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Demography Research of Ancient Civilizations

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ABSTRACT

A review of the literature on ancient populations and civilizations reveals that the evidence is more in conformity with the hypothesis that humans began with a small population about 6,000–10,000 years ago than the position that humans evolved from ape-like ancestors approximately 2–4 million years ago. No evidence exists of any civilization before roughly at most about 10,000 years ago, and the earliest known civilizations are very complex. The world population was relatively small from the start of recorded history and rapidly increased. At the beginning of the Christian era, the total human population was estimated at only 200–300 million, a reasonable value given that all humans came from two persons that lived about 4 millennia previously. Conversely, this is an incredibly small population if humans and their immediate ancestors have lived on the earth for about 2 million years as argued in evolution theory. The most evolutionarily advanced of all species would have certainly reproduced during this 2 million years to a number far beyond a mere 200–300 million, the number of persons added to the world population today in about a week.

INTRODUCTION

If the biblical scenario of a recent creation of the first humans is correct, we would not expect to find evidence of human populations or civilizations before the Genesis creation event. The creation scenario would also predict that the intelligence of Adam and Eve would be identical to that of humans today, the only difference being Adam and Eve's immediate progeny would not have the benefit of the accumulated wisdom of humans' 6,000 years as do young people today. On the other hand, if the evolutionary scenario is correct, we would expect evidence of a gradual increase in the 'human' population and its immediate ancestors from its start, variously estimated from about 1 million to 4 million years ago, and evidence of sizable populations dating back hundreds of thousands of years.[1] Humans, as the most successful evolutionary organism, would have shown a general long term growth in numbers from their origin until today. In fact, since virtually no evidence of humans exists until very recently, researchers can only hypothesize a minuscule population and almost no growth until around 6,000 or 7,000 years ago.[2,3] Weber estimates that '*it took four million years for humanity to reach the two billion mark. That was in 1927.*'[4] Since then, the population has almost tripled.

If the standard evolution model were true, we would expect humans to have slowly become more technologically developed, and civilizations existing about 50,000 years ago would have lived in far more primitive circumstances than those 10,000 years ago.[5] The standard evolution theory also requires huge populations and much time in order to produce the level of mutations required for selection to allow the level of evolution needed to evolve humans. Minuscule populations of less than a few million members is highly inadequate, even over long periods of time, to allow the evolution level necessary to produce modern humans. Consequently, the study of ancient populations can help us to produce estimates of the number of individuals living from earliest times to the present, and estimates of the population available for evolutionary mechanisms to operate on can be deduced.

In Morris' words, a major inconsistency in evolutionary theory relative to population is that

> *'The same population statistics which supposedly presage a serious population problem in the future also indicate a very recent origin of man in the past.'*[6]

He estimates that, given an annual 2% growth rate, two humans would balloon to 3.5 billion in only 1,075 years,

and an average growth rate of a minuscule ½% (one-fourth of the current growth rate) would *'generate the present world population in only four thousand years'*.[7] The population now is very small, even given a population beginning from 4,000 to 10,000 years ago. A major difficulty with Morris' population estimates can be dealt with by assuming that the Noachian Flood wiped out the existing human population, and the world population at this time consisted of only about eight people from which our modern population descended.

Thus, Morris' date of 4,000 years would take us only from the general time period of the Noachian Flood. Morris also estimates that, assuming a high death rate, one-third of 1% population growth annually appears to be the norm for population growth throughout most of history.[8] Given this number — which is probably well below the actual rate — the time required for the population to expand from two individuals to 1 billion people is 6,100 years, not taking into account the population bottleneck caused by the Noachian Flood. From this data Morris concludes,

> *'Thus, the most probable date of man's origin, based on the known data from population statistics, is about 6,300 years ago*.'[9]

Morris uses the longer figure, although he estimates the date of the Flood could be from 2,350 BC (Ussher's chronology) to *'about 6,000 BC'* given that there are *'possible gaps in the genealogies of Genesis 11*.'[10] He notes that even using the short Ussher chronology, given a growth of eight people to 3.5 billion in 4,350 years represents a mean annual increase of only 0.44% and an average doubling time of 452 years.[11] Even this growth rate, though, still assumes numerous huge catastrophes which wiped out significant proportions of the population, or a horrendously high death rate from other causes. The increase in the world population is currently estimated at about 350,000 per day, and only a 1% growth rate would give 2 billion people in only about 2,100 years. Keyfitz[12] in a purely mathematical exercise projects that a total of 64 billion persons have ever lived, but concedes he would arrive at half of this value if he *'assumed that the race started a half a million years ago rather than a million,'* given an average life expectancy of a mere 25 years.

THE STUDY OF HISTORICAL DEMOGRAPHY

Major concerns of modern demographers include population increases, its distribution by sex and age, social class, and also reproduction control, food distribution, emigration, mortality, rates of disease and famine, and statistical and analytical studies of population size, growth and decline.[13] Our focus here is on estimating ancient population sizes from the earliest civilizations to about the time of the Roman Empire, and the various problems in obtaining parameters of the human populations that existed at this time. Our specific focus is from about 7,000 BC, before which evidence of human existence is extremely sparse and controversial, to the birth of Christ. Even the chronologies as recent as 4,000–5,000 years ago are problematic because of sparse and mixed archaeological evidence, thus much controversy exists in the field.

