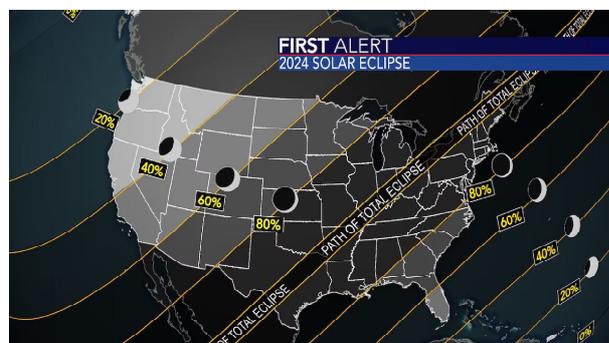


HALACHIC AND HASHKAFIC ISSUES IN CONTEMPORARY SOCIETY

SERIES 2: 87 - ECLIPSES OU ISRAEL CENTER - SPRING 2024

- Later today (April 8 2024) a total eclipse will pass over 13 states in the US¹. Starting at sunrise in the Pacific Ocean, it will move from the south-west to the north-east, ending a couple of hours later at sunset over the Atlantic Ocean. In the US an estimated 31.6 million people live in the path of totality with many hundreds of millions more set to experience a partial eclipse².
- In Texas the eclipse will last over 4 minutes 20 seconds, with this decreasing as the shadow moves north-east - the eclipse will last 3 minutes 50 seconds in Cleveland.
- Of course, direct visibility will depend on local weather conditions, with a higher chance of clear weather in the south-west.

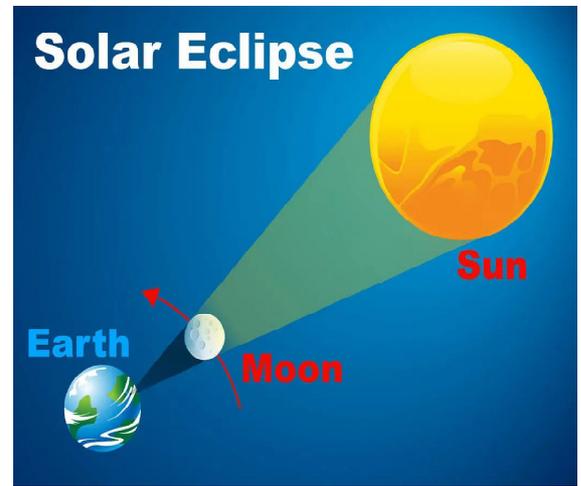
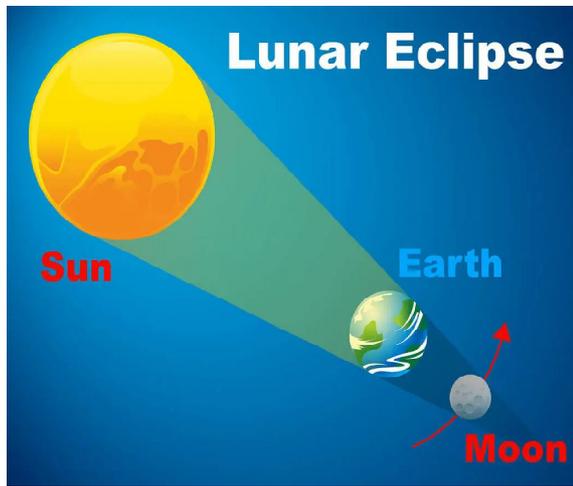


A] THE SCIENCE BEHIND AN ECLIPSE

- Every month (or, more accurately, 29.53 days) the Moon orbits around the Earth, with the new moon (around Rosh Chodesh³) occurring when the Moon passes between the Earth and the Sun, and the full moon (around the 15th of the Jewish month) when the Earth passes between the Sun and the Moon.
- However, eclipses do not occur every month because the Moon's orbit around Earth is tilted by 5% relative to the Earth's orbit around the Sun. As a result, from our viewpoint on Earth, the Moon normally passes either above or below the Sun each month at new moon, and no shadow is cast.
- Nevertheless, when the planes of the orbits line up, this results in a solar or lunar eclipse. In most calendar years there are two lunar eclipses and, in some years, there can be one, three or none. Solar eclipses occur two to five times a year, although five is very rare.⁴



1. The total eclipse will take around one hour to cross the US, beginning at 1.30pm (CDT) in Texas, around 2pm in Illinois, 3.10pm (EDT) in Ohio, 3.20pm in upstate NY and 3.30pm in Maine.
2. For detailed maps of cities which will experience the eclipse see <https://nationaleclipse.com/maps.html>. For 3D maps of the Sun/Earth/Moon interactions during the eclipse see <https://spaceplace.nasa.gov/eclipses/en/>.
3. A solar eclipse will normally occur around Rosh Chodesh but may be off by a day, as with Rosh Chodesh Nissan which is on April 9th while the eclipse is on April 8th. This is because Rosh Chodesh is calculated by reference to the halachic molad (the moment of conjunction of the new moon) and not the astronomic molad, which will be the exact time of the eclipse. The halachic molad is calculated by using the length between one new moon and the next and assumes that every lunar month is of exactly equal length - 29 days, 12 hours and 3 1/3 seconds (Rambam, Hilchot Kiddush HaChodesh 6:3). All molad calculations are based on the theoretical time for the 'first molad', which is assumed to have been in Tishrei of the first year of Creation, and to have occurred on Monday night at 5 hours and 204 chalakim. By definition, this calculation is theoretical since, according to Jewish tradition, the world had not even been created at that time! (See Rambam ibid 6:8 and Tur OC 427). To determine the time of any molad since then, we simply add 29 days, 12 hours and 773 chalakim for each month from the primordial Tishrei. Nevertheless, this calculated time differs from the actual time between one new month and the next, which is not constant. In fact, the halachic molad for Nissan 5784 is April 8 2024 at 10:57pm (Jerusalem time) and 7 chalakim, which is almost exactly the time of the eclipse! For more on this and commentary on the issues raised in this shiur see *The Great American Eclipse of 2017, Halachic and Philosophical Aspects*, Dr. Jeremy Brown, Hakira, Vol 23 pp. 171-180.
4. The last time there were five was in 1935 and there will not be five again until 2206.



- Since most of Earth is covered by water and much of the land is not heavily populated, it is rare that a solar eclipse will pass over large cities. In fact, a total solar eclipse is likely to pass over any given place on earth around once every 375 years⁵.
- Lunar eclipses are experienced far more often. Any given place on earth could experience 8 or 9 total lunar eclipses⁶ (and more partial eclipses) in the 18 years eclipse cycle⁷.
- Also, since the shadow of the Earth is much bigger on the Moon than that of the Moon on the Earth, total lunar eclipses are much longer (up to 1 hour 45 minutes) than total solar eclipses (maximum 7.5 minutes) and are visible to all.
- During a total solar eclipse, the disk of the moon EXACTLY⁸ covers the disk of the sun, such that the corona of the sun and, potentially, solar flare activity⁹, can be seen. This is due to a “cosmic coincidence” that, right now¹⁰, the sun is exactly 400 times bigger than the moon but is also 400 times further away.
- During a total lunar eclipse (at full moon), the light of the moon is significantly decreased so that it can look dark brown. It can also look red since the sunlight reaching the moon is refracted at a low angle through Earth’s atmosphere which absorbs blue light and lets through red. Basically, all the sunsets on earth are being projected onto the moon!

