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## Concerning the Choices of Dates for WRR’s Rabbis Samples

By Doron Witzum

### Introduction

WRR's experiment concerning the hidden *Genesis* code, (publicized in *Statistical Science* [1]), is the subject of the critical paper of MBBK (McKay, Bar-Natan, Bar-Hillel & Kalai): “Solving the Bible Code Puzzle,” in that same journal [2]. They discuss (Section 5 and Appendix B) the dates used in WRR’s samples, claiming that WRR had many choices pertaining to these dates. Their argument is twofold:

1. They claim that WRR exploited “freedom” in choosing dates to **directly optimize** their results.

In this respect, they claim that WRR always (or almost always) made choices that improve their results.

2. MBBK used these alternative choices as “variations” in their own “study of variations”.

In this context they claim that *apparent* deliberate optimization of dates to improve results, is not necessarily from deliberate optimization of dates, but rather *indirect* evidence that WRR *directly* optimized the **appellations**.

In their discussion MBBK mixed up the two perspectives, but we will deal with them separately, and thus clarify this issue.

In part **A** we will discuss perspective **1**: Did WRR actually exploit “beneficial” choices to directly optimize their results or not.

In part **B** we will discuss perspective **2**: Does the analysis of the variations pertaining to dates indicate optimization through the appellations?

## Part A: Direct Optimization

### Introduction

In this section we will scrutinize MBBK’s claim that WRR directly optimized the results by exploiting “beneficial” choices pertaining to the dates.

Concerning direct optimization, remember that originally P1 and P2 were the sole statistics used to measure the success of L1 and L2. Therefore, any optimization of dates must have been in relation to P1 or P2, or, more probably, in relation to  $\text{Min}(P1-P2)$ . Therefore, it is most sensible to examine the situation with these statistics. Instead, MBBK present their results in relation to other statistics. Our article [3] (Chap. 3) already points out that this grossly distorts the real results. This article will also give some clear examples of this.

The choices presented by MBBK are far less relevant to the second rabbis sample, L2, than to the first sample, L1. This is because the conditions of the second experiment were already defined by the first experiment, leaving little room for choice in the second experiment. Therefore we will discuss the two samples separately.

- Chapter one will discuss “optimization” through date choices in L1.
- Chapter two will discuss the same concerning L2. This discussion will be brief and simple because only one kind of choice is relevant in L2.
- Chapter three will evaluate MBBK’s “replication” which used alternative dates.

## Chapter I

### The First Sample: Was there any optimization through dates?

In Section 5 of their article (pgs. 155-156), MBBK list the following possible date choices:

1. The choice to correct/add/remove dates.
2. The choice to write the day and month without the year.
3. The choice to use specific names of months (and not others) and specific spellings (and not others).
4. The choice of not "specifying dates by special days such as religious holidays".
5. The choice to write days falling on the 15<sup>th</sup> or 16<sup>th</sup> in two different forms and not only in one.
6. The choice of certain forms of dates.

We will explain the background of each choice, and investigate whether it would have improved or worsened WRR’s original results. To keep things brief, most details are in the appendix and only conclusions are discussed here.

Careful examination of all the choices indicates WRR’s perfect integrity. Alternative choices, based on MBBK’s suggestions, would have yielded **better results** — sometimes by a factor of 2 or 3, sometimes by a factor of 10 or 100, and sometimes by a factor of **tens of thousands**.

All this starkly contradicts MBBK’s report and the impression created by their article.

#### An example:

Regarding choice 6 mentioned above, “the choice of certain forms of dates”, we write in the appendix (Section 6):

Most of the dates pertaining to L1 are given in Encyclopedia Margalio in standard forms and not specified by “special days”. Of the 37 dates in L1, 30 are given in standard forms. The Encyclopedia uses the following four standard forms:

- a. "א' תשרי".
- b. "בא' תשרי".
- c. "א' בתשרי".

d. "בא' בתשרי".

The linguist Ya'akov Orbach o.b.m., WRR's linguistic advisor, suggested using the three standard forms a-c. We do not know his reasons, and we specifically do not know whether he examined or considered the forms used by Encyclopedia Margalioth. (Perhaps it is just a coincidence, but the date forms used by Encyclopedia Hebraica for the rabbis of L1 are precisely forms a-c.).

