

Integrating and Rejuvenating Old and New Gems

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1 Introduction

Ladies and Gentlemen; friends; organizers and participants of BISFAI, the Bar-Ilan International Symposium on the Foundations of Artificial Intelligence; the Choueka clan and its distinguished Chieftain, Professor Ya'acov Choueka. I feel privileged and pleased to have been invited by Prof. Nachum Dershowitz, Program Committee Chair of BISFAI, to pay tribute to our guest of honor, Ya'acov Choueka.

Although I have known Ya'acov for over 35 years, I always had some uncanny feeling that I don't really know him fully. I have therefore secured the Ya'acov Choueka files from the Shin Bet, the Secret Service of the State of Israel, under the pretext of the Free Information Disclosure Act. These files are very extensive, and they confirmed my suspicion that there is more to Prof. Choueka than meets the eye. I cannot hope to relate all the contents of these voluminous files in an after-dinner talk. Nevertheless, I'll try to share with you the essence of their main points.

Incidentally, I told the Shin Bet chief, upon his request, that I would transcribe some of the files onto a computer, in order to read it off on the occasion of a banquet honoring Ya'acov, and that this would actually be the first time ever, that I would read a lecture from a written record. The chief told me that, interestingly enough, also Ya'acov was planning to do so for the first time during his keynote address. As you all heard earlier today, this indeed happened.

Since the life of Ya'acov is intimately intertwined with the Hebrew language, I'll intersperse a few sentences in Hebrew from time to time, and then translate their gist into English. My dear wife Shaula, who has been supporting my efforts for over 45 years, did these translations. Obscurities, if any, are due to my editing of the translation.

2 The Beginning

Fig. 1 depicts the lead page of the first book of Moses, published in Vilna in 1922, fourteen years before the birth of Ya'acov. Fig. 2 shows the successor of the lead page, with a written entry in a special script called "Chatzi Kulmus", which translates