B] ECLIPSES IN TANACH

1. (יד) וַיֹּאמֶר אֱלֹהִים יְהִי מְאוֹרֹת בְּרָקִיעַ הַשָּׁמַיִם לְהַבְדִּיל בֵּין הַיּוֹם וּבֵין הַלַּיְלָה וְהָיוּ לְאוֹת וּלְמוֹעֲדִים וְלַיָּמִים וְשָׁנִים: (טו) וְהָיוּ לְמְאוֹרֹת בְּרָקִיעַ הַשָּׁמַיִם לְהָאֵיר עַל-הָאָרֶץ וַיְהִי-כֵן: (טז) וַיַּעַשׂ אֱלֹהִים אֶת-שְׁנֵי הַמְּאוֹרֹת הַגְּדֹלִים אֶת-הַמְּאוֹר הַגָּדֹל לְמַשְׁלַת הַיּוֹם וְאֶת-הַמְּאוֹר הַקָּטָן לְמַשְׁלַת הַלַּיְלָה וְאֵת הַכּוֹכָבִים: (יז) וַיִּתֵּן אֹתָם בְּרָקִיעַ הַשָּׁמַיִם לְהָאֵיר עַל-הָאָרֶץ: (יח) וְלַמְשָׁל בַּיּוֹם וּבַלַּיְלָה וְלְהַבְדִּיל בֵּין הָאֹר וּבֵין הַחֹשֶׁךְ וַיֵּרָא אֱלֹהִים כִּי-טוֹב: (יט) וַיְהִי-עֶרֶב וַיְהִי-בֹקֶר יוֹם רְבִיעִי: פ

בראשית א:יד-יט

The Torah states that God created the sun and moon for both light and also as ‘signs and seasons’. The Sun and Moon are also described as the ‘great lights’ and then immediately after as the ‘greater’ and the ‘lesser’ lights.

- This shift from describing the sun and moon in the same way to describing the moon as smaller gave rise to midrashic commentary that the moon was made smaller¹¹.

5. The next solar eclipse visible from Jerusalem will be a partial (80.54%) eclipse on August 2 2027 at around 1pm. The line of totality will pass to the south over Luxor, Egypt. The last total solar eclipse visible from Jerusalem occurred on Sunday, August 20, 993, and the next one will not occur until Sunday, August 8, 2241. The one after that will not take as long - August 5, 2548.

6. The next total lunar eclipse visible from Jerusalem will be on September 7 2025.

7. The line of intersection of the planes of the Moon’s orbit is called the line of the nodes, being the two points where the Moon’s orbit intersects the ecliptic plane, completing a revolution in 18.6 years. This cycle is known as the Saros cycle, after which time the Moon and the Sun return very nearly to the same relative positions. The Saros was known to the ancient Babylonians and comprises 223 synodic months. See <https://www.britannica.com/science/eclipse/The-frequency-of-solar-and-lunar-eclipses>.

8. An annular eclipse occurs when the Moon is further away from the Earth and thus covers almost all of the Sun, leaving a ring of light visible.

9. The 2017 eclipse over the US occurred at a time of low solar activity but the 2024 eclipse happens at a maximal point of the solar activity cycle. As such, more coronal solar activity may be visible.

10. The moon is currently gradually spinning further away from Earth at a rate of 4cm per year. This means that, when life on earth began, the Moon was significantly closer and would have entirely engulfed the sun at eclipse. In millions of years from now, the moon will appear smaller than the sun and total eclipses will be impossible. So it is only now. when we are privileged to live, that a total eclipse can occur!

11. See for instance Rashi on Bereishit 1:15.

2. ... וחכמי המדות מודים כי השמש היא הצריחה הגדולה ... אם כן איך יקרא הכתוב הירח המאור הגדול? והתשובה כי הכתוב לא דבר רק כנגד האור הכהו בארץ. על כן לא הזכיר שם 'ירח' רק מאור והיה אורה גדול בעבור היותה קרובה אל הארץ. ...

אבן עזרא שיטה אחרת - בראשית א:טו

The Ibn Ezra (who was an astronomer) points out that the description of the moon and sun as different sizes relates to their different luminosities from the human perspective on earth. He also points out that, even though the Sun is objectively bigger¹² than the Moon, the Moon is much closer to Earth.

3. וְהָיָה בַיּוֹם הַהוּא נֶאֱמַר אֲדֹנָי ה' וְהִבֵּאתִי הַשֶּׁמֶשׁ בְּצַהְרֵימָּהּ וְהִחֲשַׁכְתִּי לְאֶרֶץ בַּיּוֹם אֹרֶךְ.

עמוס ח:ט

Part of Amos's vision of the end of days is the 'sun setting at noon' and the darkening of the earth on a sunny day.

4. כִּי הִנֵּה יוֹצֵר הַיָּרִים וּבִרְאָה רוּחַ וּמַגִּיד לְאָדָם מִה־שָׁחַו עֲשֵׂה שְׂחַר עֵינָיָהּ וְדַרְךְ עַל־בְּמַתֵּי אֶרֶץ ה' אֱלֹהֵי־צְבָאוֹת שָׁמָּה:

עמוס ד:יג

Amos praises God who 'turns day into darkness'.

5. עֲשֵׂה כִמְאֵה וְכִסִּיל וְהַפֵּךְ לְבַקֵּר צְלָמוֹת וַיּוֹם לַלַּיְלָה הַחֲשִׁיךְ הַקּוֹרֵא לְמִי־הַיָּם וַיִּשְׁפֹּכֶם עַל־פְּנֵי הָאֶרֶץ ה' שָׁמָּה:

עמוס ה:ח

Here too, Amos praises God who 'darkens day into night'.

6. הַלֵּא־חֲשֵׁךְ יוֹם ה' וְלֵא־אֹרֶךְ וְאֶפֶל וְלֵא־נֶגְהָ לּוֹ:

עמוס ה:כ

The 'day of the Lord' will be darkness in the place of light.

• In fact, there was a total eclipse in Assyria during the time of Amos - on June 15 762 B.C.E. in the morning at around 9am, which also constituted a 90% partial eclipse in the Shomron. This is also recorded in the Assyrian chronicles - the Limmu List - as an eclipse in Simanu (= Sivan) 762 B.C.E.¹³

7. הִנֵּה יוֹם־ה' בָּא ... כִּי־כֹכְבֵי הַשָּׁמַיִם וְכִסִּילֵיהֶם לֹא יִהְיוּ אֹרֶךְ חֲשֵׁךְ הַשֶּׁמֶשׁ בְּצִאתוֹ וַיָּרַח לֹא־יִגִּיעַ אֹרֶךְ:

ישעיהו יג:ט

Yeshayahu also prophecies that on day of the Lord 'the sun shall be dark when it rises and the moon shall give no light'.

8. וְהָיָה בַיּוֹם הַהוּא לֹא־יְהִי־אֹרֶךְ יָקָרוֹת וְקִפְאוֹן: וְהָיָה יוֹם־אֶחָד הוּא יוֹדֵעַ לֵה' לֹא־יוֹם וְלֹא־לַיְלָה וְהָיָה לְעֵת־עָרֵב יְהִי־הָאֹרֶךְ:

זכריה יד:ו-ז

Zecharia also prophecies a day 'without sunlight or moonlight' and a day 'of neither night nor day'.

9. וְנִתְתִּיל מוֹפְתִים בְּשָׁמַיִם וּבָאָרֶץ דָּם וְאֵשׁ וְתִמְרוֹת עֶשֶׂן. הַשֶּׁמֶשׁ יִהְיֶה לְחֹשֶׁךְ וְהַיָּרֵחַ לְדָם לִפְנֵי בּוֹא יוֹם ה' הַגָּדוֹל וְהַנּוֹרָא. (רש"י - לְבִישׁ אֶת הַמַּשְׁתַּחֲוִים לַחֲמָה).

