

## **The Jewish calendar during the Talmudic period.**

*It was always believed that the transition from the observation to the fixed calendar was clear-cut, with the fixed calendar immediately adopting its definitive form. In the present paper, we try to outline the history of the Jewish calendar from the Mishna period—roughly the beginning of the third century—until about 420 C.E. We prove the existence of substantial Talmudic evidence allowing the outline of this evolution; the systematic study of this material was never undertaken. We explore the progressive evolution, hardly seamless and immediate, toward the precedence of calculation and predictability upon observation and empiricism. We show the significant changes occurring under the direction of Rabbi Johanan. Later it seems that from about 290 onwards, the council of intercalation in Tiberias, began to introduce calculation instead of observation and was able to foresee the calendar in advance. This would explain how Rav Safra, a traveling Babylonian Rabbi close to the members of this council could know in advance the Palestinian calendar while traveling in Babylonia.*

*It seems further that as soon as about 325, when Abbaye became the head of the academy of Pumbedita, the Council of intercalation in Tiberias began to communicate the keviah of the coming year to the Babylonian academies, which began to know the “fixing of month”. The span of time between this period and 358 – 359, the date of the introduction of a fixed calendar, would have been used to shift and advance a calendar replicating an observation calendar to a calendar centered on mean conjunctions.*

*The transition from a variable to a fixed and predictable calendar occurred thus progressively during the first half of the fourth century and ended by the middle of this century.*

*Finally we explore the most significant rabbinical positions in response to the history of the Jewish calendar and its transition from empiric to fixed structure.*

# The Jewish Calendar during the Talmudic period.

## 1. The Communication by Fires<sup>1</sup>

As far as we know, the calendar was established during the period of the Mishna on the basis of the testimony of witnesses who saw the new moon. We have clear evidence that Rosh Hashanah and Yom Kippur could fall on any day of the week.<sup>2</sup> The Neomenia communicated to the people of the Diaspora via fires informed them that the former month was defective (29 days). They lit these fires on hills, which allowed for rapid communication<sup>3</sup> to Babylonia,<sup>4</sup> which is reminiscent of the optical telegraph used around 1870 C.E. The Jews who lived on the roads near the hills received the information of the date of the Neomenia on the same evening and all could know the dates of Yom Kippur and the other festivals with certitude. But those who lived further away from this road had no information at all and had to rely on an empirical calendar of months of 29 and 30 days successively. Unsure, they had to observe two festival days out of doubt, and they perpetually worried that their calendars would indicate a difference of one month with the Palestinian calendar, due to a difference of intercalation. Even as the Temple still stood, an enactment was adopted which restricted the court's office hours for examining witnesses' testimonies of the observation the new moon, until *Minha*,<sup>5</sup> the time of the offering of the afternoon sacrifice (Tamid). Later testimonies were delayed to the following day. After the destruction of the Temple, Rabban Johanan ben Zakaï re-established the prior policy of the Court examining testimonies until night fell.<sup>6</sup>

## 2. The Communication by Messengers

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<sup>1</sup> The Talmudic quotations are according to the text of the Vilna editions of the Babylonian Talmud and according to the text and the reference of the Krotoshin edition of the Jerusalem Talmud followed by the reference of the Vilna edition.

<sup>2</sup> See the following references in the Mishna: Sabbath XV, 3 and 19; Menakhot XI, 7 and 9. See further Maimonides' commentary of the Mishna Menakhot XI, 7.

<sup>3</sup> It is clear that this communication middle could only be used in areas comprising hills; it required also a Jewish population along the way. These requirements restricted much the possibility of the system. It is clear that most of the Jews of the Diaspora had no regular information and they must find their way with a schematic calendar based on their own observation of the moon or later with a schematic fixed calendar as described in Tosefta Arakhim I: 8 (I: 4 in the Vilna edition). R' Isaac Israeli (Yessod Olam, edition B. Golderg 1848, 4:5, p. 8d and 4: 6, p. 10d) had already suggested that the Babylonians observed a calculated calendar based on the conjunction which differed systematically by one day from the Palestimian *keviyah*, as the latter was based on the sighting of the new moon. They needed additional information in order to know the intercalated years. The Talmud mentions in this respect letters sent by the Patriarch Rabban Gamliel to Galilee, the South, Babylonia, Media and the whole Diaspora, see B. Sanhedrin 11b, Y Sanhedrin 18d and Tosefta Sanhedrin II: 6.

<sup>4</sup> See B. Rosh Hashanah 22b-23a and Y. Rosh Hashanah II, 2,58a. Stern (2001) examines the problem pp. 162-163. He asks himself if the beacon procedure was ever really carried out, and if so, whether it could have been effective.

<sup>5</sup> Probably 9h 30m temporary hours i.e. 15h 30m p.m at the equinox.

<sup>6</sup> Mishna Rosh Hashanah IV, 4.

The Mishna Rosh Hashanah II, 2 tells us that the Samaritans were lighting fires when it was not wished, i.e. when the month was a leap month, in order to frustrate the communication of the calendar. In response, a radical change in the way of communication of the Jewish calendar became necessary. Rabbi Judah the Patriarch<sup>7</sup> (second half of the second century) suppressed the communicative fires, which obliged the Babylonian population to adopt the principle of two festival days out of doubt about the correct day.<sup>8</sup> Nevertheless, and without waiving the former principle of respecting two festival days, it became the rule to have Tishri<sup>9</sup> and probably also Adar<sup>10</sup> defective, so that the Jews of the Diaspora and even the Palestinians might celebrate the festival days together, without any concern. The case of Elul was specifically aimed to synchronize the fast of Kippur. We have no elements to date this new custom, which is presented in the Talmud as having found its origin during the time of Ezra. This system has certainly existed for a few centuries.

### 3. Slow evolution of the observation calendar toward a fixed calendar

The chronological classification<sup>11</sup> of the following Talmudic passages shows that the transition from the empirical calendar to a fixed calendar was much more progressive and less clear-cut than currently believed.<sup>12</sup> It shows that before the institution of a fixed calendar in 358 C.E., an early version of a pre-calculated calendar was communicated to Babylonia from approximately 325 C.E. onwards. In fact, even before 325 C.E., probably from about 290 onwards the calendar committee of Tiberias used calculations and sets of rules to establish the Neomenia (fixing of the month) at the expense of the traditional empirical observations.

#### *A. Before 210 C.E.*

##### *1. Rabbi, (also called Rabbi Judah ha-Nasi or Judah the Saint, died about 210 - 220 C.E.)<sup>13</sup>*

Rabbi suppressed the fires (see above).<sup>14</sup>

<sup>7</sup> Y. Rosh Hashanah II: 1, 58a (11b in the Vilna edition).

<sup>8</sup> As mentioned above the beacon system could have been more theoretical than effective and therefore the principle of two festival days “out of doubt” may have been much older and may have concerned all the regions of the Diaspora which were out of reach of calendric information.

<sup>9</sup> B. Rosh Hashanah 19b and Y. Sanhedrin I, 2, 18d, 5b in the Vilna edition.

<sup>10</sup> Y. Sanhedrin I, 2, 18d, 5b in the Vilna edition.

<sup>11</sup> I am fully aware of the limits of this method because of the uncertainties about the name of the authors of the different quotations. However the Talmudic material remains the only internal source of information allowing the outline of the evolution of the Jewish calendar during the fourth and the fifth centuries.

<sup>12</sup> Stern (2001) has also suggested that the transition from an empirical to a fixed calendar may have been slow and gradual (p.180 and p. 240) but his assumption remained unsubstantiated.

<sup>13</sup> In the same period, with the approbation of Rabbi, who was still living, Rav (Abba bar Eivu) the nephew of Rabbi Hiya departed for Babylonia and created the academy of Sura. He died in 247 C.E. (Epistle of Rav Sherira Gaon, in short ESG III, 2, p. 68. The references are according to the edition of Aaron Heyman.

<sup>14</sup> Y. Rosh Hashanah II,1, 58a.

Rabbi displaced the obligation to intercalate in Judea to Galilee, in order to enhance the prestige of the patriarchate whose seat was in Galilee.<sup>15</sup>

During the life of Rabbi, the Sanhedrin became more lenient in examining the witnesses of the new moon (and therefore laxer in declaring a new month). For example, in Babli Rosh Hashanah 25b, Rabbi sent Rabbi Hiya to sanctify the new moon of Tishri, although it was certain that the new crescent could not yet be seen.<sup>16</sup> This testimony was obviously wrong, but Rabbi and Rabbi Hiya accepted it to respect the rule that Elul and Adar should be defective (29 days).<sup>17</sup> The purpose of this rule was to help those people who were out of reach of the calendar envoys to observe the true holidays together with their Palestinian peers. It also aimed to make them more comfortable by fasting Yom Kippur on the true day, together with the Palestinians.

The next passage of Yerushalmi Aboda Zara<sup>18</sup> relates probably to the beginning of this period:

אמר רבי יודן, קרייא מסייע למה דאמרי חברייא, וביום עשרים וארבע לחודש השביעי נאספו בני ישראל בצום ובכי ושקים ואדמה עליהם. ולמה לא אמר בעשרים ושלושה, משום בריה דמועדא. אין נימר דהוה בשוכתא, לית יכיל דאת מחשב ואת משכח צומא רבא בחד בשוכא. ומה בה ולית רבי חוניא מיקל למאן דמעבר ליה מן אתריה. אמר רבי יוחנן בר מדיא אנא חשב יתה ולא הוה בשוכתא.

*Rabbi Judah says that the text of Nehemiah about the meeting and the fast of the people on Tishri 24 comforts the opinion of the Rabbis. Indeed why didn't they gather on Tishri 23, certainly because of the "son of the festival."*<sup>19</sup> *Should we explain that it didn't occur on Tishri 23 because it was a Sabbath, then if you calculate you will find that Yom Kippur was on Sunday! And is that a great deal? Doesn't Rabbi Hounia hold in contempt those who intercalate the year in order to displace Kippur from its place (Sunday)? Said Rabbi Johanan bar Madia:*<sup>20</sup> *"I made the calculation and Tishri 23 didn't fall on a Sabbath."*

Apparently this passage is related to the situation when the *dehiyot* or postponements *lo DU Rosh* were not yet enacted but there were already voices in their favor. This passage could perhaps correspond to the time of Rabbi when this *dehiya* was not yet practiced; Rabbi Hounia likely corresponds to the *tana* רבי חוניא דברת חוורן,<sup>21</sup> an expert and member of the council of intercalation<sup>22</sup> and Rabbi Youdan to Rabbi Judah bar Ilay.<sup>23</sup>

<sup>15</sup> Y. Sanhedrin I: 2, 18c.

