An Anotated Bibliography
of Hebrew Typesetting

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1   Introduction

Information about Hebrew type and typesetting is available, but hard to find. Information about the design and use of typefaces and about the design of books and other publications is useful for fine typesetting and printing. Publications about type and typesetting in the Latin script are widely available in bookstores, libraries, and online, but similar publications concerning other scripts are hard to find. This annotated bibliography is an attempt to make information about Hebrew typefaces and typesetting easier to find.

The focus of this bibliography is on how Hebrew is printed, and not on what is printed, where, or by whom. Thus, the main areas that are covered are Hebrew typefaces and typesetting of Hebrew. The contents of the publications listed here also apply to other languages that are printed using the Hebrew alphabet, mainly Yiddish and Ladino. Publications about non-graphic aspects of Hebrew printing, about Hebrew typography before the 19th century, and about Hebrew calligraphy are excluded. These subjects are less relevant to modern Hebrew typesetting, and I exclude them in order to keep the scope of this bibliography reasonable.

Hebrew typefaces are covered in Sections 2, 3, and 4. Section 2 lists articles and books that describe the design of Hebrew typefaces. Section 3 lists old typeface specimen books that display Hebrew typefaces. Section 4 lists articles that focus on readability and legibility in Hebrew.

I refer to Hebrew typefaces by name and assume that the reader is familiar with the main Hebrew typefaces. The papers by Friedlaender and Spitzer cited

משנת תרפ״ו יצאו לאור על ידי חברת ועל פי דפוסים מדוייקים על פי המסורה
מהדורת גינצבורג ישנים וחדשים ועל פי
חברת ידי על לאור יצאו תרפ״ו משנת
שמואל ידי על מוגהים בברלין שונצינו
מנחם·גולד מאיר בסיוע מאיר יודאוויטש

Figure 1: A typeface designed by Marcus Behmer for the Soncino society, reproduced from [7].

in Section 2 provide good introductions to modern Hebrew typefaces for readers who are not already familiar with them. The figures in this bibliography are meant to serve as visual annotations. Their purpose is to give the reader a general idea of what are the typefaces that the sources discuss, not to illustrate any specific point. Many of the figures are portions of larger type samples in the original sources. Most of samples have been scanned at a medium resolution (600 dpi), so the quality of the typefaces cannot, of coarse, be fully judged from the figures.

Three sections discuss Hebrew typesetting. Section 5 lists publications that discuss typographical conventions in Hebrew, Hebrew book design, and so on. Section 6 lists books and articles that describe technical aspects of computer typesetting of Hebrew. Section 7 lists catalogs of exhibitions of Hebrew books that can point readers to examples of well-printed Hebrew.

Section 8 lists biographies of Hebrew type and book designers. As such, these publications touch issues relating to both typefaces and typesetting. Many of the other publications listed in this bibliography also address more than one issue, so the classification into sections should not be taken too seriously.

Finally, this bibliography is probably incomplete, and I would appreciate comments and additions. There are little or no annotations to publications that I could not obtain or to publications in languages that I cannot read, most notable German and Yiddish.

2   Hebrew Typefaces

This section includes papers and books that describe Hebrew typefaces. Hebrew typefaces are also describes and shown in [44], [25]. Specimen of Hebrew type

are shown in all the references in Section 3. The design of HADASSAH is also discussed in [56].

I should point out that the articles cited below give a fairly complete overview of Hebrew text faces. They do not provide, however, a complete or nearly complete picture of Hebrew display faces. Browsing through an Israeli newspaper or magazine usually reveals more than a dozen display faces that are not described in any of the citations below.

[1]   Leila Avrin. The art of the Hebrew book in the twentieth century. In [49], pages 125–139.

Avrin briefly describes the typefaces that were available at the turn of the 20th century, then turns to 20th century typography. She describes the design and manufecture of many Hebrew typefaces, including FRANK-RÜHL, MIRYAM, HADASSAH, SCHOCKEN, DAVID, KOREN, NARKISS BLOCK, ORON, and HATZVI. Avrin conjectures that MIRYAM was designed by Rafael Frank (the conjecture is proved as correct in [15]), and points that Henri Friedlaender designed AVIV, HADAR, and SHALOM for IBM. She also briefly describes the careers of some of the designers. She also lists and describes particularly finely printed Hebrew books, calligraphers, and significant publishers and printers.

[2]   Charles Bigelow and Kris Holmes. The design of a Unicode font. *Electronic Publishing*, 6(3):289–305, 1993.

The paper describes the design of LUCIDA UNICODE, a Unicode [46] sans serif face that implements the Hebrew block of Unicode. The paper uses Hebrew to illustrate several issues in the design of multi-script typefaces. These issues include letter heights, readability studies, and typeface designs by readers versus non-readers of the script. The paper displays a specimen of the font.

[3]   Frank, Rafael. *Über hebräische Typen und Schriftarten; mit einem Nachwort von Jacques Adler; herausgegeben von der Schriftgieÿerei H. Berthold*. H. Berthold, Berlin, 1926. Reprinted from *Archiv fur buchgewerbe*, 48. jg., hft. 11.
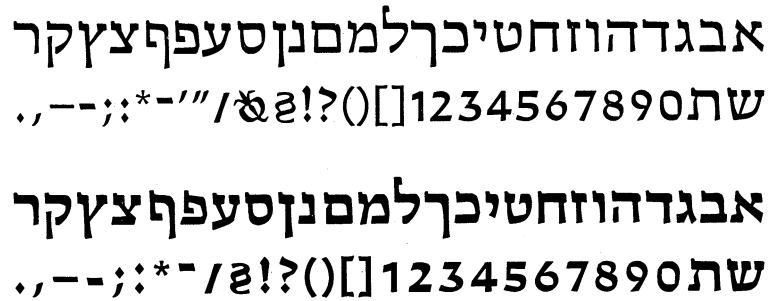
Frank describes the design of his typeface FRANK-RÜHL.

[4]   Henri Friedlaender. Toward a modern Hebrew. *Printing & Graphic Arts* 7:43-56, 1959.

I have not seen this article. Cited by Fontaine [56].

[5]   Henri Friedlaender. Modern Hebrew lettering. *Ariel: A Quarterly Review of the Arts and Sciences in Israel*, 4:6–15, 1962.

The paper discusses several Hebrew typefaces: SCHOCKEN, DAVID, KOREN, HA-

אבגדהוזחטיכךלמסנןסעפףצץקר
.,––;:*־־ʹ″/&ℬ!?()[]1234567890סתש

אבגדהוזחטיכךלמסנןסעפףצץקר
.,––;:*־/ℬ!?()[]1234567890סתש

Figure 2: A sample of HADASSAH (left) reproduced from [7].