יואל ג:ד

Yoel speaks of the end of days and describes the sun becoming dark and the moon red - apparently describing eclipses. Rashi explains that the purpose of this is to refute idolators who worship the sun.

• Of course, some or all of these verses may not be talking about actual eclipses at all, but may have a metaphoric meaning as to the nature of good and evil, clarity and confusion, or something else entirely at the end of days. But, even if this is the case, the still use the the metaphor of the eclipse to communicate something deeply impactful and religiously meaningful.

10. כֹּה אָמַר ה' אֱלֹהֵי־יִשְׂרָאֵל הַגּוֹיִם אֶל־תִּלְמְדוּ וּמֵאֲתוֹת הַשָּׁמַיִם אֶל־תִּחַתּוּ כִּי־יִחַתּוּ הַגּוֹיִם מִהֶמָּה:

ירמיהו י"ב

Yet Yirmiyahu tells the Jewish people NOT to fear astronomical wonders nor to be superstitious like the non-Jews.

12. See Redak (ob cit) who gives a similar explanation and says that the astronomers of his time understood that the Sun was 170 bigger than the Earth. (The actual number is 400).

13. See <https://www.livius.org/articles/concept/limmu/limmu-list-858-699-bce/>

C] ECLIPSES IN CHAZAL

11. (1) תנו רבנן: בזמן שהחמה לוקה - סימן רע לכל העולם כולו. משל למה הדבר דומה - למלך בשר ודם שעשה סעודה לעבדיו והניח פנס לפניו. כעס עליהם ואמר לעבדו: טול פנס מפניהם והושיבם בחושך.
- (2) תניא רבי מאיר אומר: כל זמן שמאורות לוקין - סימן רע לשונאיהם של ישראל מפני שמלומדין במכותיהן. משל לסופר שבא לבית הספר ורצועה בידו, מי דואג - מי שרגיל ללקות בכל יום ויום הוא דואג.
- (3) תנו רבנן: בזמן שהחמה לוקה - סימן רע לעובדי כוכבים, לבנה לוקה - סימן רע לשונאיהם של ישראל, מפני שישראל מונין ללבנה ועובדי כוכבים לחמה. לוקה במזרח - סימן רע ליושבי מזרח, במערב - סימן רע ליושבי מערב, באמצע הרקיע - סימן רע לכל העולם כולו. פניו דומין לדם - חרב בא לעולם, לשק - חיצו רעב באין לעולם, לזו ולזו - חרב וחיצו רעב באין לעולם. לקה בכניסתו - פורענות שוהה לבוא, ביציאתו - ממהרת לבא. ויש אומרים חילוף הדברים. ואין לך כל אומה ואומה שלוקה שאין אלהיה לוקה עמה, שנאמר (שמות יב:ב) וַיִּכְלֹ֨א־אֱלֹהֵי־מִצְרַיִם אֶעֱשֶׂה שְׁפָטִים. ובזמן שישראל עושין רצונו של מקום אין מתיראין מכל אלו, שנאמר (ירמיהו יב:ב) כִּהִן אֶמְרֵ ה' אֶל־דָּרֶךְ הַגּוֹיִם אֶל־תִּלְמְדוּ וּמֵאֲתוֹת הַשָּׁמַיִם אֶל־תִּתְחַוּוּ כִּי־יִחַתּוּ הַגּוֹיִם יִמְהָמָה - גויים יחתו, ואין ישראל יחתו.
- (4) תנו רבנן: בשביל ארבעה דברים חמה לוקה: על אב בית דין שמת ואינו נספד כהלכה, ועל נערה המאורסה שצעקה בעיר ואין מושיע לה, ועל משכב זכור, ועל שני אחין שנשפך דמן כאחד. ובשביל ארבעה דברים מאורות לוקין: על כותבי פלסטר ועל מעידי עדות שקר, ועל מגדלי בהמה דקה בארץ ישראל, ועל קוצצי אילנות טובות.

סוכה כט.

The Gemara address the issue of eclipses in 4 beraitot in Succot. In brief, they state the following: (i) A solar eclipse is a bad sign for the world. Chazal give the mashal of a king who asks his servant to remove the lights from their party; (ii) R. Meir asserts that solar and lunar eclipses are specifically bad for the Jews since they so often suffer when other things are bad for the world; (iii) Solar eclipses are specifically negative for the non-Jews and lunar eclipses for the Jews, since we have a lunar calendar. The 3rd Beraita then gives more specific details of which kinds of eclipse most affect which areas and which people, and stresses that the luminaries are being affected because these are worshipped by idolators. However, when the Jewish people do teshuva and follow the correct path, they do NOT need to be concerned about eclipses at all; (iv) Solar eclipses occur due to 4 specific sins - a great religious leader who was not properly eulogized, a young woman who was attacked and raped and no one came to her aid, active homosexuality, and two brothers who were murdered together. Lunar eclipses occur due to 4 specific sins - the forging of legal documents, those who bear false witness, raising destructive small livestock in Eretz Yisrael, and cutting down fruit trees.

12. והיו לאותות - כשהמאורות לוקין סימן רע הוא לעולם, שנאמר (ירמיהו יב:ב) מֵאֲתוֹת הַשָּׁמַיִם אֶל־תִּתְחַוּוּ. צעשיתכם רלון הקדוש צרוך הוא אין אתם לריכין לדאג מן הפורענות.

רש"י בראשית א"ד

Rashi on the Chumash quotes the beginning of the first Beraita - that eclipses are a negative sign for the world. He then brings then the end of the third Beraita - that the Jews do not need to be concerned with such things if they act properly.

13. בשביל ארבעה דברים - לא שמעתי טעם בדבר.

רש"י כט.

But on the specifics of the different sins listed in the Gemara which are connected to eclipses, Rashi does not have any explanation of how they correlate¹⁴.

D] EXPLAINING CHAZAL IN A SCIENCE-FOCUSED WORLD

- How are we to understand this approach of Chazal? By their time it was known that eclipses were a natural phenomenon and they could be predicted with some accuracy. In fact, Babylonian astronomers had discovered the Saros cycle by around the 7th century B.C. - over a thousand years before the Talmud¹⁵!
- So if eclipses were natural and predictable, how could Chazal have seen them as a special 'sign'¹⁶?

14. R. Yaakov Ettlinger (Aruch LeNer Succah 29a) does give detailed suggestions of how each of the 4 sins connected with a solar eclipse does indeed connect with the loss of the sun, and what the sun metaphorically represents.

15. The Babylonians were keen observers and kept meticulous records of astronomical events for hundreds of years on clay tablets. They also used the Saros cycle to predict future eclipses, which they also recorded on clay tablets. A common Mesopotamian belief was that the gods nevertheless used eclipses as omens to foretell future events. Lunar eclipses, in particular, were thought to portend the imminent death of a king. But since the eclipse was predicted in advance, the king would abdicate his throne briefly, while one of his subjects was substituted in his place. After the danger of the eclipse has passed, the substitute was killed, and the king could then safely resume his royal position! See <https://skyandtelescope.org/astronomy-news/how-did-the-ancients-predicted-eclipses-the-saros-cycle/>

16. One detailed approach not presented below is that of the Maharal in Be'er Hagolah 6. Jeremy Brown summarizes the Maharal's position in his article as follows: "The Maharal acknowledged that an eclipse is a mechanical and predictable event but he further suggested that if there was no sin, there would indeed never be a solar eclipse. G-d would have designed the universe differently, and in this hypothetical sin-free universe our solar system would have been created without the possibility for a solar eclipse. The

D1] ECLIPSES ARE NATURAL BUT GIVE US A SPECIAL TIME FOR CONNECTION TO GOD

14. המלעיגים על דברי רז"ל חשבו למצוא במאמרים האלה מקום לכונן חציהם על יתר כאלו ר"ל לא ידעו דרכי הטבע שליקויי החמה והלבנה נתהוו ע"פ חשבון מכוון בתהלוכותיהם כאשר חכמי הטבע מחשבים טרם בואם, שלעת ורגע הזאת תחשך השמש או הירח. אבל באמת המלעיגים נלקו בעורון! שלא יביטו איך רז"ל דברו בענין זה בלשון חכמה להראות שלא נעלם מהם זה.