MBBK wrote concerning this:

"To write the day and the month, WRR used three forms, approximately corresponding to the English forms "May 1st," "1st of May" and "on May 1st". They did not use the obvious "on 1st of May," which is frequently used by Margalioth..." (Pg. 155)

They also wrote:

"The most obvious variation would have been to add the form akin to "on 1st of May". It gives the score [1.2, 2.2; 0.6, 16.4]." (Pgs. 168-169)

We examined MBBK's "most obvious" choice of including the fourth form, d, as well. Let us check the following choices:

1. Forms a-c (used by WRR).
2. Forms a-d.

The results are (The numbers are the ratio of: "corrected" result/ original result):

Choice no.	P1	P2	Min(P1-P2)
1(WRR)	1	1	<u>1</u>
2	<u>0.3</u>	1.2	<u>0.3</u>

Table 1

(Following MBBK's usage we underlined improvements caused by the change.) Note that the result improves, contrary to the result given by MBBK! (As we proved elsewhere [3], their way of presenting results is calculated to conceal results like these).

### **Conclusion of the discussion in the appendix:**

1. Many proofs are brought which confirm that L1 was prepared honestly. Time and again we demonstrate that WRR did **not** make "beneficial" choices.
2. Our proofs are direct, and therefore are much more significant than any of the indirect proofs attempted by MBBK.
3. The "variations" examined are based on MBBK's own suggestions.
4. MBBK cannot claim, as is their wont, that WRR failed to improve their results only because they did not notice the opportunity to do so. MBBK themselves wrote:

"We believe that in fact we have provided a fairly good coverage of natural minor variations to the experiment and that most qualified persons deeply familiar with the material would choose a similar set." (Pg. 161)

5. What caused the discrepancy between their report and the truth? We suggest three reasons:
  - a. Their failure to report many of the choices. (This is the dominant cause).
  - b. Presenting results using irrelevant statistics (as in the above example).
  - c. Errors of computation.

**Conclusion:**

The main conclusion is that L1 was made with integrity.

Note that MBBK investigated L1 solely to see whether it was compiled honestly or not. As they write in Section 3 of their article:

“WRR's first list of rabbis and their appellations and dates appeared in WRR94 too, but no results are given except some histograms of  $c(w, w')$  values. Since WRR have consistently maintained that their experiment with the first list was performed just as properly as their experiment with the second list, we will investigate both.” (Pg. 154)

Therefore they must accept our conclusions and all that they imply. Now that WRR's integrity is proven, the L1 results must also be evaluated with the evidence for a hidden *Genesis* code.

**Chapter II****The Second Sample: Was there any optimization through dates?**

Since all date choices were established in L1, only one type of “choice” remained in L2: Whether to correct/add/remove dates. In their Appendix B, MBBK claim that WRR should have corrected/added/removed dates in six places in L2. At this point we will not examine the validity of this claim, because this demands historical expertise beyond the scope of this article. Instead, using MBBK’s own data, we will examine whether WRR utilized “date choices” to improve their results or not.

**1.** MBBK create the impression that WRR exploited “date choices” to improve the results of their experiment on L2. In Section 5 (Critique of the List of Word Pairs), in the paragraph titled, “The choice of dates”, they write:

" - - - we know that they [the dates] came from a wide variety of sources. Some dates given by Margalio were omitted on the grounds that they are subject to dispute, but at least two disputed dates were kept. Other dates were changed in favor of sources claimed to be more authoritative than Margalio, but at least two probably wrong dates were not corrected. One date which was neither a date given by Margalio nor a correction of one was introduced from another source. However, several other dates readily available in the literature were not introduced. The details appear in Appendix B." (Pg. 155)

This clearly implies that WRR freely manipulated the dates with no rational considerations. The reader draws the desired conclusion: WRR exploited this freedom of choice to improve L2.

After creating the impression that WRR had exploited “date choices” to improve the results of L2, MBBK allowed themselves to do the “same thing” in creating their *War and Peace* list (Section 6 of their article):

Thus their *war and Peace* list used neither WRR’s dates nor those which MBBK considered correct. Instead they chose to add one extra date to improve their results (as they report on page 157), despite their claim in Appendix B that six

dates should have been corrected/added/removed. Note that they did this even though there was not even one case where WRR added a date in L2.

2. Did WRR use “date choices” to improve the result of L2 or not? This can be settled by a simple test.

Let us first list the corrections suggested by MBBK in Appendix B.

1. Omission of a date (due to doubt) for persona no. 15.
2. Addition of a birth date for persona no. 17.
3. Correction of date for persona no. 20.
4. Correction of date for persona no 21.
5. Addition of birth date for persona no. 24.
6. Addition of birth date for persona no. 30.

Now, let us see whether these “corrections” worsen L2’s results or not. If any of them improve the results, it indicates that WRR's alternative choice was to their disadvantage. Here are the results:

Change no.	P1	P2	Min(P1-P2)
1	7.2	3.1	3.1
2	1.0	1.0	1.0
3	1.0	0.9	0.9
4	3.8	1.1	1.1
5	0.1	0.2	0.2
6	0.5	0.3	0.3
1-6	1.4	0.2	0.2

Table 2

This table clearly shows that:

- Only two suggested changes worsen the results.
- In aggregate, the changes improve the results.

