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Writing Systems as a Reflection of Ancient Societies

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This thesis examines the writing systems of two ancient societies: the Latin alphabet as a writing system within the Roman Empire and the hieroglyphic writing system within the Maya city-state. This thesis first situates writing as a technology and explains the common uses of writing systems in modern contexts, before turning to an examination of the past. Next, basic literary patterns—including estimated literacy rates, education patterns and opportunities, types of documents, and themes within writing—are examined within the context of both societies. After evaluating these literary patterns, as well as the social, political, and economic organization of both societies, this thesis examines the relationship between these writing systems and their respective societies. The literary patterns discussed in the context of these writing systems reflect the previously discussed socio-political-economic hierarchies within the two farming societies. Additionally, these literary patterns are used to examine the reflection of a society's food surplus—one based on wheat within the Roman Empire and one supported by maize in the Maya city-state—within written documents, as well as the differences formed among these farming societies due to their respective forms of subsistence.

Keywords and Phrases: writing systems, Roman Empire, Maya city-state, literary patterns, literacy rates, education, food surplus.

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Introduction

Many ancient societies that eventually grew to form state-level social and political organization followed similar paths of development. These developmental paths began with the transition away from a reliance on wild plant and animal species for subsistence, to the domestication of them (Diamond, 1999, p. 87). This increased control over a society's own food production allowed for the development of a food surplus in many areas, especially among those societies situated near the Fertile Crescent in Asia. After further increasing its food surplus and developing a system of food storage, those societies became sedentary, building permanent settlements, rather than continuing the mobile, nomadic lifeways that commonly correspond with the highly seasonal availability of food. Sedentism, in turn, often leads to higher populations and population densities, as well as the rise of social inequality over time (Diamond, 1999, p. 87). As a society continues along this developmental pathway of increasing social inequality,

forming elite and non-elite social classes, the stage is set for the formation of new political institutions and technologies, namely the formation of states and writing.

Not every society follows this common trajectory of state formation. Some develop the technology of writing apart from sedentism and the reliance on food surpluses; others develop food surpluses and become sedentary, but not develop the technology of writing. Many past and present societies have, however, followed this common developmental pathway, though occasionally in ways that can vary greatly depending on the underlying geography. In Eurasia, near the Fertile Crescent, for example, the Roman state first arose and later grew into an empire that expanded throughout much of Europe and North Africa, supported by a food surplus derived from the intensive production and farming of wheat. In the Western Hemisphere, in contrast, other societies flourished and followed a somewhat different developmental pathway to grow food surpluses and transition into sedentary societies. The Maya city-states, for example, expanded throughout what is today Honduras, Guatemala, Belize, and Mexico with a food surplus supported mainly by maize farming. Though located on separate continents and supported by different food staples—wheat and maize—as well asreaching their peaks of expansion at different times, the Romans and the Mayans followed similar, yet slightly divergent, developmental pathways. Both, however, established their own writing systems: the Latin alphabet and Mayan hieroglyphs, respectively. This thesis uses the various literary patterns—e.g., literacy rates, educational opportunities, and forms of writing—within ancient Rome and the ancient Maya to illustrate the differing socio-political-economic hierarchies that arose once a food surplus was established within these societies.

Writing as a Technology

In many societies today, the goal, if not the expectation, is that every person within the community is literate. Every child is expected to learn how to read or write, either through public education or private schooling. Due to this assumption and expectation, however, the presence of writing and a writing system within a society is often taken for granted. Many begin to lose sight of the fact that writing is an important technological advancement; it is a tool. Writing signifies the transition from prehistory to history, from strictly oral tradition to recorded narratives. Once a society has developed a writing system, it is not only able to document everyday activities—such as taxes, legal documents, and marriages—but it is also able to document broader historical narratives and religious beliefs or rituals. Schools use written textbooks and other sources to educate students on the history of one's own society, as well as the world. Similarly, many religions have written documents explaining the origins and beliefs of their faith (Draper, 2018, p. 52).

Past and present writing systems serve as important tools for communication, both within and between societies. Presently, important scientific, mathematical, and other discoveries are shared throughout the world using written reports and their translated versions. In terms of everyday communication, individuals are able to contact family members, employers or employees, friends, and businesses through written forums including memos, emails, and text messages. Writing served as an important tool for communication in the past, as well. This communication included intentional correspondence through letters and other written texts; however, it also included communication through less obvious sources. During times of conquest, many recorded

the events that transpired in the New World. Members of Hernán Cortés' troops, for example, kept note of how they successfully conquered the Aztecs to claim the region of today's Mexico for Spain. Years later, Francisco Pizarro used these notes in order to plan a more efficient conquest of the Inca Empire in South America. The written communication, though indirect, played an important role in the "discovery" and conquest of the New World.

Writing and writing systems as tools for communication goes beyond that of communication between concurrent societies. Past writings can also serve as communication between the past and the present. Texts from ancient societies, for example, are often examined by archaeologists and historians in order to begin to piece together past ways of life. In conjunction with other archaeological finds and artifacts, these texts may provide context for the social and political organization of an ancient society. Additionally, the content of these written texts shows archaeologists and historians what an ancient society chose to record, from religious to historical narratives. Narratives describing creation stories, deities, actions of a ruler (either actual or exaggerated), and everyday life provide insight into a past society and may illustrate the hierarchies that existed within it.

