virginia, and Dorie Reents-Budet  

Finamore, Daniel & Houston, Stephen D.  

Garza, Mercedes de la.  
1995   Aves Sagradas de los Mayas. Universidad Nacional Autonoma de Mexico, Mexico City.

Gill, Richardson B.  

Godman, Frederick Du Cane & Salvin, Osbert.  

Goetz, Delia & Recinos, Adrian.  
1953   Translation of the *Annals of the Cakchiquels*.  University of Oklahoma Press, Norman, OK.


Hellmuth, Nicholas. 1987 Monster und Menschen in der Maya-Kunst. Akademische Druck und Verlagsanstalt, Graz, Austria.


Houston, Stephen, Stuart, David & Taube, Karl. 2006 The Memory of Bones: Body, Being and Experience among the Classic Maya. University of Texas Press, Austin.
Howell, Steve & Sophie Webb.  

Hull, Kerry, & Fergus, Rob.  

Hull, Kerry & Fergus, Rob.  


Kennett, D.J. et al.  

Kerr, Justin  
(ongoing)  Maya Vase Database.  (*www.mayavase.com*)

Kerr, Justin & Coe, Michael D.  

Kidder, Alfred V., Jesse D. Jennings, & Edwin M. Shook.  

Laughlin, Robert M.  

Lentz, David L. et al.  
2014  Forests, fields and the edge of sustainability at the ancient Maya city of Tikal.

Louv, Richard  
2005  *Last Child in the Woods: Saving Our Children from Nature Deficit Disorder.* Algonquin Books, Chapel Hill, NC.

Lowe, Gareth W., Thomas A. Lee Jr., & Eduardo Martinez Espinosa.  
Luzzadder-Beach, Sheryl, and Timothy P. Beach

Luzzadder-Beach, Sheryl, Timothy P. Beach and Nicholas P. Dunning

Maslow, Jonathan.

Maudslay, Alfred.


Miller, Mary Ellen.
2001  *The Art of Mesoamerica from Olmec to Aztec*. Thames & Hudson, New York

Miller, Mary Ellen, and Claudia Brittenham
2013  *The Spectacle of the Late Maya Court: Reflections on the Murals of Bonampak*. The University of Texas Press, Austin.


Molina, Fray Alonso de

Perez, Juan Pio.
1898  *Coordinación alfabetica de las voces del idioma maya que se hallan en el arte y obras del padre fr. Pedro Beltran de Santa Rosa, con las equivalencias castellanas que en las mismas se hallan*. Imprinta de la Ermita, Merida.

³ No relation to the Salvin & Godman work of the same name.
Proskuriakoff, Tatiana.

Puleston, Dennis.

Rands, Robert L.

Rands, Robert L.

Reents-Budet, Dorie


1545-1590 Florentine Codex, or, the Universal History of the Things of New Spain. University of Utah Press, February 17, 1982.

Salvin, Osbert.

Saturno, William A., Beltran, Boris, Stuart, David S.

Schlesinger, Victoria.

2001 Animals and plants of the ancient Maya. University of Texas Press, Austin, TX.
Schele, Linda

Sever, Thomas L.

Spinden, Herbert Joseph.

Stone, Andrea & Zender, Marc.

Stuart, David.

Stuart, David

Stuart, David

Stuart, David, and Peter Stuart.

Stuart, David, and Peter Stuart.
Stuart, Gene & Stuart, George.  

Stuart, Peter.  

Taube, Karl A., and Norman Hammond.  

Thompson, J. Eric S.  

Thompson, J. Eric S.  

Thompson, J. Eric S.  

2012  Earliest Mexican Turkeys (Meleagris gallopavo) in the Maya Region: Implications for Pre-Hispanic Animal Trade and the Timing of Turkey Domestication. PLoS ONE 7(8): e42630. doi:10.1371/journal.pone.0042630

Tikal Project Image Database  
http://www.famsi.org/research/tikal/

Tozzer, Alfred M. & Allen, Glover M.  

Turner II, B.L.  

Wisdom, Charles.  
Yeakel, Justin D., Mathias M. Pires, Lars Rudolf, Nathaniel J. Dominy, Paul L. Koch, Paulo R. Guimaraes, and Thilo Gross

Zidar, Charles.
Appendix A

Background to the Imagery

Some parts of this appendix were written by David Stuart (in red).

People who take their first look at Maya art, either in the forested ruins or in museum display cases, often have difficulty figuring out what they are seeing. Layers upon layers of curved lines and detailed adornment distract the eye, amid highly conventionalized forms (Figure A1).

Much of the imagery seems far removed from our sense of “naturalism,” despite the fact that the overarching subject matter of Maya art was nature, at least as they saw it and understood its components. Maya art is full of images of not just people – humans and gods – but also of thematic landscapes and key pieces of the environment that stand for the whole. (For example, a certain god may be represented by just a drawing of his characteristic eyebrow.)

Maya art and iconography was so stylized and codified that a keen knowledge of the Maya complex visual vocabulary is required in order to actually see the flora, fauna and landscape in them. This has given rise to much confusion among students of the Maya culture, and this study has definitely encountered evidence of that confusion among those who have tried to find birds in the art.
The complex image shown in Figure A1 offers an example of the challenges in parsing and interpreting Maya representations of nature. There are recognizable elements here and there—a seated man, birds, serpents and trees—amid a tangle of abstract “things.” Few other traditions of ancient art and design combined nature and abstraction to this degree. From its beginnings in the first few centuries B.C. and up to the time of the Spanish conquest, Maya art, like other neighboring traditions in Mesoamerica, consistently evoked natural forms and placed them in “encoded” settings. The intended viewers of such art needed to be literate in the abstract iconography, much as they needed to be literate in the hieroglyphic script that was so closely related to it.

Looking again at the rollout view of Figure A1, taken from a cylindrical vase of about 400 A.D., perhaps the most recognizable elements are the renditions of birds. Two long-tailed birds, most likely quetzals, are shown perched atop two tree branches, facing opposite directions. The artist has emphasized the tail coverts (feathers which cover the bird’s true tail) and a tufted crest atop the head, two features which are artistic diagnostics for quetzals, but otherwise the birds assume a rather generic appearance. Other avian beings on the vessel are not so natural in
their depictions – one seems to be a hummingbird with stylized, animated wings and tail, and the other is a very unusual water-bird with an elongated neck consisting solely of bones. Since a neck without flesh does not appear in nature, we can assume this is either a mythical bird or a dead and partially decomposed one. A fifth bird may be a cormorant or anhinga, more naturalistically shown but emerging from a turtle shell.

This assortment of avian imagery offers a good overview of an artistic continuum in how Maya artists viewed and depicted the birds in the natural and mental worlds around them. Birds exist in nature, but nature in this art is full of animated metaphors -- one of the trees shown here merges with the body of an alligator, for example, and another is shown as an inverted god. These may seem like contradictions to our own eyes, but Maya art constantly played with such linkages, merging beautifully rendered and “naturalistic” depictions with highly conventionalized icons and symbols, many of them closely related also to the hieroglyphic script.

**Birds and the Imagery**

Some of these overall aspects of Maya representation have been known ever since Herbert Spinden’s *A Study of Maya Art*, published in 1913. This was the first general and comparative treatment of Maya imagery, and in it Spinden noted that “the ceremonial and artistic importance of birds and feathers can hardly be overestimated” (Spinden 1913: 78).

