

## Talmudic Metrology V: Halakhic Coinage in Post-Talmudic Period.

The Rabbis of the post-Talmudic period and of the Middle-Age had a good knowledge of the Talmudic coinage. They owned certainly samples of the shekel struck during the Roman war of 66-70. The Gaonim overestimated the weight of the shekel by 20% and considered that it weighed 17gr. the weight of four golden Arabic dinar of 4.25 gr. The German Rabbis, like R' Gershom ben Judah meor ha-gola of Mainz and Rashi had a very accurate knowledge of the weight of the Talmudic shekel which they estimated at about 14 gr.

We examine Maimonides halakhic coinage and we come back on the contradiction between his commentary of the Mishna and his Hibbur about the weight of the Egyptian dirham. We propose a new theory to solve this conundrum. We propose a little change in the text of Hilkhoh Bikkurim VI: 15 allowing a complete unity between the different sources.

We examine the German tradition of the shekel based on the standard of Köln. We show that the standards of Köln and of the Tower were practically equal. Through the analysis of several texts we show that there was only one standard of Köln and that both the iron market and the silver market, to which Rashi and the German Rabbis refer, were probably the two official weighing institutions, the Mishkal ha-barzel and the Mishkal ha-yashar, but they worked both according to the standard of Köln.

We examine the alleged undervaluation of the shekel by R' Tam in the rabbinic literature. We examine Nahmanides' position about the halakhic coinage and its evolution and the position of Estori ha-Parhi and his report of the opinion of former authorities.

## Talmudic Metrology V: The Halakhic Coinage in Post-Talmudic Period.

In a recent paper we have seen that the shekel or sela, prescribed by the Rabbis was, during the first century before the Common Era and during the first century of this era, identified with the Tyrian tetradrachma. It was a coin of silver of high fineness of about 92 to 95%, according to the periods, weighing about 14.17 gr.

During the Jewish war against the Romans, between 66 and 70 C.E., the Jewish authority struck its own money and also silver dinars and shekels of a similar weight as the correspondent Tyrian denominations. In fact these coins were generally overstruck on Roman coins. Therefore these coins had still a good fineness but their weight presented an important dispersion.

In Babylonia, in the third and in the fourth century the Talmudic dinar was probably assimilated to the Sassanide dinar and the shekel or sela to four Sassanide dinars, which weighed about 4 gr. Later, at the beginning of the seventh century, when the Arabs established their rule in these countries and introduced the golden dinar, the shekel was considered as a silver coin weighing four golden Arab dinars or 17 gr.

The golden Arab dinar, will behold its weight during many centuries and it will be used in the whole Arab empire. This will allow a good knowledge and a great stability of the Talmudic dinar. In B. Bekhorot 50a, we find an exceptional interpolation dating from the Gaonic period and stating that the five sela'im of the redeeming of the first-born which is five shekel or sela or 20 Talmudic dinar weight twenty golden Arab dinar (מתקל) or 28.5833 dirham (זוזי). As the Arab dinar weighed about 4.24 - 4.25 gr. the dirham, during the Gaonic period, weighed about 2.97 gr. Rashi, ad locum, was aware that the Babylonian dirham weighed 0.7 of the golden Arab dinar, as he had found in Gaonic responsa, but he didn't know the weight of this golden Arab dinar. Rashi thought that this golden coin had the same weight as the golden coins in use in Köln in his time and weighing about 3.5 gr. The shekel weighed thus about 14 gr. and corresponded perfectly to the weight of the extant exemplars of the shekel. Therefore Rashi could interpret correctly the Gaonic interpolation without being influenced by the Babylonian appreciation of the weight of the sela but of course he must consider a fictitious Babylonian dirham of  $0.7 * 3.5 = 2.45$  gr.

Tossafot understood more clearly that this passage is a later interpolation from the period of the Gaonim, giving the expression of the twenty dinar of the redeeming of the first-born in money of their time or more precisely giving the weight of the halakhic silver coinage in coins of their times, these coins serving as units of weight.

### 1. Maimonides and the Halakhik Coinage.

Maimonides knew the golden Arab dinar and thus knew exactly the Gaonic tradition of the shekel of about 17 gr. Maimonides specifies that this weight corresponds to fine silver; this seems in contradiction with the historical data according which the Tyrian sela had a fineness of 92-95%. We have also the proof that Maimonides had knowledge of the

sela of the Jewish war. He writes<sup>1</sup> indeed that the shekalim bear inscriptions in old ketav Ivri or Phoenician characters; they correspond certainly to those struck during the Jewish war. Now we know that they weighed about 14 gr. and we must conclude that Maimonides must consider them as older sela'im from the period preceding the reevaluation of 20%. It is indeed noteworthy that  $14.17 \text{ gr.} * 1.20 = 17 \text{ gr.}$  Despite the fact that coins and currency are likely to change faster than units of weight, the Arab world seems to have used their coins as units of weight and Maimonides made use of the Arab golden dinar and of the Egyptian dirham as units of weight.

### **The System of Talmudic weight described in his Hibbur.**

This system is the best known and it was considered in the rabbinic literature and Halakha.

#### Hilkhot Erubin I, 12.

1 Talmudic dinar = 96 barleycorns = 1 Arab golden dinar = 4.25gr.  
 1 shekel = 1 sela = 384 barleycorns = 17 gr.  
 1 reviit water = 17.5 dinar = 74.375 gr.  
 1 litra = 35 dinar.

Maimonides follows the Gaonic tradition and fixes the weight of the sela to four Arab golden dinar weighing about 17 gr. He writes explicitly that the biblical shekel was revalued by 20% of its former value to become the Talmudic sela.<sup>2</sup>

#### Hilkhot Bikkurim VI; 15.

1 omer = 7.2 log = 28.8 reviit = 43.2 eggs.  
 1 omer of Egyptian meal =  $86 \frac{2}{3}$  sela = 520 Egyptian dirham (Egyptian Zouz).<sup>3</sup>

We can deduce that 1 dinar =  $0.25 \text{ sela} = 520 / (4 * 86 \frac{2}{3}) = 1.5 \text{ dirham.}^4$   
 1 dinar = 96 barleycorns and 1 dirham = 64 barleycorns.  
 1 dirham = 2.83 gr.

We can also deduce that 1 reviit meal weighs 18.06 dirham or 12.04 dinar. The density of the Egyptian meal is then  $12.04 / 17.5 = 0.69$ .

### **The System of Talmudic Weight Described in his Commentary on the Mishna.** (following the readings of R' Joseph Kafih).

#### Mishna Sheviit I, 4.

Expression of the Talmudic Mana in Arabic Weights.

1 mana = 62 rotel +  $7 \frac{2}{3}$  ounces = 575808 barleycorns = 25491.50 gr. (1)  
 1 rotel = 16 ounces = 9216 barleycorns = 408 gr.

