Laws of Sanctification of the New Month, Chapter 11 (Auto Translated)

English

Auto Translated

Shiur Overview

Summary of Lecture – Rambam Hilchos Kiddush HaChodesh, Chapter 11

The Rambam's Introduction to Chapter 11 (Halacha 1)

A. Why the Rambam Writes These Calculations

The Rambam's Words: "Since we said in these laws that the Beis Din would calculate with precision and know whether the moon would be visible or not visible... we know that anyone whose spirit is prepared and whose heart is pure for matters of wisdom and to understand the secrets will desire to know those methods by which they calculate until a person knows whether the moon will be visible on this night or not visible."

Simple Meaning: The Rambam explains why he is going into difficult astronomical calculations. Since the Beis Din was able to calculate "with precision" whether one would be able to see the moon, a person with a clear mind will want to know how this works.

Novel Insights and Explanations:

1. **"In these laws" – a hint that something new is beginning here:** The language "in these laws" can hint that the Rambam is speaking as if about "those laws" – until now it was laws, and from here on is something different. The Rambam needs here a new introduction and apology, which he didn't need before, because until now everything was practical halachos.

2. **The fundamental difference between the previous chapters and the coming ones:** Until now everything was **practiced halachos** – either in the time of visual sighting (laws of witnesses, accepting testimony), or in our time (sanctification according to calculation per the calendar). **From now on it's not really laws at all** – not relevant in our time, and even in the time of visual sighting it doesn't determine halachos, but rather a **wisdom** that the Beis Din knew in order to know whether to wait for witnesses or to accept their testimony.

3. **The difference between "molad hamemutzah" (average molad - previous calculation) and "cheshbon bedikduk" (precise calculation - new calculation):** The previous calculation of the molad is an **average molad** – it says approximately when the molad is, but **not precisely**. At the molad itself one never sees the moon, and even afterwards (six hours later and the like) it's not always possible to see, for various reasons that the average calculation doesn't account for. **The new chapters will teach all the deficiencies of that average calculation** and give the precise calculation.

4. **Three levels of the person who will want to learn:** The Rambam describes three stages: (a) **"His spirit is prepared"** – he is settled, he has livelihood, he is calm (like Maslow's hierarchy – first one must be taken care of with basic needs); (b) **"His heart is pure for matters of wisdom"** – his heart desires wisdom; (c) **"To understand the secrets"** – he truly wants to become clear in the secrets. "Matters of wisdom" and "secrets" can be the same thing – the wisdoms are "secrets" because they weren't previously revealed.

B. The Difficulty of the Calculation

The Rambam's Words: "And the methods of calculation have in them great disputes among the ancient gentile scholars who investigated the calculation of seasons and geometries, and great wise men erred and things were hidden from them and doubts became known to them, there are those who were very precise and did not hit upon the correct path in the calculation of its intercalation but dove into mighty waters and brought up pottery in their hands."

Simple Meaning: There were great disputes among the scholars of the nations, and even great sages made errors.

Novel Insights and Explanations:

1. **"Tekufos and gematrios" – connection to the Mishnah in Avos:** The language "calculation of seasons and geometries" is based on the Mishnah (Avos 3:18): **"Rabbi Elazar ben Chisma says... seasons and geometries are side dishes to wisdom."** "Gematrios" here means **geometry**, but it's also used as a general term for mathematics. The way one calculates seasons is based on mathematics/geometry – one calculates where the sun travels, which angles, etc.

2. **"Dove into mighty waters and brought up pottery in their hands" – source in Gemara and verse:** The parable of one who jumps into deep waters and comes out with a piece of pottery (instead of a diamond) is a **language of the Gemara**. The language "they sank like lead in mighty waters" comes from the **verse in Shiras HaYam** (Shemos 15:10) which speaks about the Egyptians.

3. **Why the gentile scholars didn't clarify the sighting of the moon:** An important point – the gentile astronomers (like Ptolemy) weren't particularly interested in the precise question of when one can see the new moon, because this is a specifically Jewish need (Kiddush HaChodesh). In the classic astronomical books there isn't much written about the sighting of the moon. Therefore people who only learned the classic books didn't come out clear.

C. Why the Rambam Has More Information Than Previous Sages

The Rambam's Words: "According to the passage of days and the abundance of investigation and inquiry, some of the sages became aware of the methods of this calculation"

Simple Meaning: With time and with more investigations the calculations become clearer. The Rambam answers why he knows more than previous sages – it's not because he's smarter, but because with time one accumulates more data (archaeological records of eclipses, signs that sages wrote down over the years).

Novel Insights and Explanations:

1. **The principle of time in science:** In matters that depend on accumulating data over time (like astronomy), one must look at the newest sources. But in matters that don't change (like philosophy, morals, ethics) it's not necessary. The Rambam himself says this about Aristotle in Moreh Nevuchim – that Aristotle made errors in astronomy because it simply takes time to figure out, and certainly regarding the sages of Israel. This is not an insult – it's an apology.

2. **Traditions that weren't written in books:** The Rambam says: **"We have regarding these principles traditions from the mouths of the sages... proofs and traditions that weren't written in the books known to all"** – he also received from sages orally things that aren't in the known books. Therefore even reading all the books doesn't help – one needs the Rambam's book. It's discussed what this means: (a) He had teachers/astronomers in his area who transmitted to him; (b) Perhaps it is indeed in certain books (in Arabic, Greek) that most Jews didn't have access to, and the Rambam writes in Hebrew for them. Rav Pnavi says that there are details in this calculation that we don't know where the Rambam got from, but today one can already find the sources.

D. Why Does the Rambam Write This At All – Two Explanations

Novel Insights:

1. **Explanation A:** The Rambam is a "baal chesed" – he has compassion for the sage who struggles and doesn't succeed, therefore he wants to explain it clearly.

2. **Explanation B:** The Rambam justifies why he writes a **new book** on this topic – just as he justifies in his introduction to Mishneh Torah why he writes at all. **Here it's even more necessary**, because the coming seven chapters are **not halachos** – they are "details of calculations" which is a wisdom, not a part of Mishneh Torah's halachos-project. (Some think this was **written separately from Mishneh Torah**.) Because it's an extra thing, he must explain why he writes it – and his answer is: the previous books are "outdated" (full of errors), one can't know which parts are correct, therefore one needs a new, clear book.

E. "The Matter Was Proper in My Eyes" – The Rambam's Language

The Rambam's Words: "The matter was proper in my eyes and it entered my heart that it is a correct thing to explain the methods of this calculation, so that it will be correct for one whose heart is filled to approach the work to do it"

Novel Insights:

1. The Rambam doesn't say it's an obligation, but "proper in my eyes" – it occurred to him that it's a good thing. Whoever has a "prepared spirit" and a "heart" with desire can arrive at the wisdom, and the book is a tool for that.

2. **Hint to the work of the Mishkan:** The language "to approach the work to do it" is from Parshas Vayakhel (Shemos 36:2). The Rambam hints that the work of understanding the celestial system is connected to the work of the Mishkan – because it says in the Kuzari, Zohar HaKadosh, and other Rishonim that the Mishkan was parallel to Creation. Therefore the work of knowledge of the Mishkan is also the work of understanding the celestial system.

F. "And These Methods Should Not Be Light in Your Eyes" – The Importance of the Calculation

The Rambam's Words: "And these methods should not be light in your eyes... for these methods are distant and deep methods"

Simple Meaning: One should not belittle these calculations because one doesn't need them practically in our time (because one uses the calendar). They are "distant and deep" – deep and difficult.

Novel Insights:

1. **"Distant" means difficult to grasp:** Like the verse "distant is what was and deep, deep, who can find it" (Koheles 7:24), and "I said I will become wise but it is distant from me" (Koheles 7:23) – distant in knowledge. Also "for this commandment is not distant from you" (Devarim 30:11) doesn't mean it's not worthwhile, but that it's not difficult to understand.

2. **The Rambam's logical structure:** The Rambam answers a line of reasoning: A person might think – since one doesn't need it practically, it's probably not important, probably one found a smarter way. Says the Rambam: On the contrary – one indeed found a more practical way, but this doesn't mean the old way is "light." It's still "distant and deep."

3. **[Digression: Topics that don't appear in Shulchan Aruch]:** A person might think that a topic that's not practically relevant (doesn't appear in Shulchan Aruch) is not important. Often it's the opposite – it doesn't appear in Shulchan Aruch because it's too complicated, not because it's not important.

G. Sod HaIbbur (The Secret of Intercalation)

The Rambam's Words: "And it is the secret of intercalation that the great sages knew and don't transmit it to every person but only to ordained, understanding ones"

Simple Meaning: The calculation that the Rambam writes is the "secret of intercalation" that Chazal only transmitted to ordained, understanding people – people with semicha and with understanding.

Novel Insights:

1. **Proof of importance:** The Rambam brings this as proof that even when they didn't need it practically, the sages still learned it – because they held that it's an important wisdom. One needs both permission (semicha) and understanding – "permission doesn't help if the person's head is a wall."

2. **What does "sod" mean:** "Sod" doesn't necessarily mean "secret" but "council/assembly" – like "besod ami," "sod Hashem leyerav," "besodam al tavo nafshi." This means more like a circle/council of sages. But the Rambam did understand that there's also a meaning of a secret of Torah – a deep

wisdom that wasn't said to everyone. Even if "sod haibur" only means "the place where sages gathered to speak about intercalation" – this itself shows that it's an important matter, because they made a special assembly for it. The importance can be because they don't want everyone to make their own calendar (authority).

3. **The Rambam's deeper understanding:** The Rambam explicitly said in a responsum that the reason why sod haibur is important is because it's connected to Creation – a deep wisdom. But in the book itself he doesn't want to say it clearly.

4. **A possible "filter" explanation:** They used deep wisdoms (like astronomy) as a filter – to filter out those who aren't smart enough for the Sanhedrin. If someone can simply rule but isn't a true delver into wisdom, they knew he doesn't belong as a sage.

H. The Previous Calculation Is Not "Sod HaIbbur"

The Rambam's Words: "Lest it enter your mind that this calculation by which we calculate when there is no established Beis Din based on visual sighting... this matter is simple, even schoolchildren reach its end in three or four days."

Simple Meaning: The practical calendar calculation of the previous chapters (intercalation of years, moladot, tekufos) cannot be the "secret of intercalation," because it's too simple. Even children can learn it in three-four days.

Novel Insights:

1. **Rav Chaim Vital's similar reasoning:** Rav Chaim Vital made a similar claim against previous kabbalists – that everything they say can be learned in three-four days, so it can't be that this means secrets of Torah, because it's too simple. It must be something deeper.

2. **The Raavad's difficult position:** The Raavad himself said that he doesn't understand certain calculations of the Rambam (by "lo yada rosh"). How can this be if the Rambam says that schoolchildren can learn it in three-four days? The Raavad didn't accept from his teachers because he held that it's not important enough to devote energy to – "bitul Torah." The Raavad himself says that his teachers didn't learn it, as if therefore it's not worthwhile.

I. The Rambam's Apology: Why His Calculations Aren't Always 100% Accurate

The Rambam's Words: "Lest a sage from the sages of the nations or one of the sages of Israel who learned Greek wisdom contemplate... and see a slight approximation in some of the methods... let it not enter his mind that nature has not moved from this and we didn't know that there is in that method an approximation... we did this intentionally, because there is against it an advantage from another method... until the matter comes out to its truth in close methods without lengthy calculation, so that a person who is not accustomed to these matters should not be confused... in calculations that are not useful for the sighting of the moon."