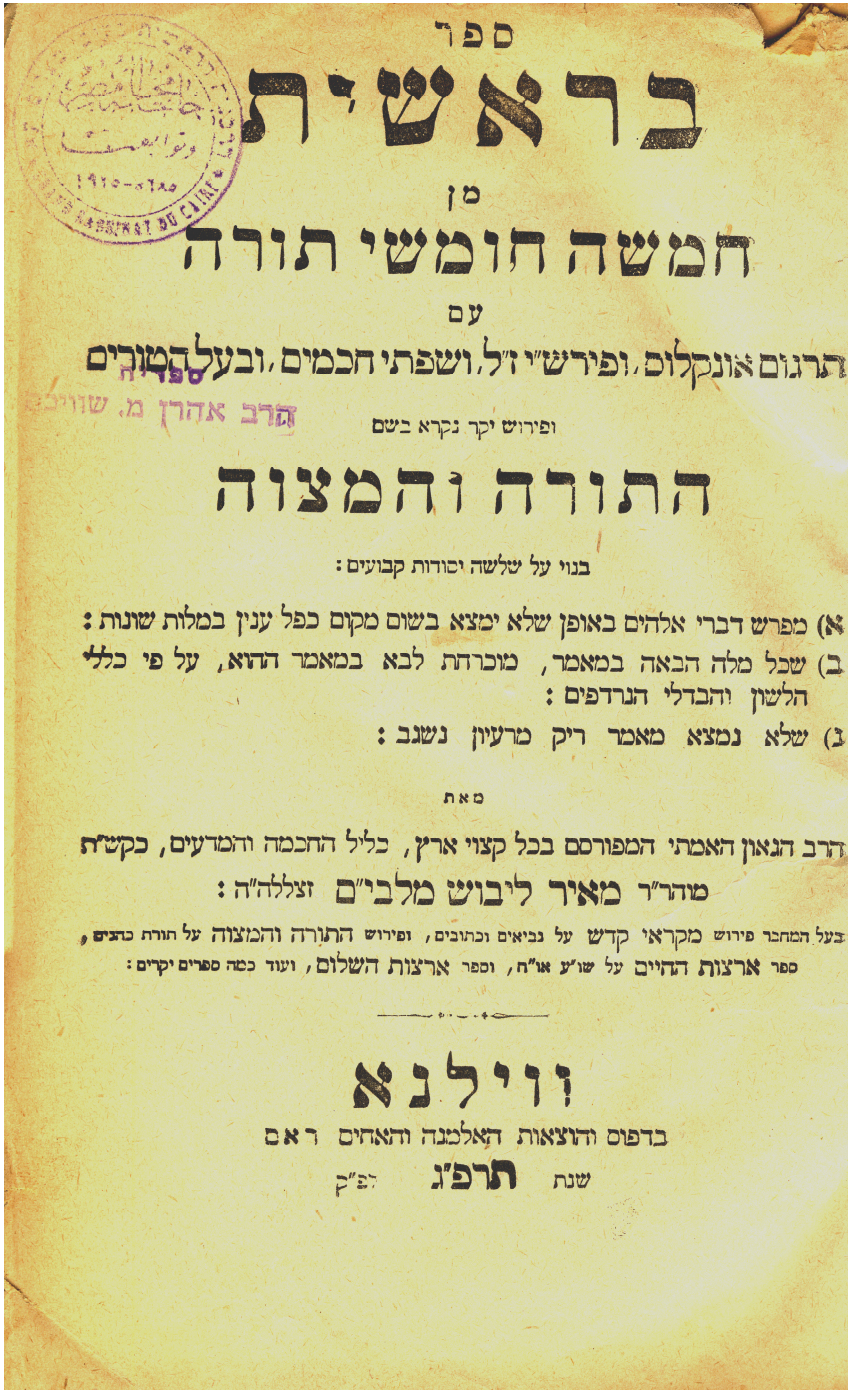


Fig. 1.

כְּהֵיָה בְּמִשְׁכַּן עֹרֹב וּבְעֵלָה עֹרֹב כְּעֵצֵי הַלְחָמוֹ וְיוֹדוּחֹו
 כְּעֵצֵי לֶגֶד וְיִחַד וְעֵשֶׂה בְּיוֹם עֲלֵי-אֵי מַלְשׁוֹכָה עֵת
 פְּעֻמָּה בִּי עֹרֹב כְּעֵשֶׂה וְקוֹכָב לִמְכִּי-יָחִי בִּן יַעֲקֹבִים כְּעֵשֶׂה
 עֲשִׂים לְחִינֹה מִיָּתֵן שֶׁכֶּן חֲנִי חֲנִי לִשְׁמֹה כְּעֵצֵי תֹכֵלֶת לִי-וִי
 נִלְבֵּד לִי עֲשִׂי-יָחִי בִּן חֲנִי לְחִי-יָחִי עֹרֹב וְעֵשֶׂה לִשְׁמֹה וְעֵשֶׂה יָחִי
 אֵשֶׁר בִּי-שְׁמֹה יַעֲקֹב חֲנִי-יָחִי וְעֵשֶׂה עֲשִׂי-יָחִי לִשְׁמֹה
 לְחִי-וִי וְלִחֲנִי וְלִשְׁמֹה עֹרֹבִים בְּחִי-יָחִי לִשְׁמֹה
 יִחֲנִי לְחֵשֶׁה וְלִחֲנִי וְלִשְׁמֹה לִשְׁמֹה וְלִשְׁמֹה לִשְׁמֹה
 בִּי-יָחִי חֲנִי-יָחִי וְיִחֲנִי וְיִחֲנִי יִחֲנִי לִשְׁמֹה לִשְׁמֹה לִשְׁמֹה לִשְׁמֹה

ספר בראשית

כָּר מִיָּתֵן עֲשִׂי-יָחִי

הָ נִשְׁמֹה רִאשִׁית

בְּיָחִי עֲשִׂי-יָחִי

עֲשִׂי-יָחִי

יוֹם פֶּסַח יָחִי אֲפֹרֶת אֲפֹרֶת (וִאֵל) עֲשִׂי
 כְּסִלִּין שֶׁנֶּה הַתּוֹרָה תְּרִיבָה
 יוֹם פֶּסַח יָחִי אֲפֹרֶת אֲפֹרֶת אֲפֹרֶת
 עֲשִׂי-יָחִי כְּסִלִּין שֶׁנֶּה
 עֲשִׂי-יָחִי