Yet surprisingly, despite Spinden’s claim, more than a century has passed without a general study of the subject of birds in Maya art and writing. Specific treatments of particular bird motifs or religious images have been published, including Bardawil’s early paper identifying the so-called Principal Bird Deity in Maya art. This was a seminal work from which many subsequent studies were based (Cortez 1986, Taube 1987). Other studies have examined specific motifs related to particular sites or architectural decorations where birds are prominently
displayed, such as the ball court of Copan (Kowalski and Fash 1991). Other studies have looked at certain water-birds in connection to Underworld symbolism (Hellmuth 1987) or in the context of political ideology (Schele 1979, unpublished). But a larger comparative study following up on Spinden’s initial remark has not been undertaken, and no general overview of birds in ancient Maya art yet exists. I believe a significant gap exists in the literature, therefore, which I hope to begin to address with this present study.

Add the difficulty with interpreting the complicated Maya imagery and the until-recently undeciphered Maya hieroglyphics, to the difficulty of traveling in the truly challenging tropical environment of the Maya area, mostly covered with jungle, and you come up with a good reason for why not only bird art, but the birds themselves, received relatively little study until recently, although there are a few notable exceptions; perhaps the greatest of these being the incredible and monumental effort conducted over the course of 1879 to 1915, *Biologia Centrali-Americana* by Salvin and Godman.

As my work has demonstrated, the majority of ancient Maya bird imagery appears on painted ceramics produced during the Classic period, up to the time of the so-called Collapse. These vessels, often decorated with beautifully painted images of humans, gods and animals, were common household wares associated with elites and the royal courts of the time, and comprised an important part of the “courtly arts” of ancient Maya culture (Miller and Martin, 2005). The study of these painted vessels began only in the 1960s and 1970s, when most of them appeared on the international art market and appeared in museums and private collections. It is worth noting that some scholars continue to object to their use by the community of experts, because they argue that scholarly use constitutes authentication of looted objects, which in turn benefits and perpetuates looters by raising their value on the art market (Coggins 1969).
The scholar who first drew attention to the information on painted vessels was the noted Mayanist Michael D. Coe, who wrote about them in a number of important publications (e.g. Coe 1973, 1978). Coe not only was the first to publish many of these vessels, he was also the first scholar to offer a systematic interpretation of their imagery. Because these vessels mostly emerged from elite funerary settings (royals tombs and caches), Coe proposed that nearly all of the imagery on these vases was concerned with the afterlife and the journey of the soul after death. More specifically, he argued that the great Maya mythic story of the Popol Vuh was the main narrative in Maya vase painting, much like ancient Greek vase paintings relate mythological subjects connected with the Iliad and the Odyssey.

Nicholas Hellmuth, a student of Coe’s at Yale University, isolated a number of bird images on Maya vases in his study of what he called the “Underwaterworld” (Hellmuth 1987:356). To him, the lids of certain vases--several of which are discussed in this work--represented the surface of this mythical realm, with amphibians, turtles, waterbirds, and most importantly bands of water, and therefore the birds, also included in these contexts, must also be mythical. According to Hellmuth, any aquatic animal present on these lids was breaking through from the surface realm to the Underwaterworld (called the “netherworld watery area” on pg. 356 of Monster und Menschen (1988)). He did not see these bird images as naturalistic, only as pure mythology.
APPENDIX B: The Stuart Database  [to be added or produced separately]

The Database begins on the next page.
1. **Provenience:** Tikal, Guatemala, Early Classic Period. This image is of a lidded bowl from the Early Classic period, from the Maya site at Tikal, Guatemala. The book states that the bird (at top) represents the sky, and the middle and lower halves of the bowl suggest a turtle. In the book, the authors suggest the bird to be a limpkin (*Aramus guarauna*), however I believe the beak is too short and ridged at the top to resemble a limpkin (the limpkin more closely resembles an ibis or heron). The ridges as well as the facial markings suggest more of a duck-like bird, possibly a Muscovy Duck (*Cairina moschata*). (Source: Finamore and Houston, 2010: 48)

2. **Provenience:** Comalcalco, Mexico, circa 800 A.D. This is a pelican sculpture, found at Comalcalco, Mexico. It is from the Late Classic period, circa 800 A.D. The head is carved in an incredibly detailed and accurate fashion for a Maya artwork. The short bill might make this a Brown Pelican (*Pelecanus occidentalis*), since the bill of the American White Pelican (*Pelecanus erythrorhynchos*) is longer.

(Source: Finamore and Houston, 2010:57)
Provenience: Guatemala ca. 350 A.D. Another Early Classic bowl from an unknown provenience in Guatemala (ca. 350 A.D.), featuring a water-dwelling bird with a fish in its mouth. The neck, crest and the way the fish is being caught all suggest a heron. The authors hypothesize that it might be a Yellow-crowned Night Heron (*Nyctanassa violacea*), yet I see no confirming features of the species in the artwork.

(Source: Finamore and Houston, 2010: 51)

---

Provenience: Northern Guatemala circa 750 A.D. A Late Classic (ca. 750 A.D.) vase from an unknown provenience of northern Guatemala, featuring a long-legged water-dwelling bird with the face of a deity emerging from its chest. The authors write that this may be a cormorant, but the bird's plumage is rosy pink and the legs are too long, and its feet lack webbing like all cormorants. The long legs and clawed feet therefore suggest a wading bird. As the Greater Flamingo (*Phoenicopterus roseus*) is not currently present in Guatemala, it may have been in the past, this along with the lack of white on the body leaving out the only other candidate for this bird species identification, the Roseate Spoonbill (*Ajaia ajaja*). (Source: Finamore and Houston 2010:103)
5. Provenience: Tikal, Guatemala circa 350 A.D. An Early Classic (ca. 350 A.D.) jar with a bird on it; this time with an image of the Ocellated Turkey (*Meleagris ocellata*). The jar was excavated at the Mundo Perdido complex at Tikal, Guatemala. This species is one of the most recognizable in the pantheon of Maya artwork, and can be easily identified by large, boldly patterned wings and tail, and several wart-like globules on its bare head.

Source: Photo archive, The Mesoamerica Center, UT-Austin

6. Provenience: San Bartolo, Guatemala, circa 200 B.C. This Late Preclassic painting (ca. 200 BC) is from the west wall of the San Bartolo murals (Structure sub 1-A) in Guatemala. Two small, gray birds with yellow legs are shown jumping (dancing?) are shown. The gray bodies and yellow legs suggest that the species could be American Dippers (*Cinclus mexicanus*). The American Dipper is a species that dwells near streams and rivers on mountains.