Simple Meaning: If someone who knows Greek wisdom compares the Rambam's numbers with other sources, he will see small deviations. He should not think that the Rambam didn't know – he intentionally simplified, because he calculated that the deviations don't matter for the purpose (sighting of the moon).

Novel Insights:

1. **The Rambam's method of "cancelling out":** When in one calculation there's a missing half minute and in another calculation there's an extra half minute, the Rambam leaves both out – because they cancel each other out, and this way the calculation becomes easier without harming the result.

2. **The difference between small deviations that accumulate vs. those that remain small:** Often small calculations can have a huge effect over hundreds/thousands of years (like the winter becoming displaced). But other small deviations remain small. The Rambam only left out what remains small.

3. **A great principle in pedagogy (teaching) from the Rambam:** The Rambam wrote for people who aren't accustomed – whoever already knows Greek wisdom already knows on his own. For the student who doesn't know, the principle is: **A teacher may not sell approximations as precise calculations — he must himself know the precision, so he'll know what he can leave out.** The teacher must know the purpose of each calculation — if the purpose is only to know about the moon, one can leave out precision that's only relevant to Mars. But the teacher himself must know the whole picture, because without it he can make an error that is indeed relevant to his goal.

4. **[Digression: Application to all of Mishneh Torah]:** The same principle is applied to the entire Rambam's book: The Rambam makes abbreviations and simplifies many halachos. Don't think he doesn't know the Gemara (as the Raavad often thinks) — he does know, but he held that it makes no practical difference regarding halacha, therefore he says it more simply.

"Principles That a Person Must Know First" – Beginning of the Rules

The Rambam's Words: "The principles that a person must know first for all calculations of seasons and geometries"

Simple Meaning: The Rambam begins to explain the foundations/rules that one must know before one can make astronomical calculations. "Principles" means like foundations of a building or the root of a tree – the bottom-line on which everything is based.

Novel Insights:

1. **Structure of the chapters:** All chapters until chapter 17 are rules – only in chapter 17 does the Rambam come to say exactly how one knows when the moon will become visible. The rest of this chapter doesn't yet say actual calculations, but rules that the calculations are built upon.

The Base System of Degrees

The Rambam's Method: One divides the sphere (celestial circle) into 360 degrees, each degree into 60 parts (minutes), each part into 60 seconds, and further thirds etc.

Simple Meaning: This is the tool by which one can determine an address in the sky – where exactly the moon or a star is located.

Novel Insights:

1. **Why one needs this system:** One cannot calculate astronomical positions without an address system. One cannot simply say "high" or "left" – one needs a precise measurement system. Therefore the ancient Babylonian sages decided to use the sphere model.

2. **What "galgal" means in this context:** The concept "galgal" here is **not** secrets of Torah and not the same topic as in Hilchos Yesodei HaTorah where spheres rotate the stars. Here "galgal" means only **the surface on which it travels** – the apparent sphere of the sky that one sees when looking out. One can learn this calculation even if one doesn't believe in physical spheres. It's only a geometric tool.

3. **Why 360:** The sun goes around the sphere every year, and a year is approximately 365 days, so each day the sun moves about one degree. 360 is a "good number" (divisible by many numbers), and therefore it was adopted. This is the historical source for our modern 360-degree system.

4. **Maalos = degrees:** The word "maalos" means "steps," like the 15 steps in the Beis HaMikdash. The celestial circle goes up and down, therefore the name fits.

Twelve Mazalos (Constellations)

The Rambam's Words: One divides the sphere into 12 mazalos, each mazal = 30 degrees. **"And the beginning is from the beginning of mazal Taleh (Aries)."**

Simple Meaning: The sphere is divided into 12 equal parts, each with a name, beginning from mazal Taleh.

Novel Insights:

1. **Mazalos are only names for zones:** "Mazal Taleh" is **not** based on the stars one sees there today. Once the stars of mazal Taleh used to be in that zone (therefore it's called that), but since then it has changed (precession). The Rambam himself mentioned this in Hilchos Yesodei HaTorah. Today "mazal Taleh" is simply a name for the first 30 degrees.

2. **Practical use of mazalos:** On an "empty sky" it would be difficult to identify where one is. The mazalos give a friendly address system.

3. **Order of the 12 mazalos:** Taleh, Shor, Teomim, Sartan, Aryeh, Besulah, Moznayim, Akrav, Keshes, Gedi, Deli, Dagim. The mnemonic (Rashi): **Tashad Seav Meak Kadad**.

4. **Source of the names:** The names come from an ancient gentile who imagined figures in the star groups when the sun rose near them. The Rambam is "not endorsing the symbol" (not the content of the images), but he uses it "as a good mnemonic" – a practical address.

5. **[Digression: Mazalos and months]:** There is a connection between mazalos and months (Teomim=Sivan, Sartan=Tammuz, Aryeh=Av, Besulah=Elul, Moznayim=Tishrei), but this doesn't match "truly" because it doesn't go precisely with the moon – "it's just a little Torah teaching." The saying "behind a lion and behind a woman" (one shouldn't travel too much in the month of Av [lion] and Elul [virgin]) is also mentioned.

6. **All mazalos are living creatures or vessels/people**, with Keshes as an exception.

7. **Sartan/Cancer:** The name cancer originally means a crab (sartan), and the disease was named after it.

Chalakim, Shniyos, Shlishiyos (Minutes, Seconds, Thirds)

The Rambam's Words: "Each and every degree is sixty parts" – each degree is divided into 60 parts, each part into 60 seconds, each second into 60 thirds, **"so that the calculation will be precise and you can divide whatever you want."**

Novel Insights:

1. **The connection to our time system:** Our minutes/seconds system comes from the same sexagesimal (base-60) system. A minute is a 60th of an hour, a second a 60th of a minute – exactly like chalakim/shniyos by degrees.

2. **Etymology:** "Shniyah" literally means "the second" (second division), "shlishis" = "the third" – these are not fractions (a third) but successive divisions by 60.

The Rambam's Examples of Conversion

The Rambam's Example: If a star is at 70 degrees, 30 minutes, 40 seconds – it is in mazal Teomim (which begins at 60), specifically "at half of eleven degrees of this mazal" (10.5 degrees + 40 seconds into Teomim). Second example: 320 degrees = mazal Deli (300–330), "at ten degrees in it."

Simple Meaning: The Rambam teaches how to convert from absolute degrees to mazal-position.

Rules of Calculation: Addition, Subtraction, and "Borrowing" on a Circle (Halacha 11)

The Rambam's Words: Any calculation that comes out with a remainder, or when you add number to number – gather each type with its type. Seconds with seconds, parts with parts, degrees with degrees. If the seconds reach sixty – make them one part. If the parts reach sixty – make them one degree. If the degrees exceed 360 – cast off 360. And when you want to subtract number from number and cannot – add to the degrees 360 and then subtract.

Simple Meaning: The Rambam teaches the basic rules of arithmetic with degrees/parts/seconds: (1) how to add – each level separately, and when one has 60 seconds make a part, 60 parts make a degree, more than 360 degrees throw off 360. (2) how to subtract when the lower number is larger – add 360 to the degrees, or borrow from the higher level.

Novel Insights:

1. **Negative numbers on a circle:** In modern mathematics one has "negative numbers" (e.g. 200 minus 300 = minus 100), but on a circle there is no negative. On a circle of 360 degrees, if one goes back from 200 by 300 steps, one arrives at 260 (because 360 - 100 = 260). This is the foundation why one adds 360 when one cannot subtract – because 360 is like "back to zero" on a circle, it doesn't change the position on the sphere.

2. **The Rambam's example with "borrowing":** One wants to subtract 250 degrees, 40 minutes (250°, 40') from 120 degrees, 30 minutes (120°, 30'). One cannot do 30 minus 40 minutes, so one takes from the 120 degrees one degree (= 60 minutes), leaving 119 degrees with 90 minutes, now one

can subtract. The same with degrees – one adds 360. The answer comes out 259 degrees, 29 minutes, 50 seconds.

3. **The Rambam as "Rebbe":** The Rambam was a very good teacher – he teaches basic arithmetic (subtraction with borrowing) that today one learns in first grade. In the Rambam's times the basic symbols of mathematics weren't yet developed, and most people didn't know how to subtract a larger number from a smaller one. The Rambam therefore had to teach the algorithm.

Mahaleich HaShoveh – The Foundation of Uniform Motion (Halacha 12)

The Rambam's Words: The sun and moon and also the other seven stars (planets), the motion of each and every one of them in its sphere, is uniform motion – without stopping and without heaviness. Like the motions of today like the motions of yesterday, like the motions of tomorrow, like the motions of each and every day.

Simple Meaning: Each celestial body – sun, moon, and the other planets – travels on its own sphere with a precisely uniform speed, never faster and never slower. This is called **mahaleich hashoveh** (uniform motion).

Novel Insights:

1. **Mahaleich hashoveh is an assumption (axiom), not an observation:** What the Rambam says – that all celestial bodies always go the same speed – is **not something one sees**. On the contrary, when one looks at the sun, moon, and stars, one clearly sees that they go sometimes faster and sometimes slower (e.g. the sun in winter travels differently than in summer). This is an **assumption of the ancient sages** – a metaphysical/scientific principle that celestial bodies must go uniformly, because "it cannot be that a celestial thing should go faster one day and stand still another day."

2. **How one answers the difference between mahaleich hashoveh and what one sees (mahaleich hanireh):** The sages said that the sphere on which the star rotates is not centered around the earth. The earth is not in the middle of the circle, but at an angle (eccentric circle). Therefore, when the star is on the side of its circle that is closer to us, **it appears** to go faster; when it's on the farther side, it appears to go slower. But in truth it always goes the same.

3. **Kepler's innovation – ellipses instead of circles:** In later times **Kepler** gave a new answer to the same problem: Who said the motion is in a circle? Perhaps it goes in an **oval (ellipse)**. On one side of the ellipse the path is longer (slower), on the other side shorter (faster). Also by Kepler remains the foundation that the star travels "approximately" the same speed, but the path is different.

4. **Practical difference of the assumption: Without** the assumption of mahaleich hashoveh one wouldn't be able to make any calculations at all – if the motion were random, there would be no place for calculation. The assumption is the foundation that enables all astronomical calculations.

5. **"Still correct":** Although the theory (spheres, eccentric circles) is today outdated, **the calculations still come out correct**, because the mathematical model produces the correct results even if the physical model is different.

Mahaleich Emtzai and Mahaleich Amiti (Continuation of Halacha 12)

The Rambam's Words: And the sphere of each and every one of them, even though it encompasses the world — the earth is not in its center... therefore if you estimate the motion of each and every one of them to the sphere that encompasses the world where the earth is in its center... its motion will change, and its motion on this day in the sphere of the mazalos will be found less or more than the average motion.

Simple Meaning: Each planet has its own sphere where it travels uniformly (mahaleich emtzai/shoveh). But because the earth is not in the center of that sphere, when one calculates its motion relative to the sphere of the mazalos (where the earth is in the center), the motion becomes non-uniform — sometimes more, sometimes less. This is the mahaleich ha'amiti.

Novel Insights:

1. **Why is the non-uniform motion called "amiti"?** "Amiti" doesn't mean the other is false — both are true. The mahaleich emtzai is true regarding the star's own sphere; the mahaleich amiti is true regarding us, the observers on earth. It's called "amiti" because this is what we need to know for sighting the moon — we're not interested in where the moon is in its own sphere, but where it stands in relation to us.