The field of demography as a formal field of inquiry originated only in 1662 with the publication of John Graunt's **Observations**.[14] The discipline received its technical name demography *(demos* — people, and *graphy* — writings or words about) only in the middle of the 19th century. Extensive scholarly study of ancient demography is also quite recent: Carcopino[15] claims that Dureau de la Malle was the first modern scholar to seriously research ancient population data. Another early pioneer, K. J. Beloch, published his classic study only in 1886. The search for details about our human urban origins began in earnest only after World War II.[16] It is partly for this reason that our knowledge of early civilizations, especially rural but also urban areas, is still very limited. Hollingsworth[17] notes that, although achieving reasonable historical demographic data is very difficult because it *'draws upon such a wide variety of disciplines,'* data about historical populations is helpful to understand human history. In Coale's words, we do not understand *'the process by which a few thousand wanderers a million years ago became billions of residents of cities, towns and villages today*.'[18]

TECHNIQUES USED TO RESEARCH ANCIENT POPULATIONS

Rough estimates of the total world population before the time of Christ can be obtained by evaluating the evidence brought to light from the thousands of recent archaeological digs. Presumably few large cities have been totally lost to history, and researchers can therefore obtain reasonable population estimates of most large ancient cities. Factors used to obtain these estimates include the city's physical dimensions and the number and size of its buildings and artifacts.[19] Calculating the population of ancient cities involves an examination of both the local terrain and the living area from the foundation evidence, and from this attempting to reconstruct the city dimensions which are in turn used to estimate its population. If the foundations of the physical structures can be located, an estimate of the number of people who lived in the buildings can be ascertained. Problems with this technique include difficulties in determining if a building was used solely for residential living or partly for business, government or religious functions. Almost all ancient civilizations constructed many religious temples and/or public buildings, and some buildings or parts thereof were used for large water ritual bathing pools. Some structures may be incorrectly judged as living areas, and private abodes categorized as public may produce an underestimate of the population. Because it is not always easy to determine building use, other means are used to improve estimates.

Even if the exact size of the city is known, population

estimates can vary because living densities vary greatly. Carcopino[20] cites a study of Paris that found during a certain long time span the perimeters of the city did not increase, but the population per hectare did because construction of apartment buildings with more storeys and smaller rooms was the common response to population increases. Estimates of the height of buildings from the rubble found around the foundation and in close proximity to the building can be made if it can be determined that bricks and building materials were not carried away for use on other projects. Sometimes structures were destroyed by invading armies, or were for other reasons replaced by constructing a new building next to the old one. If archaeologists do not discern this, they may overestimate the size of each original building if they assumed that one large structure existed instead of two, non-contemporaneous smaller ones.

Artifacts such as pottery and toys are also often used to estimate population size and composition, a method which also has problems. The large number of toys found caught in the sewer catch basins in the ancient city of Mohenjo-Daro prompted the conclusion that so many toys existed in the city that the people there must have manufactured them for export, given estimates of the number of children living there and the probability of a toy getting caught in a drain sewer. They would be far less expensive for locals if manufactured locally, and thus a larger percent of the population could afford them. Many of the toys were ingenious: balls with rattles, boxes likely used for insect cages, animals with moving parts, and even a ram with wheels.

These difficulties illustrate the problems in obtaining accurate data of ancient populations and why many factors must be used to obtain estimates. And the farther back one researches, the higher the likelihood that population size evidence was destroyed or rendered useless. Also, the farther the population lived from the so-called civilized world (predominantly the Middle East during the period we are concerned with) the less accurate the information. Demographers are therefore typically forced to rely heavily on such sources as official population counts, taxation returns, vital registration data and other written evidence, much of which is similar to that contemporary historians use. Hollingsworth[21] notes that official census data, civil registrations, bills of mortality, ecclesiastical records, wills, marriage settlements, eye witness estimates, and graveyard evidence are the most useful.

Genicot[22] lists other sources used to make historical demographic estimates, most of which depend on written evidence:—

(1) Military and fiscal documents
(2) Inventories of seigneurial property and rights
(3) Genealogies or similar records
(4) Prices, especially agricultural, over a long term
(5) Number, physical size, and extent of towns
(6) Technology changes and the fragmentation of traditional land holdings
(7) Changes in ecclesiastical geography and physical alterations of public buildings
(8) Colonization of new territory
(9) War records kept by invaders or conquerors

PROBLEMS IN DEMOGRAPHIC RESEARCH

As many difficulties exist in obtaining accurate **modern** demographic data, it should not be surprising that far more problems are encountered in arriving at reasonably accurate conclusions for ancient populations. Hollingsworth stresses as to knowledge of historical demography:

> *'No one can ever be totally certain or totally uncertain of anything. The degrees of certainty run from "sure" to "very likely" to "probable" to "possible", and "untrue" and "unproved" and "rather unlikely" and "improbable" to "presumably wrong" and "wrong". Statistical information about the past has to be classified, provisionally, somewhere along the scale, and from time to time some of it has to be moved to another position, of greater or lesser confidence.'*[23]

Although good estimates (at least much better than the early periods) can be obtained for some populations at the time of the Roman Empire and in the Semitic world due to the data available in biblical records and historical accounts such as the works of Josephus,[24] similar information is available for few other contemporary or earlier populations.