Source: Photo archive, The Mesoamerica Center, UT-Austin
<table>
<thead>
<tr>
<th>Image</th>
<th>Description</th>
</tr>
</thead>
</table>
| 7.    | Provenience: Unknown, circa 400 A.D. A rollout drawing of a vase called the Deletaille Tripod, from the Early Classic (ca. 400 A.D.). Two birds are shown in the right of this long picture near the center. At first glance they are not distinctively identifiable, but they do have long tails and are perched in an upright position. They could potentially be motmots (family *Momotidae*) or trogons (family *Trogonidae*).  
Source: Hellmuth 1988: Figure 1 |
| 8.    | Provenience: Nakbe or Calakmul area, ca. 700 A.D. Detail of Codex style vase K511. God L is shown wearing a headdress with feathers of the Resplendent Quetzal (*Pharomachrus mocinno*). Although the bird itself is not a quetzal (perhaps an owl or hawk), the long tail feathers are not present in other trogons, or motmots. The tail feathers were likely added for decorative purposes. Taken from the Princeton Vase at the Princeton Art Museum.  
Source: Photograph by J. Kerr, Photo archive, The Mesoamerica Center, UT-Austin. Kerr 511 |
| 9.    | Provenience: Naranjo area, ca. 750 A.D. This image features another bird (perhaps a hawk with quetzal tail feathers) being used as an adornment of the hat of God L. Taken from the so-called “Bunny Pot” from a private collection.  
Source: Photograph by J. Kerr, Photo archive, The Mesoamerica Center, UT-Austin |
Late Classic (ca. 750 A.D.), from an unknown location and provenience, probably the Naranjo area of northern Guatemala. This image depicts a bird, likely an anhinga or a cormorant, catching a fish underwater. Though clearly a water-dwelling bird by design, the added plumes are likely to be a touch added by the artist.

Source: Hellmuth 1987

Provenience: El Mirador, Late Pre-Classic (ca. 100 B.C.). Detail from a stucco sculpture at El Mirador, Guatemala, adjacent to an ancient bajo. A water-dwelling bird, possibly an anhinga, is catching a fish.

Source: Photo archive, The Mesoamerica Center, UT-Austin

Provenience: Unknown. Early Classic. This bowl shows a nature scene, with birds, monkeys and a scorpion on a tree. A figure is pointing towards a bird on the topmost branch. The topmost bird is entirely black, and the head and body shape could imply a vulture. The red bird on the middle branch is a parrot, and a bird-like figure (the Principal Bird Deity) sits on the top branch at right. From the Museo del Mundo Maya, Merida, Mexico.

Source: Photo archive, The Mesoamerica Center, UT-Austin
| 13. | Provenience: Copan, ca. 450-500 A.D. This is the crest of the Copan king, K’inich Yax K’uk’ Mo’. Two birds are shown embracing (?) each other. They have large, thick beaks (suggesting a parrot) and ornate decorations around their eyes, which resembles the bare white skin on the faces of macaws. Although the bird facing to the right is a Scarlet Macaw, the bird facing to the left is not actually a macaw, but a quetzal (note the crest and the blunter beak). On the Margarita temple, Copan. 

Source: Photo archive, The Mesoamerica Center, UT-Austin |
|---|---|
| 14. | Provenience: San Bartolo. Late Preclassic, ca. 200 B.C. In the center of this mural from San Bartolo, the Principal Bird Deity is shown, being worshipped. To the far right of the mural, three small passerine birds appear, yet these cannot be identified due to a lack of coloration in the picture. 

Source: Image archive, The Mesoamerica Center, UT-Austin |
| 15. | Provenience: Unknown. Early Classic period (ca. 350 A.D.). A pot lid with a bird carved as its handle. A water-band motif is carved below the bird. The neck shape and wings point to this being a wading species, and the only one in the Mesoamerican region with a similar beak shape to the drawing is the Roseate Spoonbill (*Ajaia ajaja*). 

Source: Hellmuth 1987: Fig. 163 |
Provenience: Dos Pilas, Guatemala. Period: Late Classic. This image, from the Dos Pilas stela, has a wading bird carved on the right with a fish in its mouth. Despite a lack of coloration, the hooked beak disqualifies it as an anhinga. Therefore, the bird is likely a cormorant since they have hooked beaks.

Photograph by Ian Graham, Corpus of Maya Hieroglyphic Inscriptions, Harvard University.

Source: Photo archive, The Mesoamerica Center, UT-Austin

---

Provenience: Tikal. Period: Early Classic (ca. 400 A.D.) Detail of stucco covered vessel. Two small parrots are seen on a tree. Due to the drawing style, they lack identifiable characteristics of certain species, so these parrots are unidentifiable as species.

Source: W. Coe 1965: p. 100
<table>
<thead>
<tr>
<th>Image 114x516 to 334x715</th>
<th>Provenience: Holmul, in northeast Peten, Guatemala. Period: Late Classic (ca. 700 A.D.). Another representation of a bird with a snake-like neck and a hooked beak, likely an Anhinga. This distinctive balled-up plumage is characteristic of what the birds look like when wet. Source: Reents-Budet 1994:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Image 114x343 to 372x504</td>
<td>This is a painting of a Late Classic (ca. 100 B.C.) carved image of the Principal Bird Deity, from a stucco façade at San Bartolo. The image shows a scene from a mythological story in which the Principal Bird Deity descends from the sky. The beak, which is rather large like a macaw’s, can be seen to the lower middle of the carving. Painting by Heather Hurst Source: Image archive, The Mesoamerica Center, UT-Austin</td>
</tr>
<tr>
<td>20.</td>
<td>A bowl with a painting of an owl in a headdress. Charles Zidar of FAMSI identifies this as the Vermiculated Screech Owl (<em>Otus guatamalae</em>), which could be the basis for the <em>muan</em> bird, a demon in Maya culture. I found no identifying characteristics to tell me which type of owl it might be. Note that this bowl (along with all other Kerr Archive artifacts) was looted from an unknown tomb, so it's impossible to determine where this came from. Source: Kerr Maya Vase Database, K8797</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>21.</td>
<td>Provenience: Unknown. Late Classic period, ca. 750 A.D. Two figures are seated with the faces of vultures. Given that the Black Vulture (<em>Coragyps atratus</em>) is the only candidate for a vulture I have yet seen in Maya art (no renditions of the Turkey Vulture (<em>Cathartes aura</em>) have been shown, and the black vulture was likely a symbol of death to the Maya as it features prominently in their codices), it is the only possible identification for this picture. Source: Kerr Maya Vase Database, K6991</td>
</tr>
</tbody>
</table>
22. Provenience: Unknown. Period: Early Classic period (ca. 400 A.D.). A vase constructed around an image of the Ocellated Turkey. The spots on the head shown here (which in real life are orange bumps) are the key feature of identification for the species.

Source: Kerr Maya Vase Database, K3164

23. This Early Classic (ca. 350 A.D.) lidded bowl is of a Scarlet Macaw (*Ara macao*), with the lid being a very realistic painting of the macaw’s head.

Source: Was formerly in the Kerr Maya Vase Database
This is a unique construction of two bowls built in connection to each other. The bird shown is certainly a Resplendent Quetzal (Pharomachrus mocinno), with its distinctive features including a small beak, a crest, and finally a long tail being used presumably as a carrying handle. It may have been a whistle.
Source: Kerr Maya Vase Database

25. Provenience: Copan. Period: Late Classic, ca. 750 A.D. This is a sculpture of a head, on top of which grows out the head of an aquatic bird carrying a fish in its mouth. As the hooked beak rules out a pelican, and the only water-dwelling bird with a hooked beak present on all the other Mayan artworks are cormorants, the bird is a cormorant.
Source:

Source: Reents-Budet 1994


Dumbarton Oaks Collection, Washington D.C.

