# Analysis of the Numbers in Genesis 5

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One of the peculiarities of Genesis that gives it a mythical quality is the impossibly large ages attributed to the characters, especially those who lived before the flood. The oldest of the antediluvians listed in Genesis 5 was Methuselah who has become the epitome of longevity because he was reported to have lived 969 years. Noah was given an equally incredible age of 950 in Genesis 9:29. The Genesis genealogy numbers have been analyzed by many Biblical commentators, both ancient and modern. Those who have not rejected the text as mythical,[1] have usually taken the numbers at face[2] value. Commentators have constructed precise but impossible chronologies with these numbers[3] and others who attempted to rationalize the numbers have encountered difficulties. For example, changing the word *years* to *months* will not produce credible results, because then Mahalalel and Enoch would have been only five years old when they fathered sons.

Nearly all modern translations of Genesis are derived from the Masoretic (Hebrew) Text, because it is generally the most reliable. But there are also two other versions of Genesis: the Samaritan (in an early Hebrew script) and the Septuagint (a Greek translation of an early Hebrew text). Although, scholars are aware that these three versions of Genesis 5 have different numbers, people who have seen only the commonly available translations are often unaware that other versions exist. Even among scholars, it is customary to see every difference outside of the Masoretic Text (MT) as an error or a correction, an emendation, because the Masoretic Text is the standard with which other texts are compared. But this preference, as one scholar[4] commented, "is a mere convention for the scholarly world" and "it should not be postulated in advance that MT reflects the original text of the biblical books better than the other texts."

The numbers[5] in the Masoretic, Samaritan, and Lucianic Septuagint versions of Genesis 5 are shown in Table I.

|             | Masoretic | | | Samaritan | | | Septuagint | | |
|-------------|------|--------|-------|------|--------|-------|------|--------|-------|
|             | son | | total | son | | total | son | | total |
|             | born | remain | | born | remain | | born | remain | |
| Adam        | 130 | 800 | 930 | 130 | 800 | 930 | 230 | 700 | 930 |
| Seth        | 105 | 807 | 912 | 105 | 807 | 912 | 205 | 707 | 912 |
| Enosh       | 90 | 815 | 905 | 90 | 815 | 905 | 190 | 715 | 905 |
| Kenan       | 70 | 840 | 910 | 70 | 840 | 910 | 170 | 740 | 910 |
| Mahalalel   | 65 | 830 | 895 | 65 | 830 | 895 | 165 | 730 | 895 |
| Jared       | 162 | 800 | 962 | 62 | 785 | 847 | 162 | 800 | 962 |
| Enoch       | 65 | 300 | 365 | 65 | 300 | 365 | 165 | 200 | 365 |
| Methuselah  | 187 | 782 | 969 | 67 | 653 | 720 | 167 | 802 | 969 |
| Lamech      | 182 | 595 | 777 | 53 | 600 | 653 | 188 | 565 | 753 |
| Noah        | 500 | – | – | 500 | – | – | 500 | – | – |
| Until flood | 100 | 350 | 950 | 100 | 350 | 950 | 100 | 350 | 950 |

Table  I

A comparison of the numbers in Table I shows that each version is internally consistent. The ages when the sons were born plus the remainders equal the totals given in each version, but each version uses different numbers to arrive at these totals. This implies that the differences between the three versions were not accidental or the result of scribal errors. The differences are due to carefully constructed systems of chronology. By comparing the three versions it may be possible to determine which chronology is closest to the original Priestly chronology.

The three versions agree on some of the total ages at death, but many of the other numbers differ by exactly 100. The Septuagint numbers for the ages of the fathers at the birth of their sons, are in many instances 100 greater than the corresponding numbers in the other two versions. It is therefore tempting to suspect, as some commentators have,[6,7] that the Septuagint translators added 100 to the original numbers. But in the case of Jared, the Septuagint and Masoretic versions agree; the Samaritan version is the non-conformer. Hence, it is just as possible that the Samaritan editor subtracted 100 from the ages at son's birth, as did the Masoretic editor, except that the latter left Jared's numbers unchanged. The Samaritan editor also reduced the ages at death of Jared and Methuselah so they would not live after the flood.

This problem of the antediluvians living after the flood was important to the editors of the Masoretic and Samaritan versions. Because the story in Genesis 7 failed to mention anyone surviving the flood besides Noah, his sons and their wives, the Samaritan editor apparently felt obliged to alter the

text so that Jared, Methuselah and Lamech would die in precisely the 600th "year" of Noah, the flood year. The Masoretic Text also has Methuselah dying in Noah's 600th year, but the editor of the Masoretic Text arrived at this through a different chronology than the Samaritan.

The Septuagint translators were apparently not concerned with whether other people besides Noah and his family survived the flood. As Klein[6] noted, the Lucianic Septuagint chronology has Methuselah living through the flood and thus the differences of 100 were not an attempt by the Septuagint editors to have Jared, Methuselah or Lamech die prior to the flood. But later Septuagint manuscripts were altered by giving Methuselah an extra 20 years before his son's birth,[5] so that he would die before the flood.