TZVI, and his own HADASSAH. Samples of all except KOREN are shown. The paper also displays examples of Hebrew lettering from the early 1960's from book jackets, outdoor inscriptions and signs, ads, and decorative artifacts.

[6]   Henri Friedlaender. Modern Hebrew type faces. *Typographica*, 16:4–9, 1967.

This paper is superseded by [7], except for some of the figures that show Hebrew lettering. The paper describes and displays many Hebrew typefaces: A 19th century high-contrast typeface, FRANK-RÜHL, STAM, CHAYIM, AHARONI, GENOOZOT, HATZVI, SCHOCKEN, DAVID, KOREN, GILL, and his own HADASSAH. Friedlaender's viewpoints on individual typefaces are substantiated by current use with a few exceptions. The high contrast 19th century faces that he characterizes as being ugly and illegible are not used in Israel as text faces, but they are still used as display faces. CHAYIM and AHARONI, two sans serif faces that Friedlaender severely criticizes, are still used extensively as display faces in Israel. The positive qualities of these two faces are explained by Tamari [13].

[7]   Henri Friedlaender. The making of Hadassah Hebrew. In Hebrew. in [12], pages 67–84.

הנרי פרידלנדר. איך יצרתי את האות ״הדסה״.

Friedlaender describes the design process of his Hebrew typeface HADASSAH. He states that his objectives were to design an unobtrusive book face, to base the shapes on traditional letter forms but to simplify them when possible, and to create a design that is influenced by printing technology and not by calligraphy. He describes and displays several typefaces and manuscripts that influenced him and helped him understand the development of the letters. Among them are two typefaces from Haag-Drugulin, one square and the other half-cursive (HEBRÄISCH IV and RABINISCH CICERO respectively, see [19]), three typefaces from H. Berthold AG (MERUBA, FRANK-RÜHL, and STAM), a typeface designed by Marcus Behmer and letters drawn by Berthold Wolpe (the designer of

אאֱ בְּרֵאשִׁית בָּרָ֣א אֱלֹהִ֑ים אֵ֥ת הַשָּׁמַ֖יִם וְאֵ֥ת הָאָ֑רֶץ: וְהָאָ֗רֶץ א
הָיְתָ֥ה תֹ֙הוּ֙ וָבֹ֔הוּ וְחֹ֖שֶׁךְ עַל־פְּנֵ֣י תְה֑וֹם וְר֣וּחַ אֱלֹהִ֔ים מְרַחֶ֖פֶת
ג עַל־פְּנֵ֥י הַמָּֽיִם: וַיֹּ֥אמֶר אֱלֹהִ֖ים יְהִי־א֑וֹר וַֽיְהִי־אֽוֹר: וַיַּ֧רְא אֱלֹהִ֛ים
ה אֶת־הָא֖וֹר כִּי־ט֑וֹב וַיַּבְדֵּ֣ל אֱלֹהִ֔ים בֵּ֥ין הָא֖וֹר וּבֵ֥ין הַחֹֽשֶׁךְ: וַיִּקְרָ֙א
אֱלֹהִ֤ים ׀ לָאוֹר֙ י֔וֹם וְלַחֹ֖שֶׁךְ קָ֣רָא לָ֑יְלָה וַֽיְהִי־עֶ֥רֶב וַֽיְהִי־בֹ֖קֶר י֥וֹם
אֶחָֽד:

Figure 3: A sample of KOREN, reproduced from [9].

the Latin typeface ALBERTUS), as well as several older typefaces. (Behmer's type-
face was commissioned by the "Soncino Gesellschaft der Freunde des Juedis-
chen Buches" society, which used it to print the Pentateuch in the Officina Ser-
pentis printing press in Berlin in the 1930's.) He describes the Hadassah design
process and displays several preliminary designs. Several examples of the final
1958 design and an example of a 1964 typewriter face are also shown.

This is a translation of an article that has been published in German in 1967
and later translated into English and published in 1972 and 1975:

- *Die Entstehung meiner Hadaesah-Hebraisch.* In German. Kurt Christians
  and Richard von Sichowsky, Hamburg, 1967.

- The making of Hadassah Hebrew. In English. *Israel-Forum*, 1972.

- *The making of Hadassah Hebrew.* In English. Special edition of 500 copies
  for The Typophiles. Central Press, Jerusalem, 1975.

[8]   Eliyahu Koren. [The letter as an element in the design of sacred books]. In Hebrew.
      In [12], pages 85–90.

אליהו קורן. האות כיסוד בעיצוב ספרי קודש.

Koren describes the design of his typeface KOREN. He describes his objectives,
which were mostly legibility, beauty, and maintaining the traditional character-
istics of the letters. He describes three problems in Hebrew typography that he
attempted to fix: the correct placement of vowel and cantillation marks, the in-
teraction of the shin-dot or sin-dot with a holam, and the ascender of the lamed.
He describes a solution to the shin/holam problem (see [35] for a different solu-
tion). The article shows a few examples of poor typesetting and typefaces with

עומלפן ecnolpן   ecnolpן עומלפן

ecnolpן עומלפן   ECNOLPן עומלפן

Figure 4: Samples of ARIAL HEBREW with ARIAL (top left), LUCIDA UNICODE (bottom left), ORON with UNIVERS (top right) and NARKISSBLOCK with FOLIO (bottom right). The samples on the right are reproduced from [10].

אבגדהוזחטיכלמנסעפצקרשת ךםןףץ

אבגדהוזחטיכלמנסעפצקרשת ךםןףץ

אבגדהוזחטיכלמנסעפצקרשת רםוףץ

אבגדהוזחטיכלמנסעפצקרשת רםוףץ

Figure 5: Zvi Narkiss's NARKISSIM (two top lines) and NARKISS TAM (two bottom lines) in regular and bold weights.

a poor legibility (MERUBA, CHAYIM, and AHARONI), a table comparing letters from 16 manuscripts and typefaces, and a sample page from the bible typeset in KOREN.

[9]   Asher Oron. [Designing a new Hebrew typeface]. In Hebrew. In [12], pages 91–95.
אשר אורון. עיצוב כתב עברי חדש.

Oron describes the design of his sans serif typeface ORON. He designed the typeface to match the latin UNIVERS, and chose the height of the letters so that the Hebrew aligns with the lowercase latin letters. He shows a preliminary design as well as the final design. Some vertical strokes in the original design were given a slight curve to the left to indicate the right-to-left directionality of the text. The article also displays Zvi Narkiss's NARKISS BLOCK together with FOLIO capitals. (Oron writes, incorrectly, that NARKISS BLOCK to designed to align with the FOLIO capitals.) The paper also shows short samples of many modern hebrew typefaces: FRANK-RÜHL, MERUBA, MIRYAM, STAM, SCHOCKEN, HADASSAH, DAVID, NARKISS, AHARONI, NARKISS BLOCK, ORON, and a typeface designed by Yerachmiel Shechter for exclusive use by El-Al Airlines.