Even ancient records that have been passed down are not always accurate or faithful to the original. Until printing presses, obtaining a copy of a written work required that it be copied from the original by hand, work often done by professional copiers called scribes. Thus errors accumulated and, as early copies were usually lost and variant readings now often exist (and often no way exists to prove which one was the original), accuracy can no longer be assured. Copies were both rare and expensive and could be afforded only by the wealthy. Unfortunately, few of what were in essence state university and public libraries that existed even before the time of Christ have been preserved. A famous center of learning was in Alexandria which was

> *'. . . particularly famous for its great library associated with the Alexandrian "museum", a sort of state-sponsored university where all branches of arts and sciences were studied by scholars of many countries. The library had been founded and enlarged under the first two Ptolemies and sought to collect copies of all books written in Greek and Latin. Eventually it was said to possess 900,000 volumes or papyrus rolls.'*[25]

After several wars, civil disturbances, and major economic upheavals, the library was partly destroyed in AD 391. Heavily damaged by fire during Julius Caesar's reign, it was finally completely destroyed by the Arabs in the 7th century of our Common Era. Almost no other library of the time or earlier has survived to today.[26]

Another problem is that official statistics were at times

doctored or even forged. In ancient times, as today, countries often exaggerated their military strength and for this reason some official statistics reported highly inflated estimates of their male population. If demographers interpolated the total population from the military strength number, that is, added estimates of women and children, serious overestimates of the whole population resulted. On the other hand, a country may produce a count that is underestimated due to individual government officials endeavouring to avoid paying to the king the full amount of taxes that they collected. The kings' demographers would simply report fewer inhabitants in an area, and share the excess tax collected with the tax collectors.[27] The king may never be the wiser, and most of those who became suspicious of foul play had no convenient way of proving their concern until efficient modern census systems were developed.

Another major problem was that the ancients used numbers in both a literal and a figurative way. Numbers were often estimates or used as literary illusions, not tally counts, and the modern reader unfortunately often has no way of knowing this. Historical accounts may contain such phrases as *'the enemy had tens of thousands of soldiers'* which may not even be estimates, but a way of conveying only that the enemy army was judged by some observer to be huge. Exaggeration to show importance was evidently also used. Kings were wont to exaggerate their population for reasons that ranged from psychological advantage (as for warfare propaganda) or to show their personal importance. One example is the biblical Methuselah, son of Enoch, who is said to have lived to be 969 years old (1 Chronicles 1:1–4; Jude 14,15; Genesis 5:21–29). Biblical critics often claim this number is a literary technique to underscore his importance to his contemporaries. The problem with this conclusion is that the only thing noted about him is his longevity, and no mention is made anywhere about his importance. If the age of biblical personages — often in the hundreds of years — and their family sizes is any indication of ancient patterns, a growth rate of far more than one or two percent per year is suggested. Many lived into the hundreds of years and produced families in double digit figures. Adam lived 930 years, Noah lived 850 years, and many persons even after the Flood lived in the hundreds of years.

THE STUDY OF INDIVIDUAL CITIES

Sjoberg estimates that cities arose somewhere between 5000 BC and 6000 BC, although the only clear evidence puts the earliest city at about 3000 BC.[28] According to Sjoberg[29] cities at this time had populations of from 1,000 up to about 10,000 for the few larger ones. During the third millennium, cities became much larger. Among the better known ones are Eur, which Frankfort[30] claims had as many as 24,000 people, and Lagish, which boasted about 90,000, Umma 16,000 and Kahafjae 12,000. Wiley estimates by the beginning of the next millennium Eur grew to 34,000 persons in the inner walled city, and the number that lived in its total 'metropolitan area' was as high as 360,000. Sjoberg concluded that both Frankfort and Wiley overestimated the number of persons per house there, thus his estimate is much less.

The first modern city, according to Hamblin,[31] was Mohenjo-Daro. A bustling export and trading centre, it was one of a half a dozen large cities built in the Indus Valley in about 2500 BC. It was located on a hot, flat, floodplain by the Indus River, 300 miles north of today's Karachi in Pakistan. The population of Mohenjo-Daro then was estimated by archaeological investigation to have exceeded 40,000. The half a dozen other cities near were, on the average, about half this size, indicating the total population in this area was at this time about 160,000. Athens and Peiraeus were estimated to have 155,000 persons in 430 BC and 168,000 in 330 BC.[32] Comparable in many ways to modern cities, Mohenjo-Daro had shops, food stands and a layout that reflected much advance planning. The terracotta or alabaster screened houses had interior courtyards and windows, and the city boasted a sophisticated system of sanitation designed to ensure proper public hygiene. In conclusion, the first known cities did not consist of primitive groups of humans that lived in a small area for convenience, but were as advanced as most cities until the industrial revolution. Only sparse and controversial evidence of human populations exists before this.[33] Thus, history conforms to the view that all humans descended from a pair of humans created about 6,000 to 10,000 years ago.

ROME: OUR RECORDS ARE MORE COMPLETE

Much more is known about the population of Rome, partially because for about 800 years its government took an official quindecennial census for military and tax purposes. In Rome proper and in several surrounding areas both the citizens and their property were inventoried until 5 BC when this requirement was extended to the entire empire. The purpose was primarily fiscal and military, and not all persons were surveyed — slaves were the major group excluded. Emperor Servius, to ensure that he maintained his power in the face of resentment by wealthy landowners, allied himself with the richer members of the plebes and used the army to help maintain his position. Towards this end, he advocated classifying citizens according to wealth rather than birth family and reported some 80,000 persons capable of bearing arms.[34] Assuming one woman and child per soldier, and one slave for every fourth family, Durant estimated that the population of Rome in 560 BC was 260,000.