<sup>16</sup> B. Rosh Hashanah 25a. Another version is found in *Yalkut Shimoni*, chap. 191.

<sup>17</sup> **Elul**: B. Rosh Hashanah 19b and Y. Sanhedrin 1:2, 18d (5b); **Adar**: Y. Sanhedrin I: 2, 18d. (5b).

<sup>18</sup> Y. Aboda Zara I, 1, 39b, (4a).

<sup>19</sup> This is certainly the origin of the custom of אסרו חג.

<sup>20</sup> Rabbi Johanan ben Madia was a Palestinian Amora of the fifth generation, contemporary of Rabbi Mana II, second half of the fourth century. He lived more than hundred years later than Rabbi Hounia. In his time the calendar by vision was no more in use and the new pre-calculated calendar was operational.

<sup>21</sup> Palestinian deformation of חנינא. He was a *tana*.

<sup>22</sup> See Y. Aboda Zara III, 1, 42c, (18a).

כד דמך רבי חנינא דברת חוורן איתבזע ימי טבריא. אמרין כד הוה סליק לעיבורא הוה ימא מתבזע קומי.

<sup>23</sup> Rabbi Judah bar Ilay was a *tana*, disciple of Rabbi Tarfon and Rabbi Akiba. He is often quoted simply as Rabbi Judah. Rabbi Judah was older than Rabbi Hounia, but the latter lived to an old age, and survived

*B. From 210 until about 300 - 305*

1. *Rabbi Johanan.* – From ~239 C.E. until ~279 C.E., under the leadership of Rabbi Johanan, the calendar was still empirically based on the observation of the new moon. Nevertheless, R' Johanan introduced a new rule: in order to avoid Yom Kippur falling on a Friday or Sunday, the first day of Tishri cannot fall on Wednesday or Friday. This rule is mentioned in the declaration of Ulla (Babli Rosh Hashanah 20a):

כי אתא עולא אמר, עברוה לאלול, אמר עולא, ידעי חברין בבלאי מאי טיבותא עבדינן  
בהדיהו

*When Ulla arrived in Babylonia, he said that Elul had been made full [thirty days]. Ulla said: our Babylonian colleagues know what a pleasure we are making for them [by taking the necessary measures to prevent the occurrence of Yom Kippur near to Sabbath].*

Before this time, all weekdays were suitable for Rosh Hashanah.<sup>24</sup> Now, Wednesday and Friday were no longer suitable, requiring some manipulations<sup>25</sup> of the testimony by the witnesses (Babli Rosh Hashanah 20a):

שלח לי רבי יהודה נשיאה לרבי אמאי, הווי יודעין שכל ימיו של רבי יוחנן היה  
מלמדנו, מאיימין על העדים על החודש שלא נראה בזמנו, אף על פי שלא ראוהו, יאמרו, ראינו

*Rabbi Judah II sent a message to Rabbi Ammi: you should know that during all the years of his reign, Rabbi Johanan taught us to frighten the witnesses in the case of a new moon that has not been seen in its proper time [the eve of the thirtieth day], so that they testify that they saw it even if they did not.*

Therefore, if it was necessary to have a defective month, they resorted to frightening the witnesses (*Kiddush le-Tsorekh*).<sup>26</sup> If it was necessary to have a full month of 30 days, they could frighten the witnesses for the reason of annulling the testimony (*Ibbur le-Tsorekh*). They could also, if they were reluctant to unfairly frighten

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Rabbi Meir. The latter attended the marriage of Rabbi's son. Rabbi Johanan bar Madia was a much later Amora of the time of Rabbi Mana. His statement is from after the establishment of the fixed calendar. He made a retroactive calculation, using the rules of the new calendar and extrapolating it into the past (proleptic calendar), to prove that Tishri 23 was not a Sabbath.

<sup>24</sup> Mishna Shabbat 15:3 and 19:5, Mishna Menahot 11:7 and 11:9, see also Babli Sukkah 43b and the commentary of Maimonides on Menahot 11:7.

<sup>25</sup> The purpose is to prevent Yom Kippur from occurring on Friday or Sunday because of the difficulty of remaining for two days without fresh vegetables or without the possibility of burying the dead due to the co-occurrence of two consecutive festival days with the same restrictions, Yom Kippur and the Sabbath.

<sup>26</sup> The problem is debated. It was apparently easier, religiously speaking, to arrange for positive testimony about something false than for negative testimony about something true.

witnesses,<sup>27</sup> reach the same result by delaying the procedure until the night. Ultimately, we find three to five cases in the Talmud, in which Elul was not defective,<sup>28</sup> and all of these cases correspond to this period. The Babylonians were not pleased, and in fact even embarrassed,<sup>29</sup> contrary to Ulla's assertion.

## 2. *Another decision of Rabbi Johanan*

Another decision of Rabbi Johanan was a decree obliging those areas, which were reached by the envoys of Nissan but not by the envoys of Tishri<sup>30</sup> to observe two festival days even in Nissan.<sup>31</sup> However it is likely that this *takana* is more ancient and was already enacted before the leadership of Rabbi Johanan. We find indeed a dictum<sup>32</sup> by Rabbi Johanan on behalf of Rabbi Simeon ben Yehotsadak:<sup>33</sup>

דאמר רבי יוחנן משום רבי שמעון בן יהוצדק שמונה יום בשנה יחיד גומר בהן את ההלל  
ואלו הן, שמונת ימי החג ושמונת ימי חנוכה ויום טוב הראשון של פסח ויום טוב של עצרת.  
ובגולה עשרים ואחד יום, ואלו הן, תשעת ימי החג ושמונת ימי חנוכה ושני ימים הראשונים  
של פסח ושני ימים טובים של עצרת.

*We read the complete Hallel on eighteen days a year, eight days of Sukkot, eight days of Hanukah, the first day of Pesah and the day of Shavuot.  
In the Diaspora we read it on 21 days, nine days of Sukkot, eight days of Hanukah, the two first days of Pessah and the two days of Shavuot.*

We see thus that already prior to the leadership of Rabbi Johanan, there was one unique rule in the Diaspora for the three festivals. As soon as the messengers of Tishri did not reach in time, they held two festival days on the three festivals,<sup>34</sup> there were no

<sup>27</sup> There remains much incertitude in the Talmud and in Maimonides' *Hilkhot Kiddush ha-Hodesh* about the way the council of intercalation used these rules.

<sup>28</sup> Babli Rosh Hashanah 21a: the case of R' Nahman; B. Rosh Hashanah 21a: the case of R' Rava; B. Rosh Hashanah 20a: the case of Ulla; B. Rosh Hashanah 21a: the case of Levi; B. Rosh Hashanah 21a: the case of R' Eibu bar Nagadi and R' Hiya bar Abba.

<sup>29</sup> The situation was worse than before. The former situation (when Yom Kippur could fall on any day, even on Friday and Sunday) gave them a certain comfort and security about the fast of Yom Kippur, because Elul was always defective. But in the new situation, there were three to five cases related in the Talmud, in which there was a difference of one day between Palestine and Babylonia. This situation leads to the conclusion that the Babylonian *Amora'im*, contrary to the assertion of Ulla, did not know the reason behind the new decision. Otherwise, they would have adapted themselves to the new situation and they would have taken advantage of it. It appears that they were not able to decide when they should make Elul full.

<sup>30</sup> These areas were beyond the reach of the envoys of Tishri because the latter had two days less at their disposal to travel, the second day of Rosh Hashanah, which was not held at the place of the Council of intercalation, which preceded to the sanctification of Tishri and the day of Yom Kippur.

<sup>31</sup> B. Rosh Hashanah 21a: מכריז רבי יוחנן כל היכא דמטו שלוחי ניסן ולא מטו שלוחי תשרי ליעבדו תרי יומי גזירה ניסן אטו תשרי

<sup>32</sup> B. Ta'anit 28b and B. Erakhin 10a.

<sup>33</sup> Palestinian Amora of the first generation, at the transition from the tanaic period. He was the teacher of Rabbi Johana and Rabbi Yanay.

<sup>34</sup> Maimonides writes in *Hilkhot Kiddush ha-Hodesh* III :12, that in order to avoid any difference in the keeping of the festivals, one must keep the two festival days on the three festivals, even on Shavuot, as

intermediary solutions. The second festival days of Tishri were held out of doubt;<sup>35</sup> the second festival days of Pesah in Alexandria and the second festival day of Shavuot even in Babylonia were held because of this rabbinical enactment and were considered as a doubt of rabbinical order.<sup>36</sup>

3. *Rabbi Yose* – Yerushalmi Sanhedrin 5:3 says:

ואמר רבי יסא, כגון אנא דמן יומי לא צלית מוספא מן דלא ידע אימת ירחא

*Rabbi Yose said: for example, someone as me, who never prayed Mussaf<sup>37</sup> on Rosh Hodesh when he didn't know the exact day of the new moon.*

From the context, we see that R' Yose must be Rabbi Yose bar Hanina, Rabbi Johanan's important pupil and colleague. The exact significance of this passage has never been examined in detail. Rabbi Yose is probably a member of the academy of Tiberias, and on the thirtieth day of each month, he did not pray *Mussaf* before the proclamation, in case the Neomenia would be postponed until the next day. This decision seems to be the only acceptable stance for someone living in Tiberias. But why did R' Yose take exception more than anyone else?

I believe that the original meaning of this passage is that Rabbi Yose did not want to pray *Mussaf* if Rosh Hodesh had not been fixed on the proper day of the first sighting of the lunar crescent. His decision must have been a reaction against increasingly numerous cases of manipulation of the calendar, and its significance was forgotten over time.

4. *Levi*.<sup>38</sup>

Rosh Hashanah 21a states:

לוי איקלע לבבל בחדסר בתשרי, אמר בסים תבשילא דבבלאי ביומא רבה דמערבא, אמרי ליה אסהיד, אמר להו לא שמעתי מפי ב"ד מקודש.

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soon as the messengers of Tishri could not arrive in time. The commentators give as Talmudic reference the passage in B. Rosh ha-Shanah 21b: ..... מכריז רבי יוחנן. However the remark "even on Shavuot" is not commented and seems to be the own reasoning of Maimonides. The truth is that this remark is not the result of Maimonides' own reasoning but a deduction from the teaching in the name of Rabbi Simeon ben Yehotsadak and therefore the reference should be the quotation of Rabbi Johanan in his master's behalf in B. Ta'anit 28b and B. Erakhim 10a.