[10]   Zvi Narkiss. [Narkiss, Narkissim, and the rest]. In Hebrew. In [12], pages 103–108.
צבי נרקיס. נרקיס, נרקיסים, וכל השאר.

Narkiss describes the design of his sans serif Narkiss Block and of his text face Narkiss and shows preliminary drawings for Narkiss. He also mentions several other typefaces that he designed: Narkiss Tam, Narkiss Chadash, Narkiss Chen, Vilna, and rashi typeface, and a typeface for printing Bibles (it is used in a forthcoming Bible published by Horev, Jerusalem). The article shows blocks of text set in Narkiss and Narkiss Chadash, and short samples of Narkiss, Narkiss Block, Shoolamit, Narkiss Tam, Shimshon, Narkissim, and Narkiss Chadash.

[11] Moshe Spitzer, editor. *[A Letter is Forever: A Collection of Papers on the Design of the Hebrew Letter]*.In Hebrew. Second edition, Israel Ministry of Education and Culture, 1989 or 1990.

משה שפיצר, עורך. *אות היא לעולם: קובץ מאמרים מוקדש לעיצוב האות העברית.* משרד החינוך והתרבות, האגף לחינוך תורני, ירושלים, תש״ן.

This collection contains eight papers on Hebrew letters. Besides the articles that are listed in this bibliography, the collection also includes articles on literacy in ancient Israel, on decorated medieval Hebrew letters, and on lettering issues in the Jewish tradition and law. The article by Zvi Narkiss [12] is the only addition to the second addition; the rest also appear in the first edition dated 1980 or 1981.

[12] Moshe Spitzer. [The development of the square letter.] In Hebrew. In [12], pages 23–46.

משה שפיצר. האות המרובעת בהתפתחותה.

This is the definitive paper on the development of the Hebrew letter. Variations of this paper were published several times and in several languages, and as far as I can tell, this version is the most recent and most complete.

The paper surveys the development of Hebrew letters from the earliest known uses of the alphabet in the Second Temple Era to the 1960's. The paper displays numerous examples of Hebrew lettering from inscriptions, manuscripts, and printed works. Spitzer discusses and displays several modern Hebrew typefaces: Frank-Rühl, Chayim, Aharoni, Stam, Schocken, Gill, Koren, Hadassah, David, and Hatzvi. He also displays and describes partial typefaces cut by Harry Carter and by Frederic Goudy. His opinions on the typefaces that he describes are mostly substantiated by current use.

Other versions of this paper have been published several times:

- In *Alei Ayin*, the Zalman Schocken jubilee volume. In Hebrew. Tel Aviv, 1952.

אות עברית חדשה   אות עברית חדשה
אות עברית חדשה   אות עברית חדשה
אות עברית חדשה   אות עברית חדשה

Figure 6: From left to right, top to bottom: NARKISS, KOREN, AHARONI, CHAYIM, SCHOCKEN, and GILL. Reproduced (and rearranged) from [13].

- In [35], pages 71–85. In Hebrew. This version displays and mentions a few more typefaces than other versions, including MIRYAM, ROMEMA (not shown, a ligher version of FRANK-RÜHL), RACHEL (a handtooled version of STAM), RAMBAM (not shown, a narrow version of STAM), MEIR-BARUCH, and RAHAT, a handwriting font. (Tamari [15] cites a Berthold specimen showing STAM, RACHEL, and RAMBAM.)

- Entry "typgraphy". *Encyclopedia Judaica*, 15:1480–1488, Keter, Jerusalem, 1971. In Hebrew. This version includes different typeface samples from the other versions.

- The development of Hebrew lettering. *Ariel, a Review of Arts and Letters in Israel*, 37:4–28, 1974. Translated into English by Shirley Shpira. This article was reprinted for The Typophiles by the Israel Ministry for Foreign Affairs.

[13] Ittai Tamari, Curator. *New Hebrew Letter Type*. An exhibition catalog in Hebrew and English. University Gallery, Tel Aviv University, Israel, 1985. Includes an introductory article by Tamari under the title "Milestones in the development of the Hebrew letter."

אתי תמרי, אוצר. *אות עברית חדשה*. קטלוג תערוכה בעברית ואנגלית. הגלריה האוניברסיטאית, אוניברסיטת תל אביב, תשמ״ה. כולל הקדמה מאת תמרי תחת הכותרת "נקודות ציון בהתפתחות האות העברית".

This exhibition catalog displays and describes seven hebrew typefaces and provides brief biographies of their designers. The faces described are AHARONI by Tuvia Aharoni, GILL by Eric Gill, CHAYIM by Jan Le Witt, HADASSAH by Henri Friedlaender, NARKISS by Zvi Narkiss, KOREN by Eliyahu Koren, and SCHOCKEN by Francisca Baruch. Besides examples of each typeface, the catalog also shows preliminary drawings of HADASSAH, NARKISS, and SCHOCKEN and unissued slanted versions of HADASSAH and NARKISS. The catalog points out that in CHAYIM, some letters are redesigned in the larger sizes. A few additional type-

faces by Zvi Narkiss are also shown: Narkiss Block, Narkiss Tam, Narkiss Chadash, and Narkissim. The catalog also points out that Francisca Baruch also designed Stam, Rachel, and Rambam.

[14] Ittai Joseph Tamari. Digitization of Hebrew fonts, or: some evolutional evaluations. *Proceedings of the International Conference on Raster Imaging and Digital Typography*, Lausanne, October 1989, pages 188–197. Published by Cambridge University Press.

The paper discusses the Frank-Rühl typeface and its many variations. This typeface is the preeminent Hebrew text face today. Tamari points out that Linotype is the only type manufacturer that licensed the design from Berthold, that many of the unlicensed copies are of poor quality, and that most Israeli newspapers and many publishers use these poor fonts. The variants that are described are the 1911 original design issued by Berthold, Linotype's and Monotype's hotmetal linecasting fonts, (Monotype calls its Frank-Rühl types Peninim), a phototypesetting font from AM International, and digital fonts from Linotype and Autologic.

[15] Ittai Joseph Tamari. *Hebraische Schriftgestaltung in Deutschland von der Jahrhundertwende bis zum Ausbruch des zweiten Weltkrieges unter besonderer Berucksichtigung der "Frank-Rühl" Lettern*. In German. Ph.D. thesis, Johannes Gutenberg Universitat, Mainz, 1993. Published on microfiche, Hansel-Hohenhausen, 1996.

I cannot comment about the content since I do not read German. Includes numerous examples of Hebrew type and an extensive bibliography.

[16] Ada Yardeni. *The book of Hebrew Script*. Karta, Jerusalem, 1991.

עדה ירדני. ספר הכתב העברי: תולדות, יסודות, סגנונות, עיצוב. כרטא, ירושלים, תשנ"א.