The Roman population began to grow so rapidly during the reign of Trajan that it faced modern population problems to the extent that complete renovation of the city *'to*

bring relief to a population crushed by its own increasing numbers' was undertaken.[35] The city parameters were enlarged, the Tiber was canalized, aqueducts were built, and the largest public baths Rome had ever seen were constructed. Even private enterprise was subject to vigorous and far-sighted control. The famous Roman forum crowned their building program, dignifying the leisure of the multitudes who frequented it. Russell concludes that Rome had, *'Great apartment houses swarming with people . . .* [and] *by medieval standards* [was] *a relatively crowded city.'*[36] Its estimated 254 bakeries had a capacity of up to 450,000 loaves daily, and in view of the importance of bread, a reasonable population estimate could be achieved if we knew how many households baked their own.

The city could later well have supported a population of over half a million. More is known about Rome than any other pre-Christian era city, but estimates of its peak population vary widely, ranging from 261,000 to 4 million.[37] Although, *'accurate figures are lacking for the early period'* the first reliable census, dating around 318 BC, lists 250,000 military age males indicating *'A total population of approximately* [only] *a million citizens scattered throughout Italy.'*[38] The 234 BC census listed 270,713 free adult males, a figure which fell sharply during the great war, but rose to 258,318 in 189 BC and to 322,000 in 147 BC.[39] By 189 BC 1,100,000 persons lived in the entire city-state area, and about 275,000 within the city walls. Further, Durant estimates that by 189 BC all of Italy south of the Rubicon had a total of about 5,000,000 inhabitants.

By 160 BC the population had already begun to decline, leading to Rome's eventual fall. St Jerome gives the total population in 86 BC as only 463,000.[40] Leighton[41] claims that a major reason for Rome's fall was its population losses. Hadrian's reign experienced some gains, but most administrations after this time faced declines. Augustus passed several laws encouraging marriage, and in 18 BC the senate decreed that matrimony was mandatory for all citizens of suitable age. Plutarch claims that these efforts by the state produced few lasting effects, and decreases in population continued in succeeding generations.

OTHER ANCIENT CITIES

An important recent source of information about ancient population is the Ebla tablets recently discovered in modern Syria. The approximately 30,000 tablets found have been called one of the most important archaeological discoveries of the century. Ebla was actually a Semite megalopolis and was unearthed only in the 1960's and first identified with confidence in 1968.[42] About 30,000 persons lived within the walls and Ebla's total population, including its suburbs and satellites, peaked at about 250,000 over 4,300 years ago.[43] The only confirmed non-sacred Scripture written record that dates earlier is the Polermo stone from Cairo, Egypt, dated at c. 2400 BC. Another city which we now know a good deal about is Catel Huyuk located in modern-day South Central Turkey. Although much of the area has yet to be excavated, the 32 acre city probably housed up to about 6,000 persons as early as several thousand years before Christ.[44]

Jericho, made famous largely by Joshua's famous trek around its walls, was actually several cities, each one of which was evidently destroyed by an 'earthquake' and rebuilt on the older one. The walls were about 15 to 20 feet high in places and houses were built against most of its length. Its foundations rested firmly on bedrock 50 feet below the surface of the existing mound. Hamblin[45] estimates the ten acre city had hardly more than *'two or three thousand inhabitants'* around 8000 BC. A population this small requires explaining how they managed to build what became an advanced city. A small number of people could have gradually constructed the walls as labor became available, but the population may have been larger and more crowded than current estimates, or a significant number of its people could have lived outside of the city walls.

Uruk (called Erech in the Bible) was built around 2,800 BC and was a major city by any standard.[46] Its population of from 30,000 to 50,000 inhabitants *'lived in mud-brick houses.'* Some of these were in its substantially middle-class areas and had two storeys, wooden balconies, and several rooms facing central courtyards. The craftsmen that lived and worked here included sculptors, scribes, carpenters, metal-smiths, and brick-layers. Estimates of the city's size were made primarily from these artifacts. Kramer[47] calls Uruk *'one of the largest and most important'* cities of Sumer. It later became part of Babylonia, and shared in the fortunes and misfortunes of its host until the fall of the Parthinian Empire, when it was abandoned altogether.[48]

Uruk was only one of about a dozen cities which soon rose on the Tigris and Euphrates Rivers (in Mesopotamia) which flow through modern Iraq. These city-states formed the Sumerian civilization which produced the well-known branches that include the Egyptians, Greeks and Romans. Although Uruk dominated and was the largest and richest of these cities, the other 11 or so cities averaged populations of around 20,000. The total population of the Sumerian civilization in this area was, at best, 250,000.