<sup>35</sup> ספק דאורייתא

<sup>36</sup> ספק דרבנן

<sup>37</sup> Stern (2001) p. 164 translates מן ד as "because." According to Stern, R' Yose never prayed Mussaf, which seems odd and incorrect. How could he not know the fixing of the month in his capacity of an important member of the Academy of Tiberias and as a very close pupil of R' Johanan? Furthermore, Stern's understanding is in contradiction with the two classical commentaries *Korban ha Eda* and *Pnei Moshe*.

<sup>38</sup> Levi was a colleague of Rav, perhaps younger than him but certainly older than Rabbi Johanan.

*Levi happened to be in Babylonia on Tishri 11 and he said to the people: How appetizing is the meal of the Babylonians on the day of the great fast of the Palestinians.*

Levi ben Sisi was one of the closest pupils of Rabbi, later a disciple of Rabbi Hanina bar Hama, and finally a friend of the father of Samuel in Babylonia. Samuel learned under him. Some commentators have believed that he arrived on this very day<sup>39</sup> in Babylonia, or more precisely that he entered the thrum Sabbath of this Jewish settlement before the night of Tishri 11, which represented the day of Yom Kippur in Palestine. He had left Israel on Elul 30<sup>40</sup> before he could have heard that the 31<sup>st</sup> had been declared Tishri 1, but he was certain that the month of Elul would be a full month of 30 days. Therefore, he could not play the role of a messenger communicating the calendar and obliging them to fast for a second day, on their Tishri 11. This commentary is not likely, however. We know that the messenger could not arrive in Babylonia before Tishri 15 nor before Nissan 15. Furthermore, Levi was lame.<sup>41</sup> The only acceptable explanation seems the following: Levi left in the beginning of Elul, but he already knew about the new rule that Rosh Hashanah cannot fall on *DU*, and thus knew that the month would be made full and lengthened to 30 days. Rabbi Zerahia ha-Levi is the only commentator to give a very similar explanation. This event would have occurred around 220 C.E. when Levi left definitively to Babylonia at the very beginning of the ascension of Rabbi Johanan, and would have been enacted under the leadership of Rabbi Hanina. However, this seems unlikely, because Rabbi proclaimed that Elul is always defective,<sup>42</sup> and similarly Rav still proclaimed that Elul is always defective.<sup>43</sup> Further the rule *Lo Du Rosh* seems to be a later enactment during the leadership of Rabbi Johanan. Therefore the second interpretation—of R' Hananel—reading that Levi happened to be in Babylonia on the Babylonian Marheshvan 10, which was in fact the Palestinian Tishri 10. Because of political reasons prevailing at that time, the Babylonians had not been informed that the year had been intercalated. But if so, this event could also have occurred much earlier in Levi's youth, during Rabbi's life when he used to travel and was probably not yet lame.<sup>44</sup>

5. *Samuel (died in 254,<sup>45</sup> 7 years after Rav).*

Babli Rosh Hashanah 20b:

אמר שמואל, יכילנא לתקוני לכולה גולה

Babli Hulin 95b:

אמר לא ידע לי מידי דרביה אנא, כתב שדר ליה עיבורא דשיתין שני

Y. Ketubot II, 6, 13a:

מן דעיתודעין מאן הויין אמרין לשמעון בר בא,<sup>46</sup> איטפל בקריבתך. נסב לקדמיתא ומיתת, לתניינא ומיתת. למה?

<sup>39</sup> They understand that he happened to come on this day, Tishri 11.

<sup>40</sup> Novellae of Ritva. The novellae of Rabbenu Nissim records Ellul 31st, before he could hear the proclamation.

<sup>41</sup> B. Ketubot 103 b.

<sup>42</sup> B. Rosh Hashanah 19 b and Y. Sanhedrin 1, 2, 18d.

<sup>43</sup> Y. Sanhedrin 1:2, 18d.

<sup>44</sup> B. Kidushin 72a ; B. Sabbath 130a.

<sup>45</sup> ESG III, 2, p. 69.



בגין דשקרון? חס ושלום לא שקרון אלא מן חטאת דחנניה בן אחי רבי יהושע שעבר את השנה בחוצה לארץ.

Apparently the Jewish population in Babylonia suffered from the situation and was unsatisfied by the obligation to keep two festival days. During the last years of Samuel's life the situation became even worse because of the decisions adopted by Rabbi Johanan giving to the doubt a biblical character instead of a rabbinical character before.<sup>47</sup> In this context, the passage in B. Rosh Hashanah is then: *said Samuel, I can solve the Problems of the Diaspora* (by establishing a precise lunar calendar in concordance with the solar year. It will allow the whole Diaspora to rest on it without being obliged to rest on the information coming from Palestine and maintaining us permanently in doubt. It will allow the Diaspora to keep only one festival day. But this festival day will not necessarily be the same as the one kept by the Palestinians).

The passage in Hulin is the following: (after the death of Rav, Samuel remained the main authority in Babylonia and Rabbi Johanan in Palestine. Rabbi Johanan considered himself equal to Samuel and he wrote him in the following terms: to my colleague Samuel in Babylonia. Samuel wanted to have the upper hand. *He asked himself which field he mastered and he (Rabbi Johanan) didn't. He sent him a calendar for sixty year* (which allowed a perfect coincidence with the lunar and the solar year).<sup>48</sup> Rabbi Johanan was not impressed at all (or affected not to be impressed) *and said it is a mere calculation!*

The passage in Y. Ketubot is the following: *when they discovered who the two hostages were*<sup>49</sup> *they said to (their relative), marry one of them. He married one of them but she died. He married the second but she died also. Why so? Should we fear that this happened because they lied?*<sup>50</sup> *Certainly not, G-d forbids!* (No they died because of the sin of their father Samuel who dared intercalate the Jewish calendar outside of Israel and committed the same sin as) *Hanania, the nephew of Rabbi Joshua committed when he intercalated the Jewish calendar outside Israel.*

The last passage of Yerushalmi Ketubot allows us understanding the anger and the resentment of the Palestinian scholars against Samuel and his miscarried endeavor to free the Diaspora from its dependence on the Palestinian council of intercalation. We see also the jealousy of the Palestinians about this only prerogative, which they maintained.<sup>51</sup>

## 6. Rav Nahman.

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<sup>46</sup> Apparently the same as Rabbi Shemen bar Abba, in the Babylonian Talmud. He was a Kohen belonging to the family of Samuel, himself a Kohen, of Babylonian origin who established himself in Palestine.

<sup>47</sup> Indeed, before this decision, the Babylonians could rest on the fact that Elul was always defective (29 days). Now this only certitude disappeared and they were not able to forecast the calendaric decisions of the Palestinian Council of intercalation.

<sup>48</sup> In our present calendar this result is achieved by a cycle of 19 years. I don't know whether the calendar of Samuel was based on a rougher approximation or if the figure 60 is a round-off of 57.

<sup>49</sup> Two daughters of Samuel were captured at the occasion of the conquest of Nehardea and apparently released, against a ransom, in Palestine.,

<sup>50</sup> And they were not pure anymore.

<sup>51</sup> The commentary *Korban ha-Eidah* did not see the connexion between the reprehensible calendaric activities of Samuel and Hanania. Therefore he understood that the two daughters of Samuel were descendants of Hanania and paid for his sins. This explanation is far-fetched and rests on an assumed lineage through their mother. Indeed Samuel was a Kohen and Hanania a Levi!

B. Rosh Hashanah 21a states:

רב נחמן יתיב בתעניתא כוליה יומי דכיפורי, לאורתא אתא ההוא גברא א"ל למחר יומא רבה  
במערבא

*Rav Nahman fasted the day of Yom Kippur, but in the evening a Palestinian told him that in Palestine the great fast was a day later.*

This seems to happen in the second half of the third century. We must again understand that this Palestinian was a traveler who left Israel in the beginning of Elul but was aware that Elul would be made full to avoid that Rosh Hashanah the 30<sup>th</sup> day of Elul falls on DU.

## 7. *Rabbah.*

רבא הוה רגיל דהוה יתיב בתעניתא תרי יומי, זימנא חדא אשתכח כוותיה.

*Rabbah was accustomed to fast two days. Once it was proved correct.*<sup>52</sup>

We know that Rava lived until 352, and according to R. Aaron Heyman,<sup>53</sup> he was born around 279 C.E. We will see below that after 325 when Abaye was promoted to head the academy of Pumbedita, the Babylonian Rabbis already knew the “fixing the month”.<sup>54</sup> We will see below that in about 305 the Court of intercalation no longer made Elul full, and two days of fasting no longer proved justified. It also seems unlikely that the Talmud would have recorded the details of the conduct of Rava before 305, when he was still a pupil under Rav Hisda. Therefore, the reading of R’ Hananel seems to be correct: He reads Rabbah instead of Rava.<sup>55</sup> Rabbah was promoted to the head of the Academy of Pumbedita in 298 and remained in that position until his death in 320.<sup>56</sup> In 305, he was already 7 years in function, and the quotation seems to fit much better; it must correspond to the conduct of Rabbah during the first years of his reign.

## C. From about 300 until 323

### 1. *Rabbi Simon.* -- Yerushalmi Sukkah 4:5 says:

<sup>52</sup> B. Rosh Hashanah 21a. In the Vilna edition the reading is Rava, but this reading is problematic and unlikely.

<sup>53</sup> Heyman, Toledot 1040 b.

<sup>54</sup> An interesting quotation from Taanit 21b proves that Rava had no doubt what about the day of Kippur: ולרבא כל מעלי יומא דכיפורי, Rava was greeted on each eve of Kippur by the celestial Academy and the context proves that Abaye was still alive. Probably from 325 onward, he knew the date of Tishri in advance and had no doubt about the day of Kippur.

<sup>55</sup> However in a responsum of R’ Hay Gaon, the reading is Rava. Otsar ha-Gaonim, Rosh ha-Shanah § 46. This responsum is reproduced in Torah Shelema, part 13, chap 3, p. 26.

<sup>56</sup> After a reign 22 years, see ESG III, 3, p. 72. In B. Rosh Hashanah 18a it states that Rabbah lived forty years. R. Aaron Heyman has already emendated the text and replaced forty by sixty: Toledot p. 1063a. Rabbah would then be born in 260 and would have been 19 at the death of Rabbi Johanan. The invitation to Rabbah to join the academy of Rabbi Johanan (B. Ketubot 111b) would have occurred before Rabbah was 19. This is likely, and it is unnecessary to postpone Rabbi Johanan’s death by 9 years, as Heyman does in his commentary ad locum in ESG and in Toledot p 671.

רבי סימון מפקד לאילין דמחשבין, הבון דעתכון דלא תעבדון לא  
תקיעתא בשבתא ולא ערבתא בשבתא...