דיש לדקדק למה אמרו בכל ג' הברייתות 'בזמן שהחמה לוקה' וכו' 'כל זמן שמאורות לוקין' וכו' 'בזמן שהחמה לוקה' וכו' - דהך 'בזמן' לשון מיותר הוא, דהל"ל כשהחמה לוקה וכשמאורות לוקין. אמנם בזה הורו שאף שהלקויים הם ע"פ הטבע עכ"ז ידעו ע"פ סודות משפטי ד' הנגלות להם שהעתים והזמנים של הלקויים הם עתות הדין. שיש עתות לטובה ועתות לרעה וכעין מה שפי' הרמב"ן פ' נח באות הקשת. שאף שהוא דבר ע"פ הטבע, עם כל זה ניתן הראות ענין הטבע הזה לאות טוב שלא יביא הקדוש ברוך הוא מבול. ושעל כן לא נאמר 'את קשתי אתן בענן' אלא 'נתתי בענן' - פי' קשתי שכבר נתתי מששת ימי בראשית אני מיעדו עתה שיהי' לכם לאות ברית

ערוך לנר סוכה כט.

R. Yaakov Etlinger explains that Chazal certainly knew that eclipses were natural and predicable. However, they also saw these natural events as opportunities to connect to God in a special way at that time. He compares this to the Ramban's understanding of the rainbow as a natural phenomenon which had existed since the beginning of creation, but which, after the flood, took on a special religious meaning as a reminder of the covenant between God and mankind.

15. רבי אליעזר אומר: העושה תפלתו קבע וכו'. מאי קבע? אביי בר אבין ורבי חנינא בר אבין דאמרי תרוייהו: כל שאין מתפלל עם דמדומי חמה. דאמר רבי חייא בר אבא אמר רבי יוחנן: מצוה להתפלל עם דמדומי חמה.

ברכות כט:

In fact, every day of the year provides two special moments of connection and reflection inspired by the sun - sunrise and sunset! R. Yochanan considers it a special mitzva to daven with the reddening of the sun - Shacharit with sunrise and Mincha with sunset.

D2] CHAZAL WERE NOT TALKING ABOUT ECLIPSES, BUT SUNSPOTS!

16. וכבר הבינו רבים זה הכוונה בליקוי הוא הניגוד שקורין ליקוי חמה ליקוי לבנה. ולכך נחקו לעירים על דברי חז"ל, שדבר זה טבעי הוא על פי חשבון ויכול אדם לחשוב מהיום עד סוף עולם כמה שנים יהיה זו הליקוי המאורע בחיזה יום ובחיזה שעה ובחיזה מקום. וא"כ מה זה דיתייחס לחטא ועונש? אך באמת אין זה שם ליקוי. ואם יעמיד אדם דבר בפני נר החוץ זינו לאורו וכי הליקוי בנר? הלא הנר מצהיק אורו מצלי חסרון, רק חסרון במקצלים שיש כאן דבר חוץ. ואף כאן בזמן נגודי הנ"ל, כי השמש והירח הולכין ומאירין מצלי השתנות, רק הלבנה חוללת בפני חמה, או לל ארץ חוץ בפני לבנה, ומה זה ליקוי אשר יקרא לו? אך באמת הוא כך כאשר דרשתי כבר - כי לפעמים נמצא בחמה עצמה כתמים גדולים כאשר נמצאו בזמנים בכלי הצטפה. וכתמים אלו אין להם סבה ידועה ומכל שכן זמן ידוע וחשבון. וכאשר יהיו זה כתמים, אין אורה מצהיק כל כך כמו בלי כתמים. וא"כ זהו ליקוי חמה באמת כי החמה חפכה אורה. וזהו סיבת עונש, וזהו מאורות לוקין. ...

יערות דבש חלק ב דרוש יב

R. Yonatan Eiberschutz (mid 18th century Germany¹⁷) writes that when Chazal refer to a 'likui chama' (literally a blemish or abnormality of the sun) which occurs due to sin, they do not mean an eclipse. First, they knew that these were natural and predictable. Second, an eclipse does not directly affect the sun; it simply blocks the light. He suggests that Chazal were referring to sunspots which are not predictable (at least in his time) and which do affect the sun's light.

conclusion from the Maharal's writings is that in a sinfree universe, the moon would not orbit as it does now, at a 5-degree angle to the sun-earth plane. But we now need to ask where, precisely, in a sinfree universe, *would* the moon be? It couldn't be in the *same* plane as the sun and the earth, since then there would be a solar eclipse *every* month. If the moon were, say, 20° above the earth-sun plane, there would still be solar eclipses, though they would be rarer than they are today. The only way for there to be no solar eclipses in the Maharal's imaginary sin-free universe would be for the moon to orbit the earth at 90° to the sun-earth axis. Then it would never come between the sun and the earth, and there could never be a solar eclipse. But this would lead to another problem. In such an orbit, the moon would always be visible, and so there could never be a Rosh Chodesh. The Maharal's thought experiment seems to provide more complications than it does solutions."

17. This piece is based on a derasha that R. Eiberschutz gave in January 1751. Jeremy Brown in *The Great American Eclipse of 2017*, observes that sunspots were first recorded in Western literature in 1611 following the invention and use of the telescope but are very difficult to see with the naked eye. As such, it seems unlikely (though not impossible) that this is what the Rabbis in the Talmud were describing. Also, the Gemara describes the phenomenon of the 'likui chama' as being visible only from some places on the earth. While this is true of a solar eclipse, sunspot activity would be visible from any place on earth. There is evidence of naked-eye observations of sunspots earlier in history so it is possible that Chazal could have seen them. They could also have been seen easily using a pinhole camera, which was invented as early as the 5th century BCE. Chinese records describe naked-eye observations of sunspots in the 11th century. Nevertheless, the darkening effect of sunspots on the sun's light is not at all noticeable on Earth (even a partial eclipse has limited impact on ambient light until close to totality), so it is difficult to fit this with the description of Chazal.

D3] THE WEATHER IS THE KEY VARIABLE

17. (ב) אם ידעו חז"ל אודות ענין ליקוים הנ"ל ואם זהו ענין טבעי.

ליקוי המאורות מובא בכמה מקומות בדברי חז"ל ופליאה גם הספק בזה, כי ידוע אשר אפילו חכמי מצרים ולפני זה בבבל כבר ערכו לוחות הליקוים האמורים וידוע בספרי דברי הימים ומובא להבדיל גם בכתבי הקדש, אשר בני ישראל עמדו בקישור עם חכמי מצרים וחכמי בבל.