Durant[49] calls ancient Crete *'surprisingly urban'* with about 90 cities plus independent villages, each under their own chief. The approximately 50,000 people in Crete spent much of their time fighting *'innumerable territory wars'* and were finally united under Cnossus by a process that Durant describes as follows:

> *'The wars become less frequent, more widespread, and* [the fighters] *more efficient in killing; at last . . . Cnossus wins. The victor organizes a navy, dominates the Aegean, suppresses privacy, exacts tribute, builds palaces, and patronizes the arts . . . It is as difficult to begin a civilization without robbery as it is to maintain it without slaves.'*[50]

In another nearby city, Attica, Caldwell[51] notes that population information is lacking, although the most recent estimates based upon the latest available scraps of information indicate a total of about 315,000 persons in 431 BC, *'consisting of 17,200 citizens, 20,500 resident aliens ... and 115,000 slaves.'*[52] The African west coast city of Carthage, founded by the Phoenicians in 813 BC, grew to as much as 700,000 population by 550 BC. Its culture, commerce, prosperity, and fabulous wealth rivalled Greece and most of the rest of the world. At about the same time, Corinth had a population of about 50,000 free men and 60,000 slaves — a ratio which Durant[53] notes is not rare, but is *'an unusually high proportion of free men to slaves.'* Gomme estimates in 430 BC the total population of Athens, Peiraeus and their environs was only 155,000, and only 168,000 in 330 BC.[54] About the same time, Aegine is estimated by Aristotle to have had a population of about half a million as early as 350 BC, the majority of which were slaves (about 470,000). Chios had about 30,000 free men and 100,000 slaves, and Athens about 300,000.[55] Diodorus claimed that Sybaris then had such wealth that few Greek cities could match it. Syracuse boasted a population of one-half million persons living within its 14 mile circumference, and Alexandria, a city with paved and lighted streets, police protection, and a good water supply, was estimated then at also about one-half million residents.

THE BIBLICAL RECORDS

Another commonly used source to estimate ancient population sizes is the biblical account. One of the two major enumerations it mentions was at the time of the Exodus in 1491 BC.[56] In Exodus 12:37, the round value of 600,000 is given as the number of *'able-bodied men on foot'*, or males about 20 or older besides the Levites. In a census shortly after the Exodus, the Levite males a month or more older (who were counted separately) totalled about 22,000 (Numbers 3:39 and verses 42–43 which give the count number 22,273). This data indicates that the Israelite population could have passed the 3 million mark by 1530 BC. The Apocryphal books of 1st and 2nd Maccabees (which include events that occurred from 180 BC to 160 BC) indicate the local Israelite population was then just over 3 million.

Franz[57] estimates that from 1563 BC to 1533 BC, 600,650 males were bom, indicating that about 3,000,000 persons left Egypt during the Exodus. This included not only Hebrews though, but a *'mixed multitude'*, likely Egyptians and other Semites. An actual census taken about a year after the Exodus claimed that the 20-year-old and older male non-Levite population numbered 603,550 (Numbers 1:2,3,45,46 and 3:39). Some feel that this number was exaggerated to impress other nations with Israelite military strength or to glorify the event. Nevertheless, this number is plausible because children were highly valued in this society, some Israelites married Egyptian women, and both polygamy and concubinage were practiced. Further, Josephus[58] quotes the Egyptian historian, Cheremon, who claimed that Moses led 250,000 *'diseased people'* out of Egypt — what is referred to by diseased people is not clear, but large numbers were involved.

The second large biblical enumeration was completed at the order of King David in 1017 BC.[59] Of this event, Joab reported the count for Israel was 1,100,000 men and Judah 470,000 (1 Chronicles 21:5). In another account, at 2 Samuel 24:9, Israel is listed as having 800,000 men and Judah 500,000. This discrepancy is attributed either to a scribe error, or the information is accurate but describes two different counts. For example, one count may have included reserves and the other only those trained and in the army. Another possibility is that two different surveys are being referred to, and the army size changed greatly between them. Some time later, David ordered the Levites numbered for temple service projections. The count was 38,000 Levites, 30 years of age and older, including 24,000 supervisors, 6,000 officers and judges, 4,000 gate-keepers and 4,000 musicians (1 Chronicles 23:1–5). In connection with the building of the temple, King Solomon counted all the alien residents in Israel. Of the 153,000, according to 2 Chronicles 2:17–18, Solomon appointed 70,000 burden-bearers (laborers), 30,000 stone-cutters, and 3,600 work-crew supervisors.

Other biblical registrations were taken by the succeeding kings of both Israel and Judah. King Amazian's count of the males 20 years or over in the Judah and Benjamin tribes alone totalled 300,000 (2 Chronicles 25:5). King Uzziah's registration of the armed forces numbered 307,500 including 2,600 heads of paternal houses (2 Chronicles 26:1–13). In 537 BC the returning exiles under Zerubbabel included 42,360 free men, 7,337 slaves and 200 singers (the Masoretic Text of Nehemiah says 245 singers), producing a total of 49,897 persons. (See Ezra 2:64, 65; Nehemiah 7:66, 67.)

Another biblical source of population data is the many battles listed in the Pentateuch which often give the troop size, and sometimes even the number of injured or dead. Assuming these numbers can be taken at face value, tens of thousands of persons often died in single battles. The numerous conflicts recorded by Moses indicate that frequent warfare occurred between the Israelites and the surrounding nations for several hundred years.

THE NORTH AMERICAN AND AFRICAN POPULATIONS

More is known about the Middle East population — which includes the Greek, Roman, Mesopotamian and Babylonian, and Egyptian societies — than Africa, Asia, Russia and other areas distant from the cradle of civilization. In America, a much smaller population existed than in the Middle East, and it may have spread out somewhat evenly throughout North America very early in history.