*Rabbi Simon ordered those in charge of the calculations (“demechashvin”): Pay attention and do not place either Rosh Hashanah on Sabbath or Hoshanah Rabbah on Sabbath. But if you are squeezed, then place Rosh Hashanah on Sabbath, but do not place Hoshanah Rabbah on Sabbath.*

Rabbi Simon (also known as Rabbi Simeon ben Pazi) was a Palestinian Amora of the second half of the third century C.E. He was the pupil of R’ Joshua ben Levi, the latter was himself the pupil of Bar Kapara the younger pupil and colleague of Rabbi. He was a friend and contemporary of Rabbi Abahu from Caesarea. I estimate that he lived until 310 C.E. The word *demechashvin* shows that calculation, rather than empirical observation, was increasingly taking place in fixing the Neomenia, even if the formalism was probably still organized as if the sanctification of the Neomenia depended on observation. The calculation helped to replicate an observation calendar based on the first visibility of the new crescent.

## 2. Rav Hisda.

R’ Hisda was the head of the Academy of Sura for ten years from 300 until 309; he lived 92 years.<sup>57</sup> Yerushalmi Rosh Hashanah<sup>58</sup> and Hallah<sup>59</sup> mention:

תמן חשין לצומא רבא תרין יומין, אמר לון רב חסדא למה אתם מכניסין עצמכם למספק הזה המרובה חזקה שאין בית דין מתעצלין.

*There, in Babylonia, they are worried about the true day of the fast of Kippur (and some Rabbis fast two days). Rav Hisda said to them: “Why are you putting yourself in this big doubt? There is a strong presumption that the Court is not neglectful.”*

This quotation of Rav Hisda must be from the very beginning of the fourth century. The classical commentary Korban ha-Eda claims that the Court sends the messengers immediately. This explanation is untenable, because we know that the messengers could never reach Babylonia in time to inform them about the true day of Kippur. I think that the correct explanation of this quotation could be the following: Until this period, the Babylonian Rabbis did not know when the Court decided that Elul would be a leap month of 30 days, and therefore they lived in great doubt, especially about Kippur. Rav Hisda seemed to know that the Court of Palestine had changed its policy and conduct; Elul is again a defective month of 29 days in all the cases. If it were necessary to avoid an instance of Rosh Hashanah falling on Wednesday or Friday, the Court would advance the Neomenia of Elul or even that of Av by one day, in order to obtain the correct result

<sup>57</sup> B. Moed Kattan 28a.

<sup>58</sup> Y. Rosh Hashanah I, 4, 57b (at the end of halakha 4), (8b in the Vilna edition).

<sup>59</sup> Y. Hallah I, 1, 57c (4a in the Vilna edition).

without making Elul a leap month. “The Court is not neglectful” would then mean that it reacts in time enough in advance and does not any more wait for the last moment, which condemns them, if necessary, to make Elul a leap month of 30 days. Of course this new policy implies that it was necessary to consider calculation more than observation.

### 3. Rav Safra.

אמר ליה רב ספרא לרבי אבא כגון אנא דידענא בקביעא דירחא ביישוב לא  
אבדינא מפני שינוי המחלוקת במדבר מאי?  
אמר לי, הכי אמר רב אמי, ביישוב אסור במדבר מותר

*Rav Safra said to Rabbi Abba: for example, in my situation, when I know the fixing of the month in a Jewish settlement, I do not perform [any work on the second festival day] to avoid any dispute, but in the desert [when I am alone] how should I behave? Rabbi Abba answered: This was the ruling of Rabbi Ammi: Among Jews it is forbidden, but in the desert, it is allowed.”*

Rav Safra was a Babylonian Amora who spent much time in Palestine at the occasion of his frequent commercial journeys between Babylonia and Palestine during the leadership of Rabbah<sup>60</sup> and Rav Joseph.<sup>61</sup> Later he retired in Babylonia where he became friendly with Abbaye<sup>62</sup> and Rava.<sup>63</sup> He died in Babylonia under the leadership of Abbaye.<sup>64</sup> Almost all of the different commentaries of this Talmudic passage about Rav Safra, depart from a false hypothesis: they all assume that the calendar was still empirical, based on the observation of the new moon. Under such conditions, Rav Safra could not have had any advance knowledge of the fixing of the moon with respect of the calendar envoys.<sup>65</sup>

It may be assumed that this dictum of Rav Safra belongs to the first quarter of the fourth century, when he was frequently visiting in Palestine. I propose the following explanation: the council of intercalation was working more and more on the basis of calculation. The calendar committee<sup>66</sup> was still announcing the fixing of each month on a monthly basis, as in the past. Therefore, the Babylonian and even the Palestinian population did not know the *keviya* before the committee's monthly proclamation and the Babylonian population was holding two days for the festivals “out of doubt”. However, the committee was already calculating the calendar in advance, and the members of the academy of Tiberias and the scholars, like Rav Safra, who were close to it, were aware of the committee's

<sup>60</sup> From 298 until 320.

<sup>61</sup> From 321 until 323, during 2.5 years.

<sup>62</sup> B. Hulin 110b, B. Eruvin 45b and B. Beitsa 38b.

<sup>63</sup> B. Batra 144a and B. Zevahim 116b.

<sup>64</sup> B. Moed Katan 25a

<sup>65</sup> Stern (2001) pp. 249-250 has also examined the problem. He also considers that Rav Safra was still in the period of the sighting calendar and he supposes that Rav Safra was using a fixed calendar scheme of his own. This supposition seems impossible for many reasons. First, such a calendar could not guarantee that he be in concordance with the fixing of Palestine. Second, if his supposition were the actual meaning of Rav Safra's knowing of the month's fixing, Rabbi Abba would have rebuked him, because Palestinian academies never accepted calendric activities in Babylonia. Third when Samuel intended to use a fixed calendar (see B. Rosh Hashanah 21b), it was intended for the population of Babylonia, here Rav Safra would use this calendar for himself alone!

<sup>66</sup> With the same meaning as the « council of intercalation ».

calculations before their monthly announcements. This situation explains how Rav Safra knew the *keviya* when traveling to Babylonia before the institution of the fixed calendar (358 C.E.), and even before the communication to the Babylonian academies of a pre-calculated calendar (around 325 C.E.).

*D. Around 323 - 325 C.E.*<sup>67</sup>

*1. Era of Rabbah and Rav Joseph.* -- Babli Sukkah 43b provides:

אנן לא ידעינן בקיבוע דירחא, אינהו דידעי בקיבוע דירחא...

*We [the Babylonians] do not know the fixing of the month; they [the Palestinians], who know the fixing of the month...*

As can be seen from the context, this passage is from the time of Rabbah and Rav Joseph, before 323 C.E. (Rav Joseph died in 323 C.E.). At this time, in Babylonia, the Jewish people were not yet aware of the fixing of the month. In other words, Babylonians (except perhaps those living in western Babylonia) did not know the exact day of the Neomenia before the fifteenth of each month<sup>68</sup> and were obliged to keep two festival days out of doubt while people living in Palestine did know that exact day before the fifteenth.<sup>69</sup>

*2. Bar Hedyā.* – In Babli Sukkah 43b, we find:

כי אתא בר הדיא, אמר לא איקלא

*When Bar Hedyā came back to Babylonia, he said that Hoshanah Rabbah does not occur on Sabbath.*<sup>70</sup>

We know that Bar Hedyā came back to Babylonia when Rav Joseph was still alive,<sup>71</sup> henceforth in 323 C.E. or slightly earlier.

*3. Rava.* – Babli Sanhedrin 12a says:

והא שלחו ליה לרבא, זוג בא מרקת ותפשו נשר ובידם דברים הנעשה בלזוז ומאי ניהו תכלת בזכות הרחמים ובזכותם יצאו בשלום ועמוסי יריכי נחשון בקשו לקבוע נציב אחד ולא הניחן אדומי הלז אבל בעלי אסופות נאספו וקבעו לו נציב אחד בירח שמת בו אהרן הכהן...

<sup>67</sup> Rabbi Joseph died in 323 and Abbaye was nominated in 325. There was thus a certain period of interregnum.

<sup>68</sup> Nevertheless, if my interpretation is correct, since 305 the most rigorous people didn't fast any more for two days on Yom Kippur, because Elul was again defective without practical exceptions according to the dictum of Rav Hisda.

<sup>69</sup> Y. Sanhedrin 5:3 (Mishna and beginning of Guemara).

<sup>70</sup> And therefore Rosh Hashanah does not occur on Sunday.

<sup>71</sup> Babli Berahot 56b.

*They sent a message to Rava: A couple was coming from Raqat<sup>72</sup>, but an eagle<sup>73</sup> captured it. In its hand were things made in Luz- and what are these? Purple.<sup>74</sup> Through the merit of the Merciful and through their own merit, they got out safely. And the offspring of Nahshon's loins<sup>75</sup> wished to establish a netsiv,<sup>76</sup> but that Edomite<sup>77</sup> did not allow them. However, the members of assemblies assembled and established one netsiv in the month<sup>78</sup> in which Aaron the Priest died.<sup>79</sup>*

This quotation looks like a coded message. It gives the impression that they were some communications problems between Palestine and Babylonia, which could be connected to the war between the Roman Empire and Persia. It seems furthermore, according to the Talmudic interpretation of the message, that the Romans objected to the intercalation of the Jewish calendar and its communication by the messengers; but the reason is not explained.

According to modern historians,<sup>80</sup> there is no external evidence of any Roman Imperial interference with the Jewish calendar during the fourth and fifth centuries and therefore the reason of this Roman hostile attitude remains not explicable.

However there are some indices<sup>81</sup> in the Talmud of persecutions—perhaps short-lived crisis—at this period, confirmed by the Letter of R' Sherira Gaon, who mentioned persecutions in Palestine after the period of Rabbah and Rav Joseph.<sup>82</sup>

4. *Rava*. – Babli Hulin 101b says:

אלא אמר רבא, שמדא הוה ושלחו מתם דיומא דכיפורי דהא  
שתא שבתא הוא. וכן כי אתא רבין וכל נחותי, אמרוה כרבא

*[After a discussion without a convincing conclusion between Abaye and Rava] Rava concluded that there was a persecution in Palestine and they [Sanhedrin in Palestine] sent from there [a coded message] that Yom Kippur of this year will occur on Sabbath. Later, when Rabin and all the travelers came back to Babylonia, they confirmed [the interpretation] of Rava.*

The Letter of R. Sherira Gaon<sup>83</sup> mentions that after Rabbah and Rav Joseph (predecessors of Abaye and Rava as heads of the academy of Pumbedita), there was an

<sup>72</sup> Tiberias.

<sup>73</sup> The Romans.

<sup>74</sup> The special purple required for the manufacture of the fringes. One fringe of the *tzitzit* must be *Tekhelet*.