Larsson[7] discussed the differences between these versions and noted "many peculiarities" in the Masoretic version of the Pentateuch that are not present in the corresponding Septuagint version. He argued that these differences can be explained as alterations designed to rationalize a primary Masoretic system of chronology to a later Septuagint system. Most of these peculiarities are found outside of Genesis 5 and are therefore beyond the scope of this article. But even if Larsson is correct that the Masoretic Text was primary for most of the Pentateuch, the Septuagint could still be primary for Genesis 5. Alterations from the Septuagint to the Masoretic Text, according to Larsson, make no sense. Here I will show that the Septuagint numbers do make sense and the Masoretic and Samaritan editors had sensible but erroneous reasons for altering their received text of Genesis 5.

The three versions of the Shemite genealogical data[5] of Genesis 11:12–22 are given in Table II. When a comparison is made of the three versions in Table II, the same discrepancy of 100 is found, but the Septuagint and the Samaritan versions agree on the ages at son's birth. The Masoretic version is the non-conformer in Genesis 11 just as the Septuagint is the non-conformer in Genesis 5.

| | Masoretic | | Samaritan | | | Septuagint | |
|---|---|---|---|---|---|---|---|
| | son | | son | | total | son | |
| | born | remain | born | remain | | born | remain |
| Arpachshad | 35 | 403 | 135 | 303 | 438 | 135 | 430 |
| Kenan | – | – | – | – | – | 130 | 330 |
| Shelah | 30 | 403 | 130 | 303 | 433 | 130 | 330 |
| Eber | 34 | 430 | 134 | 270 | 404 | 134 | 370 |
| Peleg | 30 | 209 | 130 | 109 | 239 | 130 | 209 |
| Reu | 32 | 207 | 132 | 107 | 239 | 132 | 207 |
| Serug | 30 | 200 | 130 | 100 | 230 | 130 | 200 |

Table II

Although the differences of 100 in Genesis 5 suggest the Masoretic Text is primary, similar differences of 100 in Genesis 11 suggest the Septuagint is primary. Therefore, we cannot rely on these differences to determine which version is primary. Determining which of the three versions reflects the original Priestly text is a problem that is best approached by relating the numbers to facts that are independent of the texts and by finding plausible reasons why the texts were altered.

## The Septuagint numbers

It would not be surprising if the Septuagint numbers were primary because when scholars translated the Hebrew Pentateuch (which includes Genesis) into Greek at Alexandria, Egypt about 280 BC, they used a Hebrew text that was edited in the 5th and 4th centuries BC.[8] This would be centuries older than the proto–Masoretic Text selected as the official text by the Masoretes after 500 CE, "a text that was already corrupted."[9]

Starting with the Septuagint numbers in Table I, we can avoid making assumptions about what time-units the word *years* represents by calculating ratios. If each age at death is divided by the age at son's birth for each man, the resulting age ratios vary between 4 and 6 except for Enoch and Noah, regardless of what time-units are used, as shown by the following calculations:

| | | | | | |
|---|---|---|---|---|---|
| Jared | 962 | ÷ | 162 | = | 5.94 |
| Methuselah | 969 | ÷ | 167 | = | 5.80 |
| Mahalalel | 895 | ÷ | 165 | = | 5.42 |
| Kenan | 910 | ÷ | 170 | = | 5.35 |
| Enosh | 905 | ÷ | 190 | = | 4.76 |
| Seth | 912 | ÷ | 205 | = | 4.45 |
| Adam | 930 | ÷ | 230 | = | 4.04 |
| Lamech | 753 | ÷ | 188 | = | 4.01 |
| Enoch | 365 | ÷ | 165 | = | 2.21 |
| Noah | 950 | ÷ | 500 | = | 1.90 |

These ratios are entirely consistent with age ratios of people living today. For example, a young man might became a father at age 16 and die at age 80, which is a ratio of 5. Likewise a death age of 72 divided by a birth age of 18 is a ratio of 4. And a man who lived to be 90 could have been 15 when he fathered his first son, a ratio of 6. The close similarity of the age ratios in the text compared with people living today suggests that the life expectancy of these men was much closer to modern life expectancies than nine-hundred years. Although this does not prove that the numbers represent ages of real people, especially as the average life expectancy was less in the past[10] than it

is now, at least finding ratios similar to those of real people reduces some of the mythical quality of Genesis 5. When similar calculations are made using the Masoretic and Samaritan numbers, the ratios increase to 13.00 and 13.77 which are not possible with real people. But all of the Septuagint age ratios are possible.

If the maximum credible age at death (then and now) is assumed to be 100 solar years of 365.25 days, the Septuagint ages of these men must have been represented in time-units no larger than 37.7 days, and probably less than that. It might be tempting to infer from this that the ages are given in months, not years. Genesis 7:11 and 8:3–4 imply that the calendar month used by the Priestly writer was 30 days. If years are changed to months, Jared would have been 162 months old when he fathered his son which converts to 13.3 years (12.5 years at conception), an age that is still too low. An alternative possibility is that the writer used a different notational system that we are not accustomed to.

A clue to the notational system can be found by examining the units digits of the Septuagint numbers in Table I. For example, in the number 165, the units digit is a 5 which counts as one occurrence of the numeral 5 in Table I. Counting the number of times each units digit is used from Adam to Methuselah:

    0 occurs    ten times
    2 occurs    four times
    5 occurs  seven times
    7 occurs    two times

It has been suggested[11] that this number pattern reflects divisibility by five with an occasional seven as a standard complement. Left unexplained is *why* the numbers are divisible by five with occasional sevens. Five years of twelve months each would be 60 months, suggestive of the Babylonian sexagesimal number system. However, as discussed below, the numbers of Genesis 5 were probably first recorded using archaic numbers before the rise of the sexagesimal system, and not in a decimal system.