Source: Miller and Martin 2001
Provenience: Unknown. A figure holds a cormorant/anhinga-type bird with black body, a grayish colored head, and a reddish leg. The vessel is of unknown construct.

Source: Kerr Maya Vase Database, K2668.
Provenience: Exact one unknown, but from the Naranjo region, northern Peten, Guatemala. Period: Unknown. A vase with two visible birds that have feathers sticking out around their necks and even their beaks (likely for artistic effect). The body, neck and wing shape suggest cormorants, and the balled-up feathers indicate wet plumage.

Provenience: Unknown. Late Classic. A bowl with Scarlet Macaws painted around the sides.
31. Provenience: Rio Azul, Guatemala. Period: Early Classic (ca. 450 AD). Several birds are present in this image. On the upper right is the head of a parrot (likely a macaw). On the lower right are two other birds—one closely resembling a Brown Jay (*Psilorhinus morio*) and the other one lacks features that would facilitate identification. Another parrot perches next to a mammal (likely a stoat). A black bird with a long beak and tail (perhaps another Brown Jay or a quetzal) perches next to a monkey in the upper left corner.

*Note: I am describing this from a right-side-up perspective since this image is flipped on the left side here.*

Source: Adams 1999:86

---


Drawing by K. Taube.

Source: Image archive, The Mesoamerica Center, UT-Austin
Provenience: Lake Peten region, Guatemala. Period: Late Classic, ca. 700 A.D. Two views of the same pot. On the view to the right, there is an image of the Principal Bird Deity standing on what appears to be the head of a vulture. The Principal Bird Deity is standing behind God D, or Itzamnaaj (the PBD's human avatar), shown at left.

Source: Image archive, The Mesoamerica Center, UT-Austin

Provenience: Tikal. Early Classic. A jar with a bird being used on the lid as the handle. The bird has the appearance of another water-dwelling bird, with a thin beak and webbed feet. The knob in front of its eye shows it might be a Muscovy Duck (*Cairina moschata*). Cormorants do not have such ridges or knobs on their beaks.

Source: Reents-Budet 1994
Provenience: Copan, Tomb 1. Late Classic. A vase with the image of a bird thought to be a quetzal. I question this assumption because the crest, posture, and overall body shape are not at all like a quetzal—it looks closest to a female guan.

Source: Reents-Budet 1994
A deity figure with the head of Scarlet Macaw from the *Dresden Codex*, ca. 1200 A.D.

Source: Image archive, The Mesoamerica Center, UT Austin
A back view of a carved sculpture of the Principal Bird Deity, emblazoned with glyphs and beads, as shown on an Early Classic vessel, ca. 350-400 A.D. The PBD as shown here appears to be a symbol of power and military might, recalling a Harpy Eagle (*Harpia harpyja*).

The same sculpture of the Principal Bird Deity as shown above, this time seen from the side, with one of the Hero Twins in Maya mythology shooting it with a blowgun.
Another painting, on a Late Classic vessel (ca. 750 A.D.) of the same cormorant motif. The painting here shows the bird looking more menacing than usual—perhaps shown as a demon, or mere creative liberties?

Source: Kerr Maya Vase Database

A Late Classic vessel, ca. 700 A.D. Provenience unknown. A bizarre-looking heron/egret type bird (or perhaps even a cormorant) is shown eating what looks like a heart.

Source: Kerr Maya Vase Database
A drawing of a pot, showing an unidentified bird flying.

I think this is from Hellmuth's book, but I don't remember.
An elaborate carving on shell, showing the head of a bird on the upper left corner. Unfortunately the style is so ornate that the bird cannot be identified, especially with a lack of coloration.

Early Classic

Rio Azul, Guatemala

Source: Adams 1999
A painted image from a pot showing a figure with a white bird on top of his headdress. The bird is small in stature, has a large curved beak like a parrot, and appears to have a long tail like a quetzal, despite its white plumage. It may have been green when newly painted, but green paint is known to fade into white after a period of time, so it might be a quetzal.

Vase in Dumbarton Oaks collections.

Photo by A. Tokovinine

Source: Image archive, The Mesoamerica Center, UT-Austin
A figure with the head and wings of a Black Vulture stands over another (presumably dying) figure.

Carved bowl from eastern Yucatan region (Chochola style)

Late Classic, ca. 700 A.D.

Source: Kerr Maya Vase Database
45. A carved image of a flower, with what is apparently the Principal Bird Deity in the center.  

M Tikal, Marcador sculpture  

Early Classic, ca. 400 A.D.  

Source: Fields and Reents-Budet 2006  

46. A Kerr vase, K9279 (origin is therefore uncertain). A figure has a bird on top of his headdress and a second bird on a branch he is holding. The bird on the branch is unusual in that it features a long, quetzal-like tail, yet sports a long beak quite unlike a quetzal. It can’t be a motmot either, due to the lack of the distinctive lobed tail tips, although the beak and the tail length and the head shape would suggest a motmot.  

Source: Kerr Maya Vase Database
Another vessel from the Kerr archive (K9111), with an all-white water-dwelling bird on the right. It isn’t an egret, as those have black legs. The body shape suggests a pelican, however, as does the beak, so it could be an American White Pelican (*Pelecanus erythrorhynchos*).

Source: Kerr Maya Vase Database

A vessel of a bird standing on two legs, complete with wings. On the back of its head is carved the word “bak-muut,” meaning “grackle.” The Great-tailed Grackle, which has in recent years established itself as one of the most pervasive species of bird in the Americas, is found throughout Mesoamerica.

Northern Peten region, Guatemala, ca. 400 A.D.

Source: Fields and Reents-Budet 2005
49. A lidded bowl from the Early Classic period (ca. 450 A.D.), site unknown, but possibly from central Peten. It features the head of a water-dwelling bird with a snake dangling from its mouth. This indicates a wading bird such as a heron or ibis, since part of most species’ diets includes snakes. Cormorants and anhingas are not capable of eating snakes due to their smaller size and inability to wade. The authors in *The Fiery Pool* claim it is a Muscovy Duck, although it is not anatomically identical.

Northern Peten region, Guatemala

Source: Finamore and Houston 2010

50. This sculpture is carved in the shape of a quail. The body at first glance suggests a bobwhite (*Colinus* spp.), however no telltale markings are present to signify the species. The hole on the front suggests this may have been a whistle, which appropriately signifies the birds’ whistling calls. However, the singing quail (*Dactylortyx thoracicus*) is the only quail on the Yucatan (out of three species) having a lighter belly, so this is likely a singing quail. Considering that the singing quail’s “song” is a loud whistle that can easily be emulated, this might have been a lure used by hunters to capture the quails with.

Recovered from an underwater cache of artifacts from Jaina, Campeche, Mexico.
<table>
<thead>
<tr>
<th>Image</th>
<th>Description</th>
</tr>
</thead>
</table>
| ![Image](image1.png) | Another wild-looking cormorant/anhinga drawing.  
Source: Reents-Budet 1994 |
| ![Image](image2.png) | Another lidded jar with a water-dwelling bird as the handle.  
**SOURCE?** |
Glyphs from the Sculpted Pier of Temple XIX at Palenque, representing what appears to be the laughing falcon (*Herpetotheres cachinnans*), however upon closer identification, these are more likely to be representing the Osprey (*Pandion haliaetus*), the only North American bird of prey that eats fish. The Osprey spends its winters in the tropics, including the majority of the Yucatan Peninsula and parts of Chiapas, including Palenque.