מעריכת לוחות האמורים מובן שתופעה האמורה היא ענין טבעי. אבל ביחד עם זה יש בזה גם סימן, ובדוגמת ענין הקשת, שגם הוא ענין טבעי עתה. וביחד עם זה משמש אות, וככתוב בארוכה. ואין בזה סתירה, שהרי במה דברים אמורים אשר ליקוי חמה וליקוי לבנה יש להם הפירושים כמרו"ל (סוכה כט.)? כשנראים הלקוים בארץ (ונראים לזה היודע ע"ד פירוש הליקוים). משא"כ באם יתכסו השמים בעננים וכיו"ב הרי אין זה ענין של סימן והוראה להאדם אשר על האדמה. ועד"ו הוא גם בענין הקשת וכמבואר במפרשי התורה.

אגרות קודש - מכתב התקעט (1957)

The Lubavitcher Rebbe writes that a solar eclipse is only considered to be a spiritual sign if it is actually visible to people, which depends on weather conditions. If the eclipse cannot be seen, then it does not convey a negative siman!¹⁸

E] IMPORTANT TORAH MESSAGES IN THE ECLIPSEE1] WE ARE OFTEN BLOCKING GOD'S 'LIGHT'

18.

הנה

איתא בגמ' [סוכה כט ע"א] "כשהמאורות לוקין סימן רע לעולם", וכבר נתקשו במאמר זה שלמים וכן רצם הלל ליקוי המאורות הוא דבר טבעי והאליטרולוגין נחממתם יודעים לחשב שעות ורגעים של ליקוי המאורות ומה זה סימן רע לעולם. ונראה לפרש הכוונה, כבר אמר הנביא [ישעי' נט ב] עונותיכם היו מבדילים ביניכם לבין אלקיכם וזו מחילה של צרול המפסקת בינינו לבין אבינו שבשמים, ואף שהקצ"ה משפיע בטובו תמיד, אבל הטובה לא תוכל להגיע אלינו כי המחילה מפסקת ועי"ז

צעו"ה הרע בא לעולם. וזה כוונת המאמר הנ"ל, כי ידוע כי ליקוי החמה או הלבנה מצד ע"י שדרך כוכב נלתי מאיר צין החמה להארץ ועי"ז תמנע החמה להאיר על הארץ, אף שאור החמה קיים בכל תוקף. ו"ש "כשהמאורות לוקים" ממה שנבין אף וצא"ה אופן המאורות לוקין, "סימן" זה לנו לסימן ולמופת שנבין "רע לעולם" אף שיכול הרעה לצוא לעולם אף שהקצ"ה משפיע בטובו תמיד.

מהר"ם שי"ק על התורה, ויקרא

The Maharam Shik¹⁹ understands Chazal to be telling us that we should see the eclipse as a metaphor for how we allow evil into the world which blocks out God's light. The downflow of good from God never ceases, just as the sun does not stop shining. But we often allow things to interpose between us and God and prevent his good from reaching us. The eclipse is not a 'sign' or omen of evil but a sign which shows us where we may be going wrong.

E2] WE NEED TO STRENGTHEN OUR SOCIETY AGAINST CERTAIN SINS

19.

ואמר לעבדו טול פנס מפניהם...". כלומר, הענין של "טול פנס..." איננו נעשה על-ידי המלך כעצמו, אלא ע"י "עבדו", כי הליקוי והסימן הרע שבתקופה זו הוא רק מצד הטבע, עבדו של מלך.

ובמאמר "כשביל ארבעה דברים חמה לוקה..." אין הכוונה שהליקוי בא כתוצאה מהתנהגות שלילית בפועל בארבעה דברים אלו, אלא שכיוון שבזמן זה יש נטיה ל"ארבעה דברים" אלו. לכן המאורות לוקין וכו'.

ז. לפי זה ניתן לומר, שפירושו של המאמר "כשהמאורות לוקין סימן רע הוא לעולם", איננו רק שזהו זמן מועד לפורענות, להענושה על התנהגות בלתי רצויה, אלא שזהו זמן שבו מתעוררות בטבעו של האדם נטיות להתנהגות לא טובה, אך עדיין אין הכרח שהאדם אכן יושפע וינהג שלא כראוי, שהרי בכוחו להתגבר על נטיות אלו.

כך יובן הדיוק שבלשון המשל³⁰ המובא בגמרא על ליקוי חמה: "מלך בשור ודם שעשה סעודה לעבדיו והניח פנס לפניו. כעס עליהם

שערי אמונה עמ' מ

The Lubavitcher Rebbe explains that Chazal did not think that eclipses happened BECAUSE of certain sins, but that the urge for such sins was greater at these times. This could also be taken as a sign to ask ourselves whether we are being sufficiently vigilant on such issues. He also explains the mashal in the Gemara of the king who sends his servant to remove the light due to the misdeeds of his people. So too, God sends nature - His 'servant' - to block out the sun.

18. This would hold true of most partial eclipses which would not be noticeable under cloudy skies. A total eclipse would be noticeable even in cloudy conditions, due to the sudden darkness. However, much of the impact of the eclipse on its viewers would certainly be missing.

19. The sources in this section and others can be found in a rabbanan.org resource - Jewish Perspectives on Solar Eclipses by R. Joshua Flug, available for download at <https://rabbanan.org/?p=25412>. Rabbi Flug's wonderful research was very helpful in preparing this source sheet.

והנה לא עת להרדם כי יש לנו התראה גלויה מן השמים על תיקון המעשים, ואילו היה נביא מכריז עתה כי ח"ו פורענות עתידה לבוא לעולם, שובו בנים ושב ורפא לו, בודאי היה פחד גדול, ק"ו בן בנו של ק"ו כשהברייתא מכרות בפירוש, ומן השמים ראינו אות, ואשרי לבנים שאביהם שבשמים מודיע להם להזהר מן הפורענות, ושב ורפא לו. נחפשה דרכינו ונחקורה ונשובה וגו'. ואיתא בברייתא (שם) "בזמן שישראל עושין רצונו של מקום אין מתיראין מכל אלו שנא' וכו'", וטוב לישראל.

גרסינן בסוכה (כט, א) "ת"ר בזמן שהחמה לוקה סימן רע וכו', ובזמן שהלבנה לוקה סימן רע וכו'". והנה בקיץ העבר שנת תרנ"א בהתחלת הקיץ היה ליקוי חמה, ובעינינו ראינו כי אח"כ נלקה העולם בחיצי רעב, ועכשיו בשבוע העבר היה בעוה"ר ליקוי לבנה, ויש לנו בית ישראל לדאוג מאד בזה, ולפי השערתי היה שחור ואדום גם יחד, ואיתא בגמ' (שם) "פניו דומים לדם חרב בא לעולם, לשק חיצי רעב באין לעולם", לא אלינו ולא אליכם, חרב וחיצי רעב באין לעולם ח"ו.

בית קלם חלק ג' עמ' שמו

R. Simcha Zissel Ziv, the Alter of Kelm, tells of a solar eclipse in 1891 over Europe (on June 6) which was followed by the terrible Russian famine of 1891-1892 in which 400,000 people died. He describes an eclipse as equivalent to the announcement of a prophet that we need to do personal teshuva. If we do teshuva to the best of our ability, we can avoid any superstition and embrace Yirmiyahu's promise that we have nothing to fear from celestial events.