Originality and Importance: A Modern-Day Comparison

These literary patterns, and the hierarchies they reflect, serve an important role in comparing the similarities and differences among farming societies. However, these patterns also serve as a comparison between ancient civilizations and the modern world. Writing today fulfills a variety of purposes, including those used within the Roman Empire and the Maya city-states. Many forms of modern writing serve the purpose of

entertainment, much like certain documents within the Roman Empire (Pulgram, 1950, p. 459). Further, both the Roman Empire and Maya city-state used writing within religious, as well as political and historical contexts. Among the Maya, for example, certain inscriptions dedicated temples to various gods and deities, or included stories surrounding these gods, while some stelae would depict rulers as gods responsible for bountiful maize harvests (Rice, 2008, p. 76). Modern religions, likewise, use writing to record their religious history and beliefs. In terms of political themes and purposes within writing, both the Romans and the Maya used writing to document important accomplishments and responsibilities of their rulers. Today, writing documents important political occasions, such as treaties, political histories of nations, responsibilities of government organizations/employees, and various other political matters.

Despite similarities between the past and the present regarding purposes and themes within writing, there are several differences between modern writing and writing within the Roman Empire and Maya city-state. One such difference occurs within education and literacy rates. As will be discussed, education was often reserved for the elite in ancient societies (more so within the Roman Empire than within the Maya city-state). This resulted in a very low literacy rate within both societies; neither likely above two percent. The pattern of restricting access to education and low literacy rates, however, has been steadily changing throughout history. Today, although some social stratification is reflected in education (namely access to private schooling and/or access to a college education), public schooling has provided access to basic education for the majority of the population. Due to the wider access of education, literacy rates have also risen. While each country's literacy rate may vary—and literacy rates among developing

nations will likely be lower—global literacy rates have reached up to 91 percent (UNICEF, 2019, para. 1). Such steadily rising literacy rates often create the assumption that everyone has at least basic literacy skills; an assumption that clearly cannot be made among the Roman Empire and Maya city-state.

Literary Patterns

Estimated Literacy Rates

During the first two centuries AD, the Roman Empire witnessed its greatest period of expansion, gaining control of a majority of present-day Europe, the Near East, and the Mediterranean regions of Africa. This wide geographic territory, as well as high population densities in the major cities, set the stage for major population growth throughout the Roman Empire. Although archaeologists and historians have not been able to agree on a concrete population size during the height of the Roman Empire, they have been able to make population estimates ranging from 60 million to 90 million inhabitants (Jongman, Jacobs, & Goldewijk, 2019, p. 138). However, like many ancient cultures with stratified societies, much of the large Roman population was not literate. Access to education was reserved for the sons of elite families.

In order to determine the proportion of the Roman population that was likely literate, one must first estimate the number of elite versus non-elite citizens. Walter Scheidel and Steven Friesen do this in their paper estimating the size of the Roman economy and income distribution throughout the empire. Scheidel and Friesen identify various methods that can be used to estimate the Gross Domestic Product of the Roman Empire at its peak. These methods include evaluating how much was likely consumed by the population and assigning a value to this (usually expressed in terms of grain);

estimating the income of certain groups and moving toward a broader total estimate; and comparing segments of the economy that have previously been estimated by other historians (Scheidel & Friesen, 2009, p. 63). By using these methods and considering both pessimistic and optimistic scenarios in order to establish a plausible range, Scheidel and Friesen are able to critique previous estimates of the Roman GDP given by other historians, as well as provide their own. A final estimate places the total generated income of the population of the Roman Empire at around 50 million tons of wheat per year (Scheidel & Friesen, 2009, p. 62).

After estimating the annual Gross Domestic Product of the Roman Empire during its peak, Scheidel and Friesen turned their attention to the income distribution among its citizens. Rather than trying to generalize between the "rich" and the "poor", Scheidel and Friesen estimate the income of broad status groups, such as senatorial elite and civic notables, then combine these numbers to obtain an estimate for the larger elite class as a whole (Scheidel & Friesen, 2009, p. 75). Once estimated tax rates are determined and the GDP is adjusted accordingly, Scheidel and Friesen begin to compare previous scholars' income distribution models and, once again, provide their own. The distribution table provided by Scheidel and Friesen lists the estimated population and income of four status groups—the senatorial order, the equestrian order, the decurion order, and other general wealthy citizens—as presented by three previous scholars. Following these estimates, Scheidel and Friesen include their own, revised estimates for the population and income of these status groups, as well as the total elite population. After considering both their pessimistic model and the optimistic model (in which they consider the lowest and highest possible total and elite population estimates), Scheidel and Friesen estimate that

the total elite population represented approximately 1.2-1.7 percent of the general population and accounted for roughly 16-29 percent of the total income (Scheidel & Friesen, 2009, p. 75). Therefore, using Scheidel and Friesen's estimated total population of 70 million, the elite class accounts for roughly 840,000-1.1 million citizens.

Many historians realize that literacy for many ancient societies involved more than simply being able to read and write; oral traditions were still considered important factors in ancient literacies (Cribiore, 2018, p. 388). Nonetheless, when estimating literacy rates in the context of writing systems and their development, the ability to read and write is most relevant. Therefore, though the elites had more opportunities for education and gaining literacy skills, not all of the 840,000-1.1 million members of the elite were able to read and write. Archaeologists and historians use both titles, such as official scribes, and material evidence from burials and other archaeological sites in order to determine who was likely to have been literate. Archaeologist Hella Eckardt, for example, uses inkwells and other material remains from elite burials in order to establish whether a member of the Roman elite was literate, as well as investigate the prevalence of literacy among elite women and children. Ekardt's findings supported previous scholarship claiming that, while some elite women had access to education (and included inkwells in their burials, indicating some level of literacy), this occurrence was rare (Cribiore, 2018, p. 389). Because some levels of literacy did exist among elite women, however rare, one cannot simply estimate literacy rates as half of the elite population (1.2-1.7 percent of the total population). Therefore, literacy rates were likely closer to 0.8-1.1 percent of the total estimated population of the Roman Empire and around two-thirds of the estimated elite population.