2. **[Digression: Subjective vs. Relative]:** People confuse "subjective" with "relative" — but that's not the same thing. "Relative" can be quite precise and true. When something is closer to earth, that's a real, measurable fact — not imagination or falsehood. One can be mistaken in a relative measurement (one thinks something is closer when it's farther), but that doesn't make the concept itself subjective.

Ikar HaCheshbon – The Rambam's Epoch (Halacha 2)

The Rambam's Words: We made the principle from which we always begin the calculation — from the beginning of the night of Thursday which is the third day of the month of Nissan of this year, which is year 17 of cycle 260, which is year 4938 from Creation, for contracts 1489, for the destruction of the Second Temple 1009.

Simple Meaning: The Rambam establishes his own starting point (epoch) for all calculations: Wednesday night (beginning of Thursday), 3 Nissan, year 4938.

Novel Insights:

1. **Why does the Rambam make a new ikar?** He already had two ikars — from Shmuel and from Rav Ada (molad BeHaRaD). Rav Rabinowitz suggests an interesting explanation: The Rambam understood that the old calculations aren't precise enough, and by his time a large difference had accumulated between the old calculations and the true reality. By making a new ikar, he hints that when Mashiach comes, the Beis Din will have to go with the true calculation, not with the old one. But it can also simply be that it's easier to calculate from a closer time.

2. **Minyan leShtaros:** The Rambam also brings the minyan leShtaros (1489) — a count from the kingdom of Alexander the Great. The custom is from the time of the Mishnah that on contracts they would write "to the kingdom of Greece." He also

brings from the destruction of the Second Temple (1009) — it seems people used to count from the destruction, as one sees in Kinnos.

3. **When did the Rambam write this section?** An interesting historical note: In the introduction to Mishneh Torah the Rambam writes year 4937, but here he writes 4938 — a year later. This shows that the Rambam already published (or at least finished) the rest of Mishneh Torah, and this section on astronomical calculations he wrote later, because he had to learn extra astronomy. This fits with his apologies at the beginning of this chapter.

4. **The Lubavitcher Rebbe's interpretation:** The Lubavitcher Rebbe says that the time the Rambam writes here is when he proofread the book, not when he originally wrote it. From here he learns the concept of "each day they should be in your eyes as new" — that when the Rambam proofread, he looked at it as if he's writing it fresh. **But the lecture doesn't hold of this explanation**, because the Rambam's entire calculation is built on this epoch — it's not a small correction, he would have had to change all the calculations. More likely is that he indeed wrote this section later.

Mekom HaCheshbon – Jerusalem

The Rambam's Words: All these calculations... all for Jerusalem and places close to it up to six or seven degrees... inclines from under the equator that circles in the middle of the world toward the northern direction by approximately thirty-two degrees.

Simple Meaning: All calculations are built on Jerusalem's location, because sighting of the moon is only relevant in Eretz Yisrael. Jerusalem is approximately 32 degrees north of the equator, with a margin of 29 to 35 degrees (i.e. places that are 6-7 degrees away).

Novel Insights:

1. **Longitude and latitude:** Just as one

Continuation of Translation

Novel Insights:

1. **Longitude and latitude:** Just as one divides the sky into 360 degrees, one can also divide the earth into degrees — both width (north-south) and length (east-west). The Rambam gives Jerusalem's latitude as approximately 32 degrees north.

2. **Why six-seven degrees?** The Rambam says that the calculation applies to places up to 6-7 degrees from Jerusalem. For testimony one only comes from one day's journey — why does he say 6-7 degrees (which is more than one day)? The answer is perhaps that according to the astronomical calculation the difference within this area is not significant — one sees the moon at the same time.

3. **Jerusalem's horizontal location (east-west):** The Rambam also calculates Jerusalem's location in the east-west direction. He says **"and so it inclines from the middle of the settled area"** — Jerusalem is a certain number of degrees (approximately 24) from the point called "middle of the settled area" (the meridian that was once calculated as the center of the inhabited world, approximately in India, where the "dateline" is). Today one calculates from Greenwich, but the difference is only from where one begins to count — the Rambam wasn't wrong in his determination of Jerusalem's place.

4. **Why is the location important?** Because **the moon is seen in each place at a slightly different time**. The Rambam wants to indicate the calculation for Jerusalem, and whoever is in another place can add or subtract degrees in order to know the calculation for his location. This is the Rambam's method — he makes the calculation easy by giving one base-point (Jerusalem), and from there one can adjust.

5. **The molad is announced according to Jerusalem:** Today when one announces the molad in shul, one announces the molad **as it is in Jerusalem**, not as it is in the local place — because **that's where Kiddush HaChodesh is done**. This is why one says the same molad in Europe, in Australia, everywhere.

6. **[Digression: "Mi She'asah Nissim" / "Chaverim Kol Yisrael"]:** Before announcing the molad, one says "Mi She'asah Nissim... yekabtzenu... in the four corners of the earth" — but no one knows from where the molad is calculated. The text "Chaverim Kol Yisrael" is interpreted that **we are not from the sects (like Samaritans/Karaites) who make a false Kiddush HaChodesh**, or who will make Kiddush HaChodesh everywhere — in Babylonia, in America — instead of only in Eretz Yisrael as it should be. This is the meaning of "Chaverim Kol Yisrael" — we hold together with the true Kiddush HaChodesh of Jerusalem.

General Note

These are rules that one must know in order to be able to learn further — the Rambam's introductory material (astronomical foundations, degree-system, mazalos, calculation methods, mahaleich hashoveh/amiti, epoch, Jerusalem's location) is a preparation for the detailed calculations that come in the coming halachos, until chapter 17 where the Rambam comes to say exactly how one knows when the moon will become visible.

Full Transcript

Rambam Laws of Sanctification of the Month Chapter 11 – Introduction to the Precise Calculation

Opening

Speaker 1:

Eleven, okay, I'm going to record it. We're learning Rambam, Sefer Zemanim, Laws of Sanctification of the Month. We're now going to learn the eleventh chapter, Chapter 11.

Until now we've already learned for the most part the laws, starting from the sanctification of the month when there was sighting by the court, and afterwards a nice few simanim about how the calendar works, what is the math that one needs to know to know when the molad will be. And later we learned about intercalating the year, and we also learned the laws of how the court intercalates the year, and afterwards the reality of how the tekufot work, the calculation of the tekufot. There are four tekufot a year, how the tekufot work, so that we should know when we intercalate a year, when the court

doesn't do it, but it works automatically. I mean to say, the calendar does it according to the court, according to the previous court, so far.

In the next chapters the Rambam is going to go into a somewhat higher level of math, to know how we can expect to see the moon again, more math. And the first half of this chapter is an introduction to why it's necessary for a person to delve into difficult mathematical calculations and understand astronomy in order to know when the moon will come.

Law 1 – The Rambam's Introduction: Why He Writes the Calculations

Speaker 1:

The Rambam says as follows: **Since we said in these laws** – in previous chapters the Rambam taught us that when the court received witnesses to accept testimony that witnesses saw the new moon, they knew beforehand according to their calculations whether it's a time when it's time to expect witnesses or not. And they were also able to know according to their calculations whether the witnesses are telling the truth or not.

The Rambam says, **since we said in these laws that the court would calculate precisely** – the court made calculations, calculated precisely, with clarity, **and they knew** – and according to this they knew, **whether the moon will be seen or will not be seen** – whether one will or will not be able to see the moon.

Discussion: The Difference Between the Previous Chapters and the Coming Ones

Speaker 1:

Yes, let me just explain clearly for one second. So, there are two different things that from here will be different than the previous things, what you want to say. But first of all, in a certain sense, everything until now... I thought earlier that perhaps "in these laws" means as if here is already not "these laws". I don't know if it's a true inference, it's an interpretation I thought of, because you see clearly that here the Rambam comes with a completely new introduction.

Why? Because until now essentially the Rambam didn't need to give any introductions, any justification, apology, for why he goes into all these sciences? But until now everything was literally practical laws. As the Rambam explained in Chapter 11, I remember, that there are simply two laws: there's a law of sighting, where the witnesses come and the court receives witnesses, and there are laws of testimony and the like. And besides that there are laws of calculation, where part of the law is that when there's no sighting one calculates the calculation. True, that even when there's a sighting one also calculates the calculation, as we'll see there, but that's not really that calculation.

So, until now we've learned, even the calculations we've learned, are essentially laws that are relevant nowadays more even than the calculations than in the past, because today we sanctify according to calculation, whatever the reasons are why we sanctify today according to calculation. Therefore, everything we've learned until now is laws, practiced laws, it's all laws of the mitzvah of sanctifying the month and intercalating the year, everything we've learned is laws, you can say.

From now on there are no laws at all, there's no law whatsoever in all these laws, that means it's not relevant nowadays, it's certainly not relevant. True is that even in the time of sighting it doesn't determine any laws according to this, it's just a fact that the court knew, according to this they knew whether they should wait or whether they should accept the witnesses and the like. It's a wisdom that the court knew, and not any laws.

Speaker 2:

But this they already knew from the laws that we've already learned until here.

Speaker 1:

No, but they didn't. So that's one thing, that's the second thing. First of all, what did we...

Speaker 2:

But according to the previous calculations one already knew whether the court can expect.

Speaker 1:

No, no, that's two things. Earlier we learned what the month will be according to today's calculation, because we don't, we don't care. A month can be that there's no moon, it has nothing to do with the moon, it has a calculation.

Speaker 2:

With those calculations wouldn't the court have known whether they expect witnesses?

Speaker 1:

No, certainly not. The calculation is only an average molad. That says, there are two things. As it were, the calculation we make is a calculation. Now, earlier is a law, now is a science.

Second, even if you're making the previous calculations, you must remember that the previous calculations, a little bit it has to do with the moon, it revolves around the molad and the like, but that molad, that's why we say around the word precisely, that molad is not precise. When it says in the calendar that it's the molad, not always can one then see the moon. That means, not even yet afterwards, at the molad one never sees the moon, but not always, six hours, whatever, afterwards one can see the moon. Many times it has nothing to do with various reasons, various things that that calculation doesn't calculate. We're going to essentially see in the next several chapters all the deficiencies of that calculation.

So it's actually a calculation that was based on the moon, and it could be that the Rambam said then, that it's the beginning of the calculation that the court spoke of, because it's approximate, it has something to do with the moon. But one must know precisely, in order to know truly if he can come. He needs to know the precise calculation. The precise calculation, that's the difference of the calculation that we're learning now, that we've learned until now. And this is not a law that is relevant not nowadays, and not then is also not a law. The Rambam says why he wants to say it at all.

Speaker 2:

Yes, that's... correct. Makes sense.

Continuation of Law 1 – The Three Levels of the Person Who Wants to Learn

Speaker 1:

Yes, the Rambam says that because we know that the court knew all these calculations, **we know**, we know, **that anyone whose spirit is proper**, someone who is... he's ready, he's well balanced, I don't know exactly, one must understand what

exactly means as... I don't know, a good person, a proper person. I mean there are three levels, as it were, in order for a person to want to make the calculations, there must be the basic, the first level is, I don't know, Maslow's hierarchy, first he must be normal, he shouldn't be hungry and he doesn't have any livelihood, then he's not of proper spirit. First he should be calm and he should be settled.