This large book is completely devoted to the Hebrew script. The third chapter focuses on the printed Hebrew letter and displays samples of many typefaces including Frank-Rühl, Peninim, Narkiss, Narkissim, Oron, Chaim, Aharoni, Stam, Schocken, Margalit, Drugulin, Koren, Hadassah, David, Dafna, and Ada. The last two were designed by Yardeni. The eight chapter discusses the typeface design in general and in Hebrew in particular. All the illustrative examples show Hebrew typefaces. The chapter describes the design of individual letters and of entire typefaces. Yardeni points out the importance and means of maintaining color and rythm. The chapter also discusses modifying typefaces. Another issue that is covered in some detail is the design and placement of vowel points.

שׁוֹמֵר מִצְוָה לֹא יֵדַע דָּבָר רָע

דברי חכמים בנחת נשמעים

אין דער ערסטען צייט דעם בוכדרוקעם

וואַרען דיא בוכדרוקער זעהר אפט אויך

אלם שריפטגיעססער אונד בוכהענדלער

Figure 7: ATF typefaces: Hebrew No. 1 (four top lines) and Hebrew No. 2 (bottom three lines). Reproduced from [18].

3   Typeface Specimen Books

This section includes references to old typeface specimen books that might be of some historical interest. The Berthold Catalog [18] is important: it is the first catalog that I found to display two important modern typefaces, Frank-Rühl and Miryam. The rest is a fairly random selection.

Specimens of Hebrew typefaces are also displayed in all the articles cited in Section 2. Specimen sheets are also available for many of the digital Hebrew fonts that are currently sold. Agfa-Monotype, Elsner and Flake, and Masterfont (www.masterfont.co.il) are suppliers of high-quality Hebrew fonts.

[17]   American Type Founders Company. *Desk Book of Type Specimens*. [San Francisco], 1900.

This catalog shows two square Hebrew typefaces, Hebrew No. 1 and Hebrew No. 2, and a Rashi typeface called Rabbinic. Hebrew No. 1 includes vowel and cantillation points and is intended for "classical works", and Hebrew No. 2 is designed for newspapers.

[18]   H. Berthold AG. *Schriftgiessereien und Messinglinien-Fabriken Aktien-Gesellschaft*. With a preface by Joseph Tscherkassky in German, Yiddish, Arabic, English, Hebrew, French, and Polish. Berlin, 1924.

This catalog of Hebrew typefaces displays five text faces: Miryam, Frank-Rühl, Magalith, Meruba, and Rahsi, and four fonts of decorated initials. Frank-Rühl, Magalith, and Meruba are also shown with vowel points. The catalog

ויפח באפיו נשמת חיים ויהי
אלהים השאיר את החשך בכדי
הבא שנאמר ועמד כלם צדיקים

ביום ט׳ לנובמבר הלך לעולמו בליבוי אחד משרידי
יוסף קצנלסון· המנוח היה אחד מאלה שדבקו בהרצל
האינטימי אשר לוה אותו על דרכו הקשה והתלולה·
ובקונגרס השלישי נבחר לכהונת מנהל של אוצר

Figure 8: Four Berthold typefaces. From top to bottom: FRANK-RÜHL, MERUBA, STAM (all reproduced from [7]), and MIRYAM, (reproduced from [18]).

shows text blocks set in each of the fonts as well as sample book pages, ads, and so on.

[19] W. Drugulin. *Die Schriften der Offizin W. Drugulin*. Leipzig, 1927-1928.

A type catalog in two volumes, compiled by F. H. Ehmcke in Munich. Volume 2, printed in 1928 and labeled "Tweiter Teil: Fremdsprachen", contains samples of Hebrew and other non-latin typefaces. Volume 1, printed in 1927, shows samples of latin typefaces. Volume 1 shows samples of several Hebrew typefaces: HEBRÄISCH I, HEBRÄISCH II, HEBRÄISCH IV, MAGALITH, MARUBA (MERUBA), RABBINISCH, and SCHREIBSCHRIFT. HEBRÄISCH I is a somewhat rounded typeface shown in one display size. HEBRÄISCH II is also a display typeface, shown in an even larger size; it has Bodoni style hairline serifs. HEBRÄISCH IV is a text typeface, shown in five sizes with and without vowel and cantillation marks. It has low contrast and is fairly rounded. MAGALITH is a high-contrast square text typeface shown in one size, with and without vowel and cantillation marks. MARUBA is very similar to MAGALITH, shown in one size (larger than the MAGALITH sample). Two different typefaces are called RABBINISCH in the catalog. The smaller size, RABBINISCH KORPUS, is a Rashi typeface. The larger size, RABBINISCH CICERO, is a half-cursive typeface (see FRIEDLAENDER90 for a sample and a brief discussion of this typeface). SCHREIBSCHRIFT is a handwriting typeface, shown in one size.

[20] Intertype Corporation. *Intertype Faces: One-Line Specimens Arranged by Point Size*. New York, 1948.

The catalog displays several Hebrew typefaces: FRANK-RÜHL, MIRYAM (listed

אוכלין ממצרים

ויהי אחר הדברים האלה

והיא שעמדה לאבותינו ולנו,

שלא אחד בלבד עמד עלינו

ויהי אחר הדברים האלה והאלהים נסה את אברהם ויאמר
אליו אברהם ויאמר הנני: ויאמר קח נא את בנך את יחידך
אשר אהבת את יצחק ולך לך אל ארץ המריה והעלהו שם
אבגדהוזחטיכלמנסעפצקרשתאבגדהוזחטיכלמנסעפצקרשתר

[Schreibschrift cursive specimen lines]

אליך: ויטסס אכרהס ככתר ויחבש את המרו ויחת
את סני נעריו אתו ואת יסחק בנו ויבקע עצי עלה
אבגדהוזחטיכרלמנסעפצקרשתאבגדהוזחטיכרלמנסעי

ואני והנער נלכה עד כה ונשתחוה ונשובה אליכם: ויקח אברהם את עצי העלה
וישם על יצחק בנו ויקח בידו את האש ואת המאכלת וילכו שניהם יחדו: ויבנו
אבגדהוזחטיכלמנסעפצקרשתאבגדהוזחטיכלמנסעפצקרשתאבגדהוזחטיכלמנסעפלו

Figure 9: Drugulin typefaces. Sizes, according to the German system, are given in parenthesis. From top to bottom: HEBRÄISCH II (Grobe Kanon), HEBRÄISCH I (Doppelmittlel), MARUBA (MERUBA, Text), HEBRÄISCH IV (Cicero), SCHREIB-schrift (Korpus), RABBINISCHE (Cicero), and RABBINISCHE (Korpus). reproduced from [?].