Source: Stuart 2005
55. A Late Classic bowl with a painting of a bird, likely the mythical *muan*. Museo del Pueblo Maya, Dzibilchaltun, Yucatan, Mexico
Source: Image archive, The Mesoamerica Center, UT-Austin

56. A vase with an image of another water-dwelling bird. Northern Peten region, Guatemala, ca. 750 A.D. Late Classic
Source: Anonymous, *Route of the Mayas*, 1995
57. A vase with decorative motifs of water-dwelling birds with fish in their mouths. Late Classic.
Carved vase, provenience unknown, from art auction, 2013
Source: Photo archive, Mesoamerica Center, UT-Austin

58. A row of incised cormorants/anhingas. Late Classic.
Provenience unknown.
Source: Kerr Maya Vase Database, K4652

59. A Scarlet Macaw is being carried on a branch to the left of this picture on a vase. Late Classic.
Northern Peten region, Guatemala
Source: Kerr Maya Vase database, K5043
60. Another vase with a wild-looking water-dwelling bird.
   Late Classic, ca. 750 A.D.
   Northern Peten, Guatemala, perhaps Naranjo region.
   Source: Image archive, The Mesoamerica Center, UT-Austin

61. A bowl with a scarlet macaw painted onto it.
   Early Classic, ca. 450 A.D.
   Balamku, Campeche, Mexico
   Source: Bridgeman Images, JPC452759

62. A flamingo-like bird is being tended to, second from left to the person tending the spider monkey.
   Source: Arqueologia Mexicana website
63. A Late Preclassic rendition of the Principal Bird Deity, from the San Bartolo murals. Source: Photographic archive, The Mesoamerica Center, UT-Austin

64. A possible quetzal is feeding its young (?) in the hollow of a tree. Detail of Early Classic bowl from Caracol, Belize, ca. 450 A.D. Source: Image archive, The Mesoamerica Center, UT-Austin
A painting discovered on the frescoes at Chilonche, Guatemala, showing what appears to be a military macaw (*Ara militaris*) with the blue heavily exaggerated.

Late Classic, ca. 800 A.D.

Source: Image archive, The Mesoamerica Center, UT-Austin

---

A Black Vulture in a hieroglyph on an Early Classic vessel from Caracol, Belize.

Source: Image archive, The Mesoamerica Center, UT-Austin
| 67. | A Late Preclassic painting of a Black Vulture from the San Bartolo murals.  
  Late Preclassic, ca. 100 B.C.  
  Watercolor by H. Hurst, Proyecto Arqueologico Regional San Bartolo  
  Source: Image archive, The Mesoamerica Center, UT-Austin |
|---|---|
| 68. | Inside of a bowl with water-dwelling birds on the rim.  
  Late Classic, ca. 780 A.D.  
  Holmul, Guatemala  
  Peabody Museum, Harvard University |
| 69. | Vessel depicting a messenger with the head of what appears to be a Black Vulture.  
  Late Classic vase, provenience unknown.  
  Lake Peten region, northern Guatemala  
  Source: Image archive, The Mesoamerica Center, UT-Austin |
70. The Principal Bird Deity with Hunahpu, presumably during their battle.

Detail of stucco relief from Tonina, Chiapas, Mexico

71. The crest of K’inich Yax K’uk Mo’ painted on the interior of a bowl.

Early Classic, Provenience unknown

Source: Hellmuth 1987
<table>
<thead>
<tr>
<th>Image</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.jpg" alt="Image" /></td>
<td>A vessel with a cormorant/anhinga depicted eating a fish. Late Classic SOURCE?</td>
</tr>
<tr>
<td><img src="image2.jpg" alt="Image" /></td>
<td>A sculpture depicting a macaw on top of a warrior's head. Uaxactun, Stela 5 Drawing by Ian Graham. Source: Corpus of Maya Hieroglyphic Inscriptions, Volume *, Number *.</td>
</tr>
<tr>
<td><img src="image3.jpg" alt="Image" /></td>
<td>A carved shell depicting a water-dwelling bird with the face of a deity in its chest. SOURCE?</td>
</tr>
</tbody>
</table>
75. A scene from San Bartolo, depicting the Principal Bird Deity in the center, and a few unidentifiable perching birds to the right.

SOURCE?

76. Various depictions of water-dwelling birds and mythical winged “dragons”. First image is of a cormorant/anhinga, and from Seibal, Stela 2, Postclassic era.

Source: Hellmuth (1987)

77. A ceramic vessel with the head of a quetzal on the lid.

Source: Kerr Maya Vase Database
78. Rollout of a vase depicting otherworldly birds resembling cormorants.
Source: Kerr Maya Vase Database

79. Itzamnaaj receives a message from a hummingbird.
Detail from vase, Burial 196, Tikal, Guatemala.
Drawing by W. Coe
See also Kerr database, K8008

80. Hunahpu fighting Seven Macaw (the Principal Bird Deity).

SOURCE?
| 81. | A stone depicting the Principal Bird Deity with the human head of Itzamnaaj.  
     | Tonina, Chiapas, Mexico  
     | Museo de la Zona Arqueologica Tonina |
| 82. | Drawing of a headdress depicted on Bonampak Stela 2, showing a vulture-human hybrid atop a sky-band.  
     | Detail of drawing by Peter Mathews  
     | Source: Image archive, The Mesoamerica Center, UT-Austin |
83. “Black basal flange bowl”
Early Classic, ca. 350-400 A.D.
Northern Peten region, Guatemala

84. A flask with an elaborately carved bird creature on one side.
SOURCE?
Above: Bowl with a bird image painted on the inside. Below: three images of a vessel similar to image 4.

Source: Hellmuth 1987, Plate XXVII

Human deities or faces as birds’ bodies. Figure 354A: Kaminaljuyu, Guatemala, Monument 65, from the Preclassic era. Figure 354B: from an incised red vase, Tepeu 2 (Late Classic). Figure 354C: Dresden Codex p. XXXVI.

Source: Hellmuth (1987)
A scan from Hellmuth (1987), showing various water-dwelling bird carvings in the top row, some Principal Bird Deity (?) images in the middle row and two other water-dwelling birds in the lower.

Source: Hellmuth (1987)

Lintel 57 from Yaxchilan, depicting the queen of Yaxchilan and her son. On her son’s head is a headdress in the shape of a cormorant, including a fish in its mouth.

Late Classic

Drawing by Ian Graham

Source: Corpus of Maya Hieroglyphic Inscriptions, Volume 3, number 2
A vessel with a lid handle depicting a water bird catching a fish, probably an Anhinga.

Early Classic, ca. 450 A.D.