Fig. 2.

into something like "reed-pen writing" in English. And thus wrote Rabbi Aharon Choueka, the leading Rabbi of Cairo:

בסמן טוב ובמזל טוב, בשעת הצלחה והרוחה, בשעת אושר רוחני וגשמי, ביום שלישי שנאמר בו שני פעמים כי טוב, בשעה קרובה לשביעית בין הערביים, בששה ועשרים לחודש סיון שבו נתנה תורה לישראל, בשנת תרצו ליצירה, נולד לי בעה"ת בן זכר לחיים טובים ולשלום, אשר ייקרא שמו בישראל יעקב מנחם יצ"ו. יהי רצון שיזכה לתורה ולחופה ולמצוות ולמעשים טובים בחיי אביו ואמו, ויזכה לחכמה ולבינה וליראה, לעושר ולאושר ולבריאות. בימיו תושע יהודה וירושלים, וישראל ישכון לבטח, אמן כי"ר. כו סיון, ש' תרצו; 16 גוניו 1936. הצעיר אהרן מנחם שוויכה, ס"ט.

"At a lucky hour and time of good fortune, at a time of success and solace, at an hour of spiritual and material happiness, close to 7p.m. on Tuesday blessed by twice 'it's good', on the 26th of Sivan, the month that the Law was given, in the year 5696 to the creation of the world, I begot, with the help of G-od may He be blessed, a male son, may he live a good and peaceful life, whose name in Israel will be Ya'acov M'nacheim, may G-od preserve him to life. May it be G-od's will that he will attain the merit of Torah, matrimony, fulfillment of religious commandments and good deeds during the life cycle of his father and mother. And may he possess intelligence, wisdom, reverence, richness, happiness and health. In his days Judea and Jerusalem will be redeemed, and Israel will dwell in peace. Amen, may it be the will of G-od. 26-th Sivan 5696, 16-th June, 1936.

The junior Aharon Menachem Choueka, Pure S'phardi."

The title "Pure S'phardi" attests to the family sprouting from a pure and old stem of Spanish Jews. Ya'acov's immediate lineage is from the exclusive blue-blooded patriarchian stock of the Jewish community in Aleppo, Syria. But Ya'acov was born in Egypt, since already his grandfather immigrated there from Aleppo.

The photo further shows the dates of the demise of Rabbi Aharon Choueka's father and mother. It is written in regular Hebrew script, which Rabbi Aharon learned and mastered within one week after coming to Israel. His teacher was none other than his youngest son Ya'acov.

The little boy, according to the Secret Service files, grew up trilingually, speaking French with his father and siblings, Arabic with his mother, and Hebrew at the Y'shivah, his school. At the same time he absorbed, from his very beginnings, Jewish and secular cultural values, which he integrated in his own ways, to become a personality in which these cultures are fused together harmoniously, in a way that's hard to find in our generation. In the next photo we see how this pre-integrated being looked at the age of 2, in Cairo, in the company, possibly guardianship, of his more senior sisters.



Fig. 3.

The one on the right is the mother of the Sabato Rabbis. In the next photo we see him together with his classmates in the “Ahavah court” of Grammar School in Cairo, in a junior year. Ya'acov is the tiniest, sitting on the extreme right. The fifth person from the right is his late uncle, Rabbi Avraham Choueka, assistant Chief Rabbi of



Fig. 4.

Egypt, who had considerable influence on the development of Ya'acov, constituting a living example of a very fruitful and satisfying integration of Jewish scholarship with mathematics. The secret service files also contained, naturally, the encounter of Ya'acov with the late Prof. Avraham Halevi Fraenkel. The chief even told me that in his keynote address today, Ya'acov would claim that I don't know about this encounter. As you heard, Ya'acov indeed did so earlier today, very brazenly. Little did he know! Moreover, the files also informed me that there was a classmate of Ya'acov to whom Fraenkel also raised his eyes, telling him that he never saw him before, and that therefore he won't get a signature for taking the math exam. This student went to the end of the line, and at his second encounter with Fraenkel, was again denied permission to take the test, because of the same reason. After a few more rounds, Fraenkel already recognized him and signed.