And afterwards, **and his heart is pure for words of wisdom**, his heart will desire words of wisdom, and then he'll be able to go next, **and to stand upon the secrets**, to actually stand and become clear in the secrets. Okay, perhaps words of wisdom and secrets is the same. That means, he wants to understand the wisdoms, and the wisdoms are hidden from him, because the court is going to say soon, they didn't tell this, so the secrets, the wisdoms are secrets. Until now we've already seen that it's not secrets.

Such a person **will desire** to desire **to know those ways by which they calculate**, to know the ways how one can calculate whether the moon will come, the calculations that the sages knew how to make, **until a person knows whether the moon will be seen on this night or will not be seen**. A person will want to learn so much until he'll know, he'll be able to actually calculate what will be and be proven when he'll see the moon actually come out that he was correct with his calculations.

Speaker 2:

Yes, but what he wants to know is if it can be seen. That he knows if... because that's what the Temple court needed to know, but that's also the calculation that the person wants to be able to learn and understand.

Law 2 – The Difficulty of the Calculations

Speaker 1:

He says, but it's not so simple. That means, it's not enough that you'll open Wikipedia and look in. It's a difficult calculation. He says as follows, **and the ways of calculation have in them great disputes among the ancient gentile sages**, as the Rambam said earlier that there was already dispute which is not in this whether between the sages of Israel, but even before that there was in this arguments between the sages of Greece and Persia. **Who investigated the calculation of the tekufot and the geometries**. They tried to investigate, to calculate the tekufot, when exactly, how many days passed between each of the four tekufot of the year.

And the geometries, in the calculation of the science of mathematics, geometries, the simple translation of it is geometry. But geometry many times one uses as a term for math in general. So the earlier sages knew the calculation of the tekufah is based on math.

Speaker 2:

Very good. In other words, apparently, this is apparently a language from the Mishnah, tekufot and geometries are side dishes to wisdom, which the Rambam apparently means that Mishnah. And the way one calculates the tekufot is through geometries, through what is also geometries, because it's not math of numbers, it's through essentially math of the area, from where the sun travels, which angles. But yes, I mean that in general today it's called that. But the Rambam apparently says geometries, although in Arabic it's called something else, because this is the language of the Mishnah. And your wisdom and your money are worthy, yes?

Speaker 1:

Yes. I don't know, it says there almost tekuot, but the Mishnah in Avot says Rabbi Elazar ben Chisma says tekufot and geometries are side dishes to wisdom, something like that. Okay, yes.

So what he means to say is, it will be pure, you'll think I can look in some book? But I can't. Yes, because there was in this many disputes. **And great wise men erred**, even great sages were confused and came to errors in this, **and things were hidden from them**, certain important knowledge didn't come to them, and therefore **and doubts became known to them**, doubts happened to them. So much so that **there are those who were very precise**, there were even those who put in a lot of effort being precise, **and did not hit upon the correct way in the calculation of its intercalation**, he didn't arrive at the truth. **But sank in mighty waters**, he swam into the difficult waters, into deep waters, and after all the efforts nothing succeeded for him, like someone who jumps into difficult water to save a diamond or something, and in the end he brings out, ah, he found something, but he comes out of the water, one sees he found a pottery shard, a cheap piece of pottery.

This is a language of the Gemara. This is a language of the Gemara, where the language of the Gemara is also on "they sank like lead in mighty waters," and it became pottery. They sank like lead in mighty waters, it's based on that verse.

Speaker 2:

Yes, because there I think, they sank in mighty waters goes back to the Egyptians or what. They sank in mighty waters, but here it says in mighty waters in the great waters.

Why the Rambam Writes This Book

Speaker 1:

But Master of the Universe, says the Rambam, that because it's so easy to err, and it's a great... The Rambam has here also, one sees here a certain compassion, a sympathy, for the sage who struggles, and in the end he arrives at nothing. So therefore it's necessary... yes, for the Rambam to write us this book.

Speaker 2:

I would have read it a bit in reverse, I would have read it as if the Rambam is justified why he needs to write a book. That means, in any case the entire Torah he already explained the introduction of his Rambam. And why does he write the Rambam? Because the world, no one knows clearly the laws, and you remember the introductions to Mishneh Torah.

This composition is an extra composition for me, because it's not any laws. The list in the next seven chapters is only details of calculations which is a wisdom. It's not part. You can say, there are those who say that it's even written extra from Mishneh Torah. It comes out, it's not part of the book Mishneh Torah. An extra thing, he needs to explain why he's writing? Everyone writes a book, one must ask a question, there are already enough books on the subject, why do you need to write?

He says, no, no, no, there are books that are mistaken. First he said that there are many disputes and many approaches where many are wrong, and he's going to say more reasons why it's necessary. He says more. He says, even if you'll find books

from the past, but further, according to the length of days... No, no, it's reversed, one minute, I want to finish this law.

The Rambam here says why one needs to have a new book, because the previous ones are mistaken, or a large part of them are mistaken, and you can't know which, something like that. I mean that this is also like a nice way of saying criticism. Presumably he could, I don't know from where he means personally, but I'm sure he has someone in mind.

Why the Rambam Has More Information Than Previous Sages

The Gentile Sages and the Sighting of the Moon

Speaker 1:

I mean here there's another thing, because the gentile sages who were engaged in this, many of them weren't especially interested in knowing exactly when one can see the moon, because that comes from the Jewish thing that one wants to see the sanctification of the month. It could be that they were more interested in other things, in general, this whole precise thing of the sighting of the moon isn't in the...

And it's true I think, if one looks in the normal books that one used to learn from Ptolemy, it doesn't say so much about the sighting of the moon, because it wasn't such a topic. He wanted to know everything at once. So the detail was people who struggled greatly in the classical books that speak about it, and they didn't come out clear. So therefore it's necessary... yes, for the Rambam to write us this book.

"According to the Length of Days and the Abundance of Examinations and Investigations"

Speaker 1:

Now he can say how does he know yes, from where does it come? Why is it yes worthwhile to look into a new book? It says, what is now better than a book from three hundred years ago for example would the Rambam have said?

He says as follows: **According to the length of days, and the abundance of examinations and investigations, it became known to some of the sages the ways of this calculation** – the more time passes, and the abundance of examinations and investigations, and the more one checks it out with examinations and investigations, it became known to some of the sages the ways of this calculation, some of the sages become yes very clarified with time.

Because in the calculation of astronomy time comes in very strongly, because there are also ancient archaeological things that have been found that the sages wrote down signs that in such and such year there was such and such lunar eclipse and the like. The more years pass, things become clarified.

Therefore, says the Rambam, another reason why now, since the books that... let's say there were Jewish sages who lived, but from then things became even clearer, because more time passed.

The Principle of Time in Science

Speaker 1:

This is actually an important thing, we spoke about this yesterday, right? People say today there's already more time, one knows even better, it's not because we're smarter, it's just simply time.

So nowadays, when a person wants to know whether it's a question whether he should learn Aristotle or he should learn contemporary philosophers, it's like this: if it's matters where things change because it has to do with writing down signs from years, actually one must look at the newest. A thing that hasn't changed at all, philosophy, it's not relevant, but this is a fact.

The Rambam himself says this about Aristotle. So everyone understands that when one wants to read about technology one shouldn't look in Aristotle, but when one wants to read about morals, about ethics, apparently not much has changed, except if one accepts everything that psychologists say as sacred.

Speaker 2:

Okay, continue.

Speaker 1:

Yes, yes. The Rambam himself says this about Aristotle in the Guide for the Perplexed, that Aristotle made errors in astronomy because it simply takes time to figure out. And how much more so regarding the sages of Israel. It's not an insult to the Rambam.

The truth is that the Rambam... It's also a bit of an apology, on the contrary. Why do you think I'm smarter than the sages before me? Because over time, I have more information than they had.

"We Have Regarding These Principles Traditions from the Sages"

Speaker 1:

And furthermore, that means, this is one thing that one must have with the Rambam, so he should read and say what the sages have figured out over time. And another reason he says, it won't be enough that you'll read all the books even, because there are things that you haven't read in the books that I know.

We Have Received These Principles from the Sages

Speaker 1:

We have received these principles from the mouths of the sages, as I have also received from them. From the mouths of the sages, from sages who have transmitted to us **proofs and traditions that were not written in the books known to all**, which are not found in the well-known books. Therefore, it won't help him that he has read the books before, the books I read.

Speaker 2:

Interesting, yes.

Discussion: What Does "Traditions from the Mouths of the Sages" Mean?

Speaker 1:

Perhaps he means, I see that he brings here from below the Rambam Aruch. It could be, I saw that Rav R' Pnovi says that there are certain details of the astronomical calculations that we don't know where the Rambam got them from, but today one can indeed find them even if those books didn't exist in the times of the Rambam.

So he learned it, presumably he had teachers, he went to a good—there was no school in his times, but he had astronomers who were active in his area, and they told him.

Or it could be, he says another interpretation, I don't know if this is true, it could be that he means to say "known to some," it could be it's written in certain books but it's in Arabic, I

don't know, most Jews don't know Arabic. The Rambam writes in lashon hakodesh (Hebrew) for those who don't know.

It could be he also means this, that there are things, principles, that aren't found in the Gemara and in the Mishnah and in the Midrash that everyone has, it's found in some Greek book that the Rambam happened to have access to a translation. I mean the simple interpretation means yes.

Speaker 2:

Okay, he doesn't say, he says clearly when the Rambam is not serious. We'll arrive at the end of chapter 17, we'll talk more about where the Rambam knows all this from.

"The Matter Was Proper in My Eyes" – The Rambam's Language

"To Draw Near to the Work to Do It"

Speaker 1:

Says the Rambam, **"I entered into these matters, and all these reasons, the matter was proper in my eyes"**, because it's very important, and on the other hand it's difficult, we'll arrive there, **"and it entered my heart that it is a correct thing"**, it occurred to me that it's a proper thing.

He doesn't say it like an obligation upon me, it's "the matter was proper in my eyes," **"to explain the methods of this calculation"**, to clarify the ways how the calculations work, **"so that it will be ready for one whose heart is filled to draw near to the work to do it"**. So it should be ready.

Earlier he said that someone who has a proper spirit and a heart that has desire can arrive at this wisdom. He says, with this book I have indeed, it's a good tool for one who has the right spirit and the right heart to be able to arrive at the wisdom.

Allusion to the Work of the Mishkan (Tabernacle)

Speaker 1:

And the Rambam uses language from the work of the Mishkan, yes? It's very interesting. "To draw near to the work to do it." It's written by Vayakhel somewhere there, yes? He brings, yes, "to draw near to the work to do it."

It could be that the Rambam is alluding here that the Mishkan... one must be a thinker of thoughts.

Speaker 2:

No, I think an allusion, because it's written in the Mishkan, it's written in the Kuzari and in other Rishonim, that the Mishkan was corresponding to ma'aseh bereishit (the work of creation). The holy Zohar, very strongly. It could be that the work of knowledge of the Mishkan is also the work of the celestial system, of the entire...

"Let Not These Methods Be Light in Your Eyes"

Why the Calculations Are Important Even in Our Time

Speaker 1:

Says the Rambam further, another piece of apology and explanations. Another reason why people might think, "Well, let me skip Hilchot Kiddush HaChodesh and go on to Hilchot Ta'anit." But until now you understand that it's a law, just like any other, so a person might think, well...

Says the Rambam, **"Let not these methods be light in your eyes"**, don't be dismissive of these methods of calculation. And he thinks, therefore **"that they are not needed in our time"**, today one doesn't need this matter, because today we sanctify according to the calendar, and the calendar is sufficient with the calculation of the seasons and the calculation of the molad (new moon) that the Rambam has already stated.