Provenience unknown, Northern Peten region, Guatemala

Photograph by Justin Kerr

Izapa, Stela 25

Principal Bird Deity before tree with small songbird.
<table>
<thead>
<tr>
<th>Image</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td>A painting in a bowl, with a White Ibis to the lower left of the scene. Late Classic, northern Peten region. Museo Nacional de Antropologia e Historia, Guatemala City. Source: Image archive, The Mesoamerica Center, UT-Austin.</td>
</tr>
<tr>
<td><img src="image2.png" alt="Image" /></td>
<td>Another carving of a cormorant/anhinga catching a fish. Palenque, Temple of the Foliated Cross, south sanctuary panel. Late Classic. Photo by Linda Schele. Source: Photograph archive, The Mesoamerica Center, UT-Austin.</td>
</tr>
<tr>
<td><img src="image3.png" alt="Image" /></td>
<td>Dancers with macaw (left) and vulture (right) headdresses. Text describes them performing the “Vulture-Macaw Dance.” Door lintel from Yaxchilan, Mexico. Late Classic, ca. 750 A.D. Source: Image archive, The Mesoamerica Center, UT-Austin.</td>
</tr>
<tr>
<td>Page</td>
<td>Image</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
</tr>
<tr>
<td>95.</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>96.</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>97.</td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td>Number</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>98.</td>
<td>A bowl with the painting of a dark-colored bird with red wing patches and a long tail. Identification is undetermined.</td>
</tr>
<tr>
<td>99.</td>
<td>Water bird, possibly an anhinga or cormorant.</td>
</tr>
<tr>
<td>100.</td>
<td>A very colorful bird specimen on a bowl. It is not identifiable due to the stylization involved.</td>
</tr>
</tbody>
</table>
101. Another lidded bowl with the head of a Scarlet Macaw.

Early Classic, ca. 400 A.D.

Northern Peten region, Guatemala

Archaeology Museum, Hotel Santo Domingo, Antigua Guatemala

Source: Photo archive, The Mesoamerica Center, UT-Austin

102. A pot used for pouring liquids, in the shape of what appears to be a parrot.

Unknown date

Archaeology Museum, Hotel Santo Domingo, Antigua Guatemala

Source: Photo archive, The Mesoamerica Center, UT-Austin

103. A similar vessel to the above.

Unknown date

Archaeology Museum, Hotel Santo Domingo, Antigua Guatemala

Source: Photo archive, The Mesoamerica Center, UT-Austin

104. To the far right, an offering is being made to Itzamnaaj, consisting of a baby macaw and a quetzal. Inscription translates to: “Good, said Pauahtun Itzamna.”

Source: Kerr Maya Vase Database
<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>105.</td>
<td>In the top middle of this underwater scene roosts a large stylized bird (likely the Principal Bird Deity). Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>106.</td>
<td>Two scenes of the Corn God dancing with the Principal Bird Deity in the background. From the Naranjo region. Source: Kerr Maya Vase Database, K517</td>
</tr>
<tr>
<td>107.</td>
<td>Scenes from the Popol Vuh, which include Hunahpu shooting his blowgun at the vulture, and an egret-like bird perched above the vulture. Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>108.</td>
<td>A vase from Tikal showing a complex design of Itzamnaaj and the Principal Bird Deity. Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>109.</td>
<td>Shown here is the dressing of the Maize God after his resurrection. A spider monkey and a bird (a cormorant?) are to his left. Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>Number</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>110.</td>
<td>God 3 emerges from the beak of a monster bird, possibly the Principal Bird Deity.</td>
</tr>
<tr>
<td>111.</td>
<td>An eagle, likely a Harpy (<em>Harpia harpyja</em>) is shown in the top middle. The snake around its neck is a common motif for a bird of prey.</td>
</tr>
<tr>
<td>112.</td>
<td>Here are tiers of animal ways, on a polychrome vessel. A bird which resembles a Black Vulture is shown second from the left, top row.</td>
</tr>
<tr>
<td>113.</td>
<td>A scene showing a peccary (left) and an Ocellated Turkey (right) in the guise of demons.</td>
</tr>
<tr>
<td>Page</td>
<td>Image</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
</tr>
</tbody>
</table>
| 114. | ![Image](114.jpg) | Two birds are seen on this vase: a dark-colored one that appears to be in the shape of an anhinga, and a light-colored one (an egret, possibly) with a fish falling from its mouth.  
Museum of Fine Arts, Boston  
Central Peten region, Late Classic  
Source: Kerr Maya Vase Database |
| 115. | ![Image](115.jpg) | A scene of a bat and a bird, in demon form.  
Source: Kerr Maya Vase Database |
| 116. | ![Image](116.jpg) | A pattern of Principal Bird Deity representations.  
Source: Kerr Maya Vase Database |
| 117. | ![Image](117.jpg) | In this palace scene, the people are wearing and holding quetzal feathers, evidenced by the green coloration.  
Northern Peten region, Guatemala  
Source: Kerr Maya Vase Database |
<table>
<thead>
<tr>
<th>Image</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Image](150x647 to 327x715)</td>
<td>Itzamna is shown dying in this palace scene. On the lower left appear some birds: one an owl, the other two being possible grackles. Late Classic vase, ca. 700 Nakbe or Calakmul region Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>![Image](150x493 to 339x566)</td>
<td>This scene of the maize god features one of the people with a flower hat, complete with hummingbird hovering in front of the flower. Northern Guatemala region Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>![Image](95x184 to 417x289)</td>
<td>Another underworld scene featuring ways, including a bird in the top left corner. Peten region, Late Classic Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>![Image](150x184 to 412x445)</td>
<td>A scene from the <em>Popol Vuh</em>, portraying a ballgame. Peten region, Late Classic Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>Image 150x611</td>
<td>K1247</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Image 150x531</td>
<td>K1254</td>
</tr>
<tr>
<td>Image 150x335</td>
<td>K1280</td>
</tr>
<tr>
<td>Image 150x233</td>
<td>K1288</td>
</tr>
<tr>
<td>Image</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| ![Image](image1.png) | **K1337**  
Bird beings (the one on the left an apparent macaw).  
Northern Peten region, Late Classic  
Source: Kerr Maya Vase Database |
| ![Image](image2.png) | **K1342**  
A turkey (*M. ocellata*) alongside a peccary or dog.  
Northern Peten region, Late Classic  
Source: Kerr Maya Vase Database |
| ![Image](image3.png) | **K1345**  
A scene from the *Popol Vuh*, with hummingbirds feeding from flowers.  
Northern Peten region, Late Classic  
Source: Kerr Maya Vase Database |
| ![Image](image4.png) | **K1377**  
A sacrifice scene with a stylized bird being (perhaps the Principal Bird Deity) in the middle foreground.  
Peten region, Late Classic  
Source: Kerr Maya Vase Database |
<table>
<thead>
<tr>
<th>Page</th>
<th>Image</th>
<th>Text</th>
</tr>
</thead>
</table>
| 130. | ![](image1) | K1383  
Two flying quetzal birds surrounded by dedicatory hieroglyphs.  
Peten region, possibly Rio Azul, Guatemala, Late Classic  
Source: Kerr Maya Vase Database |
| 131. | ![](image2) | K1491  
A plate, showing various scenes. In the bottom left corner of the picture is a painting of a man with a macaw perched on his hand.  
Peten region, Late Classic  
Source: Kerr Maya Vase Database |
| 132. | ![](image3) | K1550  
Two large birds on a carving (not sure what the scene is here, perhaps an enema scene). |
<table>
<thead>
<tr>
<th>No.</th>
<th>Object ID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>133.</td>
<td>K1609</td>
<td>Cosmological scene, but with a decorated and stylized bird at the very top of the picture. Possibly a variant of the Principal Bird Deity. Northern Peten region, Late Classic. Source: Kerr Maya Vase Database. Published in Schele and Miller 1986.</td>
</tr>
<tr>
<td>134.</td>
<td>K1698</td>
<td>Several waterbirds with large beaks are shown in a row. From the Ucanal site. Peten region, Late Classic. Source: Kerr Maya Vase Database.</td>
</tr>
<tr>
<td>136.</td>
<td>K2026</td>
<td>A pile of rabbits is seen at the bottom of this picture, with a man holding a large white waterbird on the left (likely a heron). Peten region, Late Classic. Source: Kerr Maya Vase Database.</td>
</tr>
<tr>
<td>Page</td>
<td>Vase Image</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>------------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| 137. | K2041 | An ocellated turkey and a toad are seen together.  
Northern Peten region, Late Classic  
Source: Kerr Maya Vase Database |
| 138. | K2249 | The figure at left has a bird perched on his shoulder. Due to the tail feathers it is likely a quetzal (*Pharomachrus mocinno*).  
Peten region, Late Classic  
Source: Kerr Maya Vase Database |
| 139. | K2356 | Very faint drawings of birds appear in this painting. One at the top appears ibis/egret-like.  
Peten region, Late Classic  
Source: Kerr Maya Vase Database |
| 140. | K2668 | A Hero Twin from the *Popol Vuh* is holding a cormorant-like bird while addressing a zoomorphic bee. A similar bird is shown to the left.  
Source: Kerr Maya Vase Database |
<table>
<thead>
<tr>
<th>Image</th>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.jpg" alt="Image" /></td>
<td>K2768</td>
<td>Two waterbirds, likely anhingas. Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td><img src="image2.jpg" alt="Image" /></td>
<td>K2794</td>
<td>Supernatural palace scene. Bird at the bottom of the picture in the right foreground—perhaps a grackle? Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td><img src="image3.jpg" alt="Image" /></td>
<td>K2866</td>
<td>Cormorant-like bird with fish in beak. A tetrapod bowl from the Early Classic period. Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td><img src="image4.jpg" alt="Image" /></td>
<td>K2993</td>
<td>From a Hondo River site in Belize. Two birds are unidentifiable, although in the lower left corner there is a heron-like bird.</td>
</tr>
<tr>
<td>Page</td>
<td>Image</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>145.</td>
<td><img src="145.png" alt="Image" /></td>
<td>K3062 One zoomorphic bird in the upper left corner.</td>
</tr>
<tr>
<td>146.</td>
<td><img src="146.png" alt="Image" /></td>
<td>K3200 Waterbirds catching fish in a pond.</td>
</tr>
<tr>
<td>147.</td>
<td><img src="147.png" alt="Image" /></td>
<td>K3201 Scene involving the sacrifice or welcoming of an infant. In the top left corner there is a falcon-like bird.</td>
</tr>
<tr>
<td>148.</td>
<td><img src="148.png" alt="Image" /></td>
<td>K3242 Another ocellated turkey picture, this time with a rodent to the right.</td>
</tr>
<tr>
<td>149.</td>
<td><img src="149.png" alt="Image" /></td>
<td>K3296 From the Copan site. The figure on the left is wearing a headdress with a vulture's upperparts. The vulture is likely a King Vulture (<em>Sarcoramphus papa</em>).</td>
</tr>
<tr>
<td>150.</td>
<td><img src="150.png" alt="Image" /></td>
<td>K3470 Another turkey drawing, this time with a jaguar to the right.</td>
</tr>
</tbody>
</table>
152. K3685
Stylized unidentified waterbirds appear on this vessel.
Source: Kerr Maya Vase Database