These literacy rate estimates account for an estimated average across the whole of the Roman Empire. Therefore, they may not hold consistent throughout each individual Roman city and imperial territory. Many elite individuals, depending on how elite they were, were drawn to larger cities, especially those closer to the capital. In these cities, the population of elite may account for more than 1.2-1.7 percent of the city's population. Therefore, it is likely that the literacy rates within these cities were slightly higher than that of the estimated average literacy rate throughout the Roman Empire. Meanwhile, the percentage of elite citizens compared to the general population in many small, rural towns and cities was likely slightly smaller. The Samnium region in Italy, for example, began as a rural village settlement whose construction projects focused on rural sanctuaries throughout the area (Patterson, 2003, p. 154). As a rural village, the Samnium region had a small proportion of elite citizens compared to its non-elite population. During this time, it's likely that the literacy rate of this region, and other regions with smaller proportions of elite individuals, was lower than that of the estimated literacy rate for the Roman Empire as a whole. As the Samnium region further developed and became a more urban settlement, its elite population began to rise. Elite individuals from this region gained more mobility throughout the Empire and more elite individuals were drawn to the region (Patterson, 2003, p. 157). As the elite population continued to rise in this area, the literacy rate of the area likely began to rise, as well, moving closer to the empire-wide average.

Similar to the Roman Empire and other ancient civilizations, Maya city-states did not keep detailed population and census records. Additionally, various pieces of Maya literature/writing, such as the Maya codices, which will be discussed in later sections,

were burned by the Spanish during conquest. Archaeologists and historians, therefore, have had to reconstruct ideas of Mayan society and population structure from the remaining literature and archaeological evidence. Scholars have been able to create a timeline of Maya civilization from early development during the Formative Period, to its height during the Classic Period and its decline during the Post-Classic Period. Populations grew steadily throughout Maya cities beginning in the Pre-classic Period and reached peak population densities during the Late Classic Period, around 400-700 AD (Lucero, 1999, p. 223). There is also sufficient evidence for scholars to determine which sites served as powerful "superstates" with large populations: Tikal and Calakmul (Scherer, 2007, p. 368). However, estimates of the total Maya population at this peak have not been agreed upon.

Though scholars have struggled to form an estimate for the total Maya population at the height of its expansion/development, some have been able to estimate populations for major cities and regions. In the Copan Valley, for example, various methods have been used to estimate populations during the Middle-Late Classic Period. Archaeological evidence and burials from the Late Classic period (roughly 650-800 AD) are relatively well-preserved in this region. Thus, scholars have been able to estimate later population sizes with some confidence (Paine, Freter, & Webster, 1996, p. 52). Using these later estimates, as well as settlement patterns and additional archaeological data, scholars have been able to apply population projection methods and estimate the population of the Copan Valley during earlier time periods. The reliability of these projection methods does decrease the further in time one moves from the original population estimate. However, scholars are fairly confident in the reliability of the population projection for

the time period spanning from 400 AD to 650 AD. Like those for Roman populations, these estimates have both a low/pessimistic projection and a high/optimistic projection. The average projection for the Copan Valley during this time period estimates a population size of roughly 1,500-6,500, with steady growth throughout the 200-year time span (Paine, Freter, & Webster, 1996, p. 53-54). Similar methods have been used to estimate populations in other significant Maya regions during the Late Classic Period: the population estimated to live in Calakmul or within 50 square miles of the city was estimated to reach up to 50,000 citizens, and the population living within a 100 square mile radius of the city of Caracol was estimated to be roughly 100,000 (Lucero, 1999, p. 223).

Archaeologists and historians have discovered various methods to distinguish between the elite and the non-elite Maya population. Elite individuals, for example, had a more diverse diet with a larger variety of meat and less reliance on carbohydrates than non-elite individuals (Cucina & Tiesler, 2003, p. 6). Additional differences between the elite and the non-elite can be found in burial practices, general health, residence architecture, and amount/forms of labor (Lucero, 1999, p. 228). Though archaeologists are able to distinguish between the elite and non-elite classes based on these differences, there is no estimate for the size of the general Maya elite population in proportion to the Maya population as a whole—likely due, in part, to the lack of population estimate for the general Maya population during the Classic Period. Just as some archaeologists have been able to estimate populations of specific Maya cities and regions, others have been able to estimate elite populations for these sites. In the site of Pacbitun (a site in modern-day Belize), for example, archaeologists employed various survey and excavation

methods on existing mounds, as well as evaluated architecture near the epicenter of the site. The results from these excavations allowed archaeologists to estimate a population of approximately 5,377-6,800 during the Late Classic Period (Healy et al., 2007, p. 32). However, they did not stop at a general population estimate. Further evaluation—including evaluating residence locations in relation to the epicenter, as the elite were more likely to live closer to the political center of the site—has allowed archaeologists to estimate an elite population of roughly 200 people, about 3 percent of the total population estimate for the Pacbitun site (Healy et al., 2007, p. 35). Though one cannot estimate a total elite population for the Maya city-state from this estimate, one can begin to use this proportion of elite to the general site population as a starting point for estimating other elite populations. Other Maya sites of this size could likely have had similar elite populations.

Just as one cannot assume that the proportion of elite in the Roman Empire was equal to the proportion of literate citizens, one cannot assume that all of the elite Maya population was literate. Though many may have had access to education, as well as the oral skills and knowledge of traditions to be considered literate among the Maya, fewer elite were able to read and write. Some may have used writing within their professions, such as scribes and those commissioned to engrave monumental stelae, while others may have used it in their craft production by including writing on ceramic vessels. However, similar to the Roman Empire, women had less opportunities to become literate, despite an elite status. Therefore, it is likely the literacy rate for Pacbitun, who's elite population accounted for 3 percent of the general population, was closer to 1.5-2 percent of the

population. Sites of similar size, once again, likely had similar literacy rates among their populations.

