

Thank you

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Suggested the title

Does it matter if the Bible is reliable?

- Christianity and Judaism have their roots in history
- But is the Old Testament purely fiction, or a fictional matrix with some history embedded, or of major historical content?
- The character of Jesus can only be known from the New Testament records, but are these reliable?

How can we know if the Bible is reliable?

- Many books about the reliability of the Bible. Largely proclaim personal convictions!
- This talk: examine the evidence
- 3 challenging case studies: the story of Joseph (in Genesis), the crossing of the river Jordan (in Joshua), the sun standing still (in Joshua)
- Star of Bethlehem (Matthew, my paper), the Last Supper (all four gospels, my book)
- Many modern scholars question their historicity

The story of Joseph

- Genesis chapters 30-50. 40% of Genesis!
- Joseph, Jacob's favourite son, although not the firstborn. Richly ornamented robe. Brothers jealous. **Sold him as a slave for 20 shekels of silver.** Taken to Egypt. Sold to Potiphar. His wife tries to seduce Joseph. Joseph said no. Wife then angry, says Joseph tried to seduce her. J thrown in prison. J interprets dream of Pharaoh's cupbearer, also in prison. Pharaoh has a dream (cows). J interprets it as 7 years of plentiful harvests then 7 years of famine. Pharaoh delighted, puts J in charge of his palace and second in command over all of Egypt. **Seven years of plentiful harvests, then seven years of famine then occur ...**

Is the Joseph story history?

- Redford: “The Joseph story shows all the hallmarks of a composition, rather than a record.” (Egypt, Canaan and Israel in Ancient Times)
- Ahlstrom: “The Joseph story is not history. Just as, for instance, Shakespeare wrote about Richard III, a biblical writer could compose a story about Joseph and his brothers in Egypt.” (The History of Ancient Palestine ...)

Many scholars think story a myth

- Three main reasons:
- Inconceivable that an Egyptian Pharaoh would appoint a foreigner to be his deputy
- Story written 1000 years after the supposed events. Cannot be accurate
- Seven-year famine in Egypt improbable
- Many evangelicals ignore such criticisms!
- We should take them seriously and engage with them

The problem of a seven-year famine

- If Joseph is historical, when did he live?
- Humphreys and White, “The Eruption of Santorini and the Date and Historicity of Joseph”, *Science and Christian Belief*(1995) 7, 151-162
- Also our paper in *Geology Today*
- We argue that a seven year famine in Egypt unusual, because of the regularity of the flooding of the Nile (failed to flood 1 year in 10, or 2 consecutive years in 100)

The 7-year famine at the time of Joseph

- A massive volcanic eruption can cause a famine due to toxic volcanic gases, lack of sunlight and low temperatures (e.g. the Haze Famine in Iceland). Acid rain destroys seed
- A massive volcanic eruption in 1628 BC caused very narrow tree-ring widths, for about seven years. Hence we place the Joseph famine at this time. The famine was also in neighbouring countries (Genesis)
- This was the time of the Hyksos kings of Egypt (c.1648-1540 BC)

The Hyksos kings of Egypt

- These were foreign kings, hated by the Egyptians (from Egyptian records)
- If accepted, the volcano induced famine in 1628 BC (from tree-ring dating) gives an absolute date for this event.
- If Joseph managed food distribution during this famine he must have been Pharaoh's deputy in 1628 BC, at the time of the Hyksos Pharaohs (c.1648-1540 BC)
- It is totally plausible that a foreign Hyksos Pharaoh would appoint Joseph as his deputy

Dating the Genesis texts

- Spelling and grammar change over time (cf Shakespeare plays). We can compare the language of existing Genesis texts with that of other ancient Hebrew texts whose dates are known. Hence date the Genesis texts
- Very difficult, since very few ancient Hebrew texts outside the Bible
- Scholars like Alan Millard date the Hebrew of the Genesis texts to between 700 and 600 BC

When was Genesis written?