Claiborne[60] estimates that some communities in North America had populations *'numbering in the tens of thousands'* that carried on *'intensive agriculture and large-scale production of luxuries and necessities'* and possessed *'complex, stratifying societies with an elaborate ceremony of life.'* These people built mysterious earth mounds, which ranged from simple conicals covering a few yards of land to structures several dozen feet high that had long ridges which outlined the shapes of gigantic birds or men. According to Claiborne[61] one near St Louis was 100 feet high and covered 15 acres. The Indians encountered by the first Europeans disclaimed knowledge of these mysteries, and the trees that were growing on them were hundreds of years old according to their rings. The Mormons even teach that the source of these mounds was the 'ten lost tribes' of Israel, who were 'lost' to Middle East history because they came to America, only later to become 'lost' again to history — exterminated by fighting with each other. Conversely, Claiborne concludes that the builders were exterminated by other Indians.

The mounds are of special interest to Ohioans, because *'the mounds numbered not hundreds but thousands — 10,000 in the Ohio Valley alone.'*[62] One 1967 study concluded they were built by several different Indian tribes, and two different civilizations for a variety of reasons, some very practical; the houses built for chiefs and nobles were set upon large quantities of earth which were stamped down until they formed a mound, which was sometimes fairly high.[63] Excavation around the mounds found that the area was once inhabited by traders and manufacturers who carried on a thriving commerce, evidently over much of North America. Their culture has slowly been uncovered — revealing art of high quality thousands of years old, some which equals the quality of that in ancient Egypt.

The better estimates of the American population come from these mounds. Many tribes moved throughout their chief's lifespan, and each time they relocated they built new mounds. Their construction took much time and labor (some contained ten million cubic feet of earth, each pound of which had to be hand-carried a basketful at a time, no small task). From this source Weeks[64] estimated that the population of native Americans was 750,000 in 1650.

Less is known about early African civilization than any other part of the world. Kush, Africa's oldest and greatest inland empire, boasted about 40,000 inhabitants at the time of Christ.[65] The 2,200 year old pyramids in Africa, of which there are dozens, although smaller than those in Egypt were nonetheless an incredible achievement. Benin, one of the most advanced ancient African cities, boasted only about 20,000 inhabitants.

AN EVALUATION OF ANCIENT CITIES

In some cities large numbers of incredibly wealthy persons lived, although the slaves, serfs and poor were vastly greater in number — up to ten or more times larger. Especially in the Greek cities, a majority of the population were slaves who performed most of the physical labor for everyone else. The citizens, in contrast *'Dressed in costly robes* [lived] *. . . their ease in luxurious homes and consumed exotic delicacies.'*[66] The likelihood of revolt by the massive numbers of slaves was always a concern which occasionally happened. Some ancient revolutions by free men were successful for a short time, but most revolutionary leaders were incapable of establishing an orderly society. Soon dictatorships by the rich were re-established and the 'class society' was again set up, and a rich minority again exploited the masses who were not uncommonly kept in abject poverty.

Many ancient cities were elaborate with splendor which could rival (and even exceed) many today, at least in the portion of beauty. Descriptions of large gardens, stone walks and fences, pools, canopy-covered streets, flowers and shrubbery paint the image of a paradisaic world that is found only in small sections of our cities today. While it is difficult to accurately fully construct the extent and beauty of these ancient cities, the image of 'paradise lost' is paramount, especially in the writings of Durant. For most people, though, life was anything but a paradise. The main source of non-human power was animals — and where large numbers of animals lived, dung, flies and disease were common, a severe problem in cities until the automobile brought new problems — pollution and congestion to name two.

THE IMPORTANCE OF ANCIENT DEMOGRAPHY FOR HISTORY

Population size has an extremely important influence on the course of history.[67] Larger populations mean bigger armies to both defend one's own cities and conquer others. In ancient times, though, if an army conquered too large a territory (as happened with Rome, and Greece) communication problems and travel distances made revolts difficult to control and the empire difficult to rule. Unless standing armies were nearby, uprisings were hard to suppress, and controlling large areas of land required large armies which were both expensive to maintain and difficult to manage. A local army commander would sometimes break from the empire and begin to rule an area himself independent of the mother nation.

Actually, very few large unified nations existed until the late 19th century. Modern Italy consisted largely of a series of city-states until the 1870's during the time of King Victor Emmanuel II, who united most of the country to its present territory. Similar unification also occurred in Germany, France and England. Huge nations are possible only if fast, safe and efficient transportation is available. The exceptions, such as the United States and Canada, succeeded partially because their states were able to exercise a great deal of independence and found it more advantageous to be part of the union than to separate. Even so,

many states have tried to secede, producing extensive Civil Wars or conflicts as modern Yugoslavia and Czechoslovakia now illustrate. One of the major functions of the American railroad system, aside from encouraging expansion and settlement, was to unite the large country. New technology which serves to further unite the world population includes satellite communications and portable dishes which a person can use to receive about 100 stations worldwide. The ubiquitous television was also a major step toward a world culture, and it is likely that mass communications will soon reduce present world divisions even further — and this process will likely be accelerated with time.[68,69] The major current barrier is language, an impediment that is slowly eroding as English rapidly becomes the universal language.

EVIDENCE OF PREHISTORIC POPULATIONS

Although evidence exists for relatively large populations at the time of Rome, only a thousand years before Rome there exists little evidence of large populations anywhere. Goldthorpe[70] notes that by the time

> *'we have worthwhile estimates, the largest human communities of people subject to a common political authority numbered scores of millions.'*

Before this time worthwhile estimates do not exist, and all guesses rely so heavily on speculation as to be close to worthless. For the time periods of which we are able to make worthwhile estimates, the total population was in the millions. Goldthorpe[71] also concludes that *'Ten thousand years ago man was a relatively rare species . . . .'* Estimates of the population in the paleolithic time period are highly speculative:

> *'it may be surmised that the maximum possible human population . . . in the paleolithic period was about ten million, and the actual population actually rose from one to five million during the* [entire] *period.'*[72]

Keyfitz[73] speculates that at 5,000 BC only 5 million persons lived.