Education

Writing and literature play a large role in the image historians and archaeologists are able to construct of education within several different ancient societies. This includes education patterns—such as who had access to education and education practices—within the Roman Empire. Certain literary works and forms of literature may discuss formal education within the context of a larger work, such as discussing the social and educational upbringing of a prominent character/citizen (Morgan, 2001, p. 13). Other sources, including teachers' handbooks and students' exercises, have been used in a documentary context, as historians recognize the possibility of exaggeration and fiction in literature. Finally, written sources in the form of bilingual manuscripts and autobiographical accounts help historians piece together an image of ancient Roman education. The bilingual manuscripts, often dated to around the third century AD, include descriptions of a child's normal school day. Written in both Latin and Greek, scholars hypothesize that these sources were originally used to teach Greek to Latin readers (Morgan, 2001, p. 12). None of these various sources seems to contradict the others, thus supporting many of the current ideas surrounding education in the Roman Empire.

Several bilingual manuscripts and autobiographical accounts, whose contents are supported by evidence found in literature and documentary sources, describe a typical day for an elite Roman student. Although there were educational practices that focused on athletic training, military training, and trade or scribal training, these sources provide historians with more thorough insight into the teaching of literacy. Beginning with the

child waking up in their home and receiving help from their slave—illustrating the family's elite status—while getting dressed and preparing materials (an inkstand and exercise book) to be used throughout the day. The student then describes going to school, greeting the master, completing various writing exercises, and reading aloud to the teacher (Morgan, 2001, p. 11-12). This typical school day and class show the informal nature of education within the Roman Empire. There was no official school; children were taught in either the private houses of their teachers or public areas, such as lecture halls or the street. As shown through the description of individual work in the manuscript, there were rarely formal class activities and lessons. Much of the material was taught one-on-one. However, once a student reached a later stage of education, they often had to complete these exercises and receive corrections in front of the entire group of students. The content itself also changed throughout the stages of education. Earlier stages began teaching literacy "with reading and tracing letters, then syllables, then words, then longer words and sentences" (Morgan, 2001, p. 13). Later stages of education furthered these basic concepts and taught advanced grammar and rhetoric.

Similar to the evaluation of Roman education, different forms of literature/writing, as well as archaeological sites and data, have been used to evaluate the education practices and schooling within ancient Mesoamerican societies/civilizations. These historical records, documents, and written inscriptions allow archaeologists to evaluate the curriculum, student/teacher relationships, and student demographics (Rossi, 2018, p. 87). In addition to writing and literature, archaeologists have used knowledge of a society's religion and archaeological data of childhood and adolescence within a society to help develop an image of ancient education. In many ancient Mesoamerican societies,

education was often tied to a religious institution, as well as a state institution. Childhood and adolescent data, meanwhile, are evaluated in order to establish how individuals/children were socialized and taught (Rossi, 2018, p. 87).

Archaeologists, for example, have been able to use these various methods to evaluate Aztec schooling in an in-depth manner; Aztec schooling is often considered the most thoroughly documented indigenous American education system (Rossi, 2018, p. 89). According to scholars, schooling was considered mandatory for all Aztec children in order to teach them how to become productive members of Aztec society, though elite and non-elite children appear to have been separated. The non-elite children attended the "telpochcalli" school, where they were to be trained as warriors and eventually be integrated into Aztec society as common, ordinary citizens (Rossi, 2018, p. 89). Elite children, however, were separated from the non-elites and attended a more prestigious school: the "calmecac" schools. In these schools, military training was still part of the core curriculum, but the curriculum also included "history, calendrics, songs, orations, and hieroglyphic writing", and the school itself was considered a form of higher education reserved for the sons of lords, nobles, dignitaries, and priests (Rossi, 2018, p. 89). Some archaeological evidence has shown that although the "calmecac" schools were generally reserved for the elite, some non-elite children were allowed to attend—depending on his abilities. Therefore, education was not strictly dependent on social status, unlike education in the Roman Empire. A second stark difference between this example of Mesoamerican education and education within the Roman Empire involves the schools themselves. As previously discussed, the Roman Empire did not have formal school buildings; children were sent to their tutors' houses or to common areas within the

city. Meanwhile, both the “telpochcalli” and the “calmecac” were formal institutions; children were separated from their families and stayed at the schools until they were finished with their education and ready to become integrated into society (Rossi, 2018, p. 89).

Among the Maya city-state, there is significantly less evidence and data for scholars to assemble an in-depth picture of schooling and education. Therefore, many archaeologists use the Aztec “telpochcalli” and “calmecac” schools as comparative examples for other Mesoamerican education systems. Archaeological evidence does support a Mayan equivalent to the Aztec “telpochcalli”, known among the Maya as “Men’s Houses” (Rossi, 2018, p. 89). Evidence for this Maya equivalent of the non-elite schools in their “Men’s Houses” is shown through archaeological and ethnographic evidence, as well as colonial records during the time of conquest. However, there has not been evidence, written or archaeological, revealing a Maya equivalent to the Aztec “calmecac” schools typically reserved for noble children.

Beyond using the Aztec “telpochcalli” and “calmecac” schools as comparisons for Maya—and other Mesoamerican—schools, much of the data that has been recorded and used as evidence for education practices has come from writing and artistic works. This evidence focuses on the transmission of literacy and other specialized skills/knowledge among the Maya during the Classic Period. It includes ceramics, murals, stelae, and codex books which, “were crafted by individuals known by their artistry and craft: as scribes, artisans, carvers, or scribal specialists” (Rossi, 2018, p. 87-88). The use of these various sources has provided archaeologists and historians with some background regarding Maya schooling/education. Some writing, for example, implies a form of

schooling similar to that of the Aztec “calmecac”, though not a direct equivalent. This school focuses more on the individual priests, who served as teachers, and their central role to the education of the children rather than focusing on the institution as an organization of the state as a whole (like the Aztec “calmecac” did). The Maya schools discussed do, however, have similar curriculum to the Aztec “calmecac” institutions, including a focus on literacy (Rossi, 2018, p. 90-91). Archaeological evidence supports these writings with structures, graffiti, and archaeological features of possible school institutions at Tikal, Chichen Itza, Copan, and Xultun (Rossi, 2018, p. 91-92).