1 ounce = 16 dirham = 576 barleycorns = 25.50 gr.

1 dirham = 36 barleycorns = 1.59375 gr.

Maimonides used here the word dirham for a weight of 36 barleycorns.

It appears that the relation (1) is only an approximation, because in fact

1 mana = 6000 dinar = 576000 barleycorns = 62.5 rotel = 25500 gr.

#### Mishna Péah VIII, 5.

1 maah = 16 barleycorns.

1 dinar = 6 maah = 96 barleycorns.

#### Mishna Bekhorot VIII, 8.

1 shekel = 24 dirham. Maimonides used here the word dirham for a weight of 16 barleycorns, which corresponds to the maah.

1 Egyptian dirham = 61 barleycorn. This is the definition of the Egyptian dirham.

1 sela = 6.25 dirham + 0.25 kirt.<sup>5</sup> (1 carat = 1 kirt = 1 kharouv = 4 barleycorns)

5 sela = 31.5 dirham.<sup>6</sup>

30 sela = 188 7/8 dirham<sup>7</sup>.

50 sela = 314.75 dirham.<sup>8</sup>

From all these relations it appears with certitude that the Egyptian dirham weighs 61 barleycorns or 2.70 gr.

#### Mishna Menakhot, Introduction 5.

1 reviit of wine weighs = 26 Egyptian dirham.

1 reviit of olive oil weighs = 26 Egyptian dirham and some negligible barleycorns.

1 omer (shiur hala) of Egyptian meal weighs 520 Egyptian dirham.

#### Mishna Edouyot I, 2.

1 reviit wine = 26 Egyptian dirham.

1 reviit water = 27 Egyptian dirham.

1 reviit corn = 21 Egyptian dirham.

1 reviit meal = 18 Egyptian dirham.

1 omer = 520 Egyptian dirham.

#### Mishna Kelim II, 2.

1 reviit water = 27 Egyptian dirham.

#### Mishna Miqvaot VI, 2.

1 kartov = 1/64 log ~ 1.5 Egyptian dirham.

### Mishna Baba Kama IX, 7.

From his commentary of this Mishna it seems that (1 / 16) Egyptian dirham weighs 1 kirt or 4 barleycorns. We refer to the edition of the Mishna with Maimonides' commentary by Kafih<sup>9</sup> and more specifically to the Judeo-Arabic version: “לגמה רבע דרהם וכרובה” which should be translated by “הייב רבע דרהם וחרוב”.<sup>10</sup> “He was indebted for one dirham and one kirt”; the second denomination being, by the context of the Mishna, the fourth part of the first.

Thus 1 kirt = (1 / 4) \* (1 / 4 dirham) = (1 / 16) dirham.<sup>11</sup>

1 dirham = 16 kirt = 64 barleycorns.

This would give us an Egyptian dirham of 64 barleycorns in contradiction with Mishna Bekhorot VIII, 8. In fact, this is not exact: the dirham, which is of course an Egyptian dirham, still weighs 61 barleycorns, the quarter of the dirham weighs 15.25 barleycorns and the sixteenth of the dirham weighs 3.81 barleycorns. Maimonides has rounded off to 4 barleycorns or 1 kirt, which represents the weight of silver that must obligatory be paid as a fine of one *homesh*.<sup>12</sup>

### **The Contradiction between these two Systems in the Mishna and the Hibbur.**

We observe a flagrant divergence between these two systems; the whole system, exposed at different places in the Mishna, is always based on the relation: 1 dirham = 61 barleycorns. On the other hand in his Hibbur, in Hilkhhot Bikkurim, Maimonides writes, indirectly, that the dirham is 64 barleycorns. This would imply that the dirham considered in the commentary on the Mishna was 2.70 gr. while the dirham considered in the Hibbur would weigh 2.83 gr. In Talmudic Metrology III, we had concluded that the dirham had been revalued from 61 barleycorns to 64 barleycorns between the time of his commentary of the Mishna and the time of his Hibbur. However, this explanation is not satisfactory: A revaluation of the dirham does not seem likely.

We have not any mention of such a revaluation.

If such revaluation really happened then Maimonides did not take it correctly into account. Note particularly that the omer of meal weighed 520 dirham in the commentary on the Mishna and it still weighs 520 dirham in the Hibbur.<sup>13</sup>

We have also seen that the assumption of the revaluation obliges us to conclude that Maimonides changed, without any comprehensible reason, the density of meal.

Therefore our assumption of a revaluation of the dirham is very problematic.

We propose here another explanation to this conundrum by the existence of a mistake in the text of Hilkhhot Bikkurim VI, 15: instead of 86 2/3 sela for the weight of the omer of Egyptian meal, also equal to 520 Egyptian dirham, the text must be 82 2/3 sela. Indeed

$$520 * 61/96 = 330.42 \text{ dinar}$$

$$\text{and } 82 \frac{2}{3} \text{ sela} * 4 = 330.67 \text{ dinar.}$$

This probable mistake seems to exist in all the extant manuscripts. It is nevertheless unclear whether it was already extant in the text of the manuscript of the Hibbur used by R' Estori ha-Parhi,<sup>14</sup> it can then be an early scribal mistake or a lapsus calami in the original manuscript.<sup>15</sup> This solution solves all the problems raised by the former

conclusions: there was no change in the weight of the dirham,<sup>16</sup> no change in the meal's density, no Maimonides' incoherency.

However, we observe that the reviiit water weighed in the commentary of the Mishna 27 Egyptian dirham or  $27 * 61/96 = 17.16$  dinar while in the Hibbur it weighs about 17.5 dinar. This seems to be a slight modification in order to come to an agreement with the data of the Gaonim.<sup>17</sup> Maimonides has increased his reviiit by 2% in order to make it correspond to the value of the Gaonim but he didn't change the other data; namely the weight of the omer of meal has remained equal to 520 dirham when it should have increased by 2% to 530.4 dirham.

### Conclusion.

The sela or Talmudic shekel weighs about 17 gr. Maimonides considers it as a coin or a quantity of fine silver. He doesn't speak of the necessity of an effigy.

The Egyptians dirham, which makes part of his metrical system, weighs 61 barleycorns or 2.70 gr.

The weight of the reviiit water has been increased from 17.16 dinar in his commentary to the Mishna to about 17.5 dinar or 74.375 gr in his Hibbur.

## 2. Rashi and the German Tradition of the Shekel.

### **The System of Weight of Köln.**

The system of weight of Köln was widely known and used in Germany. This system remained in use in Germany until 1838 when it was replaced by the metrical system. Parallel, the same system or at least a very similar system was in use in England under the name of the Tower System of Weight until 1527, when King Henry suppressed it. We have two testimonies of the value the ounce of Köln and one testimony of the value of the Tower ounce.