Says the Rambam, no, it is indeed very important, on the contrary from being light, it's distant and deep. **"For these methods are distant and deep methods"**, they are great and important ways.

"Distant and Deep" – Difficult to Grasp

Speaker 1:

Distant and deep means that it's difficult, like the verse "distant is that which was and deep, deep, who can find it," this week's parsha, yes? "For this commandment... is not distant from you," means simply difficult to grasp. When people think that "distant from you" means it's not worth doing, no, the verse means it's not worth understanding.

Like in Kohelet (Ecclesiastes) it says "distant is that which was and deep, deep, who can find it," means hard to grasp. Or "I said I will become wise but it was distant from me," means distant in knowledge. And here the Rambam says, this is why it's important, because it's indeed very difficult.

The Rambam's Logical Structure

Speaker 1:

But it's interesting, because "light in your eyes" he says, because I don't need to have it for practical application. Here he says, even though you don't need to have it for practical application, it's still important because it's a very deep wisdom.

It seems, as if he means to say like this: You will think, because one doesn't need it, it's presumably because it's foolish, because they found a cleverer way. He says, on the contrary, they found a more practical way, indeed, "and they don't need them," but not "and they don't need them" because they are light. So that's the point, yes?

You could be lenient with them and dismissive, because after all one doesn't need to have it for our calendar. He says, no, we don't need to have it for our calendar for other reasons, but it's still very "distant and deep methods."

Digression: Topics That Aren't Found in Shulchan Aruch

Speaker 1:

A person can sometimes think that a topic that one doesn't need to know in order to know halacha l'ma'aseh (practical law) is something not such an important topic, and the proof is they didn't make a Shulchan Aruch from it. He says, no, many times it's exactly the opposite. The reason why it's not in Shulchan Aruch is because it's very complicated. Or because of that, or because it's reality.

That is to say, the Rambam would seemingly agree that not every thing that's not relevant in our time needs to be explained. Although the Rambam did indeed write on all laws that aren't in our time, perhaps he didn't hold that way. He held that ma'aseh bereishit, ma'aseh merkavah (the work of the chariot), ah, very good. But he doesn't say that clearly here.

He wants to explain to you that it's a great matter because it's difficult. But the difficulty isn't simply that it's hard, there's no point in doing hard things, rather because they are important matters. But it somewhat misses the importance.

The Secret of Intercalation

Proof from Chazal That the Calculations Are Important

Speaker 1:

Now he brings a proof that even though it's not so important for practical application, the great sages exerted themselves to indeed know it. Right, and they kept it secret. Why did they keep it secret? It seems because it's important, so it seems. Perhaps because they are deep and distant methods and not everyone can.

So let's learn, something I'm not clear about now here.

"And This Is the Secret of Intercalation"

Speaker 1:

Says the Rambam, **and this, this is the secret of intercalation**, if you have ever seen that there is such a thing called by Chazal "the secret of intercalation," the secret of intercalating the years, **that the great sages knew it, and they would not transmit it to every person but only to ordained wise people**. The sages only transmitted it to sages who were ordained, who had ordination from the previous sages.

You see from here that it's an important thing, and that one needs both the authority and one needs to be intelligent, because not everyone understands. Authority doesn't help if someone's head is a wall.

He says, from this the sages transmitted it even when it wasn't needed so importantly, when one could give advice without it, it's enough that one knows approximately. Yet the sages taught it, because they held that it's a very important wisdom.

Speaker 2:

No, seemingly as a proof, it does indeed fill out. How much it fills out I don't know, but it seems that the Rambam understood from this...

Discussion: What Does "Sod" (Secret) Mean?

Speaker 1:

It's not clear which Gemara he means when he speaks of the secret of intercalation. Someone told me, I think that in Hebrew, the secret of intercalation means simply assembly, like "in the council of my people" or how... "the council of the wise and understanding."

Speaker 2:

Yes, it doesn't mean from the secret, it means more like a council.

Speaker 1:

Well, "the secret of Hashem is for those who fear Him." What is the other verse I want to ask? In short, there's an explicit verse where we see there, right? "In their council let my soul not enter," right? It doesn't mean in their secret, it means in their...

Continuation of Discussion: What Does "Secret of Intercalation" Mean?

Speaker 1: It's not clear which Gemara he means when he speaks of the secret of intercalation. Someone said, I think that in Hebrew the secret of intercalation means simply like "in the council of my people," or how did you say?

Speaker 2: In the council of the wise and understanding.

Speaker 1: Yes, it doesn't mean from the secret, it means more like a council. Well, "the secret of Hashem to those who fear Him"... what is the other verse I want to ask? In short, there's an explicit verse where we see there, right? "In their council let my soul not enter," right? It doesn't mean in their secret, it means in their assembly, gathering. That's what it meant.

But the Rambam did indeed understand, and there is some connotation in the Gemara once like this, a secret of Torah, a certain wisdom, and it seems that it wasn't told to everyone, it's something in the secrets of Torah. So the Rambam proves that if it's a secret of Torah, it seems that it's an important matter.

But I think that also the places where it says "sod" as a place where people gathered, I think it was a place where people gathered to learn a certain topic, among the wise and understanding. So a place where they gathered to learn a deep thing, only the wise and understanding. So the secret of intercalation can mean the place where the sages came together to speak about intercalation. So that itself shows that it's an important matter that one makes an assembly for it.

It could be that it's important simply because they don't want everyone to make their own years.

Speaker 2: You mean about authority?

Speaker 1: Yes. It's true that it's important, as we've already learned. But it seems that the Rambam understood, it could be as you say, it could be that it's not truly important to know the calculation of sighting, because it's only relevant to sanctify the months, but the months are more or less true, one can make sure that it's a finite number of people, it doesn't fail. The reason why it was such a matter is on the contrary, because it adds to it some wisdom.

Okay, we need to understand here better. The Rambam in a responsum said explicitly that the reason why it's important is about the topic of knowing ma'aseh bereishit. But here it seems he doesn't want to say it clearly here.

It could very well be a conspiracy like that they specifically used deep wisdom things to filter out those who aren't very smart. They'll know that he doesn't belong in the Sanhedrin. If he can simply make a calendar on the spot, but he's not a true deep thinker in math, then they knew he shouldn't be the next sage.

The Rambam's First Apology: The Practical Calculation Is Not "The Secret of Intercalation"

Speaker 1: Says the Rambam, **but this calculation...** Now the Rambam means there should be another thing. Someone will be able to think that the Rambam himself said a bit earlier, that intercalation means the calculation is to have it with Pesach. In the first few chapters the Rambam has already calculated everything one needs to know to know our calendar, the practical calendar, the intercalation of years, moladot and tekufot.

He says, but he hasn't yet calculated, he's now going to say something at a greater level of wisdom than that. He says, a person will think that I already know everything, I already know the calculation. He says, no, the calculation that we calculate when there is no beit din, that is fixed according to the sighting, that we calculate today, which we use today for the calendar, which the Rambam has already calculated in the previous chapters, this cannot be what we speak of as the secret of intercalation that this is the wisdom, because this is a simple thing. **Even schoolchildren reach its end in three or four days.** It indeed takes three or four days, but in three or four days they can grasp it.

We indeed learned it in three or four days. So from this we see that a wisdom that takes three or four days to learn, cannot be that it's the high peak level wisdom.

Speaker 2: Right. One hundred percent.

Discussion: R' Chaim Vital's Similar Reasoning About Kabbalah

Speaker 1: You know who says similarly? R' Chaim Vital. When he criticizes the earlier mekubalim, he says that... no, about Kabbalah. Simply what he says is a similar reasoning. He says that people are so into Kabbalah. He says, I don't know, everything that the later mekubalim say can be learned in three or four days, or in three or four books. It cannot be that this means the secrets of Torah, because it's something simple. He is the ma'aseh bereishit, it means something deeper.

The Rambam says the same thing, it must be that the secret is what he's now going to say, because if this is a rule, if someone has learned Kiddush HaChodesh until now, even if it was already difficult for him until now, he still isn't yet at the level of schoolchildren of the Rambam.

Speaker 2: No, it's the truth that it's simple, they learned it, it's not... yes, once one learns the calculation, yes.

Speaker 1: Says the Rambam further. Yes. He says after all that one only needs the patience, that's why he says **in three or four days**. It takes until one makes the child actually apply their mind, but when they apply their mind it's only a few days.

Speaker 2: Right, but it's literally calculations, it's math, one can crunch it.

Discussion: The Ra'avad's Difficult Position

Speaker 1: The Ra'avad said that he doesn't know that either, this is my wonder. Why didn't the Ra'avad know what the Rambam says children can know? If the Ra'avad were on the chapter, fine, but the Ra'avad says it's earlier, by "lo yada rosh," the Ra'avad said that he doesn't understand. Can't give him the three or four days that he takes.

Speaker 2: I don't know. Bitul Torah (wasting Torah time), he didn't want to learn three or four days.

Speaker 1: And he says there that he didn't receive it from his teachers.

Speaker 2: When he held that it's not important.

Speaker 1: And he says there that his teachers didn't teach it. As if therefore it's not worth it, I want to now give away energy for this.

The Rambam's Second Apology: Why His Calculations Aren't Always 100% Accurate

Speaker 1: Okay, says the Rambam further another apology. Interesting that there are various apologies. He says like this, someone will learn this book, and he'll arrive at slightly different calculations. And he thinks, "Well, I figured it out better than the Rambam." Don't be so quick, says the Rambam.

Perhaps a wise man from the wise men of the nations will contemplate, or one of the wise men of Israel who learned Greek wisdom, and he'll learn in the Greek sages, he'll learn in Ptolemy for example the same calculations, **in these methods different calculations for the sighting of the moon.** He'll learn, he'll look at my methods that I use, my tricks, my mathematical calculations, and he'll learn from the other Greek sages, **and he will see a slight approximation in some of the methods.** He'll see different ways are closer to other numbers.

For example, the Rambam says about something that the difference will be such and such days and such and such hours, he'll see that it's missing a few minutes, a few seconds, he'll think **that this nature hasn't moved from it**, that I wasn't accurate enough, I didn't make it accurate enough, **and he won't know that in that method there is approximation**, I didn't know that I'm only saying it close to the correct calculation. He'll think that I didn't grasp it and I simply cut corners.

He says, all all all is not about I didn't know it, but because I made a calculation that many times it's not worth writing. Many times I knowingly left it out, **from the known things, especially in the geometries**, because I understood with the deep thinking into the deeper principles of calculation, I knew **with clear proofs that this thing doesn't cause loss in knowledge of the sighting, and we don't worry about it. Therefore we weren't precise about it.**

The Rambam's Method: "Cancelling Out" of Small Deviations

Speaker 1: Seemingly what I mean to say perhaps is also, that there are many times when... let's say the difference only comes out a few minutes, but over the course of many years, thousands, hundreds of years for example, it won't come out that the winter will be messed up. Many times there are small calculations that have a huge effect. And then there are calculations where it remains small.

What the Rambam says is a very important thing. When one makes an approximation, it's very useful, right? Like they spoke, and they didn't speak, we're speaking for the first time.

Speaker 2: No.

Speaker 1: Now, now, now, or there is see I added too much a bit. I said for example, actually it's only half a minute, I said a minute. Or actually there's another half minute that I didn't mention at all.

Translation

He says, **"We did this intentionally, because there is an advantage to it from another approach."** For example, when he needs to calculate and here there's still an extra half minute and there a half minute is missing, I'll leave out both, because this way the calculation is easier. Not because I didn't notice the remainders, but because here it wasn't so necessary to bring the remainders.