Therefore, if there was any “freedom in date choices”, WRR used it to damage their results...

### **Conclusion:**

The above is unequivocal evidence that WRR acted honestly and exploited no “freedom in date choices” to improve their result. There was no direct optimization through date choices for L2.

This contradicts MBBK’s implications, and eliminates their rationale to exploit date choices in “imitation” of WRR.

## Chapter III

### An Instructive “Replication” of MBBK

We saw that MBBK’s report of WRR’s date choices is distorted and misleading. They claim that WRR dishonestly improved their results—but the opposite is true. This is not surprising because distortions and deceptions cloud **all** the issues

of their **entire** article, as we already proved [3]-[8]. Now we will give another example: It concerns the manner in which MBBK conducted their “replication” concerning dates.

They write:

“As an aside, a universal truth in our investigation is that whenever we use data completely disjoint from WRR's data the phenomenon disappears completely. For example, we ran the experiment using only month names (including the Biblical ones) that were not used by WRR, and found that none of the permutation ranks were less than 0.11 for any of P1\_4, for either list.” (Pg. 168)

MBBK report a replication utilizing only month names not used by WRR, claim that it failed, and claim that the same happened to all their replications.

But close scrutiny of MBBK’s list of “new” month names (details in the Appendix, Sec. 7) reveals many flaws:

- a. The list is not closed.
- b. Four of its 12 names are incorrectly spelled.
- c. Four additional names are “Biblical” and the way they are used by MBBK is most dubious.
- d. In addition, the design of MBBK's experiment's is flawed:
  - For L1: Dates based MBBK's month names apply to only 10 personalities out of 34.
  - For L2: They apply to only 15 personas out of 32.

These flaws are fatal: For example, eliminating the cases disqualified by flaws b-c leaves only three month names suitable for MBBK’s experiment.

### **Conclusions:**

1. The results of MBBK's “replication” are worthless.
2. Even if the flawed data is corrected, no replication can be prepared based on MBBK's dates, because:
  - Only three suitable names will remain.
  - The set from which the names were extracted is not closed.

Yes, we indeed subscribe to MBBK’s assertion that:

“As an aside, a universal truth in our investigation is that whenever we use [wrong] data completely disjoint from WRR's data the phenomenon disappears completely.”

Note that we have added the word “wrong” which MBBK has "erroneously" omitted.

(Similar criticism pertaining to their other “replications” is given in [9]).

## Appendix

In sections 1-6 we will list and explain WRR’s various “choices” (according to MBBK) in L1, and give the precise data and results pertaining to chapter I.

Section 7 will detail the flaws of MBBK’s “replication” discussed in chapter III.

## 1. The choice to add/remove/correct dates:

Regarding this, MBBK checked (in their Appendix B) two choices.

(A) WRR had the choice to use only the dates mentioned in *Encyclopedia Margaliot* (the source of the sample's personalities. We will denote it *EM*) or to add dates omitted by *EM*.

In this connection MBBK examined the following choice:

(1) The choice to add the birth date of “the Besht” which is not given by *EM*.

(B) WRR had the choice to use *EM*'s dates even when other sources disagree with these dates, or to omit them.

In connection to this MBBK examined the following choice:

(2) WRR's choice to include the death date of Rabenu Tam, which MBBK claim is subject to argument.

But, using such logic, MBBK should also have checked *another* choice. In L1 WRR omitted two dates that were subject to argument. Therefore MBBK should have checked the following choice:

(3) WRR's choice to omit those two dates, instead of using them as they appear in *EM*.

Let's see what would have happened had WRR chosen differently, and:

1. Not added the date of the Besht.
2. Omitted the date of Rabenu Tam.
3. Relied on the *EM* and not omitted the two dates subject to argument.

These alternative choices would behave as follows (The numbers are the ratio of: "corrected" result/ original result):

Choice no.	P1	P2	Min(P1-P2)
1	8.9	8.2	8.9
2	0.4	1.6	0.4
3	0.6	1.8	0.6

Table 3

Like MBBK we emphasized the improvement caused by the alteration.

## 2. The choice to write the day and the month, but not the year.

Concerning this choice MBBK writes:

“Only the day and month were used, not the year” (Pg. 155).

But besides stating this fact, no data is given to show how this choice affects the results. Furthermore, this claim is ambiguous. It could mean:

- (a) That WRR should have used date expressions including the day, the month and the year.
- (b) That WRR should have used two terms for each date: One including the day and month (as WRR did) and another including only the year.

Later we will examine both possibilities. But first let's make clear that WRR's choice of just the “day and month” is the most natural: Most of the dates

in L1 are death dates, and while Jewish tradition attaches great importance to death anniversaries, little significance attaches to the year of a death.