- If Joseph was alive in 1628 BC and we can date the language of the Genesis texts to 700-600 BC, this is c.1000 years after the events recorded!
- But we have dated the language of the earliest Genesis texts we have, not when Genesis was originally written
- Original text is lost, we have scribal copies

Scribal copies of ancient texts

- Moses is traditionally the author (an author) of the first 5 books of the Bible
- I see no reason to doubt that he was an author of Genesis
- Kenneth Kitchen writes: “Consider a Moses writing on papyrus, skins, etc., Copies of originals would be recopied, modernising outdated grammatical forms and spellings, a process universal in the ancient Near East. Experienced scribes were able to transmit very accurate copies of works for centuries.”
- Although our earliest texts of Genesis have a language datable to 700-600 BC, the lost original text may be much older

Date of Shakespeare texts

- Cover of book at home: “William Shakespeare: The Complete Works”
- Inside: “Tudor Edition: First Published 1951”
 - Shakespeare not write in 1951! His earlier writings copied and edited then
- Can find out when Shakespeare wrote by:
 - Dating the language he used
 - Dating Shakespeare himself

Date of ancient texts

- Suppose you discover a text of Genesis in an ancient library erected in 3 BC
- The spelling and grammar are typical of Hebrew literature in 700 BC. Hence you date this text to 700 BC or later
- However, it may have been the revised text, updated in spelling and grammar but otherwise faithfully copied, of a much earlier original text.
- This updating was standard practice by scribes in ancient Egypt, Babylon and Israel
- Hence the original, lost, text of the Joseph story in Genesis may be very ancient

The price of slaves

- Kenneth Kitchen has shown that the price of slaves was subject to inflation
- 1700-1600 BC, price 20 shekels of silver
- 1400-1300 BC, price 30 shekels of silver
- 700 BC, price 50 shekels of silver
- 400 BC, price 100 shekels of silver
- Joseph was sold for 20 shekels of silver!
- Consistent with living in 1700-1600 BC
- If story invented in 700 BC, 50 shekels would have been used
- Suggests the original story dates back to 1700-1600 BC and faithfully transmitted

Is the story of Joseph historical?

- There was a famine of about 7 years in 1628 BC from tree-ring data. This was the time of the foreign Hyksos Pharaohs of Egypt (1648-1540 BC). Consistent with Joseph living then and being made the deputy ruler
- Joseph was sold as a slave for 20 shekels of silver. This was the known price of slaves in 1700-1600 BC
- If the story had been invented later, the higher price of slaves at that time would have been used
- The Joseph story shows all the hallmarks of being historical, the original text being faithfully copied by scribes over the centuries, who only updated the language used (like modern Bible translations)

Crossing the River Jordan

- The last miracle of the Exodus – the climax
- Recorded in the book of Joshua

Joshua 3 : 15, 16

“Now the Jordan is in flood all during harvest. Yet as soon as the priests who carried the Ark reached the Jordan and their feet touched the water’s edge, the water from upstream stopped flowing. It piled up in a heap a great distance away, at a town called Adam in the vicinity of Zarethan, while the water flowing down to the sea of the Arabah (the Dead Sea) was completely cut off. So the people crossed over opposite Jericho.”

Picture the Scene

- **River Jordan in flood**
- **Israelites on one side**
- **Want to be on the other side – their promised land of Canaan**
- **Waited forty years**
- **Tantalisingly can see Canaan**
- **Situation looks hopeless**
- **Suddenly raging river stills**
- **Water stops flowing**
- **Israelites cross riverbed in triumph**

Is the story historical?

- **Most readers believed it to be historical until modern times**
- **Today, most people believe the story to be a legend**
 - **Rivers in flood suddenly stopping flowing, and then starting again after people crossed over, one would normally suspect to be a legend**

Picture the Scene

- **River Jordan now not too impressive**
- **Large quantities of water used for irrigation since 1940**
- **Israelites crossed in the spring (Tenth day of first month – Joshua)**
- **Source of Jordan, the snowcapped Mount Hermon**
- **Snow melts in spring**
- **River floods – photograph taken in 19th century**



Picture the Scene

- **British expedition to Jordan in nineteenth century**
- **Jordan in flood half a mile wide**
- **This was the river the Israelites crossed**