<div dir="rtl">

די ערפֿאַלגרייכע שטאַן 123
די ערפֿאַלגרייכע שט 123

</div>

Figure 10: Intertype faces: HEBREW CONDENSED (top), and HEBREW MODERN (bottom). Reproduced from [21].

as MIRJAM), HEBREW, HEBREW NO. 1 (which appears to be a different from ATF's HEBREW NO. 1 [18]), HEBREW NO. 2, HEBREW MODERN, HEBREW CONDENSED, RABBINIC, and RASCHI. All but the last two are square faces. RABBINIC, and RASCHI are rashi-script typefaces. Earlier Intertype catalogs, for example from 1930 and 1946, also display Hebrew typefaces.

[21] Letraset Limited. *[A Catalog of Hebrew Typefaces]*. 1986.

This catalog of dry-transfer typefaces shows 40 Hebrew typefaces, and a 1987 specimen sheet shows another one. Some of the typefaces come in several weights and widthds. Some of the typefaces are designed to match specific Latin typefaces, which the the catalog specifies. Two typefaces, MEIR DAN and MOSHE AMAR, include 2 or 3 varations for some of the letters. The typefaces that are displayed are AHARONI (for use with GROTESQUE 216), ORON, (for use with the Latin UNIVERS), EYAL (a variation of HAZVI), ANNONCE GROTESQUE (for use with the Latin ANNONCE GROTESQUE), ARMON, BEN-YEHUDA, GAD (for use with ANTIQUE OLIVE and FOLIO), GROTESQUE 7 (for use with the Latin ANNONCE 7), GROTESQUE 9 (for use with the Latin ANNONCE 9), DAVID, DAN (for use with HELVETICA), HADAS (HADASSAH), HAZVI, VENUS (for use with the Latin VENUS and with ANNONCE GROTESQUE), ZOREA, HOMA, HAIM, UNIVERS (for use with the Latin UNIVERS and with HELVETICA), MEIR DAN (for use with AVANT GARDE), MIZRAHI, MICROGRAMMA (for use with Latin MICROGRAMMA and with EUROSTYLE), MIRYAM, MOSHE AMAR (for use with FRANKFURTER), NARKIS (NARKIS BLOCK, mostly designed to be used with FOLIO, but some fonts designed to be used with VENUS, ANNONCE GROTESQUE, and FUTURA), NARKISS TAM, STAM (somewhat similar to MERUBA, but unrelated to Berthold's STAM), IRIT (for use with FUTURA), AMIT (for use with FOLIO and FUTURA), ETZ ATIK, POLLY (for use with FLASH), FRUAK-RÜHL, AMRAM PRATH (for use with LINEAR and PUMP), ADI (for use with DIN), ZWIAH, COMPACTA (for use with the Latin COMPACTA), ROLI BAZAK (for use with FLASH), ROLI ATID (for use with FUTURA),

Figure 11: Letraset typefaces. From top to bottom: AMRAM PRATH, ZOREA, GAD, VENUS, IRIT, MICROGRAMMA, ARMON, BEN YEHUDA, ETZ ATIK, MIZRAHI, RAHEL, ROLI BAZAK, and YAHALOM, Reproduced from [21].

אויף דעם ליינאָטײיפ וועראָן א 12

אויף דעם ליינאָטײיפ 12

אויף דעם ליינאָטײיפ וע 12

Figure 12: Linotype typefaces: HEBREW (top two lines), HEBREW CONDENSED, and HEBREW EXTRA CONDENSED (bottom). Reproduced from [22].

RACHEL (unrelated to Francisca Baruch's RACHEL), SHMUEL, and TEL VARDI (for use with UNIVERS and COMPACTA). The loose specimen sheet shows YAHALOM, a formal script.

[22] Mergenthaler Linotype Company. *Specimen Book: Linotype Faces*. Brooklyn, New York, 1939.

This catalog displays several Hebrew typefaces. HEBREW, HEBREW NO. 2, HE-BREW NO. 3 (a version of MIRYAM), HEBREW CONDENSED, and HEBREW EXTRA CONDENSED. HEBREW and HEBREW NO. 3 are also shown in an oblique (slanted) version, HEBREW is shown in medium and light weights, and HEBREW NO. 2 in medium and bold. The catalog claims that HEBREW NO. 3 "introduces the modern sans serif design to Hebrew Types." In fact, however, this typeface is a version of MIRYAM that appeared in a Berthold Catalog [18] fifteen years earlier. A Linotype catalog from 1920 also shows a single Hebrew typeface, HEBREW.

4   Readability

This section lists articles that focus on readability and legibility in Hebrew. Legibility is also discussed, of course, in many of the articles about typefaces listed in Section 2.

[23] Joseph Shimron and David Navon. The distribution of visual information in the vertical dimension of Roman and Hebrew letters. *Visible Language*, 14(1980), pp. 5–12.

The paper shows, using experiments, that a mutilated Hebrew text containing only the bottom part of letters is more readable than a mutilated text contain-

ing only the top part of letters. The opposite is true for English. The authors conclude that most of the information is contained in the bottom halves of Hebrew letters as opposed to the top halves of Latin letters. Bigelow and Holmes state that they have used this study in their design of the Hebrew letters in Lucida Unicode [4].

[24] Ittai Joseph Tamari. Decipherability, legibility and readability of modern Hebrew typefaces. in *Raster Imaging and Digital Typography II*, Robert A. Morris and Jacques André, editors, Cambridge University Press, 1991, pages 128–136.

This paper touches on several topics that are not tightly integrated. Tamari describes the Hebrew writing system, including the alphabet important properties of the letter forms, diacritical marks, and orthography. He than briefly displays and describes a few Hebrew typefaces: Frank-Rühl, Drugulin, Hadassah, David, Narkiss, and Narkiss Chadash. He concludes with a few remarks about the process of reading Hebrew and the conservatism of Hebrew printers.

5   Typography

This sections lists publications that discuss how Hebrew is typeset from the graphic point of view.. Technical aspects of computer typesetting of Hebrew are covered in Section 6.

[25] Aharon Cohen. [Correct word division in Hebrew]. In Hebrew. *Olam Ha-Defus* Volume 3, Number 9/33, July 1960, page 131.

אהרן כהן. חלוקת מלים נכונה בעברית. *עולם הדפוס*, יולי 1960.

This article suggests rules for word division in Hebrew. Using the suggested rules requires a thorough knowledge of Hebrew grammar.

[26] Shalom Eilati and Varda Lenard. Guide for contributors. In Hebrew. An addendum to *Katedra* 70, 1994.

שלום אילתי וורדה לנרד. הנחיות למחברים. נספח *לקתדרה*, תשנ״ד.

This is a condensed "manual of style" for a Humanities journal in Hebrew. It describes current typographic conventions for both English and Hebrew materials. Perhaps the most important convention requires the use of a bold face in Hebrew where an italic face would be used in English, such as in cited book titles. Slanted or cursive Hebrew faces are not mentioned at all. (Slanted and cursive typefaces are used, however, in current Hebrew typography.)