(A) Let us examine the choice to include the day, month and year in each date. It transpires that such dates are generally useless when it comes to measuring the odds:

- (1) Either because they do not appear in *Genesis* as ELSs.
- (2) Or because there are insufficient numbers of “competitors” with unequal letter sequences.

So if we write the dates as MBBK suggests, only **three** (out of 34) personalities will have any results measurable with our procedure. Therefore this option is impractical.

(B) Let’s try the second option: To create two dates for each personality. One with the day and month (as WRR did) and another with only the year. This choice improves the results by a factor greater than 10.

Conclusion: Here too, WRR “chose” to their disadvantage.

### 3. Choices concerning month names and their spelling.

The choices of month names and their spelling for L1 were made *a priori* by an independent expert, the linguist Ya’akov Orbach o.b.m. Nevertheless, MBBK claim that certain choices of months and their spellings were exploited by WRR to their advantage.

Detailed analysis reveals the opposite: Examination of the MBBK’s alternative “choices” indicates that WRR “chose” to their disadvantage.

In this case, MBBK discriminate between normal suggestions and those of “more drastic” changes. Accordingly, we will divide our discussion into two: In (A) we will discuss their “conventional” “variations”, and in (B) we will discuss their “unconventional” ones.

(A) In Appendix B (pg. 168) MBBK suggest three “conventional” changes to the month names and their spelling. Because Orbach, the expert who chose them, is no longer alive, we cannot ask him his reasons. But we can still check whether these choices were the best for WRR’s interests.

(1) Concerning the month “חשוון” (Cheshvan), MBBK suggests using the alternative “מרחשוון” (Marcheshvan). There are three possibilities:

1. To only use “חשוון” (like WRR).
2. Only “מרחשוון”.
3. Both forms together.

Choice no.	P1	P2	Min(P1-P2)
1(WRR)	1	1	1
2	10.0	6.4	8.5
3	1.0	1.0	1.0

Table 4

Please note that for the form “Marcheshvan” there is no relevant date in L1 which appears as an ELS in *Genesis*. Therefore, the worse result in 2 is not because of unsuccessful convergences of dates based on “Marcheshavan”, since there are **no** such convergences. The worse result was simply because of the omission of the dates based on “Cheshvan” in option 2.

(2) Concerning the month “אייר” (Iyyar), MBBK suggests the spelling “אייר”. There are three possibilities.

1. Only “אייר” (Like WRR).
2. Only “אייר”.
3. Both spellings.

Choice no	P1	P2	Min(P1-P2)
1(WRR)	1	1	1
2	55	7.2	9.4
3	3.8	<u>0.3</u>	<u>0.4</u>

Table 5

Note that Orbach’s choice of “אייר” (and not “אייר”) is consistent with his choice of *grammatical orthography* (“ktiv dikduki”) and only demonstrates his consistency. Imagine MBBK’s criticism had Orbach chosen “אייר” ...

(3) Concerning “אדר א”, MBBK suggest the form “אדר ראשון”, and similarly for “אדר ב” they suggest “אדר שני”. There are three possibilities:

1. Only “אדר א” and “אדר ב” (like WRR).
2. Only “אדר ראשון” and “אדר שני”.
3. Both forms together.

Choice no.	P1	P2	Min(P1-P2)
1(WRR)	1	1	1
2	5.6	9.1	5.6
3	<u>0.9</u>	<u>0.8</u>	<u>0.9</u>

Table 6

(4) It turns out that there is yet another possibility checked by MBBK, but not reported in their article. I discovered it incidentally through an e-mail McKay [10] sent me concerning an experiment described later in Sec. 7. MBBK chose to replace the second month of Adar, “אדר ב”, by the rare form “אדר”. This also creates three possibilities.

1. Only “אדר ב” (like WRR).
2. Only “אדר”.
3. Both variations together.

Choice no.	P1	P2	Min(P1-P2)
1(WRR)	1	1	1
2	1.0	4.6	1.0
3	<u>0.8</u>	<u>0.8</u>	<u>0.8</u>

Table 7

(B) Now let us deal with MBBK's "unconventional" suggestions. MBBK suggests using "Biblical names":

"A more drastic variation available to WRR was to use the names of months that appear in the Bible, which are sometimes different from the names used now. Those names are: Ethanim, Bul, Kislev, Tevet, Shevat, Adar, Nisan, Aviv (another name for Nisan), Ziv, Sivan, Tammuz and Elul. The month of Av is not named at all. This variation gives a score of [220, 24, 3400, 2800] if the Biblical names are used alone (with two names for Nisan and none for Av) and [1.7, 10.5, 67, 450] if both types of name are used together. This variation is consistent with WRR's frequently stated preference for Biblical constructions." (Pg. 168)

In fact, their list of "Biblical names" includes only four not used by WRR: "Ethanim", "Bul", "Aviv", and "Ziv". This is for good reason: **No one** ever used or uses expressions like "טי אביב" (9 Aviv) or "י"ג בול" (13 Bul) to mark dates (whereas the names used by WRR are common). Therefore **using these expressions cannot be considered as "a choice"**.