- **Can it be true?**
- **It sounds impossible**
- **Can we know what happened 3000 years ago?**
- **Most people (and most biblical scholars) believe story is a legend**

Curious Detail of Story

- **Is the account historical fiction?**
- **What did the writer intend?**
- **What did his/her original audience understand?**
- **There is a curious detail in account of crossing the Jordan.**

Joshua 3 : 15, 16

“Now the Jordan is in flood all during harvest. Yet as soon as the priests who carried the Ark reached the Jordan and their feet touched the water’s edge, the water from upstream stopped flowing. It piled up in a heap a great distance away, at a town called Adam in the vicinity of Zarethan, while the water flowing down to the sea of the Arabah (the Dead Sea) was completely cut off. So the people crossed over opposite Jericho.”

The miracle occurred elsewhere!

- **Water stopped flowing miles upstream at a town called Adam**
- **What stopped the water flowing at Adam?**
- **Can we find out 3000 years later?**

Geography of Jordan

Crossing

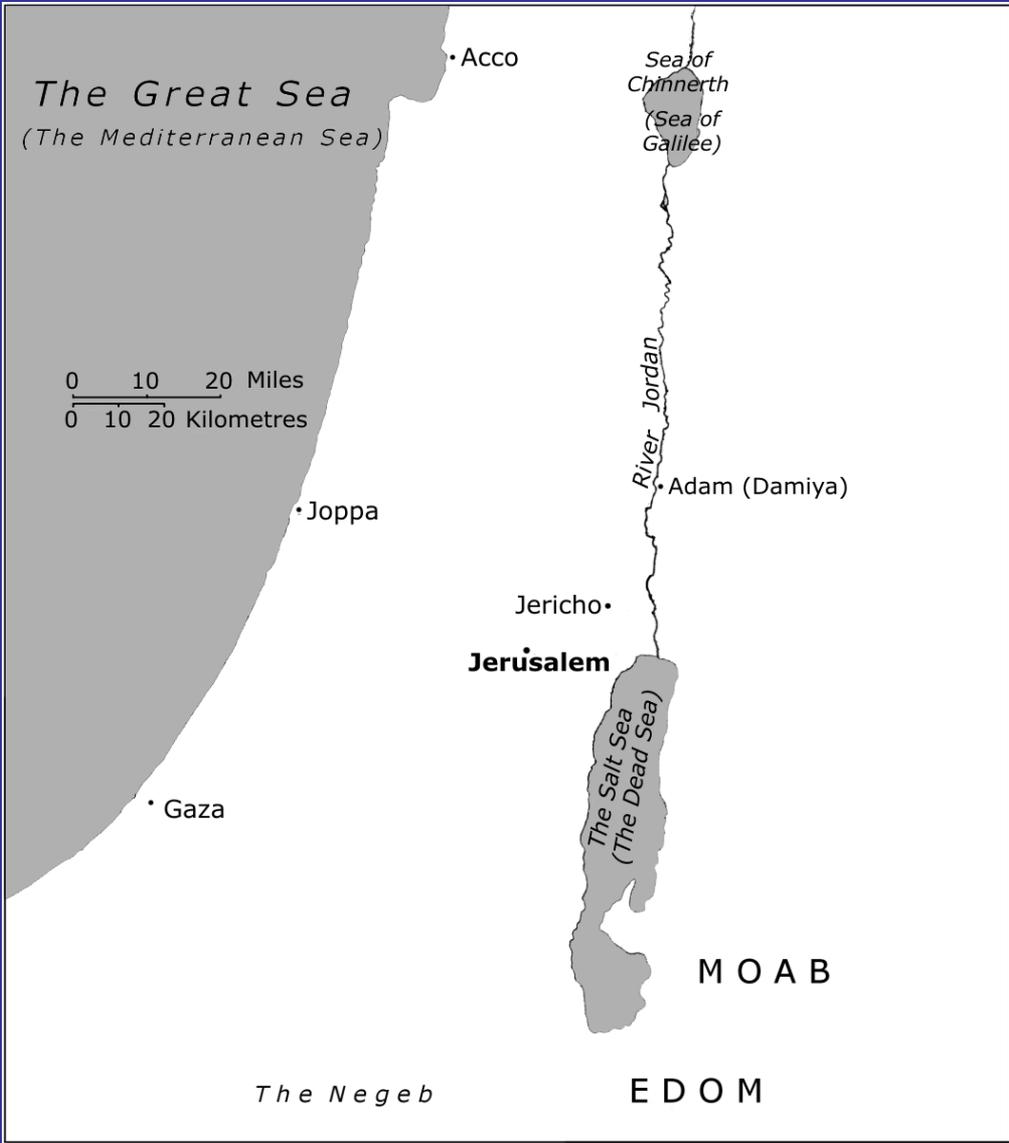
- **Careful attention in text**
- **Writer wants to point to precise spot**
- **Crossed Jordan opposite Jericho**
- **Water stopped a great distance away at a town called Adam in vicinity of Zarethan**
- **All these places upstream from Dead Sea**
- **Writer wanted to root crossing in history and geography: intended story to be factual**