E3] WE NEED TO APPRECIATE THE 'NORMAL' WONDERS OF NATURE

21. **העשרים ושלוש** - שזכור תמיד גדולתו של האל יתברך. ויבחין בריאות העולם, גדולים וקטנים, ואיך הגלגלים הולכים והשמש והירח והכוכבים, וירידת הגשמים, ונשיבת הרוחות, וכאלו עוד הרבה עצמו מספר. ובשביל שאדם רואה אלו הנפלאות תמיד אינו תמה לבו על כך. אבל כשהחמה או הלבנה לוקה אז הוא תמה מאד בשביל שאין זה תדיר ורגיל כמו סיבוב השמש בכל יום ממזרח למערב. לכן הבט אליהם ועשה עצמך כאילו לא ראית הנפלאות מימך, ויהא נראה כאילו היית סומא עד עתה ועכשיו פתחת עיניך, אז היה נפלא בעיניך מאד. כן תעשה עצמך בכל יום. וכן אמר דוד (תהלים קל"ט:ד) **נִפְלְאוֹת מַעֲשֵׂיךָ יְיָ וְנִפְשֵׁי יַדְעֵת מְאֹד.**

ספר אורחות צדיקים שער הזכירה

The Orchet Tzadikim writes that the overwhelming awe of eclipses and their rarity come to remind us of the unbelievable wonders of nature which we can often take for granted. As such, we should take the opportunity to see an eclipse and then take that feeling with us when we experience the daily cycle of the natural world.

E4] WE NEED TO REMEMBER THAT GOD RUNS THE WORLD

22. The gemara says that a solar eclipse is a sign of ill fortune for the gentiles. (A lunar eclipse is a sign of ill fortune for Jews.) So this gentleman asks, rightly, how can it be a sign of ill fortune if it happens according to mathematical precision? And the answer is as follows.
Any change in the fortunes of the world is foreseen by Hashem. Nothing happens by itself. Hashem ordains when some good fortune should happen to the world, or chalila when some misfortune should happen, and He makes it turn out on certain auspicious dates. When He plans a misfortune for the umos haolam, He makes it happen at the time of a solar eclipse. A solar eclipse is to let you know that this is planned by Hashem and it's not an accident.
Let's say at the time of a solar eclipse something happens in far off country like Tibet where there are no Jews. You shouldn't say that one thing has nothing to do with the other. The reason that it happened then was to bring your attention to it and make you aware that Hashem is in charge of the world. He made it turn out at the time of the solar eclipse... Therefore, it's not that the solar eclipse is made to happen at a time of some misfortune to the gentiles, the misfortune to the gentiles is made to happen at the time of the solar eclipse. Why? In order to label it, to let us know that it's the yad Hashem.

Rabbi Avigdor Miller Abraham and Lot (#046)

F] ECLIPSES AND THE WORLD WARS

23.

הראיתי להרב שליט"א עדותו של הרב אריה פינסקי, שפורסמה ברבים, שבהיותו נער קטן, בשנת תשט"ז לערך, זכה ללמוד חומש רש"י עם זקינו הגה"צ ר' אליהו לאפיאן זצ"ל בהיכל ישיבת קמניץ בירושלים. אמו ביקשה ממנו שילמד עמו פרשת השבוע - פ' בראשית, וכשהגיע לפסוק "והיו לאותות ולמועדים ולימים ושנים" (א, י"ד), למד עמו את

הרש"י על "והיו לאותות" - שבזמן שהמאורות לוקים סימן רע הוא לעולם... וכאן הפסיק וסיפר לו שיום לפני פרוץ מלחמת העולם הראשונה, היה חושך בחוץ באמצע היום ממש כמו לילה, ולמחרת פרצה המלחמה העולמית הראשונה ששינתה סדרי עולם! (וצריך לברר אם היה שם עפ"י חשבון).

דרך שיחה עמ' יז

Rav Eliya Lopian tells of the total solar eclipse over Europe on Aug 21 1914 (Rosh Chodesh Elul) which happened as WWI was beginning. In those first weeks of the war hundreds of thousands of soldiers were killed, including at the Battle of the Frontiers which took place the day after the eclipse.

24.

כי גם הטחו נשאלת חסם ונשקר כידוע נגמ', והלחמה נעדרת ונאכזריות מה שלא היתה עוד כזאת. לכן גם מדת הדין תסכים לרחם על ישראל, ונגלה עון אפרים רפואה נגד עונותיהם, ויהיו ישראל נגדר מעלה יותר שעונות ישראל ומאפרים הם אינם עונות, וכאין וכאפס יחשזון כנגד עונותיהם מהעכ"ר מה שיעשו אז נאחרית הימים לישראל הרבים והעלומים. לכן גם מדת הדין תאמר: „נחמו נחמו עמי יאמר אלקים" נמורה ציימנו לזמן.

והנה נשנת תרנ"ט ניום ראשון דר"ה אייר היה לריך להיות ליקוי חמה [ורק שהיה ניום ההוא כל היום גשמים ויום מעונן ולא היה נראה]. וכן מנינו במסכת סנהדרין: אם ראית שהמלכות מתגרות זו נזו חכה לי, עיין שם. והמלחמה הזאת שזריכה להיות תהיה מלחמה אשר לא היתה מלחמה כזאת מעולם. ולקוי חמה הוא סימן רע וכו', ולא כן תהא המלחמה הזאת אחרית ותהא נע"ה הנורא רפואה לישראל,

פלגי שמן עמ' קצג-קצד

R. Menachem Mendel Rizikov, a Rav in Brooklyn, noted in a derasha in 1939 that the upcoming eclipse on April 19 1939 (Rosh Chodesh Iyar) was a siman that terrible cruelty and war was coming on a scale that had never been seen before.

G] IS A BERACHA REQUIRED UPON SEEING AN ECLIPSE?

25. על הזיקין ועל הזועות ועל הברקים ועל הרעמים ועל הרוחות אומר 'ברוך שכחו וגבורתו מלא עולם'. על ההרים ועל הגבעות ועל הימים ועל הנהרות ועל המדברות אומר 'ברוך עושה מעשה בראשית'. ר' יהודה אומר הרואה את הים הגדול אומר 'ברוך שעשה את הים הגדול' בזמן שרואה אותו לפרקים. על הגשמים ועל הבשורות הטובות אומר 'ברוך הטוב והמטיב'. ועל שמועות רעות אומר 'ברוך דיין האמת'.

משנה מסכת ברכות פרק ט משנה ב

The Mishna rules that upon seeing wonders of nature (after more than 30 days) - such as great mountains, seas, rivers and deserts - one should say the beracha 'Oseh Ma'aseh Bereishit'. On awe-inspiring natural phenomena - such as thunder, lighting, shooting stars, and earthquakes - the Mishna rules the beracha 'Shekocho U'Gevurato Maleh Olam'.²⁰ Eclipses are not mentioned²¹, even though they are infrequent and awe-inspiring natural wonders.

- The presentation of these halachot in Shulchan Aruch (OC 227, 228) is generally limiting, restricting the berachot to specific cases.
- The Acharonim also debate whether the lists giving in the Mishna and Shulchan Aruch are exclusive and particular or indicative and paradigmatic²². If the later, one could possibly extrapolate to other similar situations. On the other hand, the overarching principle of 'safek berachot lehakel' ('if in doubt, leave it out') would limit berachot to only those cases which are clear.
- NO Acharon rules unequivocally that one must say a beracha on an eclipse, even though some accept berachot on stalagmite caves, waterfalls, volcanoes and more.

26. אמר ליה רב אחא מדיפתי לרבינא: וליבריך הטוב והמטיב! אמר ליה: אטו כי חסר מי מברכינן דיין האמת, דלבריך הטוב והמטיב? וליבריכו לתרווייהו! - כיון דהיינו אורחיה - לא מברכינן. (רש"י - זכר חודש זריאת עולם כמנהגו היא ואין כאן דין פורענות זכרונה ולא בטבתה לנו חסד צמילוחתה.)

סנהדרין מב.