Incidentally, expressions like "טי אביב" or "י"ג בול" and suchlike are never found in the Bible. Therefore, MBBK's claim that they are "Biblical constructions" is **a joke**.

To reconstruct MBBK's computations we e-mailed McKay and asked:

" There are three samples of pairs of Hebrew expressions, which were the basis of replications whose results are quoted in Appendix B, using "Biblical names" for the months. But the samples themselves were never published. I would appreciate your help in receiving these data."

McKay replied on Feb. 22 '00. Concerning our discussion he answers:

"Dates were unchanged except for changing the month spelling.  
The month names appearing in the Tanach are:  
KSLW )DR [we used )DR) and )DRB also] #B+ )TNYM )LWL TMWZ  
)BYB BWL ZW SYWN NYSN +BT "

(1) Based on his reply we calculated the following "choices":

1. The month names used by WRR.
2. The "Biblical names" (as suggested by MBBK) alone.
3. Both types together.

Choice no.	P1	P2	Min(P1-P2)
1(WRR)	1	1	1
2	433	222	292
3	0.4	0.3	0.4

Table 8

It turns out that contrary to the data for choice no. 3 in their article, the result improves.

(2) Perusal of the dictionary [11] and Concordance [12] reveals that the word "Aviv" is never used as a month name. It's an adjective. "The month of Aviv" is a

sobriquet for Nissan. Is there any meaning to the expression “13<sup>th</sup> of Aviv”? We are doubtful about MBBK's other suggestions because they have no precedents, but the case of “Aviv” is most probably a mistake. Therefore let us repeat the last experiment without “Aviv”.

Let's again calculate the following “choices”:

1. The names as used by WRR.
2. The “Biblical” names excepting “Aviv”.
3. 1+2.

Choice no.	P1	P2	Min(P1-P2)
1(WRR)	1	1	1
2	161	176	161
3	0.1	0.2	0.1

Table 9

Choice no. 3 indeed improves even more.

But as we said these expressions are spurious: No authentic source indicates that the names (?) “Ethanim”, “Bul” and “Ziv” were ever used without their Biblical suffixes: “ירח האתנים” (the **moon** of Ethanim), “ירח בולי” (the **moon** of Bul), “ירח זוי” (the **moon** of Ziv) and “חדש זוי” (the **month** of Ziv).

#### In conclusion:

1. Considering *all* the choices, it is clear that WRR chose to their disadvantage. No bias toward “beneficial” choices is observed.
2. MBBK systematically ignored the choices that would have improved the results, thus creating the illusion that WRR chose to their advantage.
3. MBBK invented new date expressions (which they called “Biblical”), harnessing them to “convince” the indiscriminating reader.

### **1. The choice to not specify dates by “special days”.**

Concerning this option MBBK write:

“...and the standard practice of specifying dates by special days such as religious holidays (used in WRR’s main source Margaliot (1962), for example) was avoided.” (Pg. 155)

First let us make clear that:

1. MBBK’s implication that the *EM* regularly specifies dates by “special days” is unfounded. The biographies of the personalities of L1 were authored by various authors, each one writing dates in his specific style. MBBK’s “standard practice of specifying dates by special days” was used in only about **half** of the possible cases.
2. WRR acted scientifically correct by using the standard date forms used in most of *EM*’s dates, and avoiding unusual forms. Had they used unusual forms, MBBK would probably have complained why they didn’t use the standard ones...

Let us now check how this choice influences the results of L1. MBBK’s meaning concerning this choice is unclear. There are three possibilities:

- (a) To use only those dates specified by “special days”.

(b) To use WRR's standard forms and *add* the dates specified by "special days" where applicable.

(c) To use the dates specified by "special days" where applicable, and use standard forms only for personalities for whom the former kind is not applicable.

Let us examine these possibilities one by one.

(A) Using only those dates specified by "special days".

This option is impractical: *EM* uses such dates for only seven out of the 34 personas. (Even MBBK admitted in *Galileo* [13] that it is impractical to have dates for only seven personalities.)

(B) Using WRR's standard forms and *adding* the dates specified by "special days" where applicable.

With this option we get uniformity: In principle, each date is specified in both ways: by the standard forms of WRR's and by "special days". (Obviously, not every date is a "special day". In such a case we have only the standard forms.)

Besides the problem to which of options (a)-(c) MBBK refer, it is also unclear what they mean by "special days". In their article in *Galileo* [13] they included the following:

- "ר"יח תשרי" (this is an abbreviation for "Rosh-Chodesh Tishri" = the head of the month of Tishri).
- "בר"יח תשרי" (this is an abbreviation for "in Rosh-Chodesh Tishri").
- "ראש השנה" (Rosh Hashana = head of the year).
- "בראש השנה" (in Rosh Hashana).