Where was Adam?

- No town called Adam on modern map.
- Can we find after 3000 years?
- Ancient Hebrew texts – only consonants
- When read, vowel sound used
- Mobile phones: text is txt
- In original Hebrew text Adam was 'dm

Where was Adam?

- **When modern Arabic words replace ancient Hebrew, the initial ' is usually dropped and an Arabic ending added**
- **Need to look on modern map of State of Jordan for suitable town containing consonants dm.**
- **There is! Modern Damia (Damiya) on east side of River Jordan, 17 miles north of Jericho.**
- **Most scholars agreed ancient Adam is modern Damia.**



The Clue of the Earthquakes

July 11, 1927

- **Well-documented earthquake shook Jericho, buildings collapsed, walls cracked. Detected in Europe, USA, Russia**
- **6.5 on the Richter scale (earthquake, Christchurch, New Zealand on February 22, 2011, killed over 200 people: was 6.3 on the Richter scale)**
- **Due to slippage along Jericho fault**
- **Runs N/S under River Jordan (part of Great Rift Valley)**

What Happened at Adam?

Letter from Professor Amos Nur –Professor of Geophysics, Stanford University.

“During the 1927 earthquake, several ground cracks appeared, together with an outpouring of ground water. This soil liquefaction phenomenon has been well observed in earthquakes elsewhere. During the earthquake, mud slides occurred along the Jordan near Damia, about 30 km (18 miles) north of Jericho: these temporarily stopped the river’s flow”



Has this Happened before 1927?

- **Historical records of Jordan stopping.**
- **Prof Amos Nur:**

“Adam is now Damia, the site of the 1927 mud slides which cut off the flow of the Jordan. Such cut-offs, lasting typically one to two days, have also been recorded in 1906, 1834, 1546, 1534, 1267 and 1160. The stoppage of the Jordan is so typical of earthquakes in this region that little doubt can be left of the reality of such events in Joshua’s time.”

Is the crossing the Jordan story historical?

- Story of the river Jordan stopping and then starting again hours later is far from being impossible: it has occurred many times, owing to earthquake-induced mudslides in the region
- Consistent with book of Joshua saying the water “piled up in a heap”
- Location of this heap of water not nearby, as expected if account a legend, but “at a great distance away: at a town called Adam”
- This is precisely where the mud slides have regularly occurred. The story is historical

Did God really make the sun stand still?

- One of the most difficult passages in the Bible. Recent work: my first talk about it
- “The sun stood still”, “The long day of Joshua”
- “And the Sun stood still [Hebrew *dom*], and the Moon stopped [Hebrew *amad*] until the nation took vengeance on their enemies... There has been no day like it, before or since.” (Joshua 10:13-14, NRSV)
- Hebrew *dom* means to be silent, dumb or still, *amad* means stop or stand
- All English translations assume *dom* means that the Sun stopped moving

The scientific problems of the sun stopping

- If an all-powerful God exists, he can do anything
- Key question: not what *could* God do? But what *did* God do?
- If sun stops, then the earth stops rotating on its axis
- Rotates once in 24 hours. Person on equator rotating at 1,000 mph. We rotate at about 500 mph.
- If earth stops, we fly off through the air. Massive tsunamis worldwide. Huge destruction.
- No evidence of such destruction. No records.