Because the text has the numerals 0, 2, 5 and 7 in the units position, but not 1, 3, 4, 6, 8 or 9 prior to Methuselah, it seems more probable that the units digit represented quarters of some time unit converted to tenths. Two tenths and 7 tenths were simply single-digit approximations for 1 quarter and 3 quarters. The 5 meant one half. If these were quarters of solar years, the low-order (right) digit may have represented tenths of years, not years and the 165 "years" of Mahalalel meant 16.5 solar years, i.e. Mahalalel was sixteen and a half years old when he became the father of Jared.[12]

By assuming one decimal place in the Genesis 5 and 9:28 numbers, the Septuagint numbers yield ages in solar years as shown in Table III.

|            | Son Born | Total Life |
|------------|----------|------------|
| Adam       | 23.0     | 93.0       |
| Seth       | 20.5     | 91.2       |
| Enosh      | 19.0     | 90.5       |
| Kenan      | 17.0     | 91.0       |
| Mahalalel  | 16.5     | 89.5       |
| Jared      | 16.2     | 96.2       |
| Enoch      | 16.5     | 36.5       |
| Methuselah | 16.7     | 96.9       |
| Lamech     | 18.8     | 75.3       |
| Noah       | 50.0     | 95.0       |

Table  III

All of the ages in Table III are consistent with the ages of people living today. The numbers become much more credible once the notational system of the writer is understood. The fantastic stories about these men living over nine hundred years and not getting around to fathering their children until they had lived a century or two, are based on a misunderstanding of the number system. Except for Noah, each young man fathered his first son during his late teens or early twenties, just as young men do today.

To cling to the notion that the Genesis 5 numbers represent hundreds of solar years creates three problems: how could these men live to be over nine hundred years, how could they have fathered children when they were over a century old, and why did they wait so long to have children? All three of these problems disappear if we make two simple assumptions: the Septuagint has the original numbers and each of the numbers has one decimal place.[12]

## Why the text was altered

The Masoretic and Samaritan editors were probably skeptical about men fathering children when they were more than a century old. This apparently led them to use the following procedures to alter the text (decimal points omitted). They initially subtracted 100 from all ages at son's birth, thus yielding more plausible ages such as 65 and 62. But this immediately created a problem with Jared, Methuselah, and Lamech living after the flood.

The Samaritan editor recognized that Lamech's remaining years after Noah's birth would have to be 600 if Lamech were to die in Noah's 600th year, the flood year. But Lamech's age at Noah's birth was still too large when calculated backwards from Lamech's death:

753 – 600 = 153.

The Samaritan editor eliminated this problem by subtracting 100 from Lamech's death age:

753 – 100 = 653
653 – 600 = 53

The Samaritan editor then reduced the death ages of Jared and Methuselah by exactly the amounts required for them to die in Noah's 600th year.

The Masoretic editor used a different approach to the same problem. After subtracting 100 from all ages at son's birth and finding that this created a problem with Jared, Methuselah, and Lamech, the Masoretic editor then restored the original birth ages for Jared (162), Methuselah (167), and Lamech (188). Jared and Lamech would thus die before the flood, but Methuselah would die 14 years after the flood. The editor eliminated this problem by increasing Methuselah's 167 to 187. Thus the flood would be delayed 20 years and Methuselah would die 6 years before the flood. The editor then eliminated this 6 years by subtracting 6 from Lamech's 188 so that Methuselah would die in the year of the flood. The Masoretic editor also subtracted 100 from the ages at son's birth in Genesis 11.

Except for the differences of 100, the only other differences between the three versions of Genesis 5 are for Jared, Methuselah and Lamech. These are the very people whose deaths would occur after the flood if the hundreds digit were omitted from the ages at son's birth. Moreover, the hundreds digits of the Masoretic ages at son's birth agree with the Septuagint prior to Noah only for Jared, Methuselah and Lamech. It is very improbable that these coincidences occurred by chance. They are the result of emendation procedures used by the Masoretic and Samaritan editors and provide the clues from which those procedures can be reconstructed.

## Mistaking fractions for integers[12]

Use of the tenths digit to represent quarters in Table III suggests that the original data prior to Methuselah was recorded in years and quarter years (seasons) rather than years and months. For example, the birth of Jared son of Mahalalel may have been recorded like this: "When Mahalalel lived 16 years and 2 seasons his son Jared was born." Fractional years of .3, .8 and .9 began with Methuselah which suggests that some of the data was recorded in years and lunar months for events within recent memory of people still living at the time of the flood, but the best available data from old family tradition or from the temple archives was years and seasons.

The person who first calculated the numbers in Genesis 5 may have been using tenths of years rather than months simply for personal convenience, just as we sometimes calculate tenths of feet when we do not want to bother with inches. Calculating in tenths of years would have been easier than calculating lunar months and years with frequent intercalary periods. Just as

the calculator of the numbers represented seasons to the nearest tenth year, he may have represented lunar months to the nearest tenth year or the next lowest tenth year. Use of tenths of years does not imply use of a ten-month calendar and may have been only the personal notation of one scribe.

Noah was a Sumerian chief executive during the Jemdet Nasr period which ended with the river flood of 2900 BC.[13] The Genesis 5 numbers, representing ages of Noah and his ancestors, were probably based on records written in clay before the flood in an archaic (pre-cuneiform) Sumerian number system. Some of the numbers may have been recorded by Noah or his father from the memories of their elderly relatives. It also seems likely that most of the deaths (including Noah's) were originally recorded by temple scribes who routinely recorded deaths, especially in families of the nobility in Shuruppak.