According to the German transition rule of 1838 to the metrical system, one mark of eight ounces weighed 233.855 gr. This gives an ounce of Köln of 29.23 gr.

According to the notes of Pegolotti,<sup>18</sup> the ounces of Köln and London were equal and weighed 29.24 gr.

According to the law of October 1527 the Tower pound was replaced by the Troy pound according to the following rule: 11.25 Troy ounces are equal to 12 Tower ounces. Hence  $1 \text{ Tower ounce} = 11.25/12 \text{ Troy ounce} = 29.16 \text{ gr.}$

Therefore we can conclude that the Köln and the Tower standards were very similar and virtually equal.

### The Köln Standard.

1 pound = 12 ounces = 20 shilling = 350.7825 gr.

1 mark = 8 ounces = 233.855 gr.

1 ounce = 20 esterling = 29.23 gr.  
1 esterling = 1 penny = 1 pfennig = 1.46 gr.  
1 shilling = 12 esterling = 17.54 gr.  
1 pound = 12 ounces = 20 shillings = 240 esterling

### German Rabbinical Standard.

1 penny = 1 pfennig = 1 esterling = 1 פשיט = 1 איסטרלינג  
1 shilling = 1 דינ"ר  
1 ounce = 1 אוקיא  
1 mark = 1 זקוק  
1 pound = 1 pfund = 1 זקוק = 1 מנה = 1 ליטרא

Until the twelfth century we find that the zakuk was worth 12 ounces, afterwards we find the zakuk at 8 ounces, and finally it will be only six ounces.

### Rashi and the Shekel.

Shemot XXI, 32:

והשקל משקלו ארבעה זהובים שהם חצי אונקיא למשקל הישר של קולוני"א

Shemot XXV, 39.

והמנה הוא ליטרא ששוקלין בה כסף למשקל קולוני"א והם מאה זהובים, עשרים וחמישה סלעים, והסלא ארבעה זהובים.

B. Bekhorot 49b

דהסלא ד' זהובים והזוז במשקל זהוב של משקל שני פשיטין ומחצה למשקל הברזל

B. Baba Kama 36b.

הסלא ד' דינר והדינר משקלו זהב וכן קורין בקושטנטינ"א לזהב דינר והוא שנים ומחצה למשקל הברזל

The former references, except the second one, state that the sela weighs a half of the ounce of Köln of the standard of the Right Weight of Köln or four golden coins of 2.5 esterling each according to the standard of the Weight of iron of Köln. This must represent the half of 29.23 gr. or 14.61 gr. It is also the weight of 10 esterling of 1.46 gr. each or the weight of four German golden coins of 3.65 gr. (at least their theoretical weight).

In the second reference Rashi writes that the mana or hundred dinar i.e. twenty five shekel has the same weight as a pound of the standard of Köln which corresponds to the weight of ninety six golden coins of Köln.

According to this last statement one mana weighs one litra or one pound of the standard of Köln with which one weighs silver. This pound has the same weight as 240 esterling, it weighs  $240 * 1.46 = 350.78$  gr. It corresponds also to  $96 * 2.5$  esterling i.e. to the weight of 96 golden coins of 2.5 esterling. We see then that:

1 mana = 25 shekel = 100 dinar = 240 esterling = 96 German golden coins weighing 2.5 esterling.

As a result 1 dinar = 2.40 esterling = 0.96 golden coin of 2.5 esterling.

We have then two possibilities of interpretation:

1. The relation in weight:

**1 dinar = 2.5 esterling = 1 German golden coin = 3.65 gr.** (1)

is a rough relation and the accurate relation is in fact:

**1 dinar = 2.4 esterling = 0.96 golden coin of 2.5 esterling =  $0.96 * 3.65 = 3.50$  gr.** (2)

2. Both relations are rigorous but refer to two different standards.

**1 dinar = 2.5 esterling of the iron market.**

**1 dinar = 2.4 esterling of the silver market.**

The standard of the silver market is higher than the standard of the iron market by the ratio 100/96 or 25/24.

This second position has been championed by Jacob Weiss<sup>19</sup> and before him, R' Hayim Jacob Sheftiel<sup>20</sup> has discussed it, but it was criticized by Samuel Zeev Reich.<sup>21</sup> The following passage in Makhzor Vitry is not clear and could be, at the first glance, understood according to the second assumption of the existence of two standards.

Nevertheless there is no mention of the existence of two standards in Köln; we have knowledge of only one standard of Köln for precious metals which has hold out through the middle-ages until the modern times. Furthermore we have additional evidence that rabbinical authorities used the relation (2) and referred explicitly to the standard of the iron market. It appears then that there was only one standard in Köln. Let us examine some evidence of other German authorities.

**There is only one standard of Weight in Köln.**

We examine different quotations by German authorities.

Mahazor Vitry.<sup>22</sup>



והמנה שלנו הוא מנה של צורי, והוא ליטרא ששוקלים בה כסף למשקל ישר של קולוניא. והיא כ"ה סלעים שהוא ק זהובים שקורין קושטנטינין, שכל זהוב שוקל שנים פשיטים ומחצה למשקל הברזל. נמצא שהמנה שוקל כ"ה דינרים למשקל הברזל, וזו היא ליטרא פילפלין שלנו.

In this text, ק should be corrected by צ"ו and, at the end of the quotation, כ"ה by כ.<sup>23</sup>

*“Our mana –the Talmudic mana- is the Tyrian mana. It corresponds to the weight of the pound used for weighing silver according to the Right Weight of Köln. And it contains 25 Sela (or 100 dinar) of the same weight as ninety six<sup>24</sup> modern golden coins, which are called coins of Constantinople,<sup>25</sup> each of them weighing 2.5 esterling according to the Iron Weight of Köln. Finally the conclusion is that the mana weighs twenty shillings (or one pound) according to the Iron Weight and this is also the weight of our pound for weighing pepper.”*

This text presents much similarity with the commentary of Rashi on Ex. XXV, 25. It is much older than most of the texts listed beneath and it is already mentioned by Reich as evidence that there was only one standard of weight in Köln. Unfortunately this passage needs one addition and one correction to become intelligible. These corrections are nevertheless evident and indisputable. According to this text the pound used for weighing silver had the same weight as 20 shillings of the Iron Weight and therefore there is only one standard of weight in Köln. I suppose that there were in Köln two official weighing institutions, the first the Mishkal ha-Yashar for the precious metals and the second the Mishkal ha-Barzel for the other metals. But both institutions worked according to the same standard of Köln. Therefore the Talmudic mana is equivalent to the litra (pound) of the Mishkal ha-Yashar, but it is also equivalent to twenty shillings of the Mishkal ha-Barzel. It seems thus that there was only one standard.