153. K4012
Old god dying, supernatural scene. At the bottom left corner sits an owl and two corvid-like birds.
Source: Kerr Maya Vase Database

154. K4151
A hunter is shooting a blowgun at birds that appear to be egrets.

155. K4180
This carving depicts birds with large beaks—perhaps toucans.

156. K4358
Multiple scene, including the dressing of the Young Corn God. A white ibis (*Eudocimus albus*) is shown in the lower left foreground.
Source: Kerr Maya Vase Database
<table>
<thead>
<tr>
<th>Image</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K4550</td>
<td>A figure is talking to a parrot on the left. Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>K4574</td>
<td>An entire stucco of quetzals and spoonbills. Late Classic</td>
</tr>
<tr>
<td>K4575</td>
<td>Same design as K4574, likely part of the same stucco. Late Classic</td>
</tr>
<tr>
<td>K4576</td>
<td>Same stucco design, but with more mythical figures. A spoonbill appears twice. Late Classic</td>
</tr>
<tr>
<td>K4599</td>
<td>Heavily stylized carving of a deer sacrifice. A bird is shown in the top middle. Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>Image</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>162.</td>
<td>K4619 From the Naranjo site. The Maize God is shown dancing with the Principal Bird Deity. Source: Kerr Maya Vase Database.</td>
</tr>
<tr>
<td>163.</td>
<td>K4647 A carving from Copan. What exactly it represents is not known, though bird heads appear in the upper left corners of each hieroglyph. Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>164.</td>
<td>K4652 A Copan carved vase with stylized waterbirds. Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>165.</td>
<td>K4669 A plate with vertical text, flanked by two zoomorphic bird figures. Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>Number</td>
<td>Code</td>
</tr>
<tr>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>166.</td>
<td>K4675</td>
</tr>
<tr>
<td>167.</td>
<td>K4681</td>
</tr>
<tr>
<td>168.</td>
<td>K4687</td>
</tr>
<tr>
<td>169.</td>
<td>K4857</td>
</tr>
<tr>
<td>170.</td>
<td>K4924</td>
</tr>
</tbody>
</table>
| 171. | K4958 | From the Naranjo site, this vase shows a zoomorphic bird, whose pattern makes it hard to discern the species.  
Source: Kerr Maya Vase Database |
Source: Kerr Maya Vase Database |
| 173. | K5008 | This vase shows the Principal Bird Deity (Seven Macaw), who in the Maya creation story brought the first light to the world.  
Source: Kerr Maya Vase Database |
| 174. | K5038 | Waterbirds with exaggerated feathers.  
Source: Kerr Maya Vase Database |
The Hero Twins from the Popol Vuh bring an offering of a bird (a scarlet macaw, *Ara macao*) to the moon goddess.

Peten region, Late Classic

Source: Kerr Maya Vase Database

This plate shows perhaps a *muan* bird. It is very similar to a plate I saw in the Museo del Pueblo Maya (no. 55 above).

Source: Kerr Maya Vase Database

Scarlet macaws are shown on the lining of one of these vases.