Although the Babylonians used place-value notation[14] after 2000 BC and a sign for zero after 400 BC, these features had not yet been invented in 2900 BC. Hence, the original Genesis 5 numbers were not originally recorded using place-value notation or zero or decimal digits as they appear in Table III. But Sumerian number signs representing tenths, quarters and other fractions were already in use in 2900 BC before the invention of cuneiform numerals and the sexagesimal system.[15]

Prior to 2000 BC, the Sumerians used a round stylus for making archaic number signs in soft clay. A small diameter round stylus held perpendicular to a tablet made a small circular impression in the clay that often meant ten but could also mean six, depending on context.[16] The same small diameter stylus held obliquely and pressed into the clay tablet made a horizontal cup-shaped sign that often meant one. When held at different angles in different combinations, a round stylus could make other kinds of number signs. But the different signs that could be made by a round stylus were limited and such archaic signs were gradually replaced by cuneiform signs using a wedge shaped stylus between 2600 BC and 2000 BC.[17]
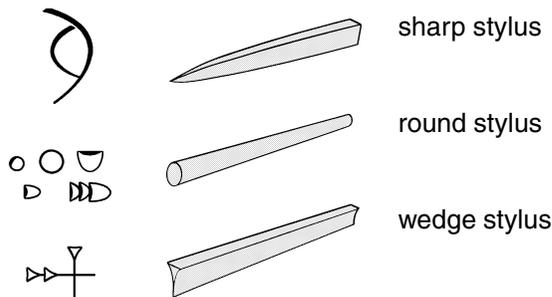


Figure 11. Clay impressions and the stylus shapes that made them.[18]

In 2900 BC there was no single standard number system in Sumer. In the city of Uruk, more than a dozen different archaic number systems[19] were used for counting different things. One system was used to count discrete objects such as animals. Another system was used for counting volumes of grain and cereal products. A different system was used for volume measures in beer brewing. Another system was used for time and calendar units which seldom exceeded eleven years.[20] These number systems were as different from each other as Roman numerals are from the decimal system we commonly use. Since the same round stylus was used in each of these number systems, the round-stylus number signs had different meanings in the various systems depending on what was being counted.

When the compiler of the Genesis 5 numbers calculated the years/ seasons data in years and tenths of years, he used one of several number systems then in common use. The compiler could not have written 16 years and one season as 16.2 years because the decimal point and place-value notation had not yet been invented. Instead, he probably used one or more archaic number sign for tens, a different sign for units and a different sign for tenths. This is called sign-value notation. A later scribe familiar with the archaic signs might still have difficulty interpreting them correctly if he did not know in which number system they were written and the context in which they were written.

As discussed in the next section, tens of years were misunderstood as hundreds of years in the Genesis 5 numbers, probably when a scribe translated the original archaic numbers into cuneiform using sexagesimal notation. The scribe incorrectly assumed that the archaic numbers were written in the Sumerian proto-sexagesimal number system designed for counting discrete objects such as animals, when actually the Genesis 5 numbers were written in a number system designed for counting volumes of grain (Shuruppak was a grain distribution city). This error converted tens of years to hundreds, years to tens of years, tenths of years to years, and also inflated the ages at death.

## Conflicting number systems

Only two simple assumptions are needed for the Genesis 5 numbers to conform to ages of people living today, i.e. that the Septuagint has the original numbers and each of the numbers has one decimal place in modern decimal notation.[12] But men living into their 90's for seven generations is still improbable. In this section, an additional amendment is proposed that reduces by 12 most of the death ages in Table III and also explains why tens of years became hundreds of years.

To understand what probably happened during transmission of the Genesis 5 numbers, we should distinguish how the numbers were processed during four periods of time:

- when the raw birth and death data for Noah's ancestors were recorded during the two centuries before the flood (ca. 3100–2900 BC);
- when the Genesis 5 numbers were calculated from the raw data during the Early Dynastic IIIa period (ca. 2600 BC);
- when the archaic calculated numbers were mistranslated into cuneiform during the Old Babylonian period (ca. 1800 BC); and
- when the proto-Masoretic text of Genesis 5 was altered (ca. 300 BC).

Original contemporaneous records of each ancestor's death were probably created at the times of their deaths for tax reasons and dated by year name by taxation scribes. These separate records would be stored with similar death records in the temple archives in Shuruppak from before and after the flood of 2900 BC. These records included Noah's death and the Genesis numbers were calculated after Noah's death.
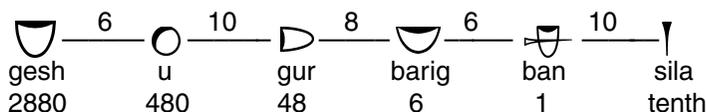
The flood story was first written in clay during the Early Dynastic IIIa period.[21] The scribe who compiled the flood story from various oral traditions about previous floods, may have been the same scribe who searched the archives for records of Noah and his ancestors and calculated the Genesis 5 numbers from raw birth and death records which the scribe found in the archives. The Genesis 5 numbers were probably calculated using one of the archaic (pre-cuneiform) Sumerian number systems during the Early Dynastic IIIa period (ca. 2600–2500 BC).