Ya'acov immigrated to Israel in 1957, at the age of 21.

3 The Family Man, The Poet

The birth inscriptions in the Pentateuch suggest closely knit family ties in the Choueka clan, which Ya'acov inherited, embraced and amplified. In fact, he gave a personal example, by marrying his own niece Sarah, the daughter of his oldest brother Avraham, in August, 1965. See the photo.



Fig. 5.

He is very close to his family and has a fruitful formative influence on his children. Some of these attributes are reflected in the beautiful and moving speeches at the Bar-Mitzvah festivities of his sons, which exude a spirit of reverence and culture and a strong commitment to transmit these values to his children, a task in which he excels. On the death of his father, he organized and edited the striking and distinctive book "Minchat Aharon" to commemorate his father's legacy.

Ya'acov has a special love for poetry. His nephew Rabbi Chayim Sabato teaches at a Y'shiva, a Rabbinical College. In a recent article in the literary supplement of a newspaper, Rabbi Sabato related, inter alia, how he once visited his uncle Jacquot, as Ya'acov is known in the Choueka family, while uncle Jacquot was studying mathematics at the Hebrew University, and saw there a book on Jewish poetry. Ya'acov opened it "accidentally" on a certain page, containing a poem about the famous Bible Commentator Rashi. The boy Chayim, who had just learned to read the special Rashi script, drank it up, and this encounter made Sabato an addict to poetry. It is thus to Ya'acov's credit that Chayim

Sabato became one of the leading novelists of Israel, if not the greatest, though writing novels is only a secondary occupation, perhaps just a hobby, of Rabbi Sabato.

Not only does Ya'acov love poetry, he also engages in writing it. Here is an example of a "brindizi" piece, so called "real-time", or "on-the-fly" poetry, which the scholars of Aleppo and their descendants engage in with relish in arguing with each other at festive and other occasions, exhibiting their command of Jewish and secular knowledge. Ya'acov wrote it in September 1990, at a small gathering at the Math Department of Bar-Ilan University, when I retired from there.

מכם רבותי וידידי ומחתן המסיבה אבקש רשות
ולנפשי אומר במעמד זה חרוזיך שזרי
ושאי ברכה והוקרה עם שמץ של התרגשות
לידיד וותיק, ובאחזור מידע הוא מורי
שבשעת חסד הגה רעיון ויצק בו ממשות
לפתוח שערי מחשוב וחיפוש בכל טקסט עברי
לא נרתע ממכשולים והתמיד בעיקשות
ולא ויתר גם אם סבל מכך מחולי ומררי
ובניגוד לכולם אמר זו הדרך, אף אם אין זה פשוט
והמריץ להגביר בזה חיל ולהתגבר כארי
לעשות אזניים לדברי רבותינו, וללמוד בהתחדשות
תוך ניצול כל פועל ה' למענהו מהמצאות דורי
ומה אאריך לשון והלא כולכם יודעים את מפעל השו"ת
ואת השם הנרדף לו זה עשרים שנה הוא פרנקל אביעזרי
שא ברכה ותודה אביעזרי מריעים ותלמידים, ובליבנו אתה תמיד בראשות
להמשך פעילות וחיים ובריאות, ועד דור עשירי

Guests of honor, friends and participants,
Permit me at this gathering to compose my rhymes.
And albeit a little nervous,
to bless and honor an old friend,
my mentor in Information Retrieval,
who conceived an idea and realized it,
to open computer gates for searching any Hebrew text.
He overcame obstacles and persisted unyieldingly,
didn't give up in spite of opponents and hardships.
Alone, facing opposition, showed the right way,
and encouraged us to work hard and persist;
to expose the teachings of our sages, renew and regenerate,
harness modern new inventions and tools
for the benefit of Judaism.
Well, in brief, you all know about the Responsa Project,
And its synonym, for decades now, Aviezri Fraenkel.
Your friends and disciples bless and thank you,
for us you are always at the lead.
Wishing you an active healthy life until 120 years.