What do the Hebrew words mean?

- *Dom* means to be silent, dumb or still. If the sun is silent, it stops emitting (light)
- *Amad* means to stop. All bible translations assume it means to stop moving. Can it mean the sun stops doing what it normally does, it stops shining?
- I asked Alan Millard (Prof of Hebrew and Ancient Semitic languages, Liverpool)
- “Colin, you are correct. But this has been said before, 100 years ago by the Princeton University linguist Robert Wilson.”

A solar eclipse?

- Robert Wilson: in Babylonian cuneiform texts there are words with the same root as the Hebrew *dom* that are used in astronomical tablets to describe solar eclipses
- “The Sun stood still” should be translated as “The Sun was eclipsed”
- At a solar eclipse, the sun stops (shining) and the moon also stops (shining): moon at conjunction
- The best translation of the Hebrew is that the sun was eclipsed. But 100 years ago it was not possible to do the eclipse calculations for before 1000 BC.

Where were Joshua and the Israelites?

- In Canaan (modern Israel and Palestine): Joshua 10
- Merneptah stele: large granite block now in Egyptian Museum in Cairo
- Egyptian Pharaoh Merneptah son of Ramesses II (Ramesses the Great)
- Stele says it was carved in the fifth year of the reign of Merneptah
- Mentions campaign in Canaan in which he defeated people of Israel
- Israelites must have been in Canaan by fifth year of Merneptah

When was fifth year of Merneptah?

- Bronk Ramsey et al, Science, 328, 1554 (2010)
- Radiocarbon modelled Accession Dates for Dynasty 19.
- First year of reign of Mernaptah in the range 1231-1207 BC (95% probability)
- Israelites were in Canaan “as a people” in his first 5 years
- The sun stopped shining in the first year they entered Canaan