Among the dozen or so number systems used in Sumer, the SHE–GUR system for counting volumes of grain was widely used because grain had become the usual medium of exchange.[22] People who frequently calculated volumes of grain learned to add and subtract in this grain number system. The peculiar SHE–GUR number system used in Shuruppak during the Early Dynastic III period is of special interest because records of Noah and his ancestors would most likely be stored in Shuruppak where Noah had been chief executive. A Shuruppak scribe apparently calculated the Genesis 5 numbers during the Early Dynastic III period from birth and death records stored at Shuruppak, and he did his calculations in a peculiar version of the SHE–GUR number system that was used only at Shuruppak.

In the SHE–GUR system, the number of *barigs*[23] in a *gur* changed from time to time. In Shuruppak during the Early Dynastic III period, there were 8 *barigs*[24,25] in a *gur* in the SHE–GUR–MAH number system. There were 4 *barigs* in a *gur* in the later GUR–SAG–GAL number system.[24] There were 5 *barigs* in a *gur* in the still later GUR–LUGAL number system. The Shuruppak *gur* of 8 *barigs*, attested only at Shuruppak,[20] was termed GUR–MAH, meaning large *gur*, to distinguish it from the regular *gur* of 4 or 5 *barigs*.

In the Shuruppak SHE–GUR–MAH number system, the *bán* sign represented the basic unit of capacity,[16] a volume of 8.4 to 10 liters. Various number signs represented fractions of a *bán*, especially the *sila* sign[26] which

represented one tenth of a *bán*. The SHE–GUR–MAH system units are shown in the following factor diagram. The numbers over the horizontal lines represent ratios of larger units to smaller units. For example, there were six *báns* in a *barig*.

| gesh | | u | | gur | | barig | | ban | | sila |
|---|---|---|---|---|---|---|---|---|---|---|
| | 6 | | 10 | | 8 | | 6 | | 10 | |
| 2880 | | 480 | | 48 | | 6 | | 1 | | tenth |

Such volume-measure signs were also used as numerals. According to Schmandt–Besserat,[27] "It appears that the impressed signs, while retaining their primary meaning, for example as grain or land measures and as animal count, acquired a secondary meaning as numerals." This phenomenon "is particularly explicit on tablets where, in the same text, the same signs are used alternately (but according to a different ratio) to express grain measures or numerals."

The Shuruppak scribe who calculated the Genesis 5 numbers probably understood the archaic number signs used in archive records for representing years and months. But adding and subtracting in these archaic number signs used before the flood may have been as difficult for him as adding and subtracting in Roman numerals would be for us. Today, if someone wanted to subtract CCXXIX from CMXLVI, they would probably convert to decimal numbers, do the subtraction in decimals and leave the result in decimals, rather than convert the result to DCCXVII.

The Shuruppak scribe had a similar problem. He probably knew how to add and subtract integers in the animal-counting number system, but this system originally had no signs for fractions, because there was seldom any need to refer to a tenth of a sheep or a fifth of a goat. The scribe also probably knew how to add and subtract integers and fractions in the SHE–GUR grain-measuring number system which already had signs for fractions, originally used to represent fractional cups of grain. The scribe probably converted the Jemdet Nasr year and season numbers he found in the archives into grain number signs so he could more easily add and subtract years and fractional years. Rather than convert the results back into Jemdet Nasr number signs, he left the years and tenths of years in grain number signs. The original Genesis 5 numbers were probably first calculated using SHE–GUR–MAH number signs with *bán* representing year and *sila* representing a tenth of a year, because a *bán* was equal to ten *silas*.

Hundreds of years later during the Old Babylonian period (1800–1600 BC), when a different scribe, perhaps a student scribe, translated these numbers into cuneiform in the classical Sumerian sexagesimal number system, he erroneously assumed that the archaic SHE–GUR–MAH number signs were

in a proto-sexagesimal system. He made this error because of similarities in the signs that can be seen in the following diagram:

| | | | | |
|---|---|---|---|---|
| SHE–GUR–MAH numbers | gur —8— | barig —6— | ban —10— | sila |
| original meaning | 48 | 6 | 1 | tenth |
| erroneously assumed to be proto-sexagesimal | geshu —10— | gesh —6— | u —10— | dish |
| erroneous translation in cuneiform | | | | |
| meaning in decimals | 600 | 60 | 10 | 1 |

The Babylonian scribe was misled by five similarities between the SHE–GUR–MAH number signs in his received tablet and number signs in the proto-sexagesimal and classical Sumerian sexagesimal systems:

1. In his received tablet the low order *sila* sign resembled the vertical wedge meaning **one** in cuneiform.

2. The *barig* sign in his received tablet resembled the cup-shaped *gesh* sign in proto-sexagesimal.

3. The high-order *gur* sign in his received tablet resembled the cup-shaped *geshu* sign in proto-sexagesimal, but without the small round punch mark.

4. A *bán* was equal to ten *silas*, just as in proto-sexagesimal where *u* meant ten *dish*.

5. A *barig* was equal to six *báns*, just as in proto-sexagesimal where a *gesh* was equal to six *u*.

The presence of the *bán* sign with the distinctive cross stroke alerted the scribe to the fact that the signs were in the SHE–GUR number system which continued to be used in modified form until the final phase of the Old Akkadian period (about 2250 BC).[26] In this number system, a *gur* was equal to 4 *barig*. But in the scribe's received tablet, the number of *barig* in a *gur* was greater than 6 because the tablet showed numbers with up to 6 *barig*. This was not the SHE–GUR system the scribe was familiar with. He probably studied the tablet to determine what other number system may have been used.