The golden coin of Köln weighs 2.5 esterling or  $2.5 * 1.46 \text{ gr.} = 3.65 \text{ gr.}$

The Talmudic mana weighs 96 golden coins or  $96 * 2.5 = 240 \text{ esterling} = 350.78 \text{ gr.}$

The dinar weighs 0.96 golden coin = 3.5 gr. slightly less than the golden coin.

The sela weighs  $0.96 * 4 = 3.84 \text{ golden coins} \sim 4 \text{ golden coins.}$

Sefer Ravia of R' Eliezer ben Joel ha-Levi (1140-1225).<sup>26</sup>

ובפירוש רבי אליקים ראיתי בפ' מי שמת דהדינר של כסף שקל ב' פשיטי' ימחצה למשקל הברזל. וגם רבי שלמה פי' כן בבכורות פ' יש בכור לנחלה, גבי חמש סלעים של פדיון הבן. ובתשובות הגאונים כתב שדינר כסף משקלו זהוב רומנט וכן קוראין בקושטנטינא לזהוב דינר, והוא שנים ומחצה למשקל הברזל ופחות מעט, שמאה מהן דהיינו מנה שוקלים ליטרא פשיטין – למשקל הברזל, וזה יבא י' פשיטין פחות-.

The last sentence of the quotation does not belong to the principal text of Ravia but it is an interesting reading of one of the extant manuscripts. We see here that Ravia, explicitly refers to the Iron Weighing but he adds that the weight of the Talmudic dinar is a little less than 2.5 esterling because hundred Talmudic dinar or one Talmudic mana weigh one litra of esterling (weight) i.e. 240 esterling of 1.46 gr. Thus the Talmudic dinar weighs 2.40 esterling and not 2.50 esterling, i.e. 3.50 gr. and not 3.65 gr.

R' Hezekiah ben Manoah in Hizkuni<sup>27</sup> (mid-thirteenth century).

In his commentary on Ex. XXV, 29, he quotes the commentary of Rashi and he adds:

הרי שבמנורה היו חמישים ליטרין זהובים למנין העולם שנותנין מאתים וארבעים פשוטין בליטרא,

According to Rashi, in the above commented text, 120 Talmudic mana weigh 120 pounds of 350.7825 gr. or 42093.90 gr.

Now we know (see below R' Gershom) that the golden coins of a theoretical weight of 3.65 gr. weighed in fact about 3.50 gr.

Thus the 120 Talmudic mana weighing 42093.90 gr. represent 12.026.83 golden coins or  $50.11 * 240$  golden coins or finally 50.11 litra of zehuvim which he rounded off to fifty litra of zehuvim.

Rosh or R' Asher ben Yehiel (~1250-1327).<sup>28</sup>

פ' רש"י היוצא במדינת צור, ושיעור של אותו מנה כ"ה סלעים והסלע ד' זוזים והזוז במשקל הזהב של משקל ב' פשיטין ומחצה למשקל הברזל. וכן פירש בפי' החומש בפרשת ואלה המשפטים גבי שלושים שקלים דהשקל משקלו ד' זהובים שהן חצי אוקי' למשקל הישר הקולוני"א, ונראה שקיבל דבר זה מרבותיו.

It appears then clearly that the Rosh did not make any difference between the Iron Weighing of Köln and the Right Weighing of Köln.

Sefer Agudah of R' Alexander ha-Kohen (died as a martyr in 1349).<sup>29</sup>

מצאתי בתו' בשם רבי' תם דמנה הוא זקוק כסף, נמצא חמש סלעים חמישית של מנה והוא חמישית של זקוק כסף. וכתובת בתולה היא ב' זקוק כסף.

The Zakuk was at the origin 12 ounces or one litra, i.e. one pound. This quotation is thus parallel to the commentary of Rashi on Ex XXV, 39: one Talmudic mana or 100 Talmudic dinar weigh one pound or 240 esterling. Thus one Talmudic dinar weighs 2.40 esterling i.e. 3.50 gr. The five sela of the redeeming of the first born weigh  $20 * 2.4$  esterling = 48 esterling or 0.2 pound = 0.2 zakuk and the ketubah of 50 sela weighs two pounds or two zakuk.

R' Jacob Weil (first half of the fifteenth century).<sup>30</sup>

חמש סלעים הוא ה' לוט, והוא נגד ב' אונקיות וחצי כסף צרוף מעט פחות.

Thus R' Jacob Weill still refers to the Iron Weighing of Köln and he writes that the five sela'im for the redeeming of the first-born weigh five lot or two and a half pounds according to the Iron Weighing of Köln, in fact a little less, he says.

The five sela weigh:  $5 * 4 * 3.50$  gr. = 70 gr.

And 2.5 pounds weigh:  $2.5 * 29.23$  gr. = 73.075 gr.

But 2.4 pounds weigh:  $2.4 * 29.23 \text{ gr.} = 70.15 \text{ gr.}$

Hence, "a little less" means only 2.4 pounds of silver. Indeed the Talmudic dinar weighs exactly 2.4 esterling and the 5 sela weigh  $20 * 2.4 \text{ esterling} = 48 \text{ esterling} = 48/20 = 2.40$  ounces.

R' Gershom ben Judah, Meor ha-Golah (~ 960-1028).

Before Rashi, R' Gershom wrote already in B. Bekhorot 49b:

דינר זהב הוי ה' פשוט למשקל הברזל, דינר כסף ב' ומחצה למשקל הברזל.....

But he wrote in B. Hulin 84b:

והמנה הוא ליטרא וחצי אונקיה.

This equation is surprising. Normally  $1 \text{ mana} = 240 \text{ esterling} = 1 \text{ litra} = 350.78 \text{ gr.}$

The only explanation is that the litra means here 240 esterling coins.

This litra = 240 esterling coins =  $240 * 1.4 = 336 \text{ gr.} = 11.5 \text{ ounces.}$

$1 \text{ mana} = 240 \text{ esterling coins} + 10 \text{ esterling coins} = 250 \text{ esterling coins} = 250 * 1.4 = 350 \text{ gr.}$

The esterling coin weighs thus 1.40 gr. instead of 1.46 gr.

### **Back to Rashi on the Torah.**

There remains a conundrum in the exegesis of Rashi on the Torah. Rashi knows<sup>31</sup> that the shekel of the Torah has been revalued by 20% to become the Talmudic sela. Why does he give twice the weight of the Talmudic sela in his commentary on the Torah where he should give the weight of the Torah shekel in order to describe the weight of the Menorah. Indeed his shekel in the Torah is the same as that described in his commentary on B. Bekhorot and on B. Baba Kama. As it appears from the quotation above of the Rosh and from the discussion of Rashi's commentary by Nahmanides, these Rabbis had also understood that he was referring to the Talmudic sela. The Rosh, also, compares the weight given in the Torah to that given in the Talmud. But no one has objected this anachronism.