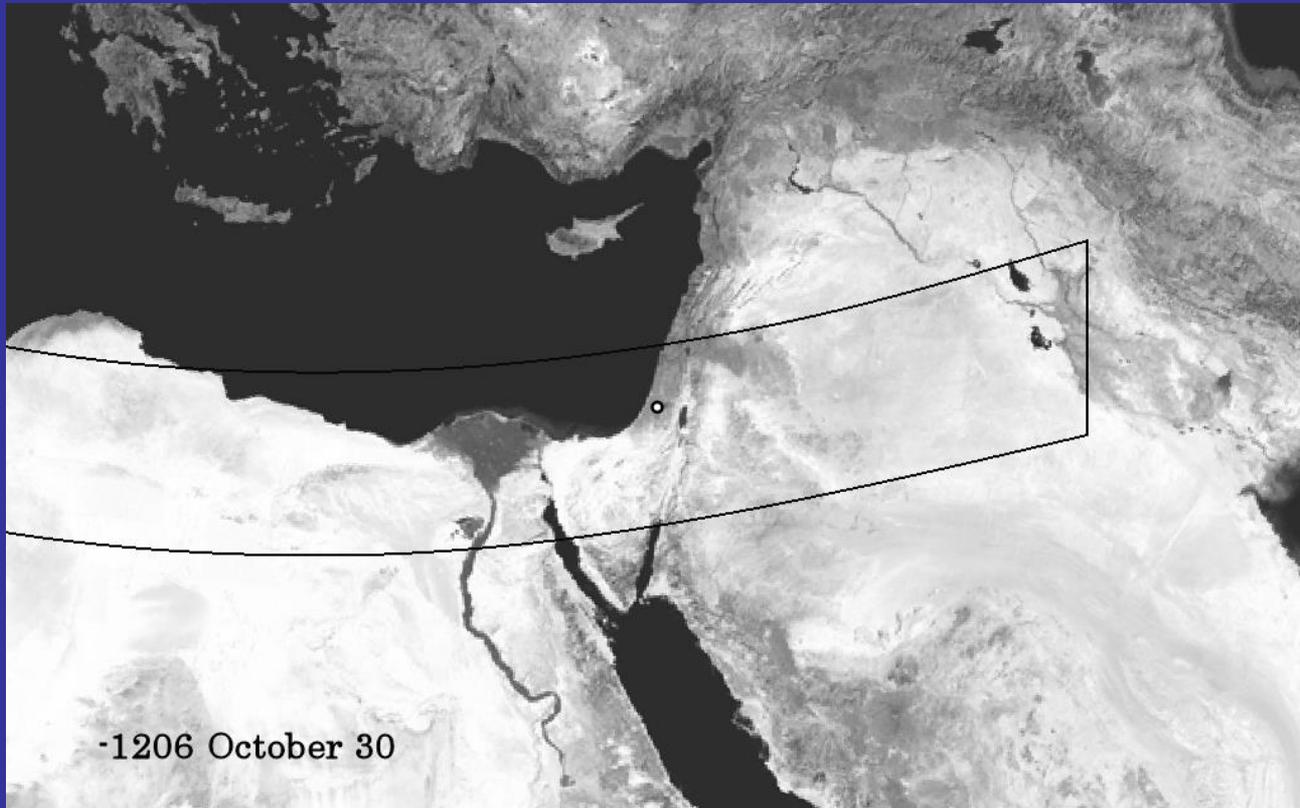
Solar eclipse calculations

- Sawyer (1972) followed up suggestion of Wilson (1918) that Joshua 10 refers to a solar eclipse
- He calculated the dates of all total solar eclipses visible from Gibeon in Canaan between 1500 and 1050 BC (giving very broad limits to the possible entry dates of Joshua into Canaan)
- Only two total solar eclipses: 19 August 1157 BC and 30 September 1131 BC.
- Both too late for latest possible date for Joshua to have entered Canaan
- **Biblical scholars ruled out solar eclipse interpretation**

Revisit solar eclipse calculations

- People in ancient world did not distinguish between total and annular solar eclipses
- Both described by same word meaning “total”
- We used latest expressions for the historical variations in the earth’s rate of rotation
- The only annular eclipse visible from Gibeon in Canaan in the period 1500-1050 BC was on 30 October 1207 BC.
- The eclipse passed directly over Canaan