<sup>75</sup> The Nasi, the Patriarchate.

<sup>76</sup> A thirteenth month in order to intercalate the year.

<sup>77</sup> The Romans.

<sup>78</sup> The month of Av. Thus exceptionally they had a second Av.

<sup>79</sup> Literal translation according to Stern (2001) p. 217.

<sup>80</sup> Stern (2001) pp. 215-218.

<sup>81</sup> See former and next quotations. Note the coming back to Babylonia of Bar Hedya, Rabin, R' Dimi and the travelers, B Sukkah 43b. See also B. Beitzah 4b mentioning a possible future persecution. See finally at the end of Horayot about the coming back to Babylonia, before 325, of Rabbi Zeira II. See also the reference hereunder.

<sup>82</sup> See immediately herunder.

<sup>83</sup> Part II, chap.3, page 54 in the edition of A. Heiman.

important persecution in Palestine. For that reason, the level of the teaching diminished drastically in Palestine and those Babylonian Rabbis in Palestine, who made journeys there and back and permitted the exchange of the rabbinical novellae between Palestine and Baylonia and conversely, such as Rabin and Rav Dimi, returned to Babylonia. Rav Joseph died in 323 C.E., and Abaye was appointed in 325 C.E. This event (the sending of the coded message) seems to occur after the death of Rav Joseph and before the return of Rabin, around 325 C.E., at the beginning of the nomination of Abaye as head of the academy of Pumbedita. This seems the older evidence of the communication from Palestine to Babylonia of the keviyah of the coming year or at least the communication of the detail of the festivals of Tishri.

I had been struck by the coincidence between the date of the return of Rabin and the other travelers in about 325 and the council of Nicaea and I had proposed an explanation similar to the suggestion of the late Prof. Lieberman.<sup>84</sup> He suggests indeed that the persecutions, which led to the institution of a fixed Jewish Calendar were the result of decrees by the Christian Imperial authorities against the Jewish calendar in order to prevent the dissident Churches of the East, after the council of Nicaea, from observing Easter at the same time as the Jews. Therefore the Christian Emperors prohibited the Patriarch (the Nassi) to dispatch messengers to the Jewish Diaspora, in Syria and Babylonia. This would give the natural explanation of our Talmudic quotation and of the former one.

However Stern (2001)<sup>85</sup> rejects this theory and considers it completely unsubstantiated. He writes: “the absence of any external evidence in either Christian or Roman legal sources, of any imperial prohibition against Patriarchal calendar reckoning, casts considerable doubt on its historical validity.”

We have already mentioned that there are some indices<sup>86</sup> in the Talmud of persecutions—perhaps short-lived crisis—at this period, confirmed by the Letter of R’ Sherira Gaon. This Talmudic quotation, as the former, must correspond to such a situation.

It appears that Rava, unlike Abaye, understood in advance that Yom Kippur would occur on Sabbath. It was perhaps the first time that the council of Palestine was sending such information so early. The council of the calendar had already decided long before that Yom Kippur would occur on Sabbath. Probably from this time onwards, Rava knew the exact date of the festivals, and they began to hold two days on the basis of a *takana*, the enactment sent by the Palestinians, but no longer out of doubt.<sup>87</sup>

This situation also provides additional evidence that the council of Tiberias calculated the calendar in advance. This evidence records one of the first instances of communicating advance calendar information to the Babylonian academies.<sup>88</sup>

<sup>84</sup> Lieberman, Saul, 1946: Palestine in the 3<sup>rd</sup> and 4<sup>th</sup> Centuries. JQR, n° 36: 329-370. See pp. 330-334.

<sup>85</sup> Stern (2001), p. 217.

<sup>86</sup> See former and next quotations. See the coming back to Palestine of Rabin, R’ Dimi and the travelers, B Sukkah 43b. See also B. Beitzah 4b mentioning a possible persecution.

<sup>87</sup> See Rabbi Yose *infra*.

<sup>88</sup> Maybe it was not the first time, and therefore, Rava was able to understand the coded message, but it could have been the first time, which is why Abaye could not understand the coded message.

5. *Babli Arachim 9b*. – This passage provides:

אמר לי רב אדא בר אהבה לרבא, אחרים מנינא אתא  
לעשמועין, הא קא משמע לן דלא בעינן מצווה לקדש על  
פי ראייה

*Rav Adda bar Ahava said to Rava: Does Aherim [generally R' Meir] intend to let us know a count [of the new month]? No, he wants to teach us that it is not an obligation to sanctify months by observation.*

This passage seems connected to the decision to switch from empirical observation to calculation for the fixing of the moon, and provides a theoretical solution to the practical problem raised by the situation described in the previous paragraph. Although Rava was Babylonian and was completely outside the calendar committee, he was consulted on the subject. This evolution occurred apparently in the beginning of Abaye's reign.

6. *Rabin*. – *Babli Sukkah 43b* provides:

כי אתא רבין וכל נחותי, אמרי, איקלא ולא דחי

*When Rabin and all the travelers came back to Babylonia, they said that Hoshanah Rabbah may occur on Sabbath.*<sup>89</sup>

As discussed above, Rabin returned to Babylonia in around 325 C.E. It appears that the problem of Rosh Hashanah occurring on Sunday was a subject of discussion and that the council was hesitant to find a solution. At first, the council decided not to accept Rosh Hashanah on a Sunday, as told by Bar Hedya, but it later reversed its decision and decided to abandon this additional constraint. Indeed, there is evidence that during the reign of Abaye, Rosh Hashanah could still occur on Sunday, and in *Babli Taanit 29b*, we see that the ninth of Av could occur on Friday.<sup>90</sup>

*E. After 325 C.E.*

1. *Rav Zeira II*. – *Babli Beitzah 4b* states:

אמר רב זירא, כוותיה דרבי אסי מסתברא, דהאידנא ידעינן

<sup>89</sup> Therefore Rosh Hashanah can occur on Sunday.

<sup>90</sup> It is very likely that this passage corresponds to the reign of Abaye, after 325 C.E. It is also very likely that the number of days between Passover and Rosh Hashanah was already fixed, so that the ninth of Av (Tisha Be-Av) occurred on the same day as Passover, and the next Rosh Hashanah occurred two days later. There is later evidence that during the reign of Rav Yemar (428-432 C.E.), Rosh Hashanah could still occur on Sunday. See *Babli Niddah 67b*, See Ajdler (Hilkhoh Kiddush ha-Hodesh, Sifriati 1996, p. 670 note). Later evidence confirms that in 506 C.E., Rosh Hashanah still occurred on Sunday and the preceding Pessah and Tisha be-Av on Friday: see Epistle of Sherira Gaon 3:4 (p. 85 edition A. Heiman): 4 Adar 4267 was a Sunday.



*Rav Zeira II said: things seem logical according to the advice of Rabbi Assi, because today, we know the fixing of the moon and nonetheless, we observe two festival days.*

Note that Rav Zeira II must not be confused, as often occurs, with his more famous predecessor, Rabbi Zeira I, the Palestinian Amora of the former generation and elder colleague of R' Abba. Rabbi Zeira I lived in the second half of the third century and probably the first years of the fourth century and lived a long life (Babli Megilah 28a).

Rav Zeira II was a Babylonian Amora, who spent some time in Palestine. He must have come back to Babylonia around 323 C.E., because he was then the colleague of both Abaye and Rava and a candidate for the direction of the academy of Pumbedita together with Abaye (who had not yet been appointed), Rava, and Rabbah bar Matna.<sup>91</sup>

Apparently, after 325 C.E., the Babylonian academies began receiving advance information about the year's calendar and thus began to know the fixing of the month. But the meaning of this concept, as expressed in this passage about Rav Zeira II, is now different: Here, the Babylonian academies know the length of each month and consequently the date of each Neomenia for a relatively longer period, probably one year in advance.

The contradiction between this passage and the passage in Babli Sukkah 43b, mentioned above, has embarrassed commentators such as Tossafot. R' Solomon ben Aderet,<sup>92</sup> in his novellae on Babli Sukkah 43b, is probably the first to give a more likely explanation of this apparent contradiction. He writes that this Talmudic passage dates from after "the institution of the calendar by Hillel, the last Patriarch, the son of Rabbi Judah the Patriarch,<sup>93</sup> grandson of Rabbi Judah the Saint." In Rashba's mind the institution of a fixed calendar implied that the Babylonians had a complete knowledge of the calendar and had reached a complete independence. In fact, as we already saw with the miscarried endeavor of Samuel, the Palestinians were very jealous of their only prerogative and they kept the secret as long as possible, until the ninth century. This discretion allowed them to change and improve the Jewish calendar during these four centuries without any Babylonian opposition. As soon as the secret was revealed, the Jewish calendar became petrified and immutable. In fact it seems that in reality this happened around 325 C.E., slightly before the institution of the calendar of Hillel. For the Babylonian as well as for the Palestinian Jews, the institution of the fixed Calendar was a non-event; it was not noticeable. Only the members of the Council of intercalation and connected scholars were aware of the change. For the Babylonians the only noticeable change was the fact

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<sup>91</sup> Babli Horayot (at the end).

<sup>92</sup> Rashba (c.1235-1310 C.E.).

<sup>93</sup> R' Judah II Nesi'ah. He forgets two generations, R' Judah III (also called Nesi'ah II) and R' Gamaliel IV. Therefore, the exact sequence is the following: R' Judah I the Saint c. (135 - 210), R' Gamaliel III c. (210 - 219), R' Judah II Nesi'ah I c. (220 - 270), R' Gamaliel IV c. (270 - 300), R' Judah III (Nesi'ah II) c. (300 - 330), and finally R' Hillel II c. (330 - 365).

that they, from now on, knew the “fixing of the month” because they received each year, in advance, the *keviyah* of the coming year.

2. *Rabbi Yose in Yerushalmi Erubin*. – The end of chapter 3 of Yerushalmi Erubin states:

רבי יוסי משלח כתב להון, אף על פי שכתבנו לכם סדר  
מועדות, על תשנו מנהג אבותיכם נוחי נפש

*Rabbi Yose sent them [the people of Alexandria] a letter: Although I sent you the order [i.e., the details] of the festivals, do not change the custom of your late ancestors.*

The last passage seems to refer to the beginning of Rabbi Yose’s leadership in Tiberias, around 325-330 C.E. There is a parallel passage in Babli Beitzah 4b:

והשתא דידיעיןן בקביעא דירחא מאי טעמא עבדינן תרי  
יומי, דשלחו מתם, הזהירו במנהג אבותיכם בידכם,  
זמנין דגזרו המלכות גזירה ואתי לאקלקולי

*And now, when we know the fixing of the month, why are we observing two festival days? Because they sent from Palestine the following order: be careful to maintain the practice of your late parents. It could once happen that the authority enacts [unfair] laws [against the Jews] and they could be wrong, if they observe only one day.*

This passage is clearer than the first one in explaining the reason for this decision. It is a later interpolation, from the time of the redaction, in the time of Rav Ashi and his son. This passage was not correctly understood<sup>94</sup> as long as people believed that the institution of a fixed calendar in 358/359 allowed the Diaspora to calculate the calendar in full independence. Under such conditions, the maintenance of two festival days is not easy to justify, because a fixed calendar gives complete independence to all communities.