"Until the matter comes out truthfully in approximate ways without lengthy calculation." I left places where I left it approximate, because this way one won't need to make any deep calculations. **"So that a person who is not accustomed to these matters should not be confused."** Someone who is not accustomed to these things, he will see many numbers on both sides, by the plus and by the minus, he will see a bit too large a plus, a bit too large a minus. So I reduced both, in order not to become lost, **"in calculations that are not useful for the sighting of the moon."** When it's things that are important, that it accumulates from it that it becomes accurate, I will do it, but when there's still no practical difference I cut it down.

A Great Principle in Pedagogy: The Teacher Must Himself Know the Whole Picture

Speaker 1: So this is the principle of the Rambam's pedagogy. That when one teaches a person, the Rambam wrote here for people who are not accustomed, the one who is accustomed has learned the Greek philosophers and already knows. The Rambam says, the Rambam says to that person, there Modi, I didn't mean you, you already know, you know, be happy.

But now we're talking about someone who doesn't know, the Rambam wants to be a teacher, the Rambam was a very great teacher. He says, the principle of a teacher is not to confuse them in both ways. The teacher may not sell approximations, because it's close enough. It must be very very precise. But after you know the precision, you can know. But the teacher must know himself.

Why? Because you need to know what the goal of each calculation is. If here we only want to ask what the sighting is, it could be that Mars comes out completely not according to the calculation. But I'm not talking about Mars, I'm talking about the moon. So if regarding my purpose this is enough, this level of precision, I can leave out the levels of imprecision that are relevant. Understand?

Like every study, one of the principles of study is that one should know what one wants to get from it, and according to what one wants to get from it, that's how precisely one needs to learn. And for this the rabbi himself must know, if the rabbi doesn't know himself, he can make a mistake that is indeed relevant to his goal. This is the important distinction, understand?

Application to the Entire Mishneh Torah

Speaker 1: So, I mean but I thought that one can write this with the introduction to the entire Rambam's work, not just here. Because the entire Rambam makes certain abbreviations and he makes many laws simpler. The Rambam says, don't think it's because I don't know the Gemara the way the Raavad often thinks. No, I do know, I held that it's not a practical difference regarding the law, therefore I say it more simply.

Beginning of the Principles of Calculations — Law 7

Speaker 1: Until here is the introduction in a general way to this book, to this section of the calculations of the sighting of the moon. And from here he begins to say actual calculations.

Speaker 2: Yes, not yet, that is, the rest of this chapter he's not yet saying actual calculations, he's going to say principles that the calculations are built upon.

Speaker 1: Actually, all chapters until chapter 17 are certain principles, because only in chapter 17 does he come to say how one knows when the moon will be. But first he says general principles, like what are the numbers that will be used and such things. So, let's try to learn as much as we can of the simple things.

The Rambam says, **"The principles"** — does the Rambam mean principles or like foundations?

Speaker 2: Foundations is when the metaphor is a building, it's the foundations of the building. But when the metaphor is a tree, the main part of the tree. Both are the same thing, the bottom, the bottom line on which everything is based.

Speaker 1: "The principles that a person needs to know first for all calculations of seasons and gematrias." One must first know the facts, the principles, so that one can afterwards make the astronomical calculations.

The Base System of Degrees

Speaker 1:

Let me explain for a second why it's very relevant to us. He brings too many complications, I mean, the man.

The first thing, we're now going, what do we want to know? We want to know where in the sky one will find the moon, or whether one can find it at all, what is below and so forth. So one needs to have some address to be able to calculate. If I tell you it's there high, left, right, there's no way to calculate. There must be a way to calculate precisely. One must have an address. Right.

Therefore the sages, I don't know who, I mean the ancient Babylonian sages, decided a simple thing. Yes? That one should say that there is a sphere.

What "Sphere" Means in This Context

Now, I'll say here very clearly, because the Rambam held that there is something called spheres... This is not the secrets of the Torah. Yes, but let's learn here. Now you're not learning secrets of the Torah, now you're learning calculations of sighting. I say, now that there is a sphere, we don't know. Yes, and now the topic is where it works. Why? That the sphere is what rotates the stars upon it and so forth, we learned that there. But now it's not relevant.

What the Rambam says here "sphere," one can learn even if one doesn't believe in spheres. It has nothing to do with it, because sphere simply means the surface on which it runs. You don't even need to have a surface. The point is, that you go outside and outside, you see that the sky is round, it's around the entire world, you see that it's a sphere, a sphere.

The Division of 360 Degrees

So any circle, one divides it like this. How does one divide the circle? This is the law, this is the principle. One divides it into 360 parts, equal parts, which is called degrees. Yes, degrees is called in English degrees. Degrees is like steps, like there were sixteen steps at the Temple, it's the same progression. Degrees is the translation of degree. I don't know, perhaps degrees is the translation of steps, yes, because it goes up you mean? It's like a circle, it goes up and down, it also comes down. In English one says degrees, I'll say degrees, because that's what... Also in Hebrew one says degrees.

One divides the sky into three hundred and sixty degrees. It's interesting, because the sun goes around the sphere every year, it's almost exactly three hundred sixty-five. So every day it moves approximately one degree. Not exactly. I'm just saying that perhaps because of this comes the number, because it's approximately three hundred and sixty. Also they already learned, three hundred and sixty is a good number. But also that is, this is how one knows, that if you made a half circle, you made a 180, so made a full circle. Yes, yes. Our math still uses the same number of 360. I'm just saying that historically it comes from this.

Twelve Constellations

Yes, so how much is... if it's three hundred and sixtieth, it comes out how much each degree is. So, each degree is a three hundred and sixtieth of the full circle, of the full sphere.

And we know that in the sky there are twelve constellations. We divide, soon we'll still learn about the constellations, but we divide the sky into twelve constellations. Mainly, the part of the sky where the sun runs, or all the stars, the planets run, we divide basically into twelve. It comes out that each

constellation is 360 divided by 12, which is 30. Sorry, the continuation is twelve, yes? It comes out thirty degrees.

Constellations Are Names for Zones, Not Stars

There is each constellation, in other words, what we'll see later. We already learned a bit in Laws of the Foundations of Torah, what we call constellations has nothing to do with the pictures that look like. It's just thirty, we call it a constellation. Since if an empty sky we would have difficulty naming, now there is the moon. But through the constellations we can say which of the degrees we're talking about.

Speaker 2:

No, no, no, it certainly doesn't help. There aren't the stars of Aries there.

Speaker 1:

Aries is a name, it was a name for the first thirty degrees. That's all in the calculation. There aren't the stars of Aries there. No.

Speaker 2:

No, not today, there used to be.

Speaker 1:

There used to be, it changed. The Rambam already mentioned this in Laws of the Foundations of Torah, if I remember. There used to be the stars there, therefore it's called that. But what we call Aries is just a name for the first thirty degrees. There is **"and the beginning is from the beginning of Aries,"** we call it Aries. And this constellation goes clearly, if I remember, in Laws of the Foundations of Torah. One divides into twelve, each one is called a constellation.

How One Measures Degrees in the Sky

It's not difficult, because you need to have a measurer, you need to have some tool. There are such tools, what is it called? Such an angle tool that can show you degrees in the sky. That's the only way you can do it. Looking at the stars won't help you.

Chalakim, Seconds, Thirds – The Finer Divisions

Now, since sometimes we need smaller parts than the degree, like a degree, a degree is a three hundred and sixtieth of the sky, it's still a very very large area, one divides it a bit more. Yes? I can show you a picture, they understand simply, yes?

When he says **"their beginning,"** I want to bring the picture. Yes, what he means to say here is, you take the entire sky, you divide it into twelve. Now, in order to use numbers, one must simply accept the number somewhere. So the zero is here, so thirty is this, and so on.

One divides each degree into sixty, sorry, **"each and every degree into sixty chalakim."** And afterwards, in each chelek one can further divide. You can call it a minute, I mean that today one calls it minutes. And each is again into sixty, it goes in order into sixty.

Speaker 2:

No, no, nothing there.

Speaker 1:

No, no, exactly. A degree, a minute is a sixtieth of a degree. And the same thing, afterwards you divide that into sixty, **"sixty seconds,"** seconds. And the third, I don't know what it's called in English, these things, **"thirds,"** I need to check a second.

This way one can divide much more precisely. That's the word, right? **"So that the calculation should be precise and you can divide whatever you want."** You can divide it further. If you want to be able to calculate where specifically in the world a person is, or not in the world, in the sky, one can make it into thirds, and in the thirds themselves one can say in the thirds, where is the world.

The Connection to Our Time System

Our minutes of the hour also work, because in an hour there is, not in an hour, in ten hours it won't help here, because a minute is a sixtieth of an hour, and a second is a sixtieth of a minute, and so on. And one calls it minutes, seconds. Yes, shniya is a second, think about it. Shniya, the second, and thirds, and so on. One can make fourths, as one wants, and so forth.

A third doesn't mean here a third, it means again divided by 60.

In short, this is simply to know how exactly I'm going to tell you that something is at the address, to know what the address is.

The Rambam's Examples of Conversion

He says the Rambam, since I've now said that here is 360 degrees in everything runs from one, it comes out, many times the calculation, the calculation doesn't calculate with the constellations, the calculation starts from zero.

Therefore it's driven by the result, if a calculation will come out that a certain star, some star, should be in the sphere at the seventieth degree and thirty-three chalakim and forty seconds, you'll know that the star is in Gemini, why is it Gemini? Gemini begins at degree 60, it comes out 70 degrees is 10 degrees into Gemini.

The Rambam will say in a minute the order, but Gemini is the third, everyone remembers, the month of Sivan. It comes out 70 degrees is 10 degrees into Gemini, **"in half of the eleventh degree of this constellation."** He says that it's in the thirty chalakim, thirty chalakim is half, because there are 60 chalakim and 40 seconds. Of that chelek. Why? If I have Aries thirty degrees, then there is Taurus thirty, there remain ten degrees and a half from Gemini, and forty seconds of half the last degree. That means forty out of sixty, right? Seconds, sixty seconds.

The same thing, he makes it very simple, he simply teaches us how to calculate. The same thing if it comes out in the sphere three hundred and twenty. What is three hundred and twenty? It shows Aquarius, because if you look at our chart here, you'll go all the way to... the constellation Aquarius, which Aquarius goes from three hundred to three hundred and thirty, it comes out three hundred and twenty is two thirds of that, yes, **"at ten degrees in it." "And in this way for all the constellations,"** and here you'll know the order in the constellations.

Order of the Twelve Constellations

It goes like this, Rashi says an acronym Tashad, Sab Mek Kadad, one can remember, Aries Taurus Gemini Cancer Leo Virgo Libra Scorpio Sagittarius Capricorn Aquarius Pisces, one says in English words.

Speaker 2:

Vertl wants to know. And these are animals, yes? All are different in Sagittarius.

Speaker 1:

Animals or tools, interesting. Vessels. Gemini is twins, Gemini. Cancer is a fish, a crab.

Speaker 2:

From where did a crab become a name for cancer?

Speaker 1:

I don't know. It's called cancer in English, but cancer doesn't mean cancer. Back then it meant something that they made cancer based on that. Good question.

Leo, Virgo, Leo the lion of Judah, yes? It's not Elul.

Speaker 2:

Ah, yes, no, it's not Elul Virgo.