(1) We must emphasize that WRR did not include any abbreviations which are **not pronounced**. Therefore they had no option to use the first two forms just quoted.

(2) For L1, only dates relating to Rosh Chodesh were relevant (no date of Rosh Hashanah existed in L1).

Let us list the various possibilities:

1. Not mentioning "special days" (like WRR).
2. Using abbreviations for *Rosh Chodesh* like "ר"יח תשרי" , "בר"יח תשרי" .

But MBBK possibly meant that one should use the expression "Rosh Chodesh" by itself, just as they suggested using "Rosh Hashanah" by itself. Therefore there is a further option:

3. Like 2, but **also** using the expression "ראש חדש" (Rosh Chodesh) and "בראש חדש" (in Rosh Chodesh).

But if so, why not also use names of holidays like "פסח" (Pesach) etc. This brings us to the following option:

4. Specifying dates through "special days" like: "(ב)ראש חדש", "(ב)ראש השנה", "(ב)פסח" etc.
5. 2+4.

Choice no.	P1	P2	Min(P1-P2)
1(WRR)	1	1	1
2	<u>0.1</u>	<u>0.4</u>	<u>0.1</u>
3	<u>0.06</u>	<u>0.1</u>	<u>0.06</u>
4	<u>0.01</u>	<u>0.09</u>	<u>0.01</u>
5	<u>0.002</u>	<u>0.04</u>	<u>0.002</u>

Table 10

(3) More detailed dates can be chosen:

1. Dates of the form: "א' פסח", "בא' פסח", "א' בפסח", "בא' בפסח".

*EM* also uses the word "של" ("shell" = of) in relation to "special days". So we can expand option 1 to include these as well:

2. 1 + dates of the form: "א' של פסח", "בא' של פסח".

*EM* also uses the letter "ד" ("de" = of) in relation to "special days". For example, "ב' דשבועות" (the 2<sup>nd</sup> of Shavuoth). Therefore, we can expand option 2 to include these as well:

3. 2+ dates of the form: "א' דפסח", "בא' דפסח".
4. 3 + option 4 in the previous paragraph, (2).

Choice no.	P1	P2	Min(P1-P2)
WRR	1	1	1
1	<u>0.003</u>	<u>0.09</u>	<u>0.003</u>
2	<u>0.0003</u>	<u>0.01</u>	<u>0.0003</u>
3	<u>0.0003</u>	<u>0.01</u>	<u>0.0003</u>
4	<u>0.00002</u>	<u>0.002</u>	<u>0.00002</u>

Table 11

(C) Using the dates specified by "special days" where applicable, and using standard forms only for personalities for whom the former kind is not applicable.

We think that this option is impractical: It is improper to have a list of dates, some denoted according to one method, and the others according to another. WRR would have been castigated if they did this.

Therefore the following data does not represent real options, and are only presented to complete the picture. These options parallel the options of paragraph (B), mentioned there in (2) and (3):

1. With no mention of "special days" (like WRR).
2. The option corresponding to (B)(2)2.
3. The option corresponding to (B)(2)3.
4. The option corresponding to (B)(2)4.
5. The option corresponding to (B)(2)5.
6. The option corresponding to (B)(3)1.
7. The option corresponding to (B)(3)2.
8. The option corresponding to (B)(3)3.
9. The option corresponding to (B)(3)4.

Choice no	P1	P2	Min(P1-P2)
1(WRR)	1	1	1
2	4.9	5.3	4.9
3	1.9	1.8	1.9
4	13.1	32.0	13.1
5	1.9	13.5	1.9
6	3.3	32.3	3.3
7	<u>0.3</u>	4.2	<u>0.3</u>
8	<u>0.3</u>	4.8	<u>0.3</u>
9	<u>0.02</u>	<u>0.6</u>	<u>0.02</u>

Table 12

In conclusion:

Here too, WRR could have made far better choices.