Rabbi Yose imposed upon the Diaspora the observance of the second festival days on the ground that new persecutions could place them, once more, in the situation of not knowing the fixing of the month.<sup>95</sup> This passage provides evidence that those in the Diaspora were not able to calculate the calendar by themselves. Each year, the Palestinians contacted those in the Diaspora with the data about the calendar for the next year. This indicates the fragility of the Jewish calendar. The only practical improvement

<sup>94</sup> Therefore Rashi felt obliged to explain that the Babylonians must perform two days as they ancestors, because if a bad kingdom would emerge and forbid the study of the Torah they could forget the rules of the Jewish calendar and be mistaken. This quite far-fetched explanation was never questioned. The truth is that the Babylonian communities didn’t know the rules of the calendar before the ninth century and still received the information from Israel. The fear was that a bad kingdom would prevent the messengers to bring the information, the *keviyah* of next year, to Babylonia in time. They would then be in the same situation of ignorance as before 325, when they didn’t know the fixing of the month.

<sup>95</sup> The expression “second festival days of the Diaspora” was created by Rabbi Yose: Y. Megilah 4:5.

upon the empirical calendar was that the envoys came only once a year rather than twice. In the case of crises or persecutions, envoys could even cut back their visits to once every few years. More importantly, the envoys could travel at the beginning of the year, well before the month of Elul. This status, in the case of a possible persecution or communication problem, would then confuse the authorities and the Jews' enemies, who were accustomed to look for the envoys around the month of Elul.

When the Babylonians began to calculate the calendar by themselves in the ninth century, one could have argued that the reason for observing two festival days had disappeared. However, the observation of the two festival days was already so entrenched in their tradition that it was too late to consider removing it, and the Babylonians did not seriously consider doing so; the *minhag*<sup>96</sup> had become irreversible. The impatience of Samuel and the correct understanding of the prescription of Rabbi Yose had been forgotten for a long time.

### 3. *Abaye in Babli Taanit 29b:*

ואם לא כבס בחמישי בשבת מותר לכבס בערב שבת מן המנחה ולמעלה, לייט עליה אביי...

*And if he didn't do the washing on Thursday (and has no cloth for Sabbath) he is allowed to make the washing on Friday afternoon, day of Tisha be-Av, from Minha onwards; Abaye cursed those who let themselves carry to such extremes.*

After 325, during the reign of Abaye, the Babylonian communities already received communication of the *Keviya*<sup>97</sup> of the year and they "knew the fixation of the month." The number of days between Passover and the next Rosh Hashanah was already fixed, so that the ninth of Av occurred on the same day as Passover and the next Rosh Hashanah occurred two days later. As we know, Rosh Hashanah could still fall on Sunday, and therefore Passover and Tisha be-Av could occur on Friday.<sup>98</sup>

### 4. *Rava in B. Taanit 21b:*

אבא אומנא הוה אתי ליה שלמא ממתיבתא דרקיע כל יומא, ולאביי כל מעלי יומא דשבתא, לרבא כל מעלי יומא דכיפורי.

*Abba the bonesetter received the greetings of the celestial academy each day, Abaye received them each eve of Sabbath and Rava each eve of Kippur.*

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<sup>96</sup> *Yom Tov Shen* is generally considered in *Halakhah* as a *Minhag*.

<sup>97</sup> The *keviyah* is the indication of the characteristic of the beginning Jewish year, i.e. the day of Rosh Hashanah, the day of the following Pessah and an indication whether the year is defective, regular or abundant, 353, 354 or 355 days in a normal year, 383, 384 or 385 days in a leap year.

<sup>98</sup> It is interesting to note that the Talmud mentions one case of occurrence of Tisha be-Av on Friday in the time of Rabbi Akiba, when Rosh Hashanah could still fall on any day: B. Erubin 41a.

Apparently Rava had no more doubt about the day of Kippur. After 325, they received the *keviya* of the next year in advance and had no more doubts about the festivals; the two festival days were held because of the *takanah* sent from Israel and no longer due to doubt. But theoretically this passage could also relate to a period earlier than 325, perhaps after 300-305, when the council of intercalation decided, according to the testimony of Rav Hisda, that Elul would be again defective, so that Kippur would be Elul 39. The attribution of the passage to a period after 325 is the most likely, because only after this year Abaye and Rava appeared as outstanding personalities.

##### 5. *Abaye and Rava in B. Sabbath 23a:*

אמר אביי ודאי דדבריהם בעי ברכה, ספק דדבריהם לא בעי ברכה. והא יום טוב שני דספק דבריהם הוא ובעי ברכה, התם כי הכי דלא לזילזולי בה. רבא אמר, רוב עמי הארץ מעשרין הן.  
*Abaye said: an obligation which has the status of certainty by rabbinical enactment<sup>99</sup> requires a benediction but an obligation which has a status of uncertainty by rabbinical enactment<sup>100</sup> does not require a benediction. But the second festival day has the status of uncertainty by rabbinical decree<sup>101</sup> and it nevertheless requires a benediction?<sup>102</sup> This is only in order that one should not despise the second festival day. Rava said: most of the peasants deduct the tithe.<sup>103</sup>*

When from about 325 onwards Abbaye and Rava knew the *keviyah* in advance, they knew that the first festival day is the true festival day while the second festival day is in fact a working day.

However, they received from Palestine the instruction to go on keeping the second festival days as before under the status that the second festival day could still be the true festival day. Thus by rabbinical enactment this second day remained a day of uncertainty in order to allow them facing a situation of disruption of the Jewish calendar because of a possible lack of information from Palestine. This corresponds well to the expression: ספק דדבריהם. The uncertain character of this day is the tenor of the rabbinical enactment. This represents a considerable evolution with regard of the situation existing before, when both the first and the second day could be the true festival day and had therefore, both, the status of uncertainty.<sup>104</sup>

<sup>99</sup> The obligation of lighting the *Hanukah* candles does not suffer any uncertainty and is a rabbinical obligation.

<sup>100</sup> Demai is the peasant's crops; by rabbinical enactment it is considered uncertain whether the peasant deducted the tithe and therefore, in order to go out of this state of uncertainty the rabbis prescribed that one should deduct מעשר. Demai is thus ספק דדבריהם.

<sup>101</sup> The second festival day should be now a working day but the rabbinical enactment sent by the Palestinians orders to go on keeping the second festival day and consider it as the possible true festival day.

<sup>102</sup> The introductory Kiddush.

<sup>103</sup> According to Rashi and Rabad, Rava says that in the case of Demai, the probability that the peasant did not deduct the tithe is very little and we cannot speak of a doubt. The deduction of מעשר is intended only to remote any fear but we cannot speak of a case of uncertainty and therefore no benediction is required. But in other cases of uncertainty by rabbinical enactment like *yom tov sheni* a benediction is required without the necessity to have recourse to Abbaye's argument.

<sup>104</sup> From the Torah. The following quotation from Yerushalmi is related to this period:

דאיפלגון, שני ימים טובים של גליות, רבי יוחנן אמר מקבלין התרייה על ספק, רבי שמעון בן לקיש אמר אין מקבלין התרייה על ספק.

6. Rabbi Yose in Yerushalmi Megilah. – Yerushalmi Megilah I, 2, 70b. says:

אמר רבי יוסא, לית כאן חל להיות בשני ולית כאן להיות בשבת. חל להיות בשני, צומא רבא בחד בשובא, חל להיות בשבת, צומא רבא בערובתא.

*Rabbi Yose said: Purim may not occur on Monday or on Sabbath. If it occurs on Monday, then the big fast [Yom Kippur] occurs on Sunday, and if it occurs on Sabbath, then the big fast will occur on Friday.*

Based on this passage, the number of days between Purim and Yom Kippur is now clearly fixed.<sup>105</sup> From Purim until the day after Yom Kippur, there are exactly twenty-nine weeks. Consequently, the number of days between Passover and Rosh Hashanah also becomes fixed. It is impossible to ascertain if this passage is from the beginning of Rabbi Yose's reign, around 325-330 C.E., or if it belongs to a later period, when the calendar had already evolved from a semi-empirical stage to a fixed calendar, probably around 350-358 C.E. It is likely that the decision to have a fixed number of days between Passover and Rosh Hashanah was made very early, because it responded to the motivation to inform the Diaspora easily. In any case, we see that the occurrence of *Rosh Hashanah* on Sunday was not a great concern.<sup>106</sup> *Rosh Hashanah* could still fall on Sunday and the rule *lo DU Rosh* implies now *lo BD Pesah* and *Tisha be-Av*, and *lo BZ Purim*. *Pessah* and *Tisha be-Av* could still fall on Friday and *Purim* on Wednesday.<sup>107</sup>

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See Y. Pesahim V, 4, 32c; Y. Nazir VIII, 1, 57a and Y. Yevamot XI, 7, 12b.

The following quotations of statements by Rava belong also to this new period when he knew the *keviyah* in advance.

1. B. Beitsah 6a:

אמר רבא מת ביום ראשון יתעסקו בו עממין, מת ביום שני יתעסקו בו ישראל.

2. B. Beitsah 5b:

רבא אמר אף מתקנת רבן יוחנן בן זכאי ואילך ביצה אסורה.....

3. B. Beitsah 17a :

אמר רבא, מניח אדם עירובי תבשילין מיום טוב לחבירו ומתנה.....

Maimonides wrote in H.K.H. V: 3 that the period of the empirical calendar by observation lasted until the time of Abaye and Rava, apparently Abaye and Rava included. This is coherent with his ruling in *Hilkhot Yom Tov* VI: 11, 12 and 14, according which the dictum 3 of Rava belongs to the first period of the empirical calendar. R' Zerahia ha-Levi on the Rif Beitsah (p. 3a of the Rif, top) has a similar position on the dictum 2. By contrast Meiri in Beit ha-Behirah on B. Sanhedrin 13b writes that Abaye and Rava belong already to the period of the fixed calendar. Ran, on Rif Beitsah (p. 9b top of the Rif) writes also that Rava knew the fixing of the month. The ruling in *Shulhan Arukh* is based on this last opinion and it still possible, in the case of emergency, to install the *Eiruv* on the first day of Yom Tov true a conditional declaration.