Types of Documents and Themes within Writing

Many Roman inscriptions can be dated to the early years of the Empire. From roughly the last century BC through the third century AD, Roman inscriptions and epigraphy continued to increase (Woolf, 1996, p. 22). Before and after this time period, inscriptions are rarer; however, during this time period, the number of inscriptions seemed to increase with each year, peaking around the second century AD—coinciding with the peak of Roman expansion. These inscriptions and writings took many forms. Within schooling and education, teachers’ handbooks and children’s exercises have been found on papyrus, broken pot fragments, and—occasionally—wooden writing boards (Morgan, 2001, p. 13). These types of documents were not solely used in the context of education. Papyrus documents were common throughout the Egyptian and Middle East territories of the Empire and writing tablets were commonly found among military sites (Woolf, 2009, p. 46). Additional Roman documents often took the form of stone or lead inscriptions, graffiti, and epigraphy on various products, such as bricks and pottery (Woolf, 2009, p. 46). Each of these various forms of documents served either a

monumental purpose for the general population or a more individualistic, everyday purpose.

Purposes for writing and literacy varied greatly throughout the Roman Empire. These purposes included literature, religion, military, politics, and many others. Several Roman documents and writings served a literary and entertainment purpose. Examples come from playwrights, especially of low comedy, and novelists (Pulgram, 1950, p.459). The literary theme among Roman writing can also be found in the works by some Roman philosophers. Many of these writers were literate and able to use proper grammar, likely from either scribe training or coming from an elite family and having the opportunity to attend schooling. However, some literary writers were still semi-illiterate (Pulgram, 1950, p. 459). Many writings serving a religious purpose came slightly later in Roman history, rising with the introduction of Christianity in the Empire. Christian writers had to consider their literate and semi-literate audiences in order to know how best to spread their messages. Additionally, as many churches developed, they began to keep written records of administrative issues and registration (Herman, 1996, p. 31). Politics and military purposes for writing documents were very common among the Roman Empire. Historians and archaeologists have found that as the Roman Empire expanded and reached its peak in the first two centuries AD, the complexity of writing and use of writing in politics increased (Woolf, 2009, p. 48). This could include every-day texts relating to politics and legal issues between individuals, or it could include monumental texts relating to the politics of the Empire as a whole.

Similar to the Roman Empire, writing and literature for the Maya took various different forms. The use of hieroglyphs in Maya writing began in the Pre-Classic Period

and lasted through the Postclassic period (Matsukawa, 2009, p. 237). One important type of document and example of Mayan hieroglyphic literacy took the form of the Maya codices. These codex books—made by pounding the bark of a fig tree into strips of cloth paper, folding these strips into rectangular shapes, covering them with white plaster, and painting the pages with imagery and text—can be dated between the Classic and Postclassic Periods (Rossi, Saturno, & Hurst, 2015, p. 117). Only four Maya codices remain to provide archaeologists with information on Maya culture; many were destroyed and burned, like other Mayan goods and literary products, by the Spanish during conquest. Other Maya literary documents and writings take the form of wood and stone inscriptions, especially on stelae (stone monuments), and texts painted on ceramic vessels or other craft products (Stuart & Houston, 1989, p. 82). Additionally, some forms of writing and proof of literacy may have taken the form of graffiti, as shown through the graffiti found in various sites whose structures may have once served the function of school buildings (Rossi, 2018, p. 91).

Less is known about the content of various Maya writings and texts. Many historians acknowledge that the Maya had one of the most highly developed systems of writing in pre-Columbian America (Stuart & Houston, 1989, p. 82). However, until the latter half of the twentieth century, Maya writings could not be read or understood. While initial decipherment was slow and limited, there have been substantial advancements in understanding Maya hieroglyphs. Historians and archaeologists know that, not only did Maya writings vary in terms of documents, but they also varied in their purpose and content. Similar to Roman writings, this purpose could be religious, education-oriented, or political. Many religious texts provide information about various Maya deities,

retelling origin myths or stories involving a certain god and the portion of nature/life he controls (Houston & Stuart, 1996, p. 294). These religious texts are often located in Maya temples, along with inscriptions including information on the dedication and construction of the temple (usually the ordered construction by a ruler), as well as the god who "owned" the temple.

Several Maya texts were also education-oriented or political. While the education-oriented documents can include graffiti and texts that may have been used within the contexts of schools, this also includes the Maya codices. The codex books contain a variety of content, from Maya ideologies to astronomy, calendrics, and the writing system itself (Rossi, Saturno, & Hurst, 2015, p. 117). The surviving four codex books support this variety of content and "deal with the intricacies of the Maya calendar and seasonal almanacs, which often served to align various astronomical phenomena with politically important events" (Rossi, Saturno, & Hurst, 2015, p. 117). The detailed texts and notes within the codices served as records for important Maya advancements, but could also have been used to educate younger Maya citizens and nobles (those with the most access to higher education) on these topics. Other Maya texts/writings containing records and historical accounts have often been used for political purposes. Various inscriptions, for example, chronical the life of specific rulers. These inscriptions include the birth, ascension, and death of the ruler, as well as historical accounts of successful conquests and rituals performed by or for the specific ruler (Stuart & Houston, 1989, p. 82). Although these historical accounts may be exaggerated or only express the point of view of the ruler/elite (Houston, 2000, p. 122), they do still illustrate the ways Maya texts were used for political advancement and/or propaganda.