The following photo shows the Choueka family at the marriage of Rony,



Fig. 6.

Center, Ya'acov and Sarah's eldest, in June 2007 (the bride, Hanna, is absent, as she was preparing herself for the ceremony). The next depicts another family gathering. Both reflect again the happy family relationships in the Choueka clan.



Fig. 7.

4 Scientific Activities

My scientific collaboration with Ya'acov began after I noticed the pioneering work of his with Meir Shapira, published in Hebrew in 1964, on the automatic analysis of Hebrew words, which I read with interest in connection with the then emerging Responsa Project, the idea of which I conceived in January 1963, in a conversation with the late Mr. Irving Kutoff of Minneapolis, MN. I told Ya'acov that I thought that in addition to the **analysis** of Hebrew words, which constituted his work with Shapira, we would also need an automatic **synthesis** tool. We produced such a tool under the leadership of Ya'acov, and the collaboration of a few eager students of computer science and linguists, including my former M.Sc. student Meir Cohen who wrote the first collection of programs for the Responsa system, and my Ph.D. student Dr. Rony Attar. Dr. Yair Halevi, in his M.Sc. thesis under Choueika, and Elazar Segal from the Responsa team contributed towards getting the online system underway.

Rabbi M'nachem Slae, David Shindler and Joseph Dueck participated in the Responsa team, as well as the late Rabbi Yitzchak Pechenik. The late Professor Aharon Schreiber initiated and got us several grants from the NEH, on whose subproject he was Principal Investigator. Incidentally, many senior computer scientists made their first steps in research with the Project, including prominent David Harel, past Dean of the Faculty of Mathematics and Computer Science at the Weizmann Institute, Nachum Dershowitz, Professor of Computer Science at Tel Aviv University, who also participated in the early linguistic efforts, my former Ph.D. students Prof. Shmuel Tomi Klein and the late Dr. Moshe Mor; Prof. Uri Schild, and many more. Professor Tzvi Arad, as rector, helped to sustain the Project in various ways. For the past few years, Rabbi Ya'acov Weinberger has been managing the Project wisely, together with a skeleton team, which includes Shim'on Goldschmidt, Sh'muel Levi and others. I apologize to those whose names I have forgotten to mention.

In 1975 Ya'acov replaced me at the helm of the Project, and it was then that he began to do research in the area of information retrieval, though his main love remained Hebrew computational linguistics. But even before he became formally the head of the Project, he participated in all of its phases and gave me considerable support and assistance, which were crucial to maintaining the shaky existence of the Project at Bar-Ilan. One of the major assets of Ya'acov, in addition to producing new ideas, is his persistent efforts in seeing things through. This was of utmost importance for the eventual success of the Responsa Project. Related to this is his talent to "market" and "sell" his achievements, getting grants and landing extra jobs. Among the extra jobs I'll just mention two:

1. Important contributions to the defense establishment of Israel. Incidentally, Ya'acov served as an officer in the Israel defense forces during 1962-65. For proof, see the next photo.
2. Consulting to industry and other institutions, mainly in the area of Hebrew computational linguistics.



Fig. 8.

A major undertaking that Ya'acov initiated and saw through is the Hebrew-Hebrew dictionary "Rav-Millim", roughly "words-chest" in English, though this translation doesn't do justice to all the connotations Ya'acov may or may not have had in mind for the Hebrew name. It is a monumental multi-volume new concept in dictionary construction, which of course, has also a computerized version, and a special youth edition. His work and experience on the Responsa system were crucial to accomplishing the "words-chest".

From Ya'acov's introduction to his "words-chest": "Basic questions, such as the mission and aim of a dictionary, what it should contain and how to edit it, have recently been radically re-evaluated. New concepts about dictionaries stem from an intensive research activity which ensued in the US and Europe (especially in England, Italy and Holland) since the beginning of the 1970s. This activity deals with the for-

mal and computerized analysis of natural languages. The new dictionary concepts have since yielded many dictionaries (in several languages), but none in Hebrew.”