<sup>105</sup> Before this period, even when the *dehiyah lo DU Rosh* was already in use, *Pesah* could still occur on any day; this was of course also the case before the institution of the rule *lo DU Rosh*, see Mishna Pesahim VII: 9.

<sup>106</sup> In his capacity as head of the Academy of Tiberias, Rabbi Yose seems to have played a major role, whereas the role of the Patriarch Hillel was probably formal and honorary.

<sup>107</sup> Tossafot Rid (R' Isaiah ben Mali Di Trani, c. 1200-c. 1260) on B. Megila 4b, used this passage in Y. Megilah to prove that the *dehiya A* was introduced much later than the two *dehiyot DU*. Maharsha on B. Pessahim 71a and *Arukh le-Ner* (R. Jacob Etlinger) on B. Sukkah 42a accept also that the *dehiya A* was a late decision.

7. *Rabbi Yose in Yerushalmi Megilah.* – Yerushalmi Megilah IV, 1, 75a. says:

הוא התקין שתהא אשה חופפת וסורקת קודם טהרתה ג' ימים, רבי יוסה בשם רבי ינאי, רבי בא בר כהן בשם רבי חיינא כדי לשבת ולשני ימים טובים של גליות.

*He (Ezra) decided that a woman should wash her head and comb out her hair not more than three days before her purification. Rabbi Yose in the name of Rabbi Yanay and...: in order to allow her to wash before Sabbath and to purify herself on Monday evening after the two festivals days of the Diaspora.*

We can deduce from this passage that after the fixed calendar was established, there were no more two consecutive festival days in Israel, even in the case of Rosh Hashanah. In other words Rosh Hashanah had only one day in Israel after the fixed calendar was established. We have also here the first mention of the Hebrew expression designating the two festival days of the Diaspora. His enactment imposing to the Babylonians to go on and keep two festival days as before when they did not know the fixing of the month, in order to be prepared in the case of a disruption of the communication of the *keviyah*, was so important in Rabbi Yose's eyes that he accepted a maximum delay of three days between the washing and the purification in the Diaspora and even in Israel to take into account the case of Sabbath followed by two festival days, although this case does not even occur in Israel but only in the Diaspora. Still, Rosh Hashanah could fall on Sunday.<sup>108</sup>

8. *Rav Huna bar Abin.* -- Babli Rosh Hashanah 21a states:

שלח לי רב הונא בר אבין לרבא, כד חזית דמשכה  
תקופת טבת עד שיתסר בניסן, עברה לההיא שתא  
ולא תחוש לה

*Rav<sup>109</sup> Huna bar Abin sent to Rava: when you see that the winter season is prolonging itself until the sixteenth of Nissan, intercalate that year and do not worry [about contradictory opinions, according to Rashi, or about the two other signs of maturity, according to the Tossafot].*

An essential condition necessary to create a fixed luni-solar calendar is to define an intercalation rule to determine which are the regular years and the leap years constituted from respectively twelve or thirteen lunar months. This is not the only Talmudic passage addressing this subject, but the particular qualities of Rav Huna bar Abin and Rava gives a special importance to it. As for Rava, we already know that he, despite being the head of Babylonian Jewry, was closely involved with the institution of a fixed Jewish calendar, and that he was apparently consulted or informed for all important items. Rav Huna bar Abin is a Palestinian Amora of the fourth century of Babylonian

<sup>108</sup> The ruling of Rabbi Yose is contrary to that of Rav Hisda and Rav Yémar, who ruled that this delay of three days is excessive (B. Niddah 67b); according to them, the woman should wash and purify herself the night after the festival days.

<sup>109</sup> This Amora has played an important role in Palestine. He was also a member of the council of intercalation. By virtue of his position, he certainly had the title of Rabbi.

origin. He studied with Rav Joseph<sup>110</sup> in Babylonia and later went to Palestine, where he was the pupil of Rabbi Jeremiah in Tiberias. He was a friend of Rabbi Yose and Rabbi Yonah. He remained in Palestine, even at the worst period during the repression of Gallus and Ursicinus in 351-352 C.E., when he had to hide himself in a cave.<sup>111</sup> He lived from around 300 until 365-370 C.E., and he seems to have played an active role in the creation of the fixed calendar together with Rabbi Yose.<sup>112</sup> Indeed, it is of special importance that he was a member of the council of the sanctification of the month,<sup>113</sup> it explains the passage above. Because of Rav Huna's special position we can consider that his rule was the practical rule in use at the inception of the fixed calendar, while other concurrent rules were merely suggestions.

Rashi's interpretation – that the object of worry is about contradictory opinions – could well have discovered the true meaning. Concerning the significance of this message, I do not think it was intended to obtain Rava's opinion in response, but was instead the message, sent probably during the repression of Gallus, of someone fearing the worst for the future of the Jewish calendar and of the intercalation council sending a practical rule to his Babylonian colleagues in case communication became impossible. The existence of such an intercalation rule implies that the Metonic nineteen-year cycle of intercalation was not yet instituted in Hillel's calendar.

The exact significance of this passage has often been discussed. Rabbinical Rishonim discussed the meaning of “until the sixteenth of Nissan.” According to Rashi<sup>114</sup> and Maimonides,<sup>115</sup> we intercalate only if the equinox occurs on the sixteenth of Nissan; according to others, such as Tossafot,<sup>116</sup> Rabbi Abraham bar Hiya,<sup>117</sup> and Rabbenu Hananel,<sup>118</sup> we intercalate only if the equinox occurs on the seventeenth of Nissan.

9. *Ravina*. – Babli Arahim 9b says:

מתקיף לה רבינא, והאיכא יומא דשעי, ויומא  
דתלתין שני

*Ravina objected: But there exists one day [made up] of hours and one day [completed] in thirty years.*

Ravina, a companion of R' Ashi,<sup>119</sup> was a Babylonian Amora of the fourth and beginning of the fifth century. He studied with Rava,<sup>120</sup> which indicates that he was born not later than about 330 C.E. According to two sources, less reliable than the Letter of

<sup>110</sup> Y. Sukkah 3:4 and Y. Yoma 7:2.

<sup>111</sup> Y. Pesahim 1:5.

<sup>112</sup> Y. Sukkah 4:3.

<sup>113</sup> Y. Sukkah 2:5.

<sup>114</sup> B. Rosh Hashanah 21a in Rashi.

<sup>115</sup> Hilkhhot Kiddush ha Hodesh 4:2.

<sup>116</sup> B. Rosh Hashanah 21a: Tossafot “*ki hazit*.”

<sup>117</sup> Sefer ha-Ibbur, book 3 chap. 5.

<sup>118</sup> B. Rosh Hashanah 21a.

<sup>119</sup> He considered himself, modestly, as his pupil and colleague. Babli Erubin 63b.

<sup>120</sup> Babli Baba Batra 16b.

Sherira Gaon, he died in 422 C.E., six years before R' Ashi's death.<sup>121</sup> In his position as pupil of Rava, he probably learned calendrical data from him. This passage could inform us that the length of the synodical lunation used in the calendar of Hillel was 29d 12h 44m, which differs from the lunation of our modern calendar. This value could have been reached in two stages. In the first stage, the lunation lasted only 29d 12h 40 m. In one year of twelve lunar months, these minutes<sup>122</sup> amount to eight hours, and after three years, they amount to one day, which was called the "day of the hours," or alternatively as the "day of three years."

In a second stage, they added 4 m or 72 *halakim*. After thirty years of twelve lunar months, the calculators of the calendar get  $360 \times 4 = 1440$  m. This additional day could have been named "day of *halakim*," but they called it, probably later, the "day of thirty years."

#### 10. B. Pesahim 58b.

חל להיות בשבת כחל להיות בשני בשבת דברי רבי ישמעאל...

The Braita was probably written in a world where Pessah could occur on any day and Rashi is then correct when he writes: ...ולא מילתא היא שהרי על פי הראייה היו מקדשין...

But later at the time of Abaye and Rava, the world had changed, and Pesah could no longer occur on BD. Therefore, they likely understood the text according to this new meaning and understood that it records בשני בשבת because it cannot be בשבת בראשון.

#### 11. Rav Yemar in Babli Niddah 67b.

ורב יימר אמר אפילו שכן אמרינן לבר מאישה חופפת באחד בשבת וטובלת בחמישי בשבת, דלמוצאי שני ימים טובים של ראש השנה שלאחר השבת ליתא<sup>123</sup> דאפשר דחופפת בלילה וטובלת בלילה. דרש מרימר הלכה כרב חסדא וכדמפרש רב יימר.

*Rav Yemar said: the principle to fix the maximum accepted delay between the washing of her hair and the purification, according to the extreme case that can be met is valid except for the case of the two days of Rosh Hashanah following Sabbath, where the delay of three days is too important, while it is possible for her to wash and purify herself the night following the festival days.*

We see that in about 432 C.E.,<sup>124</sup> seventy-four years after the introduction of the fixed calendar by Hillel the Patriarch, by testimony of the Talmud, Rosh Hashanah could still fall on Sunday.

<sup>121</sup> *Sefer ha Keritot*, R' Samson ben Isaac (Chinon, France) and *Seder Tanaim ve Amoraim in Mahsor Vitry*, Nuremberg, 1923, pg 483.

<sup>122</sup> The 40 minutes

<sup>123</sup> This word means that Rav Yemar did not accept the case of Sabbath followed by the two days of Rosh Hashanah as an acceptable interval between washing and purification, because it is too long. One cannot interpret it as meaning this case does not occur, because then R' Yemar should also consider the case of the two days of Rosh Hashanah preceding Sabbath, which still occurs today.