Since the low-order *sila* sign was a vertical wedge like the cuneiform sign for **one**, the scribe would assume that *sila* meant units, although it actually meant tenths. He would then reason that if the low-order sign was one, the next higher *bán* sign should mean ten (although it actually meant one) and

that agreed with his tablet which had nine *silas* for Methuselah. He would expect the next higher *barig* sign to be 6 *báns* and that also agreed with his tablet which never had more than 5 *báns*. The next larger *gur* sign would be a number greater than 6 *barig* because the tablet sometimes had 6 *barigs* (e.g. for Jared and Methuselah). The scribe would probably assume a *gur* was 10 *barigs*, similar to the number system used during the Jemdet Nasr period,[28] because in his received tablet a *gur* was more than 6 *barigs*. The true value of a Shuruppak *gur* was 8 *barig*, but the scribe apparently did not know that. By assuming a *gur* equal to 10 *barigs*, a *barig* equal to 6 *bán*, and a *bán* equal to 10 *sila*, the ratios alternated 10 then 6 then 10, just like the sexagesimal system. The scribe probably concluded that the numbers were in proto-sexagesimal notation and translated them as such. But he was mistaken, not only about the number system, but also about which number signs represented integers and which were fractions.

When the Genesis 5 numbers were first calculated in the SHE–GUR–MAH number system, a few tens of years could be recorded using the *bán* and *barig* signs. If the number of *báns* exceeded 48, the larger *gur* sign would be used, just as we often count years if the number of months exceeds 12. But suppose the flood occurred when a Shuruppak man was 48 years old and his age was calculated as one *gur* using Shuruppak number signs. Later, when these archaic numbers were translated into classical Sumerian sexagesimal notation, the scribe might easily mistranslate *gur* (meaning 48 in Shuruppak) as the corresponding *geshu* meaning 600. Similarly, the other numbers greater than 48 would be inflated by 12 and then effectively multiplied by ten by mistaking tenths for units. Something like this probably happened to the Genesis 5 numbers when an ancient scribe translated them from archaic numerals into cuneiform.

To use Methuselah as an example, his age 16.7 when his son Lamech was born may have been calculated during the Early Dynastic III period in Shuruppak SHE–GUR–MAH number signs as:

> 2 barig, 4 ban, 7 sila
> 2 x 6 + 4 x 1 + .7 = 16.7

and Methuselah's age at death as:

> 1 gur, 6 barig, 9 sila
> 1 x 48 + 6 x 6 + .9 = 84.9

Later if *gur* was mistranslated as 600, *barig* mistranslated as 60, and *sila* mistranslated as 1, Methuselah's age at death would be translated:
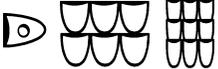
> 1 x 600 + 6 x 60 + 9 = 969

but should have been translated as 84.9.

The above example for Methuselah's age at death (Genesis 5:27) was probably written in archaic and cuneiform numerals as follows (where d indicates the place between integers and fractions):

| value: | 48 | 36 | .9 | = | 84.9 |
|---|---|---|---|---|---|

original Shuruppak numerals:



| value: | 600 | 360 | 9 | = | 969. |
|---|---|---|---|---|---|

mistranslation in archaic
proto-sexagesimal:



| value: | 600 | 360 | 9 | = | 969. |
|---|---|---|---|---|---|

mistranslation in cuneiform
sexagesimal:



The fraction of .9 years in Methuselah's age at death may have resulted from a truncation error by adding Methuselah's age at his son's birth 16.7 to the 68.2 remaining years of his life. Since .2 meant one quarter and .7 meant three quarters, Methuselah's death age would be more accurately calculated 16.75 + 68.25 = 85.0.

If the Genesis 5 numbers were calculated using Shuruppak number signs that were mistranslated as described above, all numbers in Genesis 5 greater than or equal to 48 would be inflated by 12 to numbers greater than or equal to 60. Hence, all numbers 60 or greater in Table III should be reduced by 12 yielding the numbers shown in Table IV:

|  | Son Born | Total Life |
|---|---|---|
| Adam | 23.0 | 81.0 |
| Seth | 20.5 | 79.2 |
| Enosh | 19.0 | 78.5 |
| Kenan | 17.0 | 79.0 |
| Mahalalel | 16.5 | 77.5 |
| Jared | 16.2 | 84.2 |
| Enoch | 16.5 | 36.5 |
| Methuselah | 16.7 | 84.9 |
| Lamech | 18.8 | 63.3 |
| Noah | ca. 33.0 | 83.0 |

Table  IV

The numbers in Table IV are more plausible than the numbers in Table III, because about five times as many men today live to be 78–85 years old than 90–97 years old. All of the adjustments in Table IV appear in the Total Life column because all of the numbers 60 or greater in Table III are in the Total Life column. The 36.5 years of Enoch is unchanged because 36.5 is less than 60. A chronology in years BC, based on the numbers in Table IV, is given in Table V.

The "six hundred and first year" of Genesis 8:13 was an error for "sixty-first year" (when Noah was 49) according to this modified Septuagint chronology. This was a date calculated by the Priestly editor P whose received text for Genesis 5 and 7:11 was already corrupted with tenths of years mistranslated as years, years as tens of years, and tens of years as hundreds of years. Correcting for these translation errors, the flood occurred when Noah was 48 years old and he died at the age of 83.