### 5. The choice to write 15<sup>th</sup> or 16<sup>th</sup> in two ways and not only one.

We indicated the 15<sup>th</sup> and 16<sup>th</sup> of the month in two different ways: "ט"י" (9+6) and "י"ה" (10+5) for 15, and "ז"ט" (9+7) and "י"ו" (10+6) for 16. MBBK describe this choice as follows:

"Most surprising is how they wrote the fifteenth and sixteenth of each month. These are customarily written using the letters representing 9+6 (or 9+7), avoiding the letter pairs representing 10+5 (or 10+6) for religious reasons. The nonstandard forms were in occasional use centuries ago, but are now so obscure that few except scholars have seen them used. Despite this, WRR chose to use both, a choice greatly in their favour, as we shall see in Section 7." (Pg. 155)

(A) We think that our choice is logical and correct considering the nature of the Torah codes:

The Hebrew letters are used as numbers. א = 1, ב = 2, ג = 3 etc. Accordingly, after י"ג (=10+3=13) and י"ד (=10+4=14), י"ה (=10+5=15) and י"ו (=10+6=16) should be used. But, since the last two combinations of letters are part of G-d's holy Name, there was a religious reason (respect for His Name) to avoid using these combinations outside the Bible. Instead, substitutes were invented: "ט"י" (=9+6=15) and "ז"ט" (=9+7=16).

Because we are searching for codes in **the Torah itself**, there is no reason why that text should avoid using parts of G-d's Name, or even His whole Name. The Torah mentions G-d's name hundreds of times.

Therefore, in our research **there is no reason** to substitute "ט"י" for "י"ה" and "ז"ט" for "י"ו".

We told our critics this fact at the start of our controversy [14], but they chose to ignore it, and to describe our choice as "the nonstandard forms were in occasional use centuries ago" (Pg.155), or "...the obsolete ways of writing 15 and 16" (Pg. 168).

(B) Let us examine the following choices:

1. Both "י"ה" ("י"ו") and "ט"י" ("ז"ט") (like WRR).
2. Only "י"ה" ("י"ו").
3. Only "ט"י" ("ז"ט").

Choice no.	P1	P2	Min(P1-P2)
1(WRR)	1	1	1
2	0.8	1.2	0.8
3	70.8	8.8	11.5

Table 13

Conclusion:

The use of "יה" ("יו") does improve the results, but had WRR really wanted to improve the results they should have used possibility 2 and not 1.

The improvement seen here reflects the premise of the experiment (see paragraph (A)). Note that in all the cases investigated above, using "two possibilities" together always improved the results (except one case where the result remained unchanged). So it is not surprising that here too the "two possibilities" (option 1) performed better than the MBBK's suggestion (option 3).

## 6. The choice of date forms.

Most of the dates pertaining to L1 are given in *EM* in standard forms and not specified by "special days". Of the 37 dates in L1, 30 are given in standard forms. *EM* used four standard forms:

- a. "אי תשרי".
- b. "באי תשרי".
- c. "אי בתשרי".
- d. "באי בתשרי".

The linguist Ya'akov Orbach, WRR's linguistic advisor, suggested using the three standard forms a-c. We do not know his reasons, and we specifically do not know whether he examined or considered the forms used by *EM*. (Perhaps it is just a coincidence that the date forms used by Encyclopedia Hebraica for the rabbis of L1 are precisely forms a-c.)

(A) MBBK wrote concerning this:

"To write the day and the month, WRR used three forms, approximately corresponding to the English forms "May 1st," "1st of May" and "on May 1st". They did not use the obvious "on 1st of May," which is frequently used by Margalioth..." (Pg. 155)

They also wrote:

"The most obvious variation would have been to add the form akin to "on 1st of May". It gives the score [1.2, 2.2; 0.6, 16.4]." (Pgs. 168-169)

We examined MBBK's "most obvious" choice of including the fourth form, d, as well. Let us check the following choices:

1. Forms a-c (used by WRR).
2. Forms a-d.

The results are:

Choice no.	P1	P2	Min(P1-P2)
1(WRR)	1	1	1
2	0.3	1.2	0.3

Table 14

Note that the result improves contrary to the result given by MBBK! (As we proved elsewhere [3], their method of presenting results is designed to conceal results like these).

(B) MBBK had further suggestions to widen the choice of standard forms.

We must emphasize once more that the forms a–d are the most standard and widespread in Hebrew, and are used not only by *EM*, but also by Encyclopedia Hebraica and similar works. Any other form is rare compared to these and it is extremely doubtful whether it may be regarded as a choice. In any case, if MBBK were searching for additional forms, they should have been consistent and first looked for them in *EM* which they refer to at every opportunity.

(1) Here are the possibilities of expanding the list of date forms, while adhering to *EM*. For a complete picture we will start with the choice already examined in (A):

1. Forms a-c.
2. Forms a-d.

(2) MBBK already suggested dates specified by “special days” (Sec. 4 above) mentioned in *EM*. For these dates *EM* used the possessive word “של” (“shell”) and the possessive letter “די” (“de”) to express dates. With this usage we get the following forms.

- e. “א' של תשרי”.
- f. “בא' של תשרי”.
- g. “א' דתשרי”.
- h. “בא' דתשרי”.

(Forms e-f were suggested also by MBBK.) Adding these choices to the previous ones brings us to the next choice:

3. Forms a-h.

(3) Surprisingly, MBBK suggested two *other* forms.