### **The Zakuk.**

We have mentioned above a quotation from Sefer Agudah quoting a tradition of R' Tam that the Talmudic mana is a zakouk. At the time of R' Tam the zakouk, weighed 12 ounces or 350.78 gr. This can be proved through a quotation from Sefer ha-Pardes:<sup>32</sup>

אמר ר' שלמה בשם הר' ר' גרשום זצ"ל שאסור לנהוג כדרך שנוהגין במלכות זה שנותן ליריד של קולוני"א זקוק של כסף שהוא י"ב אונקיות ומקבלים למלונם במגנצא או לוורמישא כשחוזרין י"ג אונקיות פשיטין.

The zakuk is defined here as twelve ounces.

But the normal meaning of the zakouk is the mark of eight ounces. For example in Kaftor va-Ferah chap. XVI it mentions explicitly that the zakouk is 8 ounces.<sup>33</sup>

In the fifteenth century we find the zakuk with the meaning of 6 ounces. For example in Terumat ha-Deshen, Vol. 2, § 232, we read that “in the area of the Rhine they write in the ketubah of the virgin 100 litra which are 100 zakuk while in Regensburg they write 100 pounds of the Iron Weighing standard which are 200 zakuk of silver”.

The end of the quotation means indubitably that one zakuk is a half pound or six ounces of the Iron Weighing standard; the beginning of the quotation means then that one litra of coins or 240 little silver coins of the time weighed one zakuk or six ounces i.e. 175.38 gr. We see how much the silver coins had been devaluated with regard of the sterling of the eleventh-twelfth century, they had been reduced by half. The Ketubah was thus 17.54 kg silver in the area of the Rhine while it was 35.08 kg silver in Regensburg.

### 3. About the Alleged Undervaluation of the Shekel by R' Tam.

In the Rabbinic literature we find a strange tradition assigning to R' Tam an abnormally light weight for the sela. This erroneous tradition can already be found in the beginning of the fourteenth century.

#### The Commentary Minhat Yehudah.<sup>34</sup>

In this commentary on Ex. XXI, 32, it refers to our printed Tossafot<sup>35</sup> and follows them. Like Tossafot, it reproaches to Rashi an alleged mistake according to which the Talmudic golden dinar and the Talmudic silver dinar would have the same weight of 2.5 esterling. In fact they misunderstood Rashi and wanted to understand that the Talmudic silver dinar has the same weight as the Talmudic golden dinar which weighs 2.5 esterling of the Iron weighing standard.<sup>36</sup> In the commentary Minhat Yehudah, it makes a second mistake: instead of equating the weight of the Talmudic silver dinar to 2.5 esterling<sup>37</sup> and the golden dinar to 5 esterling according to the truth<sup>38</sup> it attributes to R' Tam that the talmudic golden dinar weighs 2.5 esterling and the Talmudic silver dinar weighs only 1.25 dinar; in fact the half of the true weights. It may be noted that the text of the referred Tossafot does not support such a conclusion. The Minhat Yehudah concludes the discussion by the following summary. The five shekalim of the redeeming of the first-born are:

sixty esterling according to R' Eliahu of London (according to Gaonim: sela of 17gr or 12 esterling).

fifty esterling according to Rashi (sela of 14gr or 10 esterling).

twenty-five esterling according to R' Tam (sela of 7 gr or 5 esterling).

#### The Kaftor va-Ferah.

In Kaftor va-Ferah, R' Estori ha-Parhi writes that according to R' Tam the golden dinar weighs 2.5 esterling and the silver dinar weighs 1.25 esterling.<sup>39</sup>

It appears that these considerations are completely parallel to the conclusions of the Minhat Yehudah.

## Sefer Agudah.

We have already given above a quotation<sup>40</sup> of Sefer Agudah in the name of R' Tam, according which the mana is a zakuk. In the time of R' Tam the Zakuk was indeed 12 ounces. Another quotation of Sefer Agudah in Hilkhot Ketubot<sup>41</sup> ascertains that according to the thesis of R' Tam the Talmudic mana is a zakouk and two hundred zuz are two zakouk, so that when one gives to a virgin ten zehuvim or to a widow five zehouvim, one hasn't given less than the Torah obligation.

In other words ten zehuvim of the beginning of the fifteenth century are about two hundred Talmudic zuz. This statement is based on the data existing at the time of the author of Sefer Agudah in the beginning of the fifteenth century. We must then consider: First, the zakuk was a mark weighing eight ounces or 233.84 gr and second it seems according to Weiss that the zehuv of the Agudah weighed about 3.5 gr.<sup>42</sup> If k is the coefficient of equivalence between gold and silver then:

$2 \text{ zakouk} = 467.68 \text{ gr} = 10 * 3.5 * k$  and k is 13.36 which a very likely value for this period.

We deduce then the weight of the zuz according to R' Tam:

$1 \text{ zuz} = 467.68 / 200 = 2.34 \text{ gr.}$  and  $1 \text{ sela} = 9.35 \text{ gr.}$  i.e.  $2/3$  of the value according to Rashi. This opinion is mentioned in the responsa of Maharil<sup>43</sup> and in the glosses of Rema on Shulhan Arukh Yoreh Deah 66.<sup>44</sup>

## Conclusion.

There is a fundamental difference between the two first opinions and the third. The two first opinions attribute to the Talmudic silver dinar the half of its real weight on the basis of an incorrect understanding of the words of Rashi by R' Tam<sup>45</sup> and an incorrect understanding of R' Tam by Minhath Yehudah.<sup>46</sup> The third opinion is based on an incorrect understanding of the opinion of R' Tam, although correctly reported by the Agudah, because of the change of value of the zakuk used by the German Jews passing from twelve ounces to eight ounces without that the Rabbis, especially the Agudah himself and later the Maharil and Rema, remembered it.

### 4. Nahmanides and the Shekel.

In his Hilkhot Bekhorot, Ramban writes that the sela weighs twelve "arigenz" i.e. twelve orienco. The orienco had the same weight as the esterling. Now there are two esterling: the esterling weight of about 1.46gr, and the esterling coin of about 1.41 gr. It is likely that in Spain they referred to the orienco coin of about 1.40-1.41 gr. which is compatible with a sela of about 17 gr. corresponding to four Arabic golden dinar. The weight of the orienco and the esterling was therefore considered by the rabbis equal to  $384 / 12 = 32$  barleycorns or 8 kirt.

## Ramban in his Commentary on the Torah.

In his commentary on Ex. XXX, 14 Ramban expounds the point of view of Rashi and agrees to it especially on the point that Rashi equalizes the shekel of the Torah with the Talmudic sela, without taking any exception with the omission of the problem of the revaluation, but he says that Rashi forgot one point. *The kings of the nation reduced the weight of the golden coins. The fourth part of the shekel is in fact the dinar "shesh dang" of 4.24-4.25 gr. or 3 orienço, but it is heavier by about 1/3 than our golden coins.*<sup>47</sup> Thus, he says, *Rashi confused the dinar "shesh dang" with the modern gold coins of his (and also our) time. In fact the shekel is 3/4 of the ounce according to the weighing system of this country (Spain) and it is certainly the ounce of Rashi,* he says.