Calculation of the Genesis 5 numbers from the ancestor list of births and deaths was done after Noah's death, because the numbers included Noah's age at death recorded in Genesis 9:28. Noah's death was probably recorded routinely by Shuruppak scribes in the same archives where deaths of Noah's ancestors and other nobles were recorded. A later scribe who searched the official death records for data on Noah and his ancestors and who calculated the Genesis 5 numbers probably lived during the Early Dynastic III period, three hundred years after Noah's death, when oral traditions of the flood were first committed to writing.[21]

## Genesis 11

The Septuagint version of the Shemite numbers from Genesis 11:12–22 shown above in Table II are repeated below with decimal points inserted:

|  | Son born | Remainder | Total (calculated) |
| --- | --- | --- | --- |
| Arpachshad | 13.5 | 43.0 | 56.5 |
| Shelah/Kenan | 13.0 | 33.0 | 46.0 |
| Eber | 13.4 | 37.0 | 50.4 |
| Peleg | 13.0 | 20.9 | 33.9 |
| Reu | 13.2 | 20.7 | 33.9 |
| Serug | 13.0 | 20.0 | 33.0 |

A clue that the above numbers are estimates, are the numbers 13.0 which occur every two lines for Shelah, Peleg, and Serug. It is unlikely that every two generations a man fathered a son at exactly the same age. In the numbers for Arpachshad through Serug, there is not enough variation in the ages when their first sons were born, considering that the first child is often a daughter. A second clue is Peleg and Reu having identical life spans of 33.9 years which

is not likely. A third clue are the low ages when each man fathered a son. It is very unlikely that these men became fathers at the age of thirteen (conception at age 12.2). It should be clear that the numbers in Genesis 11:12–22 are a fictitious genealogy constructed by a family genealogist or scribe who filled in the missing data with estimates for the numbers and copied names from the table of nations in Genesis 10. There is a tendency among family genealogists to estimate numbers that have been lost.

| Era Year | | Approximate year BC |
|---|---|---|
| 0.0 | Adam born | 3113.0 |
| 23.0 | Seth born | 3090.0 |
| 43.5 | Enosh born | 3069.5 |
| 62.5 | Kenan born | 3050.5 |
| 79.5 | Mahalalel born | 3033.5 |
| 81.0 | Adam died | 3032.0 |
| 96.0 | Jared born | 3017.0 |
| 102.2 | Seth died | 3010.7 |
| 112.2 | Enoch born | 3000.7 |
| 122.0 | Enosh died | 2991.0 |
| 128.7 | Methuselah born | 2984.2 |
| 141.5 | Kenan died | 2971.5 |
| 145.5 | Lamech born | 2967.5 |
| 148.7 | Enoch died | 2964.2 |
| 157.0 | Mahalalel died | 2956.0 |
| 164.2 | Noah born | 2948.7 |
| 180.2 | Jared died | 2932.7 |
| ca. 197. | Shem born | 2916.0 |
| 208.7 | Lamech died | 2904.2 |
| 212.4 | the six-day flood | 2900.6 |
| 213.4 | Noah left the ark | 2899.6 |
| 213.6 | Methuselah died | 2899.4 |
| 214.2 | Arpachshad born | 2898.7 |
| 247.2 | Noah died | 2865.7 |

Table V   Chronology of modified Genesis 5 data

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# Conclusions

If the numbers in Genesis 5 represent ages of real people, then the Septuagint has the primary version of Genesis 5, because it is the only version (after adjusting by ten and other corrections)[12] that is consistent with human life as we know it. The Masoretic and Samaritan versions of Genesis 5 are secondary and reflect attempts by their respective editors to correct what they believed to be errors. Although we cannot be certain that the people mentioned in Genesis 5 were real people, there is nothing in the Septuagint version that strains credulity once the notational system is understood.

The excessive size of the numbers is the result of a scribe during the Old Babylonian period confusing archaic number signs in two different Shuruppak number systems. This mistake resulted in ages at death being inflated by twelve, and tenths of years being changed to years, years changed to tens of years, and tens of years changed to hundreds of years .

The original birth and death data was recorded on clay tablets stored in Shuruppak archives during the Jemdet Nasr period before the Euphrates River flood of 2900 BC and shortly after Noah's death. About three hundred years after the flood, during the Early Dynastic IIIa period, a scribe calculated the Genesis 5 numbers from the archival records. He used the Shuruppak SHE–GUR–MAH number system to record his calculations using archaic round-stylus numbers. The Early Dynastic IIIa period was the only period when a *gur* was equal to eight *barigs* and this peculiar SHE–GUR–MAH number system is attested only in Shuruppak[20] where the archival records of Noah's ancestors were most likely to be stored.

Several hundred years later, during the Old Babylonian period, a scribe who was translating the flood story into cuneiform, misread the SHE–GUR–MAH number signs as proto-sexagesimal signs. The Septuagint Genesis 5 numbers were based on that mistranslation. The numbers were furthered altered in the Masoretic and Samaritan versions of Genesis 5. After corrections are made for mistranslated Shuruppak number signs, the Septuagint version of Genesis 5 appears to be an ordinary family genealogy, subject to the same problems and uncertainties that modern family genealogists face when writing about their great-grandfather's great-grandfather.