#### 4. The Institution of a Fixed Calendar

According to a responsum of R' Hay Gaon, written in 992 C.E. and mentioned by Rabbi Abraham bar Hiya,<sup>125</sup> the fixed calendar was instituted in 670 S.E. (358/359 C.E.),<sup>126</sup> by Hillel II, the Patriarch. Maimonides does not mention Hillel II, but he writes in *Hilkhot Kiddush ha-Hodesh* (Laws of the Sanctification of the New Moon) 5: 3, that the empirical calendar based on the observation of the new moon remained in use until the days of Abaye and Rava.<sup>127</sup> By contrast, his contemporary, R' Zerahia ha-Levi, mentions the tradition relative to Hillel, the Patriarch.<sup>128</sup> R' Solomon Meiri<sup>129</sup> writes (Babli Sanhedrin 13) that the sanctification was abolished in the time of Abaye and Rava. Nahmanides<sup>130</sup> also raises the issue a number of times. In *Sefer ha-Zekhut* on Babli Gittin 43b, he recorded that Hillel the Patriarch established the Jewish calendar according to the calculations that are still in use today. He wrote the same opinion in his commentary on *Sefer ha-Mitzvot*, positive Mitzvah 153. In his commentary on the Rif (R' Isaac ben Jacob Alfassi)<sup>131</sup> on Babli Beitzah, Nahmanides recorded that the fixed calendar was established during the life of Rava. Additionally, R' Solomon ben Aderet,<sup>132</sup> in his novellae on Babli Sukkah 43b, wrote that the Jewish people knew the fixing of the month when Hillel, the last Patriarch, established the calculation that is still used today. He considered that Hillel was the son of R' Judah Nessia, the grandson of R' Judah the Saint. These authors are quite imprecise about the genealogy of Hillel the Patriarch, whom they situate correctly at the same time as Abaye and Rava. The difference of about thirty-four years between the beginning of the calculation of a predictable, and probably still semi-empirical, calendar in 325 C.E., and the institution of the fixed calendar in 358/359 C.E., escape to them. This article has shown that a calculated and predictable calendar was communicated to Babylonia from about 325 C.E.

What then does the date of 358/359 C.E. represent? In light of the different passages mentioned above related to the evolution of the calendar between the years 325 C.E. and 350-358 C.E., it seems very likely that the calendar calculated around 325 C.E. was still a semi-empirical calendar, calculated each year. It was probably still a flexible calendar like the empirical one, and it is very likely that the Neomenia were still intended to coincide with the first observation of the new moon. In fact, the transition to a fixed calendar required the choice of a Molad (conjunction), the length of a synodical month, and an intercalation rule (to respect the luni-solar character of the Jewish calendar). It also required a shift of about two days of the Neomenia to shift the

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<sup>124</sup> Death of Rav Yemar. ESG, part III, chap 4.

<sup>125</sup> *Sefer ha Ibbur*, book 3, chap 7.

<sup>126</sup> This is the only source, although it is second hand.

<sup>127</sup> Thus, according to Maimonides, at the time of Abaye and Rava they were still using an observation calendar. In fact at the time of Abaye and Rava, they were no longer sanctifying on the basis on vision.

<sup>128</sup> There is great imprecision among all these authors about the genealogy of Hillel II.

<sup>129</sup> Second half of the thirteenth century.

<sup>130</sup> Thirteenth century.

<sup>131</sup> Eleventh century.

<sup>132</sup> Second half of the thirteenth and beginning of the fourteenth century.

Neomenia from the day of first visibility of the moon to the day of mean conjunction. It is likely that defining all these elements took about thirty-four years, during which time the calendar evolved from the former semi-empirical calendar to a fixed calendar. Before the knowledge of the Letter of the Resh Galuta (835/836 C.E.),<sup>133</sup> it had always been admitted that the Jewish calendar had been completely and definitively fixed in 358/359 C.E. Rare contrary evidence, such as a date in the Letter of Sherira Gaon implying Rosh Hashanah's occurrence on Sunday, was mostly set aside as a copying error. From this letter, we know that the Babylonians were not aware of the complete rules of the calendar, and they had to receive the information sent from Palestine<sup>134</sup> in order to know the *keviyah*.

In conclusion the name of Hillel II, in connection with the institution of the Jewish calendar, is known through one unique and very late rabbinic source, a responsum of R' Hay Gaon mentioned by R' Abraham bar Hiya. As we have demonstrated in this paper the evolution from an empirical to a fixed calendar was progressive and slow and began as soon as the end of the third and not later than the beginning of the fourth century. This "official institution" of the Jewish calendar would represent the final process of the shift of the Neomenia from the theoretical day of the first visibility to the day of the conjunction (*Molad*). The exact role of Hillel II in the institution of the fixed calendar is not clear. It could have been very limited and reduce itself to the simple fact that he was the Patriarch at the epoch of the institution.<sup>135</sup>

## 5. Conclusions

The history of the Jewish calendar in the Talmudic period consists of two stages: the period of the empirical and sighting calendar, and afterwards the period of the fixed calendar. We have successfully sketched the history of the first period through the Talmudic literature. We tried to gather quotations connected to the calendar and to classify them historically, an endeavor, which seems to have been neglected previously.

The sighting calendar seems to have undergone serious changes. As soon as the council of intercalation decided not to fix Rosh Hashanah on *DU*, they were obliged to take liberties with the observation calendar, and had to introduce elements of calculation in order to acquire a certain flexibility regarding the testimonies so as to pilot the calendar. The available elements demonstrate that since the beginning of the fourth century, the calculation played an increasingly great role in the determination of the calendar. It seems that the council of the calendar was calculating several months in advance. Therefore in the case of Rav Safra the council of the calendar had already made its decision several months before he journeyed.

<sup>133</sup> The Letter of the Resh Galuta: see Stern: Calendar and Community, p. 277 for a transcription, a translation and a perfect photocopy. See also Jaffe p. 98 and Sar Shalom p. 27.

<sup>134</sup> From the Letter of the Resh Galuta it appears furthermore that the *keviyah* of the years 835/836 was different than ours in our modern calendar.

<sup>135</sup> The main, or at least, one of the main craftsmen of the Jewish calendar and its rules was certainly Rabbi Yose (Yousa), the colleague of Rabbi Yona. Similarly the Gregorian revolution and the Gregorian calendar are called after Pope Gregory XIII, but the main craftsmen of the revolution were Lilius and Clavius.

This trend probably increased around the beginning of the fourth century, when according to Rav Hisda,<sup>136</sup> the council of intercalation decided to let Elul definitively defective as it has been the case before. They then had to act on the former Av or even on Tamouz in order to prevent Rosh Hashanah from occurring on *DU*. Though the calendar were still formally a calendar of observation, communicated month per month, it became increasingly more calculated.

It was always accepted, until recently, that the evolution from the empirical calendar to the fixed calendar was clear-cut with the fixed calendar immediately adopting its definitive form. This evolution had been attributed to different parallel reasons: the situation of crisis, the political instability, the war situation between the Roman Empire and the dynasty of the Persian Sassanides, the difficulty of communications and also anti-Jewish persecution, briefly “the persecution theory”.<sup>137</sup> Historians have argued that there is no evidence of Roman religious persecutions in the third and fourth centuries in Palestine. Similarly the theory of the persecution by decrees of the Christian Imperial authorities against the Jewish calendar seems unsubstantiated: there is no external evidence of either Christian or Roman legal sources of Imperial prohibition against Patriarchal calendar reckoning.<sup>138</sup> The conclusions of the present study, based on the study of Talmudic passages connected with the calendar, are concordant: the evolution of the Jewish calendar was progressive and slow; it began already at the very beginning of the fourth century, much before the time of the litigious persecutions. This slow evolution does not seem to be the consequence of persecutions. Stern<sup>139</sup> has examined different reasons, which could have worked towards this evolution like the scientific progress theory and the unity calendar theory. I would add the following reasons:

- The will to achieve some predictability of the calendar.
- The will to pilot the calendar in order to implement the rule *Lo DU Rosh* and *Elul ,and Adar defective*.
- The awareness that the empirical calendar could not satisfy this objective without crude manipulations.

However, I think that it would be a little short to forget completely the persecutions, which are mentioned by allusion several times in the Talmud, under the pretext of the absence of external evidence. I would suggest that, even if we accept that the persecutions in the fourth century in Palestine were exceptional and short living and could not have justified the evolution towards a fixed calendar, the concretization of this natural evolution by the communication in advance, before Tishri, of the calendar of the year to Babylonia was achieved at the occasion of a persecution and a danger of calendar’s disruption. Moreover, such a special situation was an excellent pretext and justification for the institution of this change. The institution of new dispositions, as soon as they had some publicity, was certainly not an easy thing and would otherwise have raised objections.

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<sup>136</sup> If my understanding is correct; see remarks 58 and 59.

<sup>137</sup> Stern (2001) p. 212.

<sup>138</sup> Stern (2001) pp. 216-217.

<sup>139</sup> Stern (2001) pp. 211-237.

The second period of the fixed calendar is still very important in the study of the history of the Jewish calendar. Many hold the fixed calendar, i.e. our modern calendar, to have been definitively fixed in 358/359, when Hillel the Patriarch introduced the fixed calendar. We prove through Talmudic evidence that the calendar still differed from ours in about 430 C.E., in the time of Rav Yemar. Bornstein<sup>140</sup> and Jaffe<sup>141</sup> have devoted their lives to studying the development of the fixed calendar. Bornstein based his theory on several documents in the Cairo *Genizah*, whose importance he recognized. They have shown that the Jewish calendar took a definitive form only in the mid-ninth century and it was definitively fixed after the dispute between Ben Meir and Saadia Gaon in 922. The history of the Jewish calendar is still very fragmentary and restricted and still incomplete. The difficulty of the reconstitution of this history stems from the fact that the council of intercalation of the calendar worked in the greatest secrecy and its decisions were accepted in Palestine and Babylonia. Very few documents are still available to cast some light on the subject.

In the present paper we tried to sketch the history of the Jewish calendar during the Talmudic period, using the available Talmudic passages. This was apparently not yet systematically done. It brings a surprising number of interesting data. However, we cannot neglect other sources, mainly archeological elements, which are not always concordant.<sup>142</sup>

These elements of the history of the Jewish calendar during the end of the observation period and during the beginning of the period of the fixed calendar are still unknown to the overwhelming majority of the intellectual community and to most of the rabbis. Some rabbis refuse for “imaginary” ideological reasons to consider any element, which could delay the moment of the definitive implementation of the fixed calendar.

R' Casher, in the 13th part of *Torah Shelemah* has examined with great erudition all the aspects of the Jewish calendar, including the theory of Bornstein, but he fought it with all his strength, and not always with intellectual honesty. Indeed we have seen that there is already Talmudic evidence that the calendar still differed from our calendar in about 430 C.E., and Rosh Hashanah could still occur on Sunday. Apparently he refuses the principle of an evolution of the fixed calendar because it could undermine his theoretical and legal position. However, the evolution of the Jewish fixed calendar during the fifth century can be proved by Talmudic references and was recognized by Tossafot Rid,<sup>143</sup>

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<sup>140</sup> Bornstein, Hayim Yehiel, 1845-1928.

<sup>141</sup> Jaffe, Tsevi Hirsch, 1853-1927.

<sup>142</sup> For example the different tombstones of Zohar cannot be explained according to the Talmudic calendar and it must be accepted that the Jewish community of Zohar used a calendar, which could differ from the Talmudic calendar. For more details about the tombstones of Zohar, see Stern (2001) p. 146.

<sup>143</sup> See his commentary on B. Megilah 4b based on Yerushalmi Megilah I, 2,70b.