The ounce to which Nahmanides refers is the ounce of mark currently used in Spain and weighing about 23.3 gr. i.e. 16 orienço or 16 esterling.<sup>48</sup> The shekel is then 3/4 of this ounce and weighs 12 esterling and the Talmudic dinar weighs then 3 esterling.<sup>49</sup> By contrast, according to Nahmanides, Rashi thought that the shekel was the half of this ounce and weighed 8 esterling<sup>50</sup> and therefore Rashi's golden coins must weigh, according to Nahmanides, two esterling.<sup>51</sup>

#### Ramban in his Halakhot on Bekhorot.

He writes clearly that the shekel weighs twelve "arigenz of this country".

#### Ramban in his letter sent from Acco.<sup>52</sup>

Ramban writes about the shekel that he saw in Acco. *It weighs 10 esterling and this is certainly the half of the ounce that Rashi had mentioned.*<sup>53</sup>

*The Talmudic dinar weighs 96 barleycorns corresponding to the bizant sarrazin, it weighs 3 esterling and therefore the shekel weighs twelve esterling according to the Gaonim. But this is not true; the shekel is only 10 esterling as Rashi. We can deduce from it that in fact the Arabic kings increased the true Talmudic dinar by 1/6 (external) and established their Arabic dinar to 4.25 gr. representing about 6/5 of the Talmudic dinar."*

#### 5. R' Estori ha-Parhi and the Shekel.<sup>54</sup>

R' Estori ha-Parhi has given interesting data about the weight of different currencies of his time. But these data must be examined carefully because of corrupted readings, likely missing fragments and imprecision of the author.

As mentioned above he considers that the dirham of Maimonides weighs 61 barleycorns and doesn't mention the reference of the Hibbur, which according to our reading, corresponds to 64 barleycorns. He mentions that in his time the dirham weighs 54 barleycorns and he performs all his calculations on this basis.

On the basis of a sela of 384 barleycorns weighing four Arabic golden dinars, the sela or Talmudic shekel weighs 17gr. and six dirham, each of them weighing 2.83 gr.

He writes that one zakuk is worth fifty tournois,<sup>55</sup> but we know that the tournois was struck at the rate of 58 tournois per mark. The French mark weighed 244.75 gr. and the French ounce weighed 30.59 gr. The tournois weighed legally  $244.75 / 58 = 4.219$  gr. In fact the tournois weighed on average 3.95 gr. and were thus struck practically at 62 per

mark. Thus with one mark, the authority was striking 62 coins, but one could buy the mark of fine silver for 50 tournois. The tournois had thus a premium of about 12/50 or 24%. In fact the fineness of the tournois was, according to Kaftor va-Ferah 23/24 so that the premium was even greater:  $(24/23) * 24\% = 25\%$ .

He writes further<sup>56</sup> that one tournois is certainly worth two dirham. The fineness of the dirham is 2/3. In two dirham we have:  $2.83 * (2/3) * 2 = 3.77$  gr of fine silver.

$3.77 \text{ gr} * (24/23) = 3.94 \text{ gr}$ . This confirms that the tournois weighed practically, on average, 3.95 gr. This relationship was probably true in Palestine, where the tournois was considered according to its fine silver content. It was probably only in France that the tournois had such an important premium. Other currency like the esterling was indeed forbidden in France and the esterling was only a counting denomination.

Estori ha-Parhi studies carefully the weight and the value of the shekel according to the different rabbinic authorities.

Rashi in his commentary on the Torah.

We find the following relationships:

1 shekel = 0.5 ounce of Köln.

1 mark = 8 ounces = 50 tournois.

1 ounce = 6.25 tournois;

1 shekel = 1/16 mark = 3.125 tournois

1 mana = 78.125 tournois

5 shekel = 15.625 tournois.

Following remarks must be made:

The French mark is heavier than the mark of Köln. The ounce of Köln weighs 29.23 gr. while the French mark weighs 30.59 gr.

The relationship 1 mark = 50 tournois, is a relationship in value, only worth in France where the tournois was at a premium.

Thus the relationship 1 shekel = 3.125 tournois is a relation in value applicable only in France.

To get a correct relationship in weight we must correct:

$1 \text{ shekel} = 3.125 * (62/50) * (29.23/30.59) = 14.62 \text{ gr}$ .

Rashi in the Guemara.

The author is persuaded that the first calculation above refers to the Shekel of the Torah i.e. 3.33 dinar. He seems to ignore that Rashi gives the same weight for the sela in his commentary on the Torah. In fact he attributes to Rashi the theory of Maimonides but works with a dirham of 64 barleycorns. The sela weighs 384 barleycorns or six dirham; five sela weigh thirty dirham but they are worth 45 dirham.<sup>57</sup>

R' Jacob Gaon.

This is exactly the gloss in the text of B. Bekhorot: the five sela weigh 28.5833 dirham. Kaftor va-Ferah doesn't know that the Babylonian dirham (0.7 dinar) is heavier than the current dirham.

Ittur.

Two hundred dinar of the Torah weigh 40.5 ounces.  
One shekel of the Torah weighs 0.81 ounce or  $0.81 * 30.59 = 24.77$  gr.

R' Jona Ibn Janah.

One shekel of the Torah = 3.33 Talmudic dinar = 3.33 Arabic dinar.  
But the modern Arabic dinar weighs 92 barleycorns while the dinar of Tyre weighs 96 barleycorns.

Rosh.

Five sela = 27 tournois.  
It is probably a relationship in weight because in Spain the tournois has lost its premium.  
One sela = 5.4 tournois =  $5.3 * 3.95 = 24.88$  gr.

Estori ha-Parhi doesn't give any reference about the data that he ascribes to the former authorities. Furthermore we see, according to his description of the coinage of Rashi that we know relatively well, that we must take his data with much caution.

## 6. Conclusion.

It is not evident to make it out among the different denominations and still more when the same denomination<sup>58</sup> can refer to different weights. We have tried to explain the Halakhic coinage of different rabbinic authorities: Maimonides, Rashi, German Rishonim, Nahmanides and Estori ha-Parhi. We have proposed a likely solution to solve the contradiction about the weight of the Egyptian dirham between the commentary of Maimonides on the Mishna and his Hibbur.

We have seen that the German Rabbis had a surprising accurate knowledge of the Talmudic coinage.

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<sup>1</sup> Tshuvot ha-Rambam, Joshua Blau, Jerusalem 5720, Vol. 2, Responsum 268 pp. 510-515.