The Gemara raises a question as to why we do not say the beracha 'Hatov Vehemetiv' on the waxing moon and 'Dayan Ha'Emet' on the waning moon. It answers that, since these are predictable and natural occurrences, they should not be seen as specifically 'good' or 'bad' news and do not warrant a beracha.

20. For a short summary of the actual halacha, which is a little different to the presentation in the Mishna, see https://halachipedia.com/index.php?title=Bracha_For_Seeing_Natural_Wonders

21. Bircat Hachama, which is made every 28 years when the sun returns to its original alignment, does receive a beracha - Oseh Ma'aseh Bereishit. See Shulchan Aruch OC 229:2.

22. See Sha'ar Ha'Ayin who quotes R. Nissim Karelitz as ruling that the phenomena listed by Chazal are only examples and, as such, one could make the beracha Oseh Ma'aseh Bereishit' on a volcano or waterfall. However, many poskim take the view that a beracha can only be made with Shem u'Malchut on those specific phenomena ruled by Shulchan Aruch.

27. ואמר צפרק היו זודקין כיון שדרך הלצנה להיות פגומה לא מצרכין דין האמת. והקשו התוספות אם כן זלקות המאורות שאין רכבו זכך למה אין מצרכין דין האמת? ותרין שאינן אלא לפי שעה.

ספר אבודרהם ברכת הראייה השבח וההודאה

The Sefer Abudraham (13th century Spain) quotes from a Tosafot (which we no longer have) who ask why we would not make a beracha (presumably Baruch Dayan Ha'emet) on a solar eclipse, since this is not the 'normal' course of nature. They answer that the phenomenon is temporary so does not receive a beracha²³.

- The Steipler (R. Ya'akov Yisrael Kanievsky) is quoted²⁴ as ruling that one should not make a beracha on an eclipse.
- Rav Shmuel Wosner is quoted as having made the beracha 'Oseh Ma'aseh Bereishit' on natural wonders²⁵ which are not specifically listed by Chazal, but was in doubt concerning a beracha on an eclipse.
- R. Chaim David HaLevi²⁶ rules that Chazal did not institute a beracha on eclipses since they saw them as a potentially negative event²⁷. The Lubavitcher Rebbe²⁸ agrees with that psak and rules that an eclipse is a time for tefilla and not to make a beracha.
- Rabbi Michael Broyde²⁹ rules that there should be no beracha on an eclipse but suggests some alternatives which can be recited during an eclipse:
 - (i) Saying the beracha without Shem u'Malchut.
 - (ii) Possibly saying the beracha in Aramaic.³⁰
 - (iii) Reciting 'Vayevarech David' (Divrei HaYamim 1:29:10) and adding "oseh ma'aseh bereishit" at the end.
 - (iv) Reciting Tehillim 19 and 104³¹.
- R. Eliezer Melamed³² includes eclipses with phenomena such as volcanos, geysers and waterfalls on which some poskim rule to make a beracha, while others do not. He rules that this is a safek, but that someone impacted by an eclipse can make the beracha³³.

H] OTHER HALACHIC IMPLICATIONS OF AN ECLIPSE

H1] PUBLICIZING A FORTHCOMING ECLIPSE

- The Mishna Berura³⁴ rules that one may not inform someone that there is a rainbow since this is *motzei shem ra* on the generation which sinned and requires the rainbow to reassert God's covenant with man not to destroy the world. Nevertheless, R. Avigdor Nebenzahl³⁵ rules that one may publish in advance the details of an upcoming eclipse.

H2] MARRYING ON THE DAY OF AN ECLIPSE

- R. Zvi Elimelech Shapira of Dinov writes³⁶ that one should not get married when the moon is waning, "and particularly not during a lunar eclipse, G-d forbid." He does not mention whether this would apply to a solar eclipse.

23. One could raise a number of questions on this answers, including: (i) An eclipse is a natural occurrence. Did Tosafot think otherwise? If so, presumably they held this to be the view of Chazal too; (ii) Temporary phenomena, such as thunder and lightning, do receive a beracha. Perhaps 'Baruch Dayan Haemet' is different since we are only impacted by longer term bad news; (iii) Yet we have seen that many commentators understood the eclipse as a sign of longer term bad news. Tzarich Iyun!

24. Orchos Rabbeinu Vol 1 Berachot #35 concerning the partial eclipse of Feb 16 1980. This eclipse was hardly visible from Israel (around 2% coverage of the sun), although based on the halachic precedent it seems unlikely that he would have ruled differently for a total eclipse.

25. See Sha'ar Ha'Ayin 7:15, p. 77-78 (R. Elyahu Ariel) who quotes in the name of R. Moshe Goldschmidt that Rav Wosner made the beracha on the waterfalls at Engelberg in Switzerland. When the author of the sefer asked Rav Wosner if, according to his more permissive ruling on making the beracha, one should also be made on an eclipse, he responded that the issue needed clarification. The Sha'ar Ha'Ayin rules that a beracha should not be said with Shem u'Malchut.

26. Aseh Lecha Rav 5:7.

27. On the other hand, Chazal did institute berachot on earthquakes and hurricanes which are often very negative, albeit awe-inspiring. See Yerushalmi Berachot (9:2) which requires a declaration of public fasting and prayer after an earthquake due to its destructive effect. See also Rashi Chullin 86a s.v. *zikin*

28. Sha'arei Halacha U'Minhag 1:117 and Iggerot Kodesh 15:1079.

29. <https://seforimblog.com/2017/09/there-is-no-bracha-on-eclipse/>. Rabbi Broyde feels that, in our science-oriented age, most people are not connected to God more through experiencing an eclipse. That is however a subjective assessment. Displaying a 'Litvish' approach, Rabbi Broyde writes: "I myself traveled to Rabun Georgia, an epicenter for the total eclipse and sat in total darkness at for three minutes in the middle of the day and did not feel any closer to the Almighty as Creator of the World during the eclipse than I did after or before."

30. See Shulchan Aruch OC 167:10, 187:1 and 219:4 and Aruch Hashulchan OC 202:3. But see also Igrot Moshe OC 4:20:27.

31. This is the position of Chief Rabbi David Lau - see <http://shut.moresheet.co.il/shut2.asp?id=69602>. Rabbi Lau rules that a beracha cannot be said on an eclipse since nothing new was created; the moon simply passed in front of the sun.

32. Peninei Halacha, Berachot 15:6. See also the analysis of R. Dov Linzer at <https://www.sefaria.org.il/sheets/162935.2?lang=he&with=all&lang2=he>.

33. This ruling contrasts with almost all other poskim who rule that a beracha should not be said because of 'safek berachot lehakel'. The underlying dispute may turn on whether one inclines to Ahavat Hashem or Yirat Shamayim on the issue of questionable berachot. Almost all poskim would be strict on this, but some rabbanim, such as R. Yoel Bin Nun, take a different hashkafic position which places more weight on the 'ahava' element and encourages more berachot.

34. 229:1 in the name of the Chayei Adam (63:4).

35. R. Avigdor Nebenzahl, Teshuvot Avigdor HaLevi (Sifrei Kedumim: 2012), p. 249 #105. Rav Nebenzahl explains that "when the Jewish people perform the will of G-d, they have nothing to fear from these events".

36. Bnei Yissaschar, Ma'amarei Rosh Chodesh, #2.

The Mishna Berura quotes in the name of the Sefer Chassidim that one should fast on the day of a lunar eclipse.