[27] Herman Frank. *Jewish Typography and Bookmaking Art*. In Yiddish.

הערמאַן פֿראַנק. *אידישע טיפּאָגראַפֿיע און בוך אויסאַרבּעטונג קונסט*. אידישער שריפֿטזעצער יוניאָן, נום. 83, ניו-יורק, 1938.

I cannot comment on the content since I do not read Yiddish. Includes several type speciments of 19th century typefaces and of Frank-Rühl.

[28] Henri Friedlaender. *[On Letters and Digits]*. Hadassah Printing School, Jerusalem, 1960.

פרידלנדר, הנרי. *על אותיות וספרות* דפוס לימודי הדסה, ירושלים, תש״ך.

[29] Henri Friedlaender. *[Book Craft]*. Hadassah Printing School, Jerusalem, 1962.

הנרי פרידלנדר. *מלאכת ספר*. דפוס לימודי הדסה, ירושלים, תשכ״ב.

I have not yet seen these two items.

[30] [The typography of our childrens' books—existing and desired]. *Sifrut Yeladim Vanoar*. 21(2):15–21, 1995.

שלמה הרמתי. הטיפוגרפיה בספרות הילדים שלנו–מצוי ורצוי. ספרות ילדים ונוער, כ״א(ב׳):15-21, 1995

This article discusses readability in Hebrew and factors that affect readability in general. It explains why Hebrew is less readable than latin languages and compares teh readability of a few Hebrew types (Frank-Ruhl, Miryam, and Haim). Haramati makes a few suggestions regarding readable page layouts.

[31] Stephen Lubell. Bilingualism in the Hebrew Text. *Visible Language*, 27(1–2):162-204, 1993.

This article discusses Bilingualism in Hebrew text both from the linguistic point of view and from the typesetting point of view. The main issues discussed in the section on typesetting are whether to translate foreign phrases or to leave them in the original, and the correct typesetting of foreign words and phrases in a Hebrew text. The typesetting of numerical ranges, such as years or page numbers, is also briefly. discussed. The article also includes reproductions of pages that contain both Hebrew and other languages, both historical and modern.

[32] Stephen Lubell. Hebrew typography—from the sacred to the mundane. *Typo/graphic Journal* (Journal of the Society of Typographic Designers), number 41, pages 16–23, 1990.

I have not yet seen this item.

[33] Simon Prais. *Design Considerations Affecting the Simultaneous Use of Latin and Hebrew Typography*. Master Thesis, Manchester Polytechnic, 1985. With a short introduction by Berthold Wolpe.

This thesis is intended to be a design aid for those designing documents that

contain text in both the Hebrew and Latin alphabets. The thesis discusses many issues in Hebrew/Latin typography and contains specific recommendations. Most of the recommendations are based on discussions that Prais had with typographers and Designers, including Zvi Narkiss, Meir Doron, Eliyahu Koren, Elly Gross, John Tomkins, and Yarom Vardimon. The discussions in an appendix.

The main part of the thesis is devoted to discussions of the issues arising in the design of different kinds of mixed texts, such as headlines, translations, and so on.

Prais proposes that when matching typefaces, the Latin typeface should have heavier lines than the Hebrew to match in color, since the Hebrew letter has shorter lines. Latin typefaces should have x-heights slightly lower than the height of Hebrew letters, except when the latin is set in all caps, in which case the cap height should match the Hebrew. Specific typeface combinations that he proposes are NARKISS CHADASH and ANTIQUE OLIVE, NARKISSIM and SOUVENIR, HADASSAH and CONGRESS, DAVID and QUORUM, FRANK RÜHL and BENGUIAT, MIRIAM and NEWS GOTHIC, CHAIM and HELVETICA. He mentions that Eliyahu Koren suggested the use of KOREN with KORINNA. He proposes the use of old-style numerals in Hebrew; he states that all Israeli typographers initially dismissed the idea. (some Hebrew typefaces, such as Koren, are sold today with old-style numerals.) He recommends that only one set of numerals be used in mixed texts. He explains the issues that affect the slant direction of inclined Hebrew letters and lists the opinions of the various typographers that he interviewed (they were not in complete agreement on this issue). He explains that dropped large letters are more suitable in Hebrew than standing large initials. Prais writes that Hebrew needs less leading than English and that vowel points improve the uniformity of the color of Hebrew type.

The thesis also contain a fairly detailed discussion of the typeface CHAIM, based on a meeting with the designer, Jan LeWitt, who told Prais that he disapproves of the question mark, which was not designed by him.

Prais also summarized Schonfield's ideas [35], which prais considers to be wrong. Several of Schonfield's typefaces are reproduced.

[34] Hugh Joseph Schonfield. *The new Hebrew typography, with an introduction by Stanley Morison and numerous types designed by the author and drawn by Bertram F. Stevenson.* D. Archer, London, 1932.

I have not seen this book. An attempt to develop romanized Hebrew type. Henri Friedlaender writes that he received this book from Stanley Morison and that

Schonfield's main thesis is wrong, but that the book influenced his decision to create a whole family of fonts rather than a single one. Prais summarizes the book and reproduce some of Schonfield's typefaces.

[35] Gershon Silberberg with contributions by Moshe Spitzer, Meir Ben-Yehuda, Shmuel Perez, and Arie Lotan. *Principles of Printing*. Irgun Mifale ha-Defus be-Yisrael, Tel Aviv, 1968.

גרשון סילברברג, בהשתתפות משה שפיצר, מאיר בן-יהודה, שמואל פרץ, ואריה לוטן. *תורת הדפוס*. ארגון מפעלי הדפוס בישראל, תל-אביב, תשכ"ב.

This is a essentially a textbook for typography, book design, and printing. It includes Spitzer's article [12] on Hebrew typefaces. The book covers many issues in Hebrew typography, including the following.

- Punctuation in Hebrew. The main difference from English is the use of quotes for acronyms and the fact that Hebrew uses typewriter-style quotes, ″ and ′.

- A brief discussion of word division (hyphenation).

- Typesetting vowel, cantillation, and other diactirical marks. Some issues are discussed in detail, including the use of two types of vav with a holam, the correct use of alef after a holam, and the interaction of a holam with a shin-dot (the book specifies a different solution than Koren [9]). Note that the difference between the two kinds of vav with holam cannot be represented in Unicode. (One kind represents the vowel "*o*" and the other the sound "*vo*". They differ graphically by a different placement of the holam.)

- A discussion of fonts for emphasis and for titles. The book suggests the use of bold face for emphasis (the bold weight of Frank-Rühl, the main Hebrew text face, was new when the book was written). Before bold weights were available, emphasis was achieved either by using a different typeface or by letter spacing.

- The use of Hebrew initials.