Speaker 1:

In short, no, there's a Torah, behind the lion and behind the woman. One shouldn't travel in the month of Av and not in the month of Elul. Leo Virgo.

Speaker 2:

Ah, Libra? Libra is Tishrei.

Speaker 1:

In short, by the way, what I say Tishrei doesn't really match, because it doesn't really go with the moon, it's just a little Torah. But anyway, not now in the topic.

These are the twelve known constellations whose names were given, I don't know, some ancient gentile. And it was based on imagination, that he saw that the moon shone, the sun rose next to where the groups of stars were arranged in a star system.

The Rambam doesn't hold of the symbol, he only sits on the star symbol.

Speaker 2:

No, the symbol he doesn't hold of, but as a good sign he holds of it.

Speaker 1:

Yes, exactly. Yes.

Conclusion: The Basis for Further Calculations

Now, we said the Rambam also, a very simple thing. I'll say it in Yiddish how I understand it, because the Rambam makes it much more complicated than it needs to be. Listen, if you don't listen you won't know. Because the Rambam says a very simple thing. Soon you'll see that we have different calculations. Yes.

Principles of Calculation: Addition, Subtraction, and "Borrowing" on a Circle

Speaker 1: The Rambam doesn't hold of the symbols, he says this is just a measure.

Speaker 2: No, the symbols he doesn't hold of, but as a good sign he holds of it.

Speaker 1: Yes, exactly.

Now, I tell you that the Rambam also, a very simple thing. I'll say it in Yiddish how I understand it, because the Rambam makes it much more complicated than it needs to be. Listen, if you don't listen you won't know.

What the Rambam says is a very simple thing. Soon you'll see that we have different calculations. The calculations give us numbers. For example, a number can be three hundred, or two hundred, or one, or four hundred. Numbers don't have to calculate with how much there is only 360 parts. It can be a larger number, a smaller number. And many times, in order to make the calculation, one needs to make plus and minus on a number.

That is, one must sometimes make three hundred plus two hundred, it comes out five hundred. Now, where is there five hundred? Or sometimes you need to do the opposite, you need to make two hundred minus three hundred. How can one make two hundred minus three hundred?

Negative Numbers on a Circle

In modern times there is a simple... There is a thing, it's called negative numbers, one has learned that one can do it very well. Two hundred minus three hundred is how much? Negative one hundred. But what does negative mean? Negative isn't a thing. Have you ever seen a negative number? On a circle it's very easy though.

Leo minus... one, one, one, is not Leo. Forget about Leo, Leo is just a number. Right, now a negative number on a circle is very simple. A circle starts in order again from zero. It comes out two hundred minus three hundred is what? Is one hundred before the hundred is two hundred. Right.

So you can, let's say, let's use the actual numbers. 360 minus 100 is 260, right? Or 360 minus 460 is how much? Also 260, right? Because it's already come back to that place on the circle. Right? If I do ten minus sixty here, I come back here. Understand?

The Rambam's Rules of Addition and Subtraction

In total, the Rambam wants to teach you here how to do the calculation, because with numbers, because with a circle it's very easy, but with numbers it's harder. In this halacha the Rambam teaches you, actually in the next halacha, I jumped, in the next halacha the Rambam teaches you how to do the calculation, because apparently people find it difficult to subtract a larger number from a smaller number, most people don't know how to do this, so he teaches how to do it, and he also teaches an algorithm, which is called in English "borrowing", which we learned in cheder, how one can do this.

So first the Rambam says this, we've already essentially learned this in the previous thing, he just says the rules of the, what's called the "place", which level number I use. The Rambam says a simple thing: **all calculations, when there's a remainder** - we learned that remainder means a "remainder" - **or when you add one number to another**, how does this work out? The Rambam says, **gather each type with its own type**, each type of number you must consider, yes? That means seconds with seconds, parts with parts, degrees with degrees.

If you have sixty seconds, you get a whole part, right? If you have a whole part, you have sixty parts, you get a whole degree. If you have a whole degree, how much is the "whole" of a degree? It's three hundred and sixty. The moment you have more than three hundred and sixty, you can subtract three hundred and sixty, because you're back at zero. So if you have a number that comes out to four hundred, you're actually at forty. Right? Wonderful. This is a simple matter.

The Rambam's Example with Borrowing

Then he says, how can one subtract a larger number from a smaller number? The Rambam says, the solution is simple, you add three hundred and sixty. True? This is the Rambam's

solution. It's a very simple solution, because three hundred and sixty is like starting fresh, right?

Then he gives an example that's even more complicated. If you have three levels, you have two hundred degrees with fifty parts with forty seconds - 250, 40 - you want to subtract from less, from one hundred, from one hundred and twenty and thirty. The Rambam says, what will you do? You'll add, but you must do it at each level. You'll add to one hundred three hundred and sixty, you'll have four hundred and sixty, now you can subtract.

Now, if you can't subtract a smaller number from a larger number because you have seconds, you can borrow from the next level, yes? For example, I'll just say it all at once, because I don't feel like going through the whole thing, but he says a simple thing: you want to subtract here - I wrote you the numbers, right? You want to subtract from one hundred ending with forty parts, and you want to subtract from thirty parts. You can't do thirty minus forty, doesn't work. What do you do? You take from the twenty nineteen, you're left with ninety here, because ninety seconds, because it's sixty, you can make fifty, and so on with all the numbers. The Rambam explains how to do this. It comes out in the calculation 259, 29, 50.

The Rambam as Rebbe

It's very simple. I mean anyone who went to more than even first grade math in cheder knows how to do this, but the Rambam was a very good rebbe. I mean in his times they didn't teach math well in cheder, even as well as in our bad cheders, I mean. You can do it, but back then it wasn't yet so developed basic symbols of math and this is another estimate of how weak others can be.

You went to Lakewood cheder versus Williamsburg cheder. They taught you to do subtraction with a long number. Well, it's not so complicated. And if someone doesn't know this, let him look up on the internet "long division with borrowing", and he'll see what the Rambam says, because I didn't look and I'm not going to teach this now in the Rambam, which are simple matters. These are the rules of math.

Mahalach HaShoveh: The Foundation of Uniform Motion

Now the Rambam is going to say the rules of the sphere that he calculates, because this is important. This is already a bit more astronomy and a bit more theory also. But we'll see, the theory, we already calculate today according to the theory, but the calculation still comes out correct, because it's just... that's how the calculation is. Let's see. Yes.

The Rambam's Assumption: All Stars Move Uniformly

The Rambam says, **the sun and moon and also the other seven stars**, the others, what we call the planets, the stars that we see are moving, so **the movement of each and every one of them in its sphere, is uniform movement**. It could be that each one has an extra sphere. Not it could be, the Rambam said there are ten spheres, and not all... not necessarily that they run on the same sphere. Each one goes on its sphere, but all go with uniform movement.

There's no such thing that a sphere should suddenly say today I'm very lazy, or sometimes have freshness at the beginning of the term and run faster. They all always go **without ceasing and without heaviness**, they don't sometimes get faster and sometimes stop. **Rather like yesterday's movement like today's movement, like tomorrow's movement**. As we say that He gave them a law of time that they don't change their function, like tomorrow's movement like every single day's movement. They're always consistent. And therefore one can make calculations. And if not there would be no place for calculations. This makes the calculations easier, one could make. But anyway, yes. If it's random, one can't make calculations at all.

Discussion: Mahalach HaShoveh is an Assumption, Not an Observation

Speaker 2: Yes, soon you'll understand that this is only a theory, because we don't see this. We do see that it's sometimes slower and sometimes faster. What does it do?

Speaker 1: Yes. What? The Rambam himself knows about this, and he's going to say it.

This is the thing called mahalach hashoveh. He says, this must be understood. Let's say a correct thing. When one looks at the stars, that means you look at the sun, you look at the moon, you look at the other planets, you'll see, not every day do they go the same speed. In fact, they don't always go the same speed. Sometimes they go faster, that is in a certain period of the years or certain years.

Speaker 2: No, but I'm telling you for example, we see the sun from a slightly different angle, therefore it can look fast because it's closer to us and so on.

Speaker 1: Could be, I'm just telling you the fact. If you see the sun, you know it's the easiest to see. And the sun moves, the sun slower in the winter, true? You see, it takes seventy hours, it comes from early morning until evening. But here there's a thing, for example, when the sun is setting, we see that the sun goes very fast. When it's in the middle of the sky, we see it go very strongly. But this is probably for our eyes.

Speaker 2: I just think that's correct. I just think that's correct. I think you see it all day. You don't look at the sun all day. You don't see that it goes faster at sunset. What you do see is that in winter it goes faster, and in summer it goes slower, and so on. I don't know, maybe now, do you understand what I'm saying?

Speaker 1: I don't know if back then you see it faster. I have no idea. Could be because you don't see so much the difference of the sky, but someone who looked closely, he would see. I don't know.

I want to say an important thing: we do see that they all go differently. The Rambam now says here, the sun and moon all go the same speed, which is called mahalach hashoveh. This is not something that anyone has ever seen. We see, you see, that it goes sometimes this way and sometimes that way.

The Sages' Answer: Eccentric Circles

But what? The sages and ancients had an assumption. This is a certain scientific, or you could even say a metaphysical assumption. And it also made it easier to calculate. Later they saw that it doesn't make it easier to calculate, so they stopped calculating that way. But they made an assumption that no, it can't be that a heavenly thing should go as you say, it can't be that one day it goes faster, one day it stops. Actually the assumption is still true in a certain sense, but not as they meant.

And therefore they said a piece of Torah, and they said that each one has its own sphere, and besides that it has the

relation of its sphere to us. In other words, where are we? It certainly has a picture of this, right? Not such a good picture.

In other words he said, that each one of the sun - I'll put any random picture and I'll show - any thing, for example the star that he shows here, it rotates on its circle, that is the yellow circle that we see here, it rotates in a punctual circle always exactly as fast, every day as fast as the second day.

Ah, why do we see here on earth, we see sometimes it goes faster, sometimes slower? They answered that there's another thing, that the sphere on which it rotates doesn't have to be exactly around us in the middle. It could be that we're exactly at an angle. It comes out that when it rotates here it goes slower, but when it's here on the other side it goes faster. It looks to us like it's standing. Understand? What am I explaining?

So basically, so the Rambam says, about this the Rambam says here, so this was a halacha, it's just an assumption that they had that it must be that it goes the same. Therefore what looks to us certain periods it goes faster, because it's closer to us, it looks like it goes faster. When it's exactly on the other side of its circle, it looks like it goes further.

Kepler's Innovation: Ellipses Instead of Circles

In modern times we have another answer to the question, which also generally holds that it goes the same speed approximately, but we found another answer because the sage Kepler came and he decided that who said at all that we go in a circle? Perhaps it goes in an oval, therefore on that side it goes slower. Also it could be that it travels the same speed, but it's slower relative to finishing. It simply travels longer.

In any case, this was their assumption, therefore all calculations are built with this. This is the innovation.

The Difference Between Sphere and World

But this is what the Rambam says here, look, therefore the Rambam says, the sphere, in its sphere, the dreidel on which it rotates, it travels uniformly. But the sphere itself is not, the world is not in the middle of it. **And the sphere of each one of them, even though it encompasses the world**, they all go around the world, you see, we see them go around the world, but **the earth is not in the center**, because if yes we would always have to look the same.

And this is what explains, the Rambam says, **therefore if you compare the movement of each one of them to the sphere that encompasses the world with the earth in its center**, there is indeed one sphere. How do we calculate both? We can't see how it is relative to the world, we see it only relative to the constellations. But the constellations are actually according to what they imagined that it's actually exactly around the world.