Source: Kerr Maya Vase Database
<table>
<thead>
<tr>
<th>Page</th>
<th>Image</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>178.</td>
<td><img src="#" alt="Image" /></td>
<td>A seated figure (possibly a lord) is shown with a bird on his finger. Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>179.</td>
<td><img src="#" alt="Image" /></td>
<td>Waterbirds shown on a vase similar in style to Holmul. The actual site where this came from is currently unknown. Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>180.</td>
<td><img src="#" alt="Image" /></td>
<td>Heron/egret-like birds catching fish. Probably mythological birds, given the faces in their chests. Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>181.</td>
<td><img src="#" alt="Image" /></td>
<td>Another rendering of the Principal Bird Deities, perhaps as hummingbirds. Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>183.</td>
<td><img src="#" alt="Image" /></td>
<td>Black birds shown in perhaps an underworld environment. Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>Plate No.</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>K5381</td>
<td>This plate from Campeche shows a <em>muán</em> bird, or perhaps the Principal Bird Deity. Source: Kerr Maya Vase Database</td>
<td></td>
</tr>
<tr>
<td>K5632</td>
<td>Faded image showing a jaguar, serpent and a bird to the right. Source: Kerr Maya Vase Database</td>
<td></td>
</tr>
<tr>
<td>K5637</td>
<td>A sacrificial scene involving a dog. The Principal Bird Deity is shown to the right. Source: Kerr Maya Vase Database</td>
<td></td>
</tr>
<tr>
<td>K5722</td>
<td>From the Naranjo site. Another Holmul style vase with waterbirds. Source: Kerr Maya Vase Database</td>
<td></td>
</tr>
<tr>
<td>189.</td>
<td>K5723</td>
<td>Principal Bird Deity shown on a plate from the Naranjo site.</td>
</tr>
<tr>
<td>190.</td>
<td>K5792</td>
<td>An ibis-like bird. A conch shell is visible in front of its beak. Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>191.</td>
<td>K5795</td>
<td>A Honduran vase depicting a hunter shooting at a spotted bird with a blowgun.</td>
</tr>
<tr>
<td>192.</td>
<td>K5835</td>
<td>Plate from the Campeche area with a possible *muam. Source: Kerr Maya Vase Database</td>
</tr>
</tbody>
</table>
193. K5944
A ruler with a waterbird, resembling an egret or a heron.
Source: Kerr Maya Vase Database

194. K5975
A humanoid hummingbird sucking something (blood?) from a seated lord’s tongue.
Source: Kerr Maya Vase Database

195. K6040
Two waterbirds, each with fish.
Source: Kerr Maya Vase Database

196. K6181
See K5082.
Source: Kerr Maya Vase Database
<table>
<thead>
<tr>
<th>Image</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="K6218" /></td>
<td>A stucco, with waterbirds (storks? Ibises?). Peten area, Late Classic, ca. 700 A.D. Kislak Collection, Library of Congress. Source: Kerr Maya Vase Database.</td>
</tr>
<tr>
<td><img src="image2.png" alt="K6298" /></td>
<td>The Hero Twins call birds (geese?) with whistles. Peten area, Late Classic. Source: Kerr Maya Vase Database.</td>
</tr>
<tr>
<td><img src="image3.png" alt="K6438" /></td>
<td>Waterbirds with deity’s heads in chests catch fish. Peten area, Late Classic. Source: Kerr Maya Vase Database.</td>
</tr>
<tr>
<td><img src="image4.png" alt="K6501" /></td>
<td>Birds with fishes in their beaks. Peten area, Late Classic. Source: Kerr Maya Vase Database.</td>
</tr>
</tbody>
</table>
201. K6550
Deeply carved panels with waterbirds catching fish.

Peten or Campeche region, Late Classic
Source: Kerr Maya Vase Database

202. K6551
See K6550.

Peten or Campeche region, Late Classic
Source: Kerr Maya Vase Database

203. K6609
Two waterbirds with fish in beak. The beaks might suggest flamingos or spoonbills.

Peten region, Late Classic
Source: Maya Vase Database
<table>
<thead>
<tr>
<th>Page</th>
<th>Image</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>204.</td>
<td><img src="image1.png" alt="Image" /></td>
<td>K6665 Two egret-like waterbirds with conch shells. Peten region, Late Classic Source: Maya Vase Database</td>
</tr>
<tr>
<td>205.</td>
<td><img src="image2.png" alt="Image" /></td>
<td>K6989 Two figures dance, with ornate bird headdresses. Unknown region, Late Classic Source: Maya Vase Database</td>
</tr>
<tr>
<td>206.</td>
<td><img src="image3.png" alt="Image" /></td>
<td>K6994 Offering being made to deities. A stylized bird is to the very right. Peten region, Late Classic Source: Maya Vase Database</td>
</tr>
<tr>
<td>207.</td>
<td><img src="image4.png" alt="Image" /></td>
<td>K7145 Two waterbirds are shown on an incised vase. Peten region, Late Classic Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>Page</td>
<td>Image</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>208.</td>
<td><img src="image1.png" alt="Image" /></td>
<td>K7221 Two parrots on a stucco vase. Peten region, Late Classic Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>209.</td>
<td><img src="image2.png" alt="Image" /></td>
<td>K7460 Waterbirds on a polychrome vase. Peten region, Late Classic Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>210.</td>
<td><img src="image3.png" alt="Image" /></td>
<td>K7605 Vultures (likely a black vulture (<em>Coragyps atratus</em>)). Peten region, Late Classic Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>211.</td>
<td><img src="image4.png" alt="Image" /></td>
<td>K7610 Hummingbirds are shown vibrating their wings. Peten region, Late Classic Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>Page</td>
<td>Vase Number</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>212.</td>
<td>K7821</td>
<td>The Hero Twins are shown: one kneeling before Itzamna, the other before the Principal Bird Deity.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Peten region, Late Classic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>213.</td>
<td>K8068</td>
<td>Three parrots are present on this bowl.</td>
</tr>
<tr>
<td>214.</td>
<td>K8179</td>
<td>On this bowl from Salvador, two waterbirds are facing what appear to be suns.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unknown region, Late Classic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>215.</td>
<td>K8278</td>
<td>A waterbird with the water lily monster.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Peten region, Late Classic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td>216.</td>
<td>K8351</td>
<td>The scene of a sacrifice. The man sacrificing is holding a scarlet macaw.</td>
</tr>
</tbody>
</table>
217. K8504
The war serpent, in the form of a bird.
Northern Peten region, Late Classic
Source: Kerr Maya Vase Database

218. K8538
See K6438. Found in Copan, Honduras.
Late Classic
Source: Kerr Maya Vase Database

219. K8636
Two representations of the Principal Bird Deity are shown on this polychrome vase.
Peten region, Late Classic
Source: Kerr Maya Vase Database

221. K8651
A black waterbird with a fish in its beak.
Northern Peten region, Late Classic
Source: Kerr Maya Vase Database
<table>
<thead>
<tr>
<th>Image</th>
<th>Number</th>
<th>Image</th>
<th>Number</th>
<th>Image</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td>222.</td>
<td>K8734</td>
<td>What is perhaps a version of the Principal Bird Deity is shown on the left.</td>
<td>M</td>
<td>Northern Peten region, Late Classic</td>
</tr>
<tr>
<td><img src="image2.png" alt="Image" /></td>
<td>223.</td>
<td>K8755</td>
<td>A stone vessel from possibly the Esquintla area of Guatemala. The birds shown here are heavily exaggerated.</td>
<td>Early Classic, ca. 400 A.D.</td>
<td>Source: Kerr Maya Vase Database</td>
</tr>
<tr>
<td><img src="image3.png" alt="Image" /></td>
<td>224.</td>
<td>K8804</td>
<td>The lining of this vase has paintings of waterbirds.</td>
<td>Unknown region, Late Classic</td>
<td>Source: Kerr Maya Vase Database</td>
</tr>
</tbody>
</table>