H3] KIDDUSH LEVANA

- The Maharil³⁷ rules that, although one may normally recite kiddush levana until the middle of the month (14 days, 18 hours and 22 minutes) calculated according to the halachic *molad*, if there is an actual lunar eclipse in that month, one may not perform kiddush levana after that since we see the exact time half way through the astronomic month. However, we do not calculate *sof zman kiddush levana* from a solar eclipse.
- The Rema³⁸ explains that, while a lunar eclipse is seen around the world, a solar eclipse is only seen in a limited area.
- R. Chaim Kanievsky³⁹ explains that the halachic molad is used, even though it was known that it is not astronomically accurate, since halacha must be a system that is accessible to all. As such, Chazal use averages and rounded numbers which can be easily calculated, rather than relying on solar eclipse data which was not accessible to most people. A lunar eclipse is visible to most people and so becomes halachically relevant.

H4] HILCHOT NIDDA?

- Some poskim raise the question of the onset of menstruation during a total solar eclipse would be considered a 're'iat layla'.⁴⁰

H5] TAHARA FOR A TAVUL YOM?

- Rav Nebenzahl rules that a tavul yom - who was tamei and went to the mikve by day and is now waiting for sunset to become tahor - will not become tahor when the sun disappears during an eclipse. Rather, the sun is required to set in its normal manner to bring tahara⁴¹.

APPENDIX - THE CHAFETZ CHAIM AND THE ECLIPSE OF 1929

1. It was a regular summer evening, broiling, a Tuesday night. The Chofetz Chaim, the elder, had just completed saying Aleinu. After he placed his siddur down on the table, he surveyed the crowd that had gathered in his narrow room for the Maariv prayer, and then finally tapped on the edge of the table and began to speak: "Hashem (Blessed be He) established within the natural order of His creation a solar eclipse [lit: a stricken sun] to counter the errant ones (the sun worshippers who believe that a divine power abides in the Sun). A time comes and the sun is stricken, diminished so that they shall know that the sun is a creation and not a creator!"

And the Chofetz Chaim taps again with his right hand on the table with an expression of victory, and smiling he adds, "They should come to see. It is a mitzvah to see the sun eclipsed, to actually see that a creation was actually formed [by the Creator] ... And he taps lightly again with his right hand, a quiet smile ...

And the whole crowd slowly leaves the narrow room, breathing into their lungs, the refreshing air of the chilly night, and they are conversing regarding the solar eclipse that will take place in the morrow. Like lightning, the knowledge spreads, in every home they are relating that the Chofetz Chaim has declared "it is a mitzvah to see" how the sun shall be stricken tomorrow ... They are looking for broken shards of glass; a cheap purchase ostensibly, that should be easily obtainable (lit. rolls to your feet) – however not at a time of solar eclipse – this is a privileged purchase that simply cannot be found. And the elaborate production of the blackening of the broken glass shards by the light of the candle has commenced.

37. R. Yaakov Meolin (14/15C Germany), Shu't Maharil 19.

38. Darchei Moshe OC 426.

39. Derech Emuna Hilchot Terumot, Bi'ur Halacha 5:25.

40. See Yeshayahu Pinchas Rottenberg, *Minchat Peri* (Jerusalem, n.p. 2006), p. 293.

41. R. Avigdor Nebenzahl, *Yerushalayim BeMoadehah, Pesach* (Machon Kerem Ram, 2005), 317.

And it was evening and it was morning on the fourth day. With dawn, it appeared to be a regular morning like everyday, but nevertheless – so different than always. Never was the street so awake, bustling with life at such an early hour like today – the whole city old and young – on its feet. And the sun marched on its normal, pride-filled course, it burned with strength on the heads of the men that gathered, on the market and on the green treetops that are shaking, on the horizon.

The sun penetrated that narrow room, it poured light on its floor, like golden sand, sparkling underneath the venerable one. Though he wore shoes, it was like carpet to his feet, the Chofetz Chaim who is sitting on his chair, with his hands and muscles wrapped in straps of tefillin, straps that connect his hand to his heart and his heart to the [tefillin] knot on the head

And it is all made of techelet-blue, immersed in techelet-blue, in the sea and the heavens, his fist raised in the air, his voice roaring in strength: “He who forms light and creates darkness” And how strange now have the shadows become, shadows of light , that roll around the feet of the venerable one. And [the sun’s] clarity, its blinding white light has been turned to redness, redness that gains strength, like the whip that strikes a deep wound in its midst, a grave wound. The giant sphere of the sun in the midst of its flowering adolescence has been suddenly struck down – a cheerful life, its youthful days ever shortening

Here and there, groups are gathering – on the ledges and the bridges. From behind the blackened glasses across to the stricken sun which is darkened halfway – the redness. Also right next to the Yeshiva building, the bochurim are standing gazing upwards. Behold, in the corner, by the cherry tree, whose white blossoms have also now reddened, stands Rav Naftali [Trop], the Rosh Yeshiva of Radin, and he looks from behind his darkened glass shards with deep eyes, sunken into their sockets, his fist is closed and shaking, with his big thumb, he explained to those that are close – “we don’t simply look we must gaze!” The mashgiach can be seen leaving the Yeshiva building with hurried strides, with alacrity he takes the glass from the hand of one of the bochurim who hands it to him, and he stands, ready to peer deeply....

And there surrounding the venerable one, around the Chofetz Chaim is gathered a large group. He started his day early and he prayed Shacharis with the community at an earlier time than all other days; Around him stood those who davened in his minyan, in anticipation, with the intent maybe one of them shall merit and the Chofetz Chaim will use one of their pieces of broken glass to look [at the eclipse]. Except that Yitzchak, the black bearded one, preceded them ... [and] had already prepared for the Chofetz Chaim, a special triply thick, darkened pair of glasses which properly fit the good and trustworthy eyes of the holy and vaunted elder.

The righteous one does this [looking at the eclipse] with holy trepidation, exactly as he would silently gaze at his chanukiah, from it he does not remove his eyes so long as there are sparkling remnants of oil ... And the courtyard of the yeshiva entirely is turned into an observatory, except that there, they simply “look” from behind a telescope, while here they “gaze” with supple eyes behind primitive glass shards....

And behold the darkness has eclipsed the entire sphere, as if a large well of ink has spilled and filled the space ... a strange darkness, not that of the twilight nor even like the thick darkness of night ... Behold, a black curtain has been stretched on the face of the Sun; there remains not even one red streak.

And behold the Wonder : – Behold, behold, once again, born is the new sun – like the six days of creation. But not at one time – like a train it grows slowly, like a baby that develops – a red thin narrow streak emerges, it widens more and more, the red streak grows and grows and soon the light pours out from the center, a redness [that portends] the signs of life, of the blood that circulates in the veins ... and the cherry tree once again receives its white flowering and the cattle in the field are more confident, and the bird in the sky flaps its wings with greater confidence, still mixed with a small amount of fear. And the men, small creatures sparkle with their pleased and satisfied eyes ... Slowly, slowly, its redness turns to a clear and strong light – the sun in its power. And the Chofetz Chaim, the venerable one, sits and rests a bit on the chair they had brought out for him by the door of the house.

He rests, and a deep silence envelopes him – step by step, the elder returns to his house and after him R. Mendel, his son-in-law, and escorting them from behind is Yitzchak the black bearded one, who carries the chair upon which the Chofetz Chaim had rested [back] to the house. And the venerable one, who is completely pure and holy, stops once again by the side of the simple wood table which is in the middle of the room – he utters orders a joyous cry with an expression of victory: “Now all have seen that the sun is nothing more than a creation!”

R. Shmuel Pliskin’s account of the Chafetz Chaim’s reaction to a solar eclipse on June 29, 1927⁴²

42. Translated on <https://cross-currents.com/2017/08/20/chofetz-chaim-eclipse/>