Noah lived to be 83 years old and Methuselah lived to be 85. All of the antediluvians except Noah fathered their first sons in their late teens or early twenties just as young men do today. The river flood of 2900 BC occurred when Noah was 48 years old and had been king for ten years.

# References

1.　Scholars often treat the names in Genesis 5 as fictional eponyms similar to the eponymous names in the Genesis 10 table of nations and Genesis 11. I will argue that Genesis 5 was compiled by a different hand and is a surviving fragment of a real estate title search made from archival records for Noah's ancestral land in Shuruppak. The names Adam (man) and Enosh (man) in Genesis 5:3–11 were place holders for men whose names were missing or illegible in the land records and had no connection with the mythical generic man (adam) of Genesis 2–4 until a Genesis author combined parts of Babylonian myths during the exile.

2.　James A. Borland, "Did People Live to be Hundreds of Years Old Before the Flood? Yes", in *The Genesis Debate*, Ronald F. Youngblood (editor), (Nashville: Thomas Nelson, 1986).

3.　James Barr, "Archbishop Ussher and Biblical Chronology", *Bulletin of the John Rylands Univ. Libr. of Manchester*, 67(2) (Great Britain: 1985), pp. 575–608.

4.　Emanuel Tov, *Textual Criticism of the Hebrew Bible*, (Minneapolis: Fortress Press, 1992), pp. 11, 352.

5.　John Skinner, *A Critical and Exegetical Commentary on Genesis* (Edinburgh: T&T Clark, 1930), pp. 134, 233.

6.　Ralph W. Klein, "Archaic Chronologies and the Textual History of the Old Testament", *Harvard Theol Review*, 67 (1974), pp. 255–263.

7.　Gerhard Larsson, "The Chronology of the Pentateuch: A Comparison of the MT and LXX", *Journal of Biblical Literature*, 102 (1983), pp. 401–409.

8.　Charles M. Laymon (editor), *The Interpreter's One-Volume Commentary on the Bible*, (Nashville: Abingdon Press, 1971), p. 1227. See also John William Wevers, *Notes on the Greek Text of Genesis* (Atlanta, Georgia: Scholars Press, 1993), p. xv: "The LXX may [sometimes] interpret its text incorrectly; it is not a perfect document, but it is far and away the earliest, the closest in time to the original authors, that we have."

9.　Tov, op. cit., p. 9.

10.　Hans Walter Wolff, "Problems Between the Generations in the Old Testament", in *Essays in Old Testament Ethics*, James L. Crenshaw and John T. Willis (editors), (New York: Ktav Publishing House, 1974), pp. 77–95.

11.　Lloyd R. Bailey, *Genesis, Creation, and Creationism*, (New York: Paulist Press, 1993), p. 58.

12.　Before discussing how the Genesis 5 numbers were originally calculated in an archaic pre-cuneiform number system, it is first necessary to understand what the numbers mean. For ease of understanding, the numbers are represented here in modern decimal notation. But I am *not* saying that tenths of years were ever represented in a decimal system by the Babylonians or the Judeans. And I am *not* saying that they ever represented tenths of

years as decimal fractions in the sexagesimal system. The scale of the original numbers was distorted by a factor of ten because of confusion between two archaic number systems that were not decimal. This is explained in detail in the section "Conflicting number systems" above.

13.    M. E. L. Mallowan, "Noah's Flood Reconsidered", *Iraq*, 26 (1964), pp. 62–82, especially p. 81.

14.    Georges Ifrah, *From One to Zero: A Universal History of Numbers*, (New York: Viking Penguin, 1985), pp. 371, 379. Place-value (positional) number systems are like our decimal system. Each digit has a different value depending on which place or column it appears in a multi-column number.  For example, in the tens place the digit 3 means thirty, but in the hundreds place the digit 3 means three hundred. Place-value numbers were first used about 2000 BC in Babylonia based on the Sumerian sexagesimal system.

15.    Jöran Friberg, *The Third Millennium Roots of Babylonian Mathematics*, Vol. I, Research Report 1978–9 (Sweden: University of Göteborg, Department of Mathematics, 1978), p. 44.

16.    Jöran Friberg, "Numbers and Measures in the Earliest Written Records", *Scientific American*, 250 (Feb, 1984), pp. 110–118, especially p. 116.

17.    Ifrah, op. cit., p. 325.

18.    Hans J. Nissen, Peter Damerow, Robert K. Englund, *Archaic Bookkeeping* (Chicago: University of Chicago Press, 1993), p. 118.

19.    Nissen, op. cit., pp. 28–29.  The SHE–GUR system is summarized on page 48 of Nissan.

20.    Robert K. Englund, UCLA, personal communication.

21.    Mallowan, op. cit., pp. 69–70. Fara period is Early Dynastic IIIa.

22.    Denise Schmandt–Besserat, *Before Writing, From Counting to Cuneiform,* Vol. I (Austin, Texas: University of Texas Press, 1992), pp. 192–194, especially 193.

23.    *Barig* is sometimes spelled *bariga* or *nigida*.

24.    Friberg, *The Third Millennium Roots*, op. cit., p. 43.

25.    Jöran Friberg, *The Early Roots of Babylonian Mathematics*, Vol. II, Research Report 1979–15 (Sweden: University of Göteborg, Department of Mathematics, 1979), p. 16.

26.    Nissen, op. cit., pp. 48–49.

27.    Schmandt–Besserat, op. cit., p. 153.

28.    Friberg, *The Third Millennium Roots*, op. cit., p. 42.