What these Patterns Reveal

Socio-political-economic Background

As previously shown, ancient Roman society was highly stratified. Though an official, empire-wide census was never performed, certain cities and regions collected small-scale census data (Storey & Storey, 2017, p. 2). Using these census records, along with archaeological data/evidence, historians and archaeologists have been able to estimate a total population of roughly 60-90 million. However, as previously discussed, the elite 1.2-1.7 percent of the population held approximately 16-29 percent of the total income (Scheidel & Friesen, 2009, p. 75). Therefore, a small percentage of the population held almost a quarter of the total wealth of the Empire. The remaining income and wealth were split among the lower classes and general population. The stratification did not end here, however. Both the elite class and the general population were further divided by status. Among the elite, for example, a person could be a member of the senatorial elite (maintaining elite status through political connections and importance), a member of the Decurional order (maintaining elite status through military feats and accomplishments), or may simply come from a wealthy family whose connections preserve one's place among the elite (Scheidel & Friesen, 2009, p. 76). Among the general population, one could be considered slightly higher status among the non-elite through their career (craft production, scribe, etc.) or could be considered part of the lowest class as a slave, such as those described in the autobiographical accounts of children receiving help from their families' slaves while preparing for school (Morgan, 2001, p. 11).

The political organization of the Roman Empire did change throughout its centuries-long history. In the beginning of its history, Rome was considered a republic

rather than a grand empire. During this time, Rome was governed primarily by a senate, which worked in conjuncture with the emperor. Rome was gaining power and beginning its expansion into new territories; however, around 27 BC, Rome saw the end of the republic. The emperor now had primary political control and, over the next two centuries, Rome saw its greatest period of expansion. During this time, the Roman Empire's political institution was organized in a hierarchical manner. At the top of the political hierarchy was the emperor and his electors, followed by ecclesiastical and temporal princes (Stollberg-Rilinger & Mintzker, 2018, p. 141). Toward the bottom of the political hierarchy stood individual city governments and politicians, as well as imperial rulers. Conquered imperial rulers were often able to continue ruling their own territories, but there was an indirect relationship with the empire and rulers had to follow many of Rome's policies and laws.

The ancient Maya city-state was similarly stratified in terms of society. Though less is known about population numbers and proportions of elite citizens to non-elite populations, there have been several estimates. As previously discussed, a relatively small proportion of the Maya population was considered elite. The Maya elites often had more opportunities than non-elite individuals, as well as specialized duties and jobs. As explained earlier, comparative examples of Maya education based on Aztec society imply that both elites and non-elites had access to some form of education. However, elite education was more in-depth and offered a wider variety of subjects, including history, astronomy, and hieroglyphs (Rossi, 2018, p. 89). Similar class divisions took place in various other aspects of society, such as religious rituals and craft production. Archaeologists and historians have found evidence, namely in hieroglyphic inscriptions,

showing that each Maya citizen—whether commoner, elite, or royal—performed the same basic rituals. However, differences began to form within the content and meaning of these rituals depending on one's status (Munson et al., 2016, p. 76). Elite and royal rituals became fancier, more public versions of traditional rituals, with enough differences that common, non-elite Maya individuals could not perform them (Munson et al., 2016, p. 76). Within craft production, archaeologists have discovered that many works of art, including the production of hieroglyphic texts, was strictly reserved for the elite and required specialized training (Munson et al. , 2016, p. 77). These further show the social stratification that had developed within this farming society.

Just as Maya education and population sizes lacked an abundance of archaeological evidence and data, so too did knowledge of the Maya political system. For many years, archaeologists debated whether Maya cities were "ruled by priests or by secular kings, represented chiefdoms or states, [and] exhibited decentralization or centralization [of power]" (Rice, 2013, p. 686). However, the recent decipherment of Maya stelae and other hieroglyphic texts, as well as architecture and epigraphy, has allowed archaeologists to predict what the Maya political organization may have looked like. According to archaeologists, it is likely that the Maya city-state was divided into several geo-polities and shifted central power between them after a certain amount of time had passed on the Maya calendar (Rice, 2008, p. 75-76). Despite this shift of power among the regions, the Maya maintained a political organization led by one, central ruler/king. This ruler legitimized his reign by taking responsibility for both the passage of time and the wellbeing of the city-state, as he controlled the rituals connected to survival—including those surrounding food, water, and security (Rice, 2008, p. 76).

Rulers would depict themselves as the embodiment of certain Maya gods, such as the maize god or the sun god, in order to further legitimize their reign. Rulers often fulfilled this great responsibility to their kingdom from their palaces. These palaces were elaborate, multi-roomed architectural complexes that also housed the ruler's family members, other elites and nobles, guards, advisers, craftspeople, and servants (Rice, 2008, p. 76). The elites and advisers living at the palace were often part of the royal court, constituting the second level of power within the Maya political hierarchy.

Discussion

One can see various socio-political-economic aspects of these ancient societies reflected in their literary patterns. Social stratification is plainly seen through the availability of education and literacy rates throughout both societies. Within the Roman Empire, elite individuals were the only citizens with the opportunity for education, as shown through the autobiographical texts found by archaeologists describing the typical "school-day" of elite children (Morgan, 2001, p. 12-13). Similarly, education among the Maya was more widely available to elite members of society. Although some basic education within military training was likely available to non-elite children, elite children received education in a variety of topics, including Maya history, astronomy, and hieroglyphs (Rossi, 2018, p. 89). These education patterns, in turn, affected literacy rates within both the Roman Empire and Maya city-state. The social stratification illustrated through literacy rates and education opportunities takes place throughout the whole of both societies. Various differences within craft specialization, wealth, and—among the Maya—rituals further embody this social stratification.