Therefore, the matter is the sphere where the world is exactly in the middle. But therefore, how you calculate, how it looks to us that the planets move at all in being, they move relative to the constellations. Therefore, if you see it relative to the constellations, then indeed **its movement will change, and its movement on this day in the sphere of constellations will be found less or more than the average movement by what its movement is**. Yes, very simple.

Therefore, these are all rules. The Rambam doesn't yet tell us how it stands and how fast, we'll learn that later.

Understanding Mahalach Emtza'i and Mahalach Amiti

Therefore you understand a rule, there's a thing called mahalach hashoveh. A mahalach hashoveh that the sun and moon go, all of them are the same type of thing according to them in its sphere, it's called emtza a mahalach, the middle movement, which always travels the same.

But the mahalach, or the mahalach hashafal or the mahalach ha'emtza, **and the movement that will be in the sphere of constellations which is sometimes more sometimes less, it's called the true movement**. That is, both are true but relative to us, when we'll truly see it. **And this will be the place of the sun and the place of the true moon**, true doesn't mean relative to itself, but relative to us.

Digression: The Meaning of "True" — Relative and Subjective

Very interesting, true means what we see as truth, and emtza is... both are true, they understand, it indeed goes there, it's indeed closer, but I mean relative to here it's relevant to call it true, because we want to know the sighting of the moon, we don't want to know what the moon does in its own sphere.

But there's such an existentialist way of looking, that truth is what... yes, I can say in conversation, but sometimes I say, because true is not... people think that subjective... what do we say a great principle in Torah? People are very confused.

What does subjective mean? People think that subjective and relative are the same thing. Relative can be completely exact. What we are here is relative to the world, it's a true thing, it lies closer to the world. It's not true... what does true mean?

And what we call here true is because we want to know where the moon is, that's what I mean. But do you understand? I'm not happy with those who say that therefore truth is what looks true to us. It's what looks how far is something? Further or closer is a relative thing, but it's not a lie, it's not imagination, one can be mistaken in other words.

If it looks to you that it's closer to you, and it's further from you, you made a mistake. Understand? This is one rule that the Rambam says.

Halacha 16 — The Foundation of the Calculation: The Time and the Place

Now the Rambam says another interesting rule also: this is not relevant, doesn't help us anything yet, it will only help us later. The Rambam says, I haven't yet understood this one hundred percent so well, but I'll learn what he says.

We already said, that is I understood the reasoning, but what he says is actually simple: **all these methods that are not explained in these laws**, we won't learn about for example the planet Venus and Mars when we see it, it's not our topic, **there is only for the calculation of the sighting of the moon certainly**, we only care about the moon.

Therefore, because we only need to know the moon, **we made the foundation from which we always begin the calculation**. The Rambam has an assumption that in order to calculate easier, one must always assume the calculation somewhere, as they saw previously, and they started from the creation of the world, and so on. He starts from perhaps a point where one will be able to calculate easier there. Right.

The Rambam's New Foundation — The Year of the Foundation

Now, interestingly, I saw that Rav Rabinovitch mentioned this earlier, he noted, that the Rambam didn't start from there. He already had two foundations. He already had the foundation of

Shmuel, of Rav Ada, from where does the molad begin on Thursday evening? Yes? They already had such foundations.

The Rambam makes a new foundation, he makes his own foundation. It could be simply because he makes a time in his time, because it will be easier to calculate. Rav Rabinovitch argues an interesting thing, that the Rambam made a new foundation because he understood that the calculations that have been learned until now are not exact, and in the Rambam's time it had already accumulated a big difference from that and the true calculation. And with what he makes here a new foundation, he's hinting that when Messiah will come, the Beit Din will have to go with the true calculation, not with the calculation that was taken then, because there are already too many errors with that.

But it could be just that it's easier. But the Rambam says that about this, it's not clear about what. That is, for some reason, in this calculation it's easier to calculate the moon. If it would have been a different molad it would perhaps have been harder, I don't know.

The Time of the Year of the Foundation

Translation

He made it, when is the... when does it begin... That is, the main calculation simply means to work, it doesn't mean anything, it's simply to make the calculation easier. The Rambam made it, when... when is the Rambam's... in English this is called an epoch. Yes, every calculation, where is its zero?

"The beginning is from Wednesday night, which is the third day of the month of Nissan of this year." The year, the year that the Rambam wrote this book. Now there is an understanding when the Rambam wrote this book, this is the part of it. Wednesday, the beginning of Wednesday night, which is the 3rd of Nissan, **"which is year 17 of the 260th cycle."** We already saw earlier that the Rambam holds with the 260th cycle. **"Which is year 4938,"** yes? Year 4938. This is the year that the Rambam wrote this, which is from the creation of the world. **"According to the Seleucid era it is 1489."**

The Seleucid Era and the Destruction

Shetarot (the Seleucid era) is an interesting calculation. What is shetarot? They used to write this in documents. Shetarot is a count from the kingdom of Alexander the Great. Go understand, but the custom was for a long time that on documents Jews would write according to the Greek kingdom. It already says in the Mishnah "according to the Greek kingdom." This is a count that is called "according to documents." And in the times of the Rambam it was 1489.

"Which is year 1009 from the destruction of the Second Temple." It also appears that people used to count from the destruction. It appears in our kinot (lamentations) something is written, yes? But it appears that this was used as a number. Like on a check one would write this.

That the Almighty made the day as a statute for... one should count from this? As if when it would have been the world, one would count from the building of the Temple. Now that it is destruction, one will count the destruction. From when it became a world, yes. Interesting.

When Did the Rambam Write This Section?

Anyway, it's interesting because... earlier the Rambam used a different year, so he says. Another time he used a different year of how many years one counts from it. A bit, here it says 4938, yes? And there it said 4935.

It could be that this chapter, from this there is a reasoning that this piece he wrote later, because these are more complicated laws. In short, it's not relevant, it's just an interesting history, that here it appears that... that this law the Rambam wrote later. When he was proofreading, the last proofreading he wrote the time.

It could simply be that this section, you see clearly that these chapters are something of an extra part. He couldn't learn, he was holding in the middle of learning Seder Moed which he wrote in Sefer Zemanim, he couldn't learn this. He had to learn extra, and devote his time to learning astronomy, I know.

The Lubavitcher Rebbe's Interpretation

You see, the Lubavitcher Rebbe says from here, from here one sees that... he says more what he says. He says that the time that the Rambam writes here is the time when he was proofreading the book, not when he wrote it. Says the Lubavitcher Rebbe, from here one sees the concept of "each day should be in your eyes as new." That when he was proofreading, he looked at it as if he's learning it through now, he's writing it over. Perhaps it only needs a small correction. So obviously he must write the time now when he's learning it.

But I don't hold that this is the plain meaning, because the Rambam's entire calculation is built on this. It's not a correction. He says how one begins the calculation. He had to change the entire thing. It's not reasonable.

It's more reasonable that he wrote it actually extra. And one will look, I remember that he says something about this. What makes all these apologies at the beginning of the chapter is because the Rambam already had... the book Mishneh Torah was already more or less ready, yes? He had already organized all parts of the Torah, and he was still stuck with something a few... and imagine the pressure, everyone was telling him, "Where, the holy book, give it out already, gone!" And he's still stuck with some calculations. He had various friends why it's so important to him.

The Rambam in his introduction mentioned which year he's writing the book, and it's one year before this year, 4937. He says, "the eighth year after the destruction." A year after this he wrote this section, so it must be. Ah, he wrote very quickly. No, again. Ah, it can take a year to write Hilchot Kiddush HaChodesh.

I'm just saying that the Rambam already published his book before he put in this piece, because he already wrote the introduction, which he wrote at the end. I mean, imagine, he writes the year when he gives it out, and then this wasn't there yet, because he writes here that the year is 4938. Very interesting. So it appears that it was later.

Anyway, this is the main year, this is the zero year. The Rambam calls it the main year.

Law 17 — The Place of Calculation: Jerusalem

The Rambam must say another principle, how do I make my calculations? That is, I've now said from when. The Rambam says an interesting thing. Which point on the world? Right, one must make some point on how.

Says the Rambam, since the sighting is only in the Land of Israel, as one learned Hilchot Kiddush HaChodesh about making in the Land of Israel. The Rambam said, he made it

that all calculations are built on the city of Jerusalem or other places that are close to it, up to six seven days, where there one sees the moon and one comes. Although a witness comes only from one day, I don't know why he says six seven days, but perhaps according to his calculation it's the same, one sees the moon at the same time.

But how must one be in degrees? Ah, he says, where is the place? Now, the Rambam didn't say it explicitly, but one can divide the world the same as one said that one can divide it into three hundred and sixty degrees. One can do it both ways, right?

It comes out that the place, where is Jerusalem? **"It is inclined below the equator that circles in the middle of the world."** There is an equal place in the middle of the world, in the middle of the two extremes, right? **"And below it, toward the north wind,"** a bit more north. Again, it's higher, it's a bit higher than the equator, **"about thirty-two degrees to thirty-five and nine."** That is, it's a wide area. He took from 29 degrees to 32, yes, correct? That is, 32 is in the middle, but from both sides, from 32 to 35 or to 29, there is the

Horizontal Position: East-West

Speaker 1: Is that actually? I don't remember. Yes, this is how the Rambam calculated. Now, in which direction horizontally, in which direction from east to west? He says, **"And so it is inclined from the middle of the inhabited world."** Once there used to be a number called "the middle of the inhabited world" — there where the dateline is, anyway, approximately in India, and approximately 24 degrees, between 27 and 21. That is, 24 from one side, there is actually Jerusalem, approximately.

And in modern times one made some other number from where one counts, from Greenwich. No difference, but the Rambam calculated "the middle of the inhabited world" itself, and from there he calculated to the west side is there Jerusalem. Anyway, this is the place where...

Why Is It Important to Know the Location?

Later there will be a question, why is it important to know where one stands? Ah, yes, you understand yourself, **the moon is seen in every place at a slightly different time**, that this is what he wants to show you. But in order to make the calculation easy, he says where he is, and you who are not there, yes, you can add perhaps degrees you will know.

The Molad Is Announced According to Jerusalem

I mean, it's interesting that our... we announce the molad... yes, the Rambam had different degrees because he starts from some place called "the middle of the inhabited world." The time difference is still the same.

What did I want to tell you? He says that today one knows that Jerusalem is approximately there, in short. The Rambam wasn't wrong. Yes, seemingly, I mean that today when one announces the molad, one also announces the molad **where it is in Jerusalem, not where it is here**, because there one makes kiddush hachodesh (sanctification of the new month).

Anyway, these are principles that one must know in order to learn further.

Digression: "Mi She'asah Nissim" and "Chaverim Kol Yisrael"

Speaker 2: What could be about this? Before one announces the molad, one says the "Mi she'asah nissim... yikabetzenu... in the four corners of the earth." I'm now going to say the molad, but no one knows from where. One announces the molad in Europe and in Australia, everywhere one says the same molad.

Speaker 1: "Kabetzenu"...

Speaker 2: No, in general, why there can one make kiddush hachodesh.

Speaker 1: I mean that this means... yes, that's actually the plain meaning, I think. Wonderful. Okay. I mean that "chaverim kol Yisrael" (all Israel are united) means that we are not from the sects that make a false kiddush hachodesh. Or that will make kiddush hachodesh everywhere, in Babylonia and in America extra.