<sup>2</sup> See Hilkhhot Shekalim I: 2 and Hilkhhot Arakhim ve Haramim IV: 3.

<sup>3</sup> Kesef Mishneh ad locum writes that the Egyptian zuz corresponds to the dirham. This can also be deduced by the comparison of this passage with the passage mentioned of the introduction to the commentary on Mishna Menakhot according which the omer of Egyptian meal weighs 520 dirham. Similarly, R' Estori ha-Parhi writes that 1 dirham = 16 kirt.

<sup>4</sup> This is already mentioned by the commentary Kesef Mishneh ad locum. R' Joseph Caro writes the same in Hilkhhot Kelei ha-Mikdash II, 3:

ודע שדינר הוא משקל מיתקאל שהוא דרמא והצי והדרמא משקל ששים וארבע שעורות בינוניות.

<sup>5</sup> This relation is approximate: 6.25 dirham = 381.25 barleycorns and we need 2.75 barleycorns to complete the 384 barleycorns corresponding to one sela. 2.75 barleycorns represent 0.69 kirt.

<sup>6</sup> 5 sela = 5 \* 384 = 1920 barleycorns = 31.475 dirham.

<sup>7</sup> 30 sela = 30 \* 384 = 11520 barleycorns = 188.8525 dirham.



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<sup>8</sup> 50 sela = 50 \* 384 = 19200 barleycorns = 314.7541 dirham.

<sup>9</sup> The classical translation of this passage of Maimonides' commentary is corrupted.

<sup>10</sup> Kafih translated with the word מעה instead of דרהם. The word Maah is incorrect and misleading because the Maah is a coin weighing only 16 barleycorns.

<sup>11</sup> The commentary of Maimonides on this Mishna is problematic. Indeed at the last stage, according to the Judeo-Arabic text we must have the relation:

$(1/4) * 1 \text{ kirt} < 1 \text{ prutah}$ . However this is not true:  $(1/4) * 1 \text{ kirt} = 1 \text{ barleycorn} = 2 \text{ prutah}$ . Therefore we must wait for an additional step and write  $(1/4) * (1/4) * 1 \text{ kirt} < 1 \text{ prutah}$ .

Probably in order to avoid this difficulty, R' Joseph Kafih translated 1 dirham by 1 maah weighing 16 barleycorns and 1 kharuv by 1 grain of one barleycorn. But we do not find in the commentary of Maimonides a dirham of 16 barleycorns and 1 kharouf is always a kirt of 4 barleycorns.

<sup>12</sup> 20% of the total amount or 25% of the basis amount.

<sup>13</sup> In the Hibbur he speaks of Egyptian zouz; in the Mishna he speaks of the same amount of 520 Egyptian dirham. These two denominations must then be identical.

<sup>14</sup> See Kaftor va-Ferah chapter 16. He refers to Maimonides' commentary of the Mishna Bekhorot, parallel to our text, and to the Egyptian dirham of 61 barleycorns. He doesn't refer to the Hibbur and its reference of 64 barleycorns.

Nevertheless, in this chapter 16 he speaks alternatively about Maimonides' dirham of 61 barleycorns and about the current (Palestinian?) dirham of 64 barleycorns and he seems absolutely not troubled by these contradictory quantities.

<sup>15</sup> In the commentary on the Torah by R' Abraham, Maimonides' son, edited and translated by the late Rabbi Professor Ernest Wiesenberg, London 1958, it writes on Ex. XXXIX: 26, that the guerah is one maah (of 16 barleycorns) and is a quarter of an Arabian dirham. The editor notes that this is an approximation because R' Abraham writes in his responsa that one dirham is 64 corns of wheat representing  $(25/24) * 64 = 66 \frac{2}{3}$  barleycorns: this is nearly the Gaonic dirham of 0.7 dinar i.e. 67.2 barleycorns. R' Wiesenberg writes that he doesn't find a source to R' Abraham's statements which are certainly in contradiction with his father.

<sup>16</sup> Equation  $86 \frac{2}{3} \text{ sela} = 520 \text{ dirham}$  is the origin of the relations : 1 sela = 6 dirham or 1.5 dirham = 1 dinar and finally 1 dirham = 64 barleycorns. This equation was accepted by R' Joseph Caro in Kesef Mishneh on Hilkhoh Bikkurim VI: 15 and on Hilkhoh Kelei ha-Miqdash III: 3 and in Shulhan Arukh Yoreh Deah 294, 6: 1 and 305, 1: 5.

<sup>17</sup> R' Hai Gaon accounts for the measurement by R' Hilai Gaon of the weight of the volume water of one egg. The volume of water displaced by one egg was 16.66 Babylonian dirham. Therefore the weight of one reviit water is 25 Babylonian dirham =  $(7/10) * 25 = 17.5$  dinar.

See Benish, Midot ve-Shiurei Torah, p. 216. See Weiss, Midot u-Mishkalot shel Tora p. 85.

The relation: 1 dirham = 7/10 dinar is already mentioned in Rashi B. Bekhorot 49b, bottom.

<sup>18</sup> Practica della Mercatura, Francesco Balducci Pegolotti, Cambridge Massachussets 1936.

See also Midot u-Mishkalot Shel Torah, Jacob Gershon Weiss, p. 110.

<sup>19</sup> Midot u-Mishkalot shel Torah

<sup>20</sup> Erekh Milin by R' Haym Sheftiel, Berditchev 1907 and Tel Aviv 1969 : entry sela.

<sup>21</sup> Messorat ha-Shekel, Samuel Ze'ev Reich, Toronto 1988.

<sup>22</sup> Mahazor Vitry Nuremberg 1923. Vol 1; p. 44.

<sup>23</sup> Until recently I thought that this proof as well the two corrections of the text had not yet be proposed before. I have in the meantime discovered that R' P. Benish has already mentioned this text and the two corrections in his book Midot ve-Shiurei Torah, p.468 note 56.

<sup>24</sup> One can object: why 96 and why not 100 according to the text of Rashi in his commentary on EX. XXV, 29, who writes explicitly: hundred golden coins. If it was 100 then we would have in Köln two different systems, the Mishkal ha-Yashar and the Mishkal ha-Barzel.

In the Mishkal ha-Yashar: 1 mana = 1 pound = 240 esterling of Mishkal-ha-Yashar

In the Mishkal ha-Barzel: 1 mana = 100 zehouvim = 250 esterling of Mishkal ha-Barzel = 1.04 pound of Mishkal ha-Barzel = 20.883 shillings of Mishkal ha-Barzel.

This is in contradiction with the end of the quotation of Makhzor Vitry, stating that the mana is 20 shillings of the Mishkal-ha-Barzel and also one pound used for weighing pepper.