Previous to the paleolithic period, Goldthorpe[74] speculated that about a '*million years* ago' when the first tools were made, a population growth he calls '*the paleolithic revolution*' occurred, resulting in a growth of from around 100,000 to 150,000 individuals to as many as *'perhaps one million'*. He estimates that from 7,000 to 9,000 years ago, the first '*population explosion'* occurred which was also accompanied by the first great technological revolution. This technological revolution could have facilitated the population explosion, or the population explosion may have resulted in leaving much more evidence of contemporary human technological abilities.

Dritt[75] concludes that according to the evolutionary scenario, fully modern human existence began about 10,000 years ago. Before this existed Peking Man (put at about 350,000 years ago) and other close fossil relatives are estimated to date back to some 3 million years ago. He concludes that Neandertal and Cro-magnon Man were roughly contemporary, and both buried their dead with artifacts. Given reasonable population estimates, based upon the evidence of their culture, Dritt estimates *'conservatively'* that they would have buried at least 4 billion bodies during their assumed 100,000 year existence. In many areas where they lived the conditions were dry and favorable so that bones could have been preserved for as long as 100,000 years. Yet, only a minuscule fraction of bones or artifacts (many of which would have been preserved far more effectively than bones) have been found, implying that their civilization existed for a far shorter period of time than the evolutionary scenario postulates. The conclusion that Dritt arrives at is:

> *'Evolutionary timetables suggesting that prehistoric time was a long period of upward evolutionary change, simply do not fit that data. How does one account for intelligent, capable beings, like us, who could refrain from recording his existence and activities for 95,000 years? How could he do all the complex things he did before the supposed development of writing, arithmetic or calendars? . . . Recent archaeological excavations in northern Israel confuse evolutionary timetables with the discovery of the existence of modern man and date him as preceding Neanderthal.*'[76]

Lucy and other examples it is claimed survived for hundreds of thousands or millions of years and at least in these places preservation is excellent, and literally millions of dinosaur bones and bone fragments have been unearthed. Consequently Dritt states that *'It is truly amazing that only a few thousand prehistoric bodies have been found.'* He concludes from this evidence that the Stone Age lasted only a few hundred years, thus the total population during this time would have been low and, hence, archaeologists would have found only a few thousand examples, which is specifically what they have unearthed.

Although population sizes can be estimated from official censuses, the physical size of the city and such, we are more in the dark about the use of birth control, abortion, the problems of hunger, disease, etc., (these last two factors are very important) and even the type and extent of sexual activity, which is not always constant and is an important determinant of population increases.[77] Some ancient practices, especially among hunting and gathering tribes, served to reduce fertility. Almost universal were long periods of suckling before weaning, which reduced the chances of conception then. And when intercourse did take place, Wrigley notes that attempts were often made to ensure that conception did not occur — coitus interruptus, and anal and oral-genital sex were *'not uncommon in some societies.'*[78] Further, abortion was practiced in many primitive societies, and tannic acid suppositories were evidently commonly used as a spermicide. Infanticide and such cruel behavior as isolating pregnant women, all mothers or both, Wrigley claims, were also common. These practices presumably usually occurred in conjunction with limited

food supplies (such as in hunting and gathering societies) and were less common where effective agriculture methods were in vogue; population in these areas was limited primarily by the number of acres seeded, the quality of land available, and the weather. If a rapid population increase was believed to affect the quality of their life, some ancient peoples may have exercised population control, including infanticide and customs which discouraged, or delayed, marriage.[79] How common these practices were at some specific time cannot be stated with much certainty, at least until the writings of the Greeks and Romans. And aside from these cultures, contemporary civilizations are largely silent, even as to general data, on most of the issues discussed above. Many if not most civilizations and cultures throughout history, though, have encouraged large families, both to help the parents work the land and to retire, and to supply males for defense purposes.

CONCLUSIONS

The references reviewed here present several tentative conclusions about the population of the ancient world. A rapid population increase began during the agricultural revolution during about 4,000 BC to 6,000 BC, and before this no clear evidence exists of any sizable population anywhere (thus, due to this and a lack of written records, this period is called prehistory). The total Greek population at 500 BC was about 2 million, and the total world population was then between 100 million and 300 million. The building of safe large cities, an effective means of exchange, and a stable government accompanied the population increases that began about 2000 BC. After this period several fairly sizable and advanced population centres developed, especially from about 1000 BC to the time of Christ.

The fact that many ancient cities as far back as 2000 years before Christ had effective sanitation (sewers, numerous public baths, etc.) and engaged in heavy commerce, including the importation of a variety of goods from many other countries, argues against the traditional view of evolution. The rapid population increase after AD 1650 occurred because of better food, such as the importation of potatoes from Peru, and more effective sanitation, reducing the likelihood of various plagues which tended to periodically decimate European civilization.[80] Social attitudes, control of war and other factors also may be important causes of the 18th century increase. Claiborne,[81] Hamblin[82] and Davidson[83] all suggested that some type of birth control was utilized to help control some ancient populations, and that disease and malnutrition did not affect the ancient population as much as some today assume, although it had a major impact on local areas, such as during the so-called Dark Ages.