Track of the solar eclipse of 30 October 1207 BC



Solar eclipse of 30 October 1207 BC

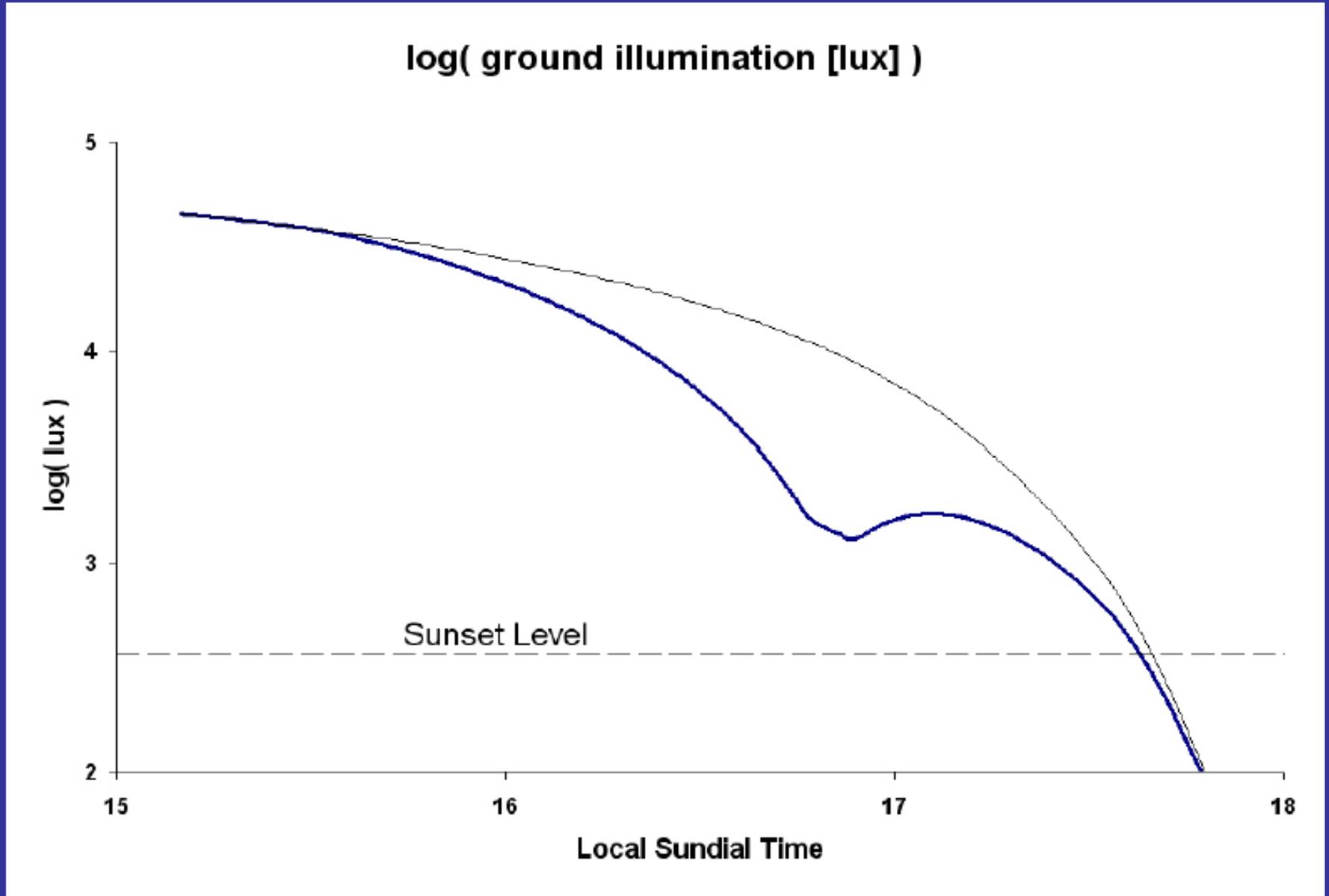


Annular eclipse (“ring of fire”) New Mexico, 20 May 2012

The long day of Joshua

- After reporting that the sun stopped, the book of Joshua states: “The sun did not hurry to set for about a whole day” (Joshua 10:13, NRSV)
- Harold Hill, President of the Curtis Engine Company and a consultant to NASA. NASA scientists computed positions of sun in future and in past. Found a missing day. Hill published book in 1974. Newspaper headlines: “NASA discovers a lost day in time”
- NASA issued press release: Story invented. No missing day. But become an urban myth