- i. “א' לתשרי”.
- j. “בא' לתשרי”.

These two forms are not only absent from *EM* (and Encyclopedia Hebraica), but they are also rarely used (see Table 16).

However, to complete the picture, we will also examine the following choice.

4. To take all the forms, a-j.

The results of these choices are:

Choice no.	P1	P2	Min(P1-P2)
1(WRR)	1	1	1
2	<u>0.3</u>	1.2	<u>0.3</u>
3	<u>0.007</u>	<u>0.09</u>	<u>0.007</u>
4	<u>0.4</u>	16.5	<u>0.4</u>

Table 15

It turns out that even adding forms i-j yields a result **2.5 times better** than WRR’s original!

Conclusion: The results speak for themselves: Beyond any doubt, WRR acted with perfect integrity in their choice of date forms!

(C) Concerning the frequency of the forms i-j:

At the beginning of the controversy [14] we wrote, concerning their suggestion to use form i:

“This is a nonstandard form of referring to a date. For example, both Margalioth’s encyclopedia, as well as the Encyclopedia Hebraica use the forms we used, and not this form. It is clear that the forms we used are the most widely used forms. We conducted a survey regarding the use of the various forms, using the computerized responsa database of Bar Ilan University. Here are the results for a pool of modern Halachic authorities:

We will categorize the forms as follows:

Form I is the pair of forms: "א' תשרי" + "בא' תשרי" ("בא' תשרי" = in "א' תשרי")

Form II is the pair of forms: "א' בתשרי" + "בא' בתשרי" ("בא' בתשרי" = in "א' בתשרי")

Form III is the pair of forms: "א' לתשרי" + "בא' לתשרי" ("בא' לתשרי" = in "א' לתשרי")

The following table sums up the frequency of I, II, and III.

Month	Forms		
	I	II	III
Tishri	178	51	2
Cheshvan	364	130	1
Kislev	409	90	0
Theveth	375	108	0
Shevat	434	190	4
Adar	582	159	6
Nisan	303	126	0
Iyyar	359	82	0
Sivan	319	86	0
Tammuz	419	181	2
Av	68	263	0
Elul	286	86	0

Table 16

MBBK certainly exaggerated when they described forms III as “regular date forms”.

## 7. An instructive “replication” produced by MBBK.

In Sec. 3 above, we mentioned MBBK’s suggestion concerning the names of months and their spelling. We quoted in 3(B) their suggestion concerning “Biblical names”. In the same paragraph they said:

“As an aside, a universal truth in our investigation is that whenever we use data completely disjoint from WRR’s data the phenomenon disappears completely. For example, we ran the experiment using only month names (including the Biblical ones) that were not used by WRR, and found that none of the permutation ranks were less than 0.11 for any of P1 \_ 4, for either list.” (Pg. 168)

Reading their words “month names (including the Biblical ones) that were not used by WRR”, we thought that they meant the suggestions for change that they

explicitly mentioned (and which we discuss in Sec. 3(A)(1)-(3) and 3(B)(1)-(2)). But it turned out that this was not so. In reply to our e-mail quoted above (Sec. 3(B)), McKay wrote:

"The "all month names not used by WRR" version used these:  
 )DRRY#WN )TNYM )DR#NY W)DR )BYB BWL MRX#WN X#WWN MRX#WWN  
 )YYR ZW SYWWN"

In other words, besides the Biblical names "Ethanin", "Aviv", "Bul", and "Ziv", MBBK also included:

1. "מרחשוון" (Marcheshvan, see Sec. 3(A)(1) above).
2. "אייר" (Iyyar, see Sec. 3(A)(2) above).
3. "אדר רישון" (Adar Rishon. They made a spelling mistake here: They probably intended "אדר ראשון") and "אדר שני" (Adar Sheni, see Sec. 3(A)(3) above).
4. A new item not mentioned in their article: "וואדר" (we dealt with this in Sec. 3(A)(4) above).
5. New items not mentioned: "חשוון", "מרחשוון" and "סיוון".  
 The spelling of the last three items is incorrect because they should have only one "י".

The flaws in this list are many:

- a. The list is not closed.
- b. Four of the 12 names in the list are incorrectly spelled.
- c. Four additional names are "Biblical" and the way they are used by MBBK is most dubious.
- d. In addition, their experiment's design is flawed:
  - For L1: Dates based on the month names of MBBK apply only to 10 personas out of 34.
  - For L2: They apply only to 15 personalities out of 32.

These flaws are fatal: For example, due to flaws a-c, only three month names can be used in the experiment.

As a result of the flaws in b-c only four usable names remain:

- "מרחשוון",
- "אדר שני",
- "וואדר",
- "אייר".

Of these, dates based on "מרחשוון", has no ELS in *Genesis*. So altogether only three suitable names remain.

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