Includes a bibliography.

[36] Erhardt D. Stiebner. *Sefer Ha-Defus*. In Hebrew, a translation and adaptation of *Bruckmann's Handbuch der Drucktechnik*, originally published by Bruckmann, 1976. Translated by Gideon Stern. National Printing Union, Tel-Aviv, 1992.

אררהרדט ד' שטיבנר. *ספר הדפוס* תרגם מגרמנית גדעון שטרן. האיגוד הארצי של עובדי הדפוס, תל-אביב, 1992.

Includes a chapter on Hebrew typography by Zvi Narkiss. Discusses hebrew typefaces, emphasizing text, combining Hebrew and non-Hebrew text.

[37] Ittai Joseph Tamari, Hebraische typographie des Schocken verlags. In *Der Schocken-Verlag/Berlin: Judische Selbstbehauptung in Deutschland 1931-1938*, Saskia Schreuder, and Claude Weber, editors, Akademie-Verlag, Berlin, 1994. Pages 327–344.

Describes the typography of books published by Schocken in Germany.

6   Computer Typesetting of Hebrew

This section lists publications that describe the technical issues that are involved in computer typesetting of Hebrew. At a very basic level most typesetting programs can handle Hebrew by reflecting their output, given appropriate fonts. Handling bidirectional text is more complex, because some of the text flows from right to left and some from left to right. At the next level are programs that can correctly place vowel points, and programs that can place both vowel and cantillation marks. Another important issue is word division in Hebrew (hyphenation). Unfortunately, I have not found any discussion of hyphenation algorithms or Hebrew hyphenation in general, except for a short discussion in [35]. This section also includes references to the Unicode standard, a character set standard, to online specification of a few older Hebrew character set encodings that are still in use, and to AFII, a glyph encoding standard, The Unicode standard [46] and two Apple manuals [40], [40] provide good introductions to typesetting of so-called "complex scripts", which include Hebrew.

Placement of Hebrew diacritical marks is also discussed in a few publications listed in other sections. Koren [9] and Silberberg [35] discuss correct layout of Hebrew with vowel and cantillation marks. Narkiss [12] remarks that he designed a program for placement of vowel points, but gives no details.

The publications that are listed in this section are all technical documents that describe in some detail how Hebrew is typeset. In addition to the programs described by these papers, there are many other programs can typeset Hebrew. These include word processors, page layout programs, and drawing programs such as Qtext, Eistein, Dagesh, Hebrew Word, Accent, NisusWriter, QuarkXpress, PageMaker, FreeHand and Corel Draw.

[38] The Association for Font Information Interchange (AFII). A registry of glyphs available in electronic and printed formats. AFII Registrar, PO Box 33683, Northglen, CO 80233-0683, afii@ix.netcom.com, http://www.rit.edu/ afii.

AFII is a registry of glyphs approved by ISO in the standard *ISO 10036 — Information technology — Font information interchange — Procedure for registration of glyph and glyph collection identifiers.* Adobe uses AFII identifiers to encode glyphs for which no standard Postscript names exist, which includes all the Hebrew letters and marks. For example, adobe recommends that fonts that include the Hebrew letter aleph name the glyph *afii57664*, since the the AFII reference number for aleph is 57664.

[39] Apple Computer. *Inside MacIntosh: Text*. Addison-Wesley, 1993. Also available online from `http://devworld.apple.com`.

[40] Apple Computer. *Inside MacIntosh: Quickdraw GX Typography*. Addison-Wesley, 1994. Also available online from `http://devworld.apple.com`.

These technical manual, and especially their introductions, provide a good general introduction to the issues involved in typesetting complex scripts, including bidirectionality and diacritical points.

[41] Daniel Berry. Stretching letter and slanted-baseline formatting for Arabic, Hebrew, and Persian with DITROFF/FFORTID and dynamic PostScript Fonts. Technical Report, Computer Science Department, The Technion, 1997.

The paper presents a system for typesetting with stretchable letters. Letter stretching is common in Hebrew calligraphy and it was used in print at least until the 1930's as a justification mechanism, using wide letters. The system is an improved version of an earlier system (J. Srouji and D. M. Berry, Arabic formatting with DITROFF/FFORTID, *Electronic Publishing, Origination, Dissemination, and Design*, 5(4):163-208, 1992). Since the new system relies on fonts with letters that stretch, it allows for an arbitrary amount of stretching (as opposed to the first system that used an integral number of horizontal connecting glyphs) and for stretching letter parts that are not horizontal. The improvement is less significant for Hebrew than for Arabic and Persian, since in Hebrew the stretching is always of a horizontal part. The system also allows for a slanted baseline in Persian.

[42] Cary Buchman, Daniel M. Berry, and Jakob Gonczarowski. DITROFF/FFORTID, an adaptation of the UNIX/DITROFF for formatting bidirectional text. *ACM Transactions on Information Systems*, 3(4):380-397, 1985.

The paper describes a system for typesetting bidirectional text, based on the Unix DITROFF (Device-Independent TROFF) formatter. The system uses a preprocessor to perform character set conversion, and a postprocessor that reverses the order of text set in font that are designated as a right-to-left font.

[43] Yannis Haralambous. Typesetting the Holy Bible in Hebrew, with TEX. *TUGboat*,

15(3):174–191, 1994. Also appeared in the *Proceedings of EuroTEX 1994*, Gda«sk, 1994.

[44] Yannis Haralambous. "Tiqwah": a typesetting system for biblical Hebrew, based on TEX. *Bible et Informatique*, 4:445–470, 1995.

Haralambous describes a system for typesetting biblical Hebrew. The paper describes in details the algorithm that is used by the system for placement of vowel and diacritical marks. The paper also lists all the typographical oddities that are found in the Hebrew bible, including inverted letters, raised letters, letters that are too small or too large, final forms in the middle of the word and vice versa, and more. (In the Jewish tradition, some of these oddities are considered typos and are merely allowed, while others are believed to convey some meaning and are required.) The placement algorithm and the list of oddities, which is essentially a specification for biblical typesetting, are perhaps the two most important contribution of the paper.

The system includes a font with all the symbols required for typesetting bibles, including letters, several styles of vowel points and cantillation marks, and other specialized symbols. The system also includes a cursive RASHI font that is often used for commentaries. Haralambous's main font is based on a square 19th century typeface.

[45] Donald Knuth and Pierre MacKay. Mixing right-to-left texts with left-to-right texts. *TUG Boat*, 8(1):14–25, 1987.

The paper describes an extension, called TeX-XeT, to Knuth's TeX typesetting program that can typeset mixed right-to-left and left-to-right text. Knuth and MacKay's implementation has since been superseded by a new implementation that produces standard TeX output, due to Peter Breitenlohner.