For these reasons, estimates of the ancient world population vary widely. Huxley[84] concluded that the total world population of 5,000 years ago cannot have been over 20 million, and when Christ walked on the earth population had increased to between 133 million to 250 million. The human population growth rate increased only slightly until about 1750 when a *'dramatic'* increase occurred.[85] It is now concluded that,

> *'In a relatively short span of time between 1750 and 1950, the population more than tripled from 800 million to 2.5 billion, a doubling time of 122 years*'.[86]

In the 25 years between 1950 and 1975, another 1.5 billion people were added, bringing the total to 4 billion, a growth rate producing a doubling time of only 37 years. The world population is now over 5 billion. The total number of persons that has ever lived was estimated by one demographer at 13 billion. Interestingly, the earth's 57,000,000 square miles of land would give each person who ever lived more than three acres (although many people would be stuck with undesirable areas such as the huge Sahara Desert, the North and South Poles, or the great wastelands in North Canada).

Even given the difficulties in obtaining population estimates, there is no evidence that a population of several billion, and extremely weak evidence that a population of several million, existed as far back as 6,000 years ago. What we would expect to find, given the naturalistic evolutionary scenario, is quite in contrast to what is actually found. The development of the earliest cities shows a vivid picture of a number of large, highly developed, sophisticated cities and little evidence that humans inhabited cities that existed for tens of thousands of years before these known, well-documented cities. Even the evidence for the existence of humans before 6,000 years ago is extremely sparse and controversial. Evolutionists explain this problem as follows:

> *'The reason the population grew so slowly during the first ninety-nine percent of human history was that death rates were very high, and the risk of death was particularly high among infants and young children. Thus people were forced to have a large number of children if they wanted to have even two or three survive to adulthood. Premodern life expectancies were rarely more than 30 years (compared to more than 70 in the United States today), and under such conditions women had to bear an average of more than four children each just to ensure that two would survive to adulthood. In those areas where mortality was even higher (such as in India where as recently as the beginning of this century life expectancy was less than 20 years) women had to bear more than six children on average just to ensure that two would live to adulthood. For most groups of people, the balance between this large number of births and an almost equally large number of deaths led over time to only slight increases in population size*.'[87]

This set of events, though, should have favored active natural selection of mechanisms that would have enabled the body to effectively fight communicable diseases, most

all of which were dealt with by modern medicine, not evolution. Secondly, since We have little evidence of any sizable population of humans before 6,000 or so years ago, the assumption that death rates were high then is unwarranted. In many of the cities that we do have records for, death rates were low compared to many cities of today and the longevity at least of the upper classes was close to as high as today.

SUMMARY

This study of ancient population data best fits the creation scenario, indicating comparatively small populations existed about 6,000 or so years ago, far smaller than would have been expected if humans and their immediate ancestors had lived on the earth for 2–4 million years. Secondly, even evolutionists acknowledge that no evidence exists for anything but a population that was at best significantly small — in the thousands at the most — for most of human hypothetical evolution, providing an inadequate base for the number of mutations needed in order to successfully apply current evolutionary mutation theory.[88–90] Mutation based evolution itself is highly theoretical and troubled by a major difficulty, namely, according to Rust, there has never been *'even a single "positive" or adaptive mutation . . . documented in any organism.'*[91]

The extant empirical evidence indicates that the earliest populations, while not having the benefits of the electronic revolution, computers, photocopiers or other modern conveniences, lived in a technologically advanced society which contained all of the basic elements of contemporary modern societies. They planned sophisticated cities with streets, sewer systems, courtyards, manufacturing companies, tax systems and houses which would be considered both luxurious and comfortable today if electrified. Many would be the pride of the community even if they existed in some of our most sophisticated neighborhoods.

According to the best estimates, only about 200 million people lived at the time of Christ, which is about the contemporary increase in the world's population in less than 100 days. As late as 1700 only 615 million people lived on the earth, and its population reached 1 billion only after the year 1800, 2 billion in 1930, 3 billion about 1960, 4 billion in 1975, and 5 billion in 1990.[92] This population curve reveals that, unless there were frequent periods during which a large percent of the population were wiped out through disasters, or the blatant contradiction that the most advanced evolutionary animal, mankind, was abysmally ineffective in reproducing and surviving, the human population began on the earth far later than the evolutionary scenario postulates. Stockwell[93] estimates that for the evolution scenario to be valid, the average number of persons added annually for 2 million years could have been only two to three persons world-wide, and that the world population at 8000 BC was a mere 5 million. This incredibly minuscule growth rate is necessary to explain the extremely small world population of humans that existed during the periods for which we can obtain reasonable estimates.[94] In contrast, the average number of humans added per year in the earliest known civilizations to 1650 was 50,000 annually.[95] For the 300 years from 1650 to 1950, it is estimated an average of 7 million persons were added annually, bringing the population total to 2.5 billion in 1950.

The 1–2 million-year-long human evolution would have produced far larger populations than 200 million by the birth of Christ. By practicing birth control and population planning, society was able to lower population growth to only two percent annual growth in the 1970s, which means a doubling time of less than 35 years.[96] And our knowledge of ancient populations indicates an increase far above this was common. Of course, wars, famines, earthquakes, and other natural disaster have caused the loss of the lives of huge numbers of people, but after natural disasters or wars, typically strong efforts exist to increase the growth rate well beyond the growth rate before such disasters.

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