Level of illumination on the ground during the Joshua eclipse

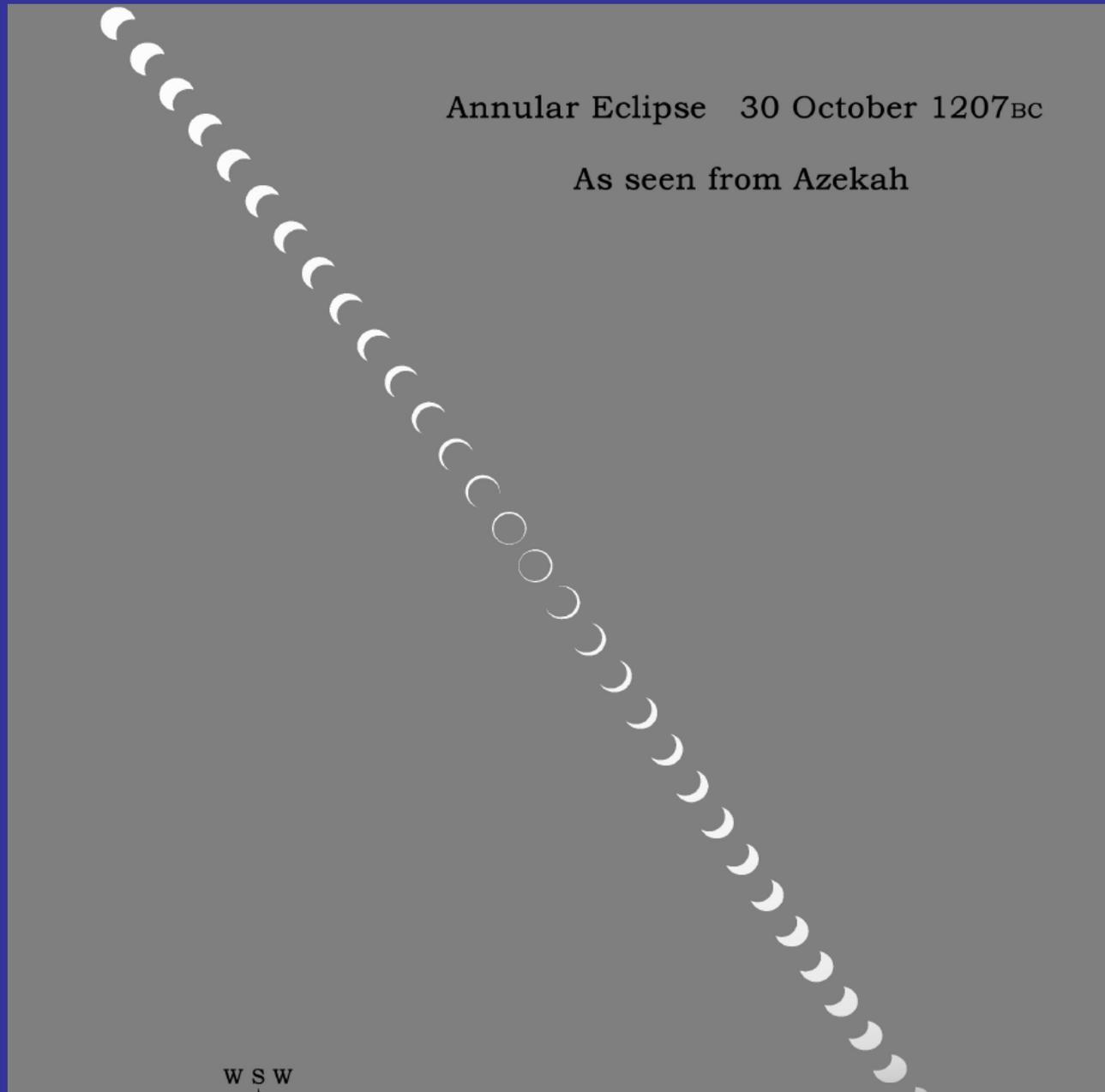


Illumination levels: thin line normal, thick line during the eclipse

The long day of Joshua

- Due to a double-dusk day
- First dusk at maximum of eclipse at 16:50
 - Illumination on the ground then ten times less than normal
 - Birds would have roosted
- Light level then rose before second dusk at normal sunset at 17:38
- It would appear that the day had been lengthened so that the Israelites could complete their victory

Appearance of the sun at three minute intervals



The solar eclipse of 1207 BC

- If this interpretation is accepted (and just published in an astronomy journal):
- The oldest datable solar eclipse recorded
- Enables us to correctly interpret the puzzling Joshua passage: suggests that the account is factual
- Enables us to refine the reign-dates of certain Egyptian pharaohs. Ramesses II: 1276-1210 BC. Merneptah: 1210-1200 BC. Both dates plus/minus 1 year
- Colin Humphreys and Graeme Waddington, “Solar eclipse of 1207 BC helps to date pharaohs,” *Astronomy and Geophysics*, 58, 5.39 (2017)
- The historic Bible enables us to refine the history of Egypt!

Conclusion

- Three very challenging test cases have shown that in these cases the Bible is reliable
- This raises our expectations that the rest of the Bible is reliable