[46] The Unicode Consortium. *The Unicode Standard Version 2.0*. Published by Addison-Wesley, 1996. Parts of the standard are available online at `http://www.unicode.org`.

Unicode is a 16-bit character set standard designed to encode most of the languages of the world. Unicode encodes the Hebrew letters, vowel points, cantillation marks, and punctuation specific to Hebrew. The vowel points and cantillation marks are *combining* characters in the Unicode terminology, which means that they are supposed to combine with letters without taking space in the horizontal direction. Unicode also specifies bidirectional behavior: directionality is a property of characters that is used by a bidirectional display algorithm. Hebrew is encoded by Unicode character block 0590–05FF which includes letters, vowel and other pronunciation marks, cantillation marks, punctuation

specific to Hebrew, and Yiddish digraphs. Unicode character block FB1E–FB4F encodes an additional diacritical mark, letters that are precombined with diacritical marks, the ligature *aleph-lamed*, wide variants of several characters, and a Hebrew form of the plus sign.

Mappings between Unicode and several 8-bit Hebrew encodings, including IBM Code Page 862, Apple's MacOS Hebrew encoding, ISO 8859-8, and Microsoft's Code Page 1255, are available from the Unicode Consortium web site.

7 Exhibition Catalogs

This section lists catalogs of exhibitions of Hebrew Typography, mainly exhibition of fine books. They are included in this bibliography because they can help readers find examples of well-printed Hebrew books.

One catalog of an exhibition of Hebrew typefaces [13] is listed in Section 2 and is omitted from here.

[47] Jewish National and University Library. *Dr. Moshe Spitzer: Books, Typography, Design*. An exhibition catalog in Hebrew and English with an introductory article [56] by Israel Soifer. H. J. Katzenstein, Editor. Jerusalem, 1981.

בית הספרים הלאומי והאוניברסיטאי בירושלים. ד״ר משה שפיצר: ספרים, אותיות, עיצוב. קטלוג תערוכה בעברית ואנגלית עם הקדמה מאת ישראל סופר. יעקב קצנשטין, עורך. ירושלים, תשמ״א.

The catalog lists books designed by Spitzer and displays sample pages from some.

[48] Jewish National and University Library. *An Exhibition of Hebrew Bibliophilic Books*. Y. Yudlov, editor and curator. Jerusalem, 1972.

בית הספרים הלאומי והאוניברסיטאי בירושלים. תערוכת ספרים ביליופיליים עבריים. י' יודלוב, עורך ואוצר. ירושלים, תשל״ג.

This catalog lists Hebrew Bibliophilic books, including finely printed books.

[49] Leonard Singer Gold, editor. *A Sign and a witness: 2,000 years of Hebrew books and illuminated manuscripts*. New York Public Library and Oxford University Press, 1988.

Avrin's essay [4] is the only essay on modern Hebrew typography in this volume. Also includes an extensive bibliography.

8 Professional Biographies

This section lists publications that are primarily biographies of Hebrew typographers. Short biographies of several type designers are also provided in [13] and [4].

[50] *Defus Graph*. An article on Zvi Narkiss, in Hebrew. Number 59, pages 94–98.

דפוס גרף. מאמר על צבי נרקיס. מספר 59, עמודים 94–98.

[51] William C. Fontaine. The Hadassah type at Dartmouth's Graphic Arts Workshop in Baker Library. *Dartmouth College Library Bulletin*, 32(1) (New Series), 1991. Available online at `http://www.dartmouth.edu/~library/Library_Bulletin/Nov1991/LB-N91-Fontaine.html`.

Fontaine tells the story of the design of HADASSAH by Henri Friedlaender and how Dartmouth College came to own a set of 16-point Hadassah type, which was originally owned by Joseph Blumenthal's the Spiral Press in New York.

[52] Stephen Lubell. Joseph Cherkassky—orientalist and typefounder. *Gutenberg Gesellschaft Jahrbuch 1996*, pages 222–239.

Cherkassky was head of the oriental section of Berthold AG (Typefounders) in Berlin during the 1920s, and he edited Berthold's catalog of Hebrew typefaces [18].

[53] G. W. Ovink. *Die Gesinnung des Typographen: Laudatio, anlassl. d. Verleihung d. Gutenberg-Preises 1971 d. Stadt Mainz am 21. Juni 1971 an Henri Friedlaender*. Gutenberg-Gesellschaft, Mainz, 1973.

I have not seen this book. It is perhaps associated with the 1971 Gutenberg prize awarded to Friedlaender.

[54] Israel Soifer. Henri Friedlaender: New approach to type. *Publishers' Weekly*, (1 July 1968):74-75.

I have not seen this article. Cited by Fontaine [56].

[55] Israel Soifer. The pioneering work of Moshe Spitzer. An introductory article in English and Hebrew in [49]. Reprinted from *The Penrose Annual*, 63, 1970.

ישראל סופר. עבודתו החלוצית של משה שפיצר.

The article describes Spitzer's work as a publisher and book designer, his contribution to the design of several Hebrew typefaces, and other contributions to fine Hebrew printing.

[56] Israel Soifer. Henri Friedlaender: Book designer. *Ariel: A Quarterly Review of Arts and Letters in Israel*, 33–34:131–140, 1973.

This professional biography of Friedlaender was published in conjunction with an exhibition of his work earlier the same year at the Israel Museum, entitled "Henri Friedlaender: Typography and Lettering".

[57] Standard, Paul. Henri Friedlaender: A Koch pupil who brings his master's reflective spirit to the Dutch book arts. *Print: A Quarterly Journal of the Graphic Arts*, 5(2):15-27, 1947. Reprinted in Hebrew in *Olam Ha-Defus*, volume 4, number 1/37, January 1961, pages 4–5.

The article describes the early part of Friedlaender's career and displays examples of his Calligraphy, book design, and preliminary designs of his typeface Hadassah.

[58] Robert Ranc. Henri Friedlaender. *Arts et Techniques Graphiques*, 85:3-26, 1972.

I have not seen this article. Cited by Fontaine [56].

[59] Walter Remy. *Henri Friedlaender und das Hohenlied ein Gruss Zum 80 Geburtstag* Edition Curt Visel, Memmingen, 1984. Pages 43–55. In Illustration 63–Jg.21,Heft 2 (August 1984)

I have not seen this publication.

[60] Ilana Valdman. *Henri Friedlaender: A print and book artist and his contribution to fine Hebrew printing*. In Hebrew, with a title and abstract in English. Master's thesis, School of Library, Archive and Information Studies, Hebrew University, Jerusalem, 1993.
אילנה ולדמן. *הנרי פרידלנדר: אמן דפוס וספר ותרומתו לדפוס העברי הנאה*. עבודת גמר לתואר מוסמך, בית הספר לספרנות, ארכיונאות ומידע, האוניברסיטה העברית בירושלים. תשנ"ד.

I have not seen this work.

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