Ya'acov has set out to rectify this situation. A spin-off of the dictionary project was an automatic punctuating tool for Hebrew, for which Ya'acov received the Prime Minister's prize in September, 1997. At a ceremony in the Knesset, Israel's Parliament, in the Prime Minister's presence, Ya'acov delivered a beautiful accomplished talk of thanks in the name of all the prize laureates.

The "words-chest" is an orchestra of many musicians, but Ya'acov was the maestro, fusing it together into a most harmonious and beautiful symphony. At the end of the introduction to the youth edition of the "words-chest", Ya'acov wrote the following:

ברכות שמיים לרעייתי ונוות ביתי, משוש ליבי ומאור עיני, שרה, שותפתי הנאמנה בניהולו של פרוייקט 'רב מלים' כמעט מאז ייסודו. בתחילת 1992 היא הציעה את פיתוחו של מילון זה, ואף צפתה את תבניתו ותכניתו. מאז ועד היום היא עמלה וטרחתה, קראה והעירה, ניפחה וביררה וגם ליוותה את כל שלבי ההכנה, העריכה וההפקה של המילון באנרגיה בלתי נדלית, ומתוך חדות יצירה ומעורבות רגשית עמוקה. ברוך טעמה וברוכות ידיה.

"Heaven's blessings to my wife and spouse Sarah, the joy of my heart and the light of my eyes, my loyal partner in managing the 'words-chest' project, almost from the start. At the beginning of 1992 she suggested the construction of this dictionary, and even foresaw its structure and plan. All these years she has toiled, read, remarked, sifted, purified and accompanied all stages of preparing, editing and realizing this dictionary. She invested endless energy, was deeply involved emotionally, and enjoyed the delight of creation. Blessed be her good taste and clever deeds."

These words, as well as the composition of this diverse and august gathering tonight at this banquet honoring Professor Choueka, once again attest to the blessed integration within Ya'acov's personality of the family man, the poet, the scientist, the Jewish scholar and the practical man, whose two feet are rooted deeply on this piece of land called Israel, a fusion that yields new gems and rejuvenates old ones.

(Paragraph added in 2007.) Talking about rejuvenation, I often tell my contemporaries that we have to keep exercising our gray cells, red cells and white cells. If you neglect to use but one of them, especially the gray ones, all three are bound to wither rapidly. As they say, "Use it or Lose it". A very good example for all of us is provided by Ya'acov: Recently, about 5 years after retirement, he took upon himself, at the invitation of Professors Menachem Ben-Sasson and Haggai Ben Shammai, to lead the computerization of the Friedberg *Genizah* Project. Building on his expertise and experience of processing Jewish texts by computer, he has begun creating very high-quality digital images of all *Genizah* fragments, scattered in many places world-wide, aimed at cataloging and permitting access and retrieval of *Genizah* information. Also here his talent to "market" and "sell" his achievements is of big help to the success of this innovative venture. I am sure that under his direction, this project will flourish and come to a successful fruition. עוד ינובון כְּשִׁיכָה דְּשָׁנִים וְרַעְנָנִים יִהְיוּ (תהלים צב טו). "They will still be fruitful in old age, vigorous and fresh they will be" (Psalms 92 15). I believe that this verse is conditional, and that its true interpretation is that as long as a person stays

spiritually fruitful in old age, he will indeed remain vigorous and fresh also physically. Yaacov Choueka is a living example demonstrating this interpretation.

In this week's portion of the Bible, "chukat", the tribes of Israel composed a brief piece of poetry commemorating the help of G-d in overcoming their many enemies. It is our prayer that in these difficult times G-d will once again redeem us from the difficult situation we are in. People such as the Choueka clan and their chieftain, Professor Ya'acov Choueka, have the potential of realizing the prayer quoted at the beginning, by Rabbi Aharon M'nachem Choueka: "In his days Judea and Jerusalem will be redeemed, and Israel will dwell in peace. Amen, may it be the will of G-d."

At the successful conclusion of the first five Bar Mitzvahs, it remains only to wish Ya'acov at least five more, in ever increasing creativity and joy amidst his wonderful and remarkable family.