Beyond social stratification, these literary patterns also reflect political organization and power within both societies. Among the Roman Empire, many inscriptions and writings held a political theme. Some documents presented important accomplishments, opinions, and notable actions of specific emperors. The *Res Gestae* of Augustus, for example, was an autobiographical document recounting the career and life of Augustus (Gordon, 1968, p. 126). While the *Res Gestae* is unique for many reasons, including the fact that it was written while Augustus was still in power, many other—much less well-preserved—biographies exist to document the lives and careers of Roman rulers (Gordon, 1968, p. 126). Many Maya documents held similar political themes. Maya stelae and stone inscriptions, for example, documented the lives of specific rulers, including their birth, ascension to the throne, rituals, conquests, and death (Stuart & Houston, 1989, p. 82). Several Maya stelae also depict Maya rulers dressed as various deities—namely the Maya maize god and the Maya sun god (Rice, 2008, p. 76). This depiction serves to relate the ruler to the Maya gods, in order to legitimize his right to rule. Additionally, this depiction associates any agricultural success to the ruler, as it was his responsibility to ensure that the necessities of life—food, water, and security—were predictable and constant (Rice, 2008, p. 76).

These political documents from both the Roman Empire and the Maya city-state help historians and archaeologists piece together the chronology of ancient societies. Documents and inscriptions that recount important conquests or accomplishments may help historians place these events into the historical timeline. The documents also help to show historians and archaeologists the power and importance of rulers in these ancient societies. Roman emperors were powerful and successful enough to continue imperial

expansion and feed the population. Meanwhile, Maya rulers linked their power to the gods, taking responsibility for the bountiful maize harvests and rainfalls, as well as continuing to conquer neighboring territories. Archaeologists and historians do acknowledge that some of these accomplishments and conquests within these inscriptions may be exaggerated in order to emphasize the power of a ruler. However, this does not render the inscriptions useless in reflecting political organization and hierarchies. As Stephen D. Houston explains, "Whether the glyphs are 'lying' […] or whether they reflect only elite thoughts and preoccupations are almost beside the point" (2000, p. 122). These inscriptions still reflect the opinions and realities of these ancient societies. Therefore, whether these political inscriptions portray the truth or exaggerate a ruler's power, they still help to explain the ways in which the Romans and Maya viewed their rulers and political system.

Despite the similarities between these two ancient societies, fundamental differences also exist. As discussed, both societies had stratified populations that allowed for specialization among the elite and distinction between the elite and non-elite individuals. However, as will be explained, the use of wheat farming as a food staple allowed the Roman Empire to expand and increase its population to a much greater extent than that of the Maya, resulting in a more strictly stratified society. This larger population size and social stratification may imply a high literacy rate among the Roman Empire. However, the increased social stratification likely led to a need for greater distinction between social classes. This resulted in the restriction of education as an opportunity solely offered to the elite, who only constituted approximately 1.2-1.7 percent of the Roman population. Therefore, the estimated literacy rate of the Roman Empire was far

lower than expected—which will be discussed further within the context of food surpluses and subsistence background within the Roman Empire—and was, surprisingly, lower than the estimated literacy rate of the Maya city-state—which did provide the opportunity for education to some non-elite children based on merit, despite social stratification.

Food Surplus

Subsistence Background

As briefly mentioned, a majority of the food surplus for the Roman Empire was supported by wheat and grains. Many historians recognize that, with an estimated population of approximately one million people in the city of Rome alone (Mattingly & Aldrete, 2000, p. 142) and an estimated population of 60-90 million across the entire empire, maintaining a sufficient food surplus is an accomplishment. The Roman Empire was able to supply and sustain its prominent cities for nearly 400 years (Mattingly & Aldrete, 2000, p. 142). Grain and wheat seed were central to the diet of many Romans, so much so that grain consumption is often used to measure general dietary needs of the population, as well as approximate income of various families/cities—as Scheidel and Friesen used estimated grain consumption as a factor in determining the total income of the Roman Empire and income distribution within. It is estimated that these cereal grains accounted for at least two-thirds of an average Roman's daily calorie intake (Mattingly & Aldrete, 2000, p. 142).

Cereals and grains were not, however, the only principal source of food and nutrition for the ancient Romans. The two other central forms of nutrition included olives, especially olive oil, and wine (Mattingly & Aldrete, 2000, p. 143). All three of

these nutrition sources were relatively easy to store and were the main components of Roman diet—though some substitutions were made when other foods were in season. Despite the abundance of and reliance on these nutrition sources, their surpluses were not always enough to feed the entirety of the Roman Empire's population. In these instances, Rome sought to increase the amount of imported foods in order to make up for the difference. This idea, however, was not always successful, resulting in the emergence of food crises and famines (Mattingly & Aldrete, 2000, p. 143).

Contrary to the Roman Empire, there was no consumption of wheat within the Maya city-state. Instead, the main food staple within the Maya civilization was maize, which was traditionally grown in small slash and burn plots known as milpas, although as will be discussed shortly, abundant evidence for more intensive maize production has also been archaeologically documented. The maize grown and harvested by the Maya was likely an ancestral form of modern-day corn grown throughout North and South America. Similar to the consumption of wheat in the Roman Empire, maize was not the sole source of nutrition among the Maya; other seasonal crops and native animals also played a role in the Maya diet.

Once again, the archaeological knowledge concerning the cultivation and harvest of Maya foodstuffs, namely maize, is not extensive. Modern-day practices may offer some insight into farming practices, as many Maya descendants try to maintain their ancestral culture within their modern practices. However, this may not be an accurate estimate of ancient Maya subsistence practices. The environment may have shifted since the height of the Maya civilization and, thus, some practices that may work in harvesting maize today may not have been viable in the Maya Classic Period (Wilken, 1971, p. 433).

Therefore, modern practices, as well as Spanish accounts from the time of conquest, may only serve as guides to predicted intensive farming methods among Classic Period Maya. Historians and archaeologists have a few theories concerning possible farming and harvesting methods. These methods include terracing (for which substantial evidence exists), the use of tablones, irrigation, and chinampas (Wilken, 1971, p. 434-438). Archaeologists do not believe that a single method of maize farming was used to produce the large food surplus of the Maya. Various other Mesoamerican and South American ancient societies used multiple forms of farming. The Aztecs, for example, used irrigation and chinampa farming, as well as terracing. Therefore, it is reasonable to assume the Maya also utilized various farming methods (Wilken, 1971, p. 433).