In other words, it is because of this last paragraph that we can correct 100 and replace it by 96, as in the text of Rashi.

- <sup>25</sup> Rashi expresses himself slightly differently in B. Baba Kama 36b בד"ה כסף צורי.
- <sup>26</sup> Sefer Ravia, Makhon Harry Fishel, Jerusalem 1965; Vol. 4, pp. 299-300. This reference, as the two following, were already mentioned by Reich.
- <sup>27</sup> Hiskuni, Venice 1524 and Cremona 1559.
- <sup>28</sup> On B. Bekhorot, chap VIII.
- <sup>29</sup> Sefer Agudah by R' Alexander Susslin ha-Kohen of Frankfurt, Jerusalem 1994, Bekhorot p. 90. He lived during the first half of the fourteenth century and died a martyr's death in Erfurt.
- <sup>30</sup> She'elot U Teshuvot Rabbi Yakov Weil, responsum 189, Jerusalem 1987/8 and 2000/1.
- <sup>31</sup> He has recalled it in his commentary on Ex. XXX, 13.
- <sup>32</sup> Sefer ha-Pardes § 269.
- <sup>33</sup> See Kaftor va-Ferah, 1997, Vol 1, p. 222.
- <sup>34</sup> By R' Judah ben Eliezer (thirteenth and fourteenth century). The commentary would have been completed in 1313 C.E. This commentary is together with the Commentary of the Tossafot, the first super-commentary on Rashi on the Torah. This commentary was edited by R' Jacob Nunez Weiss in Livorno in 1783. It was reprinted in Ofen in 1834 and then in Israel in 1967.
- <sup>35</sup> On B. Bekhorot 49b beginning with: אמר רבי אסי.
- <sup>36</sup> In fact Rashi has never spoken about the golden dinar but about the modern German golden coin weighing 2.5 esterling and which has the same weight as the Talmudic silver dinar.
- <sup>37</sup> As Rashi stated it: the Talmudic silver dinar has the same weight as a modern golden coin which weighs 2.5 esterling or about 3.5 gr.
- <sup>38</sup> Which they should have known from the commentary of R' Gershom on B. Bekhorot 49b.
- <sup>39</sup> See Kaftor va-Ferah, 1997, Vol. 2, p. 237.
- <sup>40</sup> Bekhorot p. 90.
- <sup>41</sup> Hilkhhot Ketubot chap. V, n° 75.
- <sup>42</sup> See Weiss, Midot u-Mishkalot shel Tora, chap. 48 p; 124.
- <sup>43</sup> responsum 76.
- <sup>44</sup> See Erekh Milin p. 55, entry zakuk, where it discusses if the zakuk of Agudah corresponds to eight or twelve ounces. In fact the comparison of the two quotations of Agudah does not leave any doubt on the matter: the Agudah considers a zakuk of eight ounces and Maharil understands the same.
- <sup>45</sup> Rashi ascertains that the Talmudic silver dinar has the same weight as the modern golden coin in use in Köln in his time which weighs about 2.5 esterling. R' Tam understands that Rashi equalizes the weight of the Talmudic silver and golden dinar.
- <sup>46</sup> He ascertains that R' Tam established the weight of the Talmudic golden dinar to 2.5 esterling and the weight of the Talmudic silver dinar to 1.25 esterling.
- <sup>47</sup> The Arabic dinar weights 4.25 gr. i.e. 3 esterling. Apparently, Nahmanides means that the new and diminished golden coins weigh 2 esterling i.e. about 2.83 gr. and therefore the shekel of Rashi weighs four such coins or 8 esterling. Nahmanides writes "further about 1/3" so that it is difficult to know exactly to which golden coin he refers. Probably because of this difficulty of exegesis, R' J.G. Weiss has proposed to explain this passage otherwise (see his book Midot u-Mishkalot shel Torah p. 115 and note 115). According to him, Nahmanides considers that Rashi had a shekel of 10 esterling according to the truth and his golden coin weighed 2.5 esterling, but he estimates the weight of the shekel according to the Gaonim as 15 esterling. This allows him explaining that the dinar is 50% heavier than the modern golden coins (1/3 external). This explanation seems however farfetched and incorrect. It would imply that Ramban understood correctly Rashi but erred in the understanding of the Gaonim. Nevertheless in his Halakhot on B. Bekhorot, that he wrote before leaving Spain, he understands correctly the Gaonim. Further from his letter sent from Acco, we see clearly that it is Rashi whom he had misunderstood and therefore he had ascribed him an incorrect ounce.
- <sup>48</sup> The esterling corresponding to this ounce weighs about 1.46 gr. This would give a dinar of  $3 * 1.46 = 4.38$  gr. and a shekel of 17.52 gr. It is likely that the relationship 1 shekel = 0.75 Spanish ounce is approximate and must be considered with the esterling coins of about 1.41 gr. giving a Talmudic dinar of about 4.24-4.25 gr. equal to the the bizand sarrazin of Acco of the same weight.
- <sup>49</sup> Similarly R' Solomon ben Aderet wrote in responsum 1011 that the Talmudic dinar weighing 96 barleycorns is three arigenz or three esterling of Barcelona, weighing 32 barleycorns. It is likely that he refers to the esterling coin of about 1.41 gr. and not to the esterling weight of about 1.46 gr.

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<sup>50</sup> The sela of Ramban weighs 12 esterling and, according to him, the sela of Rashi weighs 8 esterling. This corresponds with his introductory statement that the kings devaluated the golden coins by 1/3.

<sup>51</sup> The Talmudic silver dinar has the same weight as the golden modern coin of his time.

<sup>52</sup> For a complete text of the letter see:

The Letter About the Coin “Shekel Israel” and its Weight. Rabbi Tsvi Hirsh Eisenstadt, Talpiot, Yeshiva University Vol IV, N° 3-4, 1958.

Peirush ha-Ramban al ha-Torah. Ed Shavel, Mossad ha-Rav Kook.

Ramban al ha-Torah, Tuv Yerushalayim, ed. Lieberman, Jerusalem 1997.

<sup>53</sup> « and that I had rejected »

<sup>54</sup> R’ Estori ha-Parhi (1280 ~1355). French Rabbi born in Northern France (Tour, hence his name Ish Tori) or in Provence, but from parents originated from Tour, he studied under R’ Jacob ben Makhir. In 1306, when the Jews were expelled from France, he escaped to Spain and learned under R’ Asher ben Yehiel. He was in Cairo in 1313 and then remained in Israel. He completed his famous book in 1322.

<sup>55</sup> It is the “ gros tournois “, it weighed theoretically 4.219 gr. It was divided in 12 “petit tournois” of 0.351 gr.

<sup>56</sup> Vol 1, p. 283.

<sup>57</sup> Because the fineness of the dirham is 2/3.

<sup>58</sup> For example the Zakuk.