Discussion

The food surplus and farming systems within both the Roman Empire and the Maya city-state are also reflected through various literary patterns, namely themes within ancient writing. In the Roman Empire, populations were largely dependent on wheat farming. As previously explained, this accounted for roughly two-thirds of the average Roman diet (Mattingly & Aldrete, 2000, p. 142). However, there were occasions in which food shortages and famine occurred. At other points in Roman history, poor individuals could not afford enough grain to feed themselves and their families. Due to this unequal distribution of wheat, political documents began to be drafted, describing grain laws in order to monitor grain distribution. One such grain law allows for the free distribution of grain and the establishment of a qualifying age for individuals to be eligible for free grain (Mattingly & Aldrete, 2000, p. 145-146). Meanwhile, during times of food shortage, the Roman Empire had to begin importing food from other territories. Archaeologists find

written evidence of recorded imported foodstuffs, as well as evidence of various official positions to document these imported shipments—namely in the context of burial and tombstone inscriptions describing an individual's official title and assigned job (Mattingly & Aldrete, 2000, p. 152).

Contrary to those within the Roman Empire, Maya literary patterns as reflections of food surplus and farming systems did not often take the form of related laws or record keeping. Many Maya documents related to food supply and farming took the form of communication with or worship to the Maya gods that had an effect on the crops. Many Maya temples, for example, contained inscriptions in order to dedicate a temple to the gods—and indicate who ordered the construction of the temple (Houston & Stuart, 1996, p. 294)—some of which were dedicated to the Maya maize god or other gods who could negatively affect the crop if angered. Some Maya documents and inscriptions also connected the food surplus and the success of a harvest to the ruler at the time. Various Maya inscriptions, as well as depiction within pieces of art, imply that the success of a growing season and overall maintenance of a food surplus is the responsibility of the Maya ruler (Rice, 2008, p. 76). These depictions and inscriptions may connect the ruler to the various Maya gods that can affect the harvest (such as the maize god and the sun god), may include rituals used by the ruler to ensure the success of the growing season, or may simply reflect the responsibility of the ruler himself maintaining the food surplus.

Although these literary patterns—namely purposes and themes within writing—reflect the existing food surplus and farming systems within both the Roman Empire and the Maya city-state, their reflection does not stop there. Upon further analysis, one can see how the various discussed literary patterns reflect differences among these farming

societies due to this difference in food surplus. Wheat farming, as a food staple, is able to support a larger, more dense population than maize farming. This can be shown through the Roman Empire's ability to support its ever-expanding population on this food surplus. The Roman Empire, at its height, spanned throughout most of the European continent, parts of the Middle East, and the northern portion of Africa. As previously mentioned, this territory housed an estimated 60-90 million individuals (Jongman, Jacobs, & Goldewijk, 2019, p. 138). Wheat farming was able to produce enough food for cereals to remain one of the central forms of nutrition for much of the population.

The increased population density within the Roman Empire due to the reliance on wheat farming allowed for social stratification to intensify. Social stratification seems to have become more strict, with more rigid social divisions between the elite and the non-elite population, as discussed. This is evident within differing educational opportunities and literacy rates. Education was reserved solely for the elite members of society and their children, particularly sons. The opportunity for education was one of many social distinctions between elite and non-elite individuals. Social status was even exaggerated within the Roman elite in regard to who had access to education; those who could afford it, hired "child minders" to carry books and other supplies to school for their children (Morgan, 2001, p. 13). Such rigid distinctions between social classes and limited opportunities for education resulted in a lower than expected literacy rate in the Roman Empire. Amongst the Maya, however, certain non-elite individuals were able to gain access to higher education based on merit. The Maya population, based on maize, was significantly smaller than that of the Roman Empire, based on wheat. Maya social structure, while still highly stratified, was not as rigid as the Roman social hierarchy.

Merit therefore—however limited its influence—within Maya society appears to have resulted in the education of certain non-elite individuals, which occurred far less among ancient Roman individuals. These differences, which may stem in part from biological productive differences between wheat and maize, are reflected among various aspects of cultures and in differing literacy rates. Therefore, an interesting, and unexpected, outcome of this thesis may indicate that Maya food production systems helped lead to higher literacy rates relative to the Roman Empire.

Conclusions

Archaeologists agree that, through time, many societies follow a common developmental trajectory. This trajectory begins with the transition from a nomadic society, reliant on wild plant and animal species for subsistence, to a sedentary society, reliant on domesticated plants and animal species. The increased use of domesticated species for subsistence allows for the development of a food surplus and system of food storage. After a food surplus has developed and a society becomes largely sedentary, the population begins to increase, and social structure begins to stratify. This then leads to the development of new technologies, such as hierarchical political organizations and often writing.

Two societies that have followed this developmental trajectory—developing into a farming society, increasing population density, stratifying society, and developing their own hierarchical political organization and writing system—are the Roman Empire and the Maya city-state. In the Old World, the Roman Empire developed food surpluses supported largely by wheat farming and devised the Latin alphabet as their writing system. Meanwhile, in the New World, the Maya city-states developed food surpluses

supported by maize farming and devised a hieroglyphic-based writing system. Despite the different bases for their food surpluses and different writing systems, both societies were able to develop a series of literary patterns within their writing systems that reflect several aspects of their society. These patterns include estimated literacy rates, access to education, types of documents, and themes within writing. Variation in these patterns reflect the socio-political-economic hierarchies and differences within these societies, along with the food surpluses that support them. Although the numerous types of documents used by these societies vary greatly—Rome used papyrus while the Maya used codex books, for example—the themes within them were very similar: both societies included religious themes, education purposes, and political themes throughout their writing. Similarly, the education patterns within these writing systems